

**Migration, Work, Health, and Justice:
Occupational Safety and Health Among
Immigrant Workers in Somerville,
Massachusetts**

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Abstract

In this community based participatory research on immigrant workers in Somerville, a range of methods was used to understand the occupational health risks incurred by immigrants in Somerville, MA. Our project represented a healthy mix of community initiatives and research. The project was very successful in initiating a number of meaningful community outreach efforts through the Teen Educators, the administration of community occupational health fairs and the establishment of Vida Verde Co-Op. The study employed mixed methods which included - a survey (N=405) of respondents who identified themselves as immigrant workers either living or working in Somerville, MA from 2006-2009, focus groups with immigrant workers (N= 48), the performance of annual key informant interviews (N = 50) and in-depth interviews with selected recent immigrant women workers (N = 8). The results show that by partnering with five community organizations, each with access to different ethnic groups, our project benefitted greatly from the level of trust, interaction and effective communication enjoyed by these organizations.

We found that ethnicity, years in the US, English proficiency, age, occupational classification and health insurance were better predictors for occupational health risks compared to gender, work and health and safety training, knowledge of Massachusetts Workers' Compensation Law and access to doctors in this study. Construction workers reported significantly higher health problems due to work and injuries at work, and lower access to occupational health services than

cashiers and the other low income jobs explored in this study. Cleaners reported significantly lower access to work training, health and safety training and knowledge of workers compensation than cashiers and factory workers reported significantly lower work training than cashiers in this study. In our interviews with recent immigrant women engaged in low skill, unstable employment, we found that few employment choices were available. Those that were present were characterized by poor working conditions which were often conducive to abuse and worker rights violations. A number of hazardous exposures and corresponding health effects were noted in these jobs. These occupations did not benefit from adequate work safety measures and support systems which likely affected the physical and psychological health of these workers. The development of protective policies specific to informal labor markets are essential, as is the enforcement and the implementation of safety interventions to improve the quality of work and life for these workers.

Dedicated to my loving parents

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Migration, Work, Health, and Justice:
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I. Understanding Immigrant Work and Health

INTRODUCTION

Across the world millions of people are on the move in search of employment and economic opportunities. The United Nations estimates that 100 of the approximately 214 million migrants worldwide are made up of migrant workers and their families (WHO 2010). This excludes the conservatively estimated 15-30 million undocumented migrant workers worldwide (Barten et al. 2008).

International migration has more than doubled since 1975 and with it the patterns and trends in migration have changed. Generally, migrants move from low to middle and high income countries located in Europe, North America and the wealthy Arab and Asian countries like Kuwait or Singapore to meet their economic need for work, education and better living (Benach et al. 2010).

However much of the migration (60%) occurs between developing countries or between developed countries and only 37% is from developing to developed countries. More recent trends show that most countries are simultaneously countries of origin, transit and destination, that a small portion of migration is from the high income countries to the poor countries as well which includes both short and long term relocation, permanent migration and circular migration back to the place of origin (WHO 2010).

Immigrants form a significant portion of the United States population. Patterns and trends in immigration in the U.S have changed widely over time (This topic is discussed more fully later in this Chapter). Much of the migration to the U.S

today is from the developing countries of Mexico, Central America and the Caribbean and with large increases from many Asian countries especially since the 1980s. The pressures to migrate from these countries are high considering that developing countries have 342 candidates for every 100 jobs (Schenker 2008). The International Labor Organization (ILO) states that, “many developing countries face serious social and economic dislocation associated with persistent poverty, growing unemployment, loss of traditional trading patterns and what has been termed a growing crisis of economic security” (Taran and Geronimi 2000). According to the US Census Bureau (American Community Survey 2008) there were 37.9 million foreign born in the United States, comprising 12.5% of the total US population and 16% or about twenty million of the total U.S civilian labor force. Undocumented immigrants are also a significant part of the U.S economy, with about 44% of them having arrived since 2000. They make up 30% of the foreign born population.

Approximately, 11.9 million workers in the U.S labor force are estimated to be undocumented in 2008 (Terrazas and Batalova 2009, Hanson 2007) and these undocumented immigrants contribute \$7 billion a year in social security taxes even though they, in many cases do not claim any benefits (Traub 2009). The current US economic recession with the official unemployment as high as 10% has also limited the employment opportunities for immigrants as well (BLS 2010). While the unemployment rate for whites is 8.8%, the unemployment for blacks is twice as high 16.5% and Hispanics is 12.6%. The Migration Policy

Institute (MPI) estimates that the number of undocumented immigrants has fallen by about 1 million between 2007 and 2009 due to the recession (Chishti and Bergeron 2010).

Though the majority of the migrant workers are men, more women and children are becoming international labor migrants. 95% of these working immigrants live in metropolitan areas (McCauley 2005). Long standing social divisions in the United States have led to the disproportionate concentration of Black, Hispanic and other minorities in low paying dangerous jobs (Murray 2003). While a small portion of the new immigrants hold white collar jobs, a good number are young, poor, lack higher education, language skills, work in low wage sectors and perform labor intensive, high risk jobs that complement higher level jobs. In the United States one in five of all low wage workers are immigrants (Capps et al. 2003, NILC 2007). These immigrants also, in turn, work as “instruments of maintaining competitiveness” or as wage control measures that national governments often use to regulate the labor market (Taran and Geronimi 2000, Benach et al. 2010, Sassen-Koob 1981).

Depending on countries of destination, migrant workers are present in industry sectors such as construction, manufacturing, food service, health care, domestic service, agriculture and mining (Benach et al. 2010; Clougherty et al. 2010). With the shift in the structure of work from heavy manufacturing to service industries in developed countries partially due to outsourcing and enterprise movement off-

shore, immigrant workers that concentrate in urban areas comprise the bulk of the service industry. The concept of a defined and consistent workplace is also becoming relative in some of these jobs. An increasing number of the immigrant workers are in unstable work situations such as temporary work, part time work, day work, and contract work where workers are hired by outsourcing consultants in some cases. Many U.S. businesses are using temporary workers and contractor supplied services instead of hiring employees directly to retain more competitive position in the marketplace (Clinton 1997, Barten et al. 2008, NIOSH 2002). Employers view contract labor as a favorable solution to fluctuating product demand, providing for staff absences; as a means of reducing labor costs; as a means to avoid unions and the resulting demand for higher wages; and finally, to avoid compliance with regulatory and immigration issues (Clinton 1997). While contractors can provide steady employment to workers who might otherwise float between day jobs and temporary positions they can derive other sources of revenue by charging workers fees for work transportation, tools and equipment, and assistance provided to workers with immigration problems (Valenzuela 2000).

This growth of what has been termed the “informal” economy is often unregulated, small scale, home based and offering services such as food and beverage commerce, cleaning /domestic service and auto and electronics repair (Barten et al. 2008). Nationally, one-fourth of all hired agricultural crop workers are employed by a contractor rather than working directly for a grower or farm

operator (Villarejo & Baron 1999). Undocumented workers have also been shown to be occupied in potentially harmful illegal employment conditions such as servitude, bonded labor, trafficking or slavery (Vogel 2008). These informal jobs are low paid and have little job and legal security, social work related benefits, or access to occupational and health services. Few migrant workers benefit from social security compensation or rehabilitation schemes for occupational disease or injury.

Throughout the world, the poorest have been the most affected due to lack of safety at work – often, women, children and immigrants (Clougherty et al. 2010). Some migrants arrive at their new destination with many risks to their health. Migration itself compounds the health risk from the elevated levels of distress arising from displacement, insertion into a new environment, neighborhood segregation, social exclusion, and marginal access to social benefits and social services (WHO 2008). An immigrant's health and quality of life may suffer from the precarious occupational choices available upon arrival due to their immigrant status. Factors include not only deficient language skills, non-transferable education/training and economic needs but also marginalization within the job market, institutional/legal discrimination and xenophobia (Ahonen et al. 2007).

According to the International Labor Organization (ILO), more than 2 million people die from occupational accidents or work – related diseases every year. Conservative global estimates suggest 270 million occupational accidents and 160

million cases of occupational diseases occur on an annual basis. Half of these deaths may be caused by exposure to hazardous chemicals. Information on immigrant morbidity and occupational fatality rates is scarce. Few countries disaggregate data that permits analysis on occupational health issues. The U.S. alone reported 3.7 million cases of occupational injury and illnesses in 2008. Of these, 71 % occurred in service providing industries; the remainder in goods producing industries (BLS 2009).

Work also provides an opportunity for social engagement (Krieger 2006). Social inequities in occupational settings include larger social issues, labor management relations, discriminatory employment practices, autocratic management styles, exploitation of cheap labor, language, cultural barriers, and the absence of mechanisms for promoting worker involvement in prevention efforts can all serve to breed social inequities (Lipscomb et al. 2006). Without access to work and social support systems, health benefits and access to health services immigrant workers face a disproportionate risk of workplace injury, illness and social isolation.

Such high numbers of severe health outcomes among immigrant workers contribute to one of the most important impacts on the health of the world's population. Occupational injuries and diseases are of greater consequence in the developing countries as 70% of the working population of the world live in areas where occupational safety and health is poorly regulated and generally considered

a low priority (Barten et al. 2008). Affecting the health of the working population, occupational injuries and diseases have a profound effect on the productivity and economic and social well-being of workers, their families and dependents. According to ILO, the cost of work-related health and associated productivity loss may amount to decreases of several per cent as reflected in the Gross National Product (GNP) of affected countries.

History of Immigrant Occupational Health in the U.S

The United States is a country that is built and populated by immigrants. From the early eighteenth century onwards, slaves and the poor had become essential to the U.S. economy as they worked in the farms, mines and manufacturing. Until 1840, more Africans than Europeans came to the U.S each year. The continuing demand for African slave labor arose from the development of plantation agriculture, the long-term rise in prices, consumption of sugar, and the demand for miners. The slaves were employed as skilled laborers in sugar, tobacco, cotton plantations, and mines and as house servants. The success of tobacco planting and export laid the foundation for the southern agrarian economy and legalization of African slavery. The early agricultural work on the fields included clearing trees and starting crops on virgin fields. This harsh and backbreaking work, combined with poor nutrition, bad water, and exhaustion from both the journey and subsequent labor weakened the newly arrived slaves and yielded high rates of premature mortality and morbidity (USDA 2007, Abrams 2001). Commercial corn and wheat belts developed by 1850. By 1865, at the end of the Civil War, the sharecropping

system in the South replaced the old slave plantation though Blacks continued to be the dominant field hands for some time (USDA 2000).

Between the Civil War and 1900, the advent of the steam engine, electricity, railroads, textile weaving machines and other technological developments transformed industry. This nascent development of capitalism permitted some of the poor, immigrant and slave workers to leave the farm land and go into the burgeoning factories in the cities. The textile industry was the first large industry sector that transformed America from an agrarian to an industrial society. The textile industry in turn also increased the need for labor on cotton plantations. Throughout the 19th century, wave after wave of immigrants--Irish, French-Canadian, Greeks, Polish, and Portuguese--arrived in "mill towns" such as Lowell, Massachusetts looking for job opportunities in the expanding textile industry. The early mill girls in Lowell were of different ages. Some were not over ten years old; but the majority was between the ages of sixteen and twenty - five. In 1845, it was not uncommon that the working day in the mills varied from twelve to fourteen hours, from sunrise to sunset (Robinson 1883).

The railroad industry in a similar pattern was populated by immigrants from Europe and China. The economic boom propelling the nation since the Civil War posed severe labor shortages, several states established recruitment agencies in Europe and a treaty with China for the import of labor was signed in 1868 (Sassen-Koob 1981). The Union Pacific used an army of 20,000 workers most of

whom were Chinese and Irish immigrants (nine out of ten of the workers were Chinese) to lay at times 5 miles of track a day, by hand, from sunrise to sunset 12 to 16 hours a day seven days a week. In 1889, the Interstate Commerce Commission recorded 22,000 railroad workers killed or injured by the heat, the cold, or battles with Indians opposing the invasion of their territory. However, medical care was never provided to these manual workers. (Zinn 1980, Stillgoe 2010).

Mining, heavy construction and industrial jobs were dominated by Blacks and Native Americans. The Gauley Bridge project of Virginia involved digging through a mountain of almost pure silica. 80% of the workers hired to dig were Black. Acute silicosis cases resulted in these workers. 76% of those who died from the disease between 1930 – 1935 were Black (Murray 2003). Similarly, in the chromate industry, the rate of respiratory cancers was eighty times higher among Blacks (Lloyd 1971). 74% of the coke-oven workers in the steel industry were Black and suffered ten times the risk for lung cancer (Mazumdar et al. 1975). Similarly, Native Americans dominated the uranium mining industry in the Navajo areas of New Mexico until 1960 when the reservation banned uranium mining (Panikkar et al. 2007) Native Americans had higher rates of x-ray changes and restrictive lung disease than Whites or Mexican Americans (Mapel et al. 1997, Murray 2003).

As the 20th century began, immigrants predominantly from Central and Eastern Europe poured into America looking for jobs. Between 1860 and 1920, immigrants, as a percentage of the total population, fluctuated between 13 and 15% (Terrazas and Batalova 2009). Eastern Europeans found work in the steel mills, the foundries, and the coal mines. Italians and Jews entered the needle trades. Slavs found work in the great Chicago meat packing plants, alongside the Irish who had preceded them (Abrams 2001). The share of foreign born in the US population continued to decline between the 1930s and 1970s, due to the National Origins Act of 1924 and the imposition of immigration quota systems based on nationality. By 1930 the immigrant population in the U.S had dropped to 11.6%. It continued to decline, reaching a record low of 4.7% in 1970 (Terrazas and Batalova 2009).

Since 1980, even as the US industrial/ agricultural base diminished, the percentage of immigrants rose rapidly, mainly due to large-scale immigration from Latin America and Asia. In 1980 the US immigrant population rose to 6.2% and by 2008, 12.5% (Terrazas and Batalova 2009). This recent wave from Latin American and Asian countries is in stark contrast to those of mostly European countries in the 1960's. Three quarters of these 21st century immigrants to the U.S. were working in the service, sales, manufacturing, construction and seasonal farm sectors. These immigrants are experiencing a similar evolution of struggle as the immigrant workers of the 19th and early 20th centuries facing the hazards of pesticides, machinery, and poor living conditions, with little access to health care,

insurance or Workers' Compensation (Abrams 2001, Terrazas and Batalova 2009).

The health and the plight of the early indentured laborers, slaves and new immigrants has been amply recorded by scholars since the end of the 15th century. Thackarah in his 1832 seminal work, *The Effects of Arts, Trades, and Professions, and of Civic States and Habits of Living on Health and Longevity*; noted that the rich generally enjoyed better health and live longer than the poor (Ward 1970). He divided the society into different classes of occupation and concluded that manual laborers lived shorter lives than the more affluent merchants, professionals and employers (Abrams 2001) and that certain industries were associated with "painful disease and premature disablement or death to the employed persons" (Rosen 1953) . In 1848 Rudolf Virchow, crystallized the concept of social medicine when physicians observed the illnesses of slaves and serfs as being associated with their working and living conditions (Fairchild et al. 2010, Mackenback 2008). Such characterization was not new. Pliny spoke of the poisonous nature of lead, mercury, and sulphur and classified them as diseases of the slaves, referring to workers in manufacturing and mining (Abrams 2001).

The years between approximately 1890 to 1920 were considered a remarkable period in the history of occupational health in the United States. It was marked by the struggle for the eight-hour workday, child labor protection, factory inspection laws, and the development of a Workers' Compensation system. The period was

also one of intense struggle. The concept of social responsibility, labor legislation and good working conditions in America came at the price of many tragedies. By 1911, six states— California, Connecticut, Illinois, Michigan, New York, and Wisconsin—had passed laws requiring physicians to report occupational diseases. While the tragedies of unprotected workers continued daily, disfiguring bone cancers in the jaw known as “radium jaws” were detected in radium dial workers from exposures to radium and mesothorium in 1924 (Clark 1997), lead and mercury poisonings, silicosis, and other pneumoconiosis were also found to be occupationally related diseases. On March 25, 1911, a fire occurred in New York City at the Triangle Shirtwaist Company, in which 146 workers, mostly young immigrant women, were killed. Many of them perished while trying to open exit doors that had been locked or jumping from high windows to the street. This marked a turning point in workplace regulation and factory inspections. Departments of Labor could legally enter workplaces and issue orders to abate immediate hazards though they did not exert this power with any frequency (Abrams 2001). The Triangle Shirtwaist incident also increased support for the passage of Workers’ Compensation laws (Fairchild et al. 2010). Continuing high rates of accidents and mortality, including growing awareness of the problems of occupational cancer and other chronic diseases led to the Enactment of the 1969 Coal Mine Health and Safety Act and in the following year the 1970 Occupational Safety and Health Act (OSH Act). The congressional hearing on lung cancer deaths from bis-chloromethyl ether at the Rohm and Haas Chemical plant in

Philadelphia resulted in the Federal Toxics Substance Control Act (TSCA) in 1976.

Some of the regulatory changes came through occupational legislation, technological advancement, some through popular media awareness, and social movements. In 1872, the steady replacement of the manual block system with the automatic block signal, which controls intervals of electrified track circuits, abolition of the link & pin coupler and universal acceptance of the Westinghouse air brake, reduced the frequency of accidents and collisions that were killing and maiming railroad workers (Stillgoe 2010).

Upton Sinclair, a socialist writer, in his 1906 best-selling book, “The Jungle”, portrayed the struggle of the immigrant workers in the meat packing plants in Chicago, which prompted a Congressional investigation. The book and the attention generated by it was largely responsible for passage by the U.S. Congress of a new meat inspection law as well as the first comprehensive food and drug regulation – the Pure Food and Drug Act and the Meat Inspection Act. While the struggle for the eight-hour workday was taking place, some workers had already won the shorter day. Steelworkers, however, predominantly comprised of Slavic immigrants continued working 12-hour days, seven days a week. John A. Fitch, a leading advocate for the steelworkers listed their hazards as mineral dusts, tuberculosis, heat, deafness, and deaths from explosions, asphyxiation, falls, and electric shock (Fairchild et al. 2010). The 8-hour day was

not recognized as standard throughout the country until passage of the Fair Labor Standards Act in 1938, which set maximum hours and minimum wages for interstate commerce.

The pressure resulting from community action, the environmental protection movement, as well as legislation all aided the industrial worker from increasing protection from defined toxic exposures such as lead poisoning. These years also saw the many social and health reforms pioneered by Jane Adams of the Hull House Chicago, Alice Hamilton, Florence Kelly and others. As a result of their work the Illinois Legislature passed the first law limiting the hours of work for women and establishing the minimum working age of 14 years and resulted in factory inspections. Alice Hamilton pioneered occupational medicine as a free standing specialty and identified carbon monoxide poisoning among steel workers, lead palsy in painters, and pneumonia and rheumatism in many stockyard workers and studied mining and smelting, silicosis, vibration injuries and other occupational risks and diseases (Abrams 2001, Fairchild et al. 2010).

By the end of the 1990s, while the Civil Rights Movement has generated unprecedented opportunities for upward mobility in the Black community, the struggle for a classless society is not over. Occupational and health differences by race, ethnicity, and sex exist, with immigrants and Blacks still at a disadvantage within the current economic system. The daily activities of the current workers reveal extreme antagonism, persistent poverty, arduous labor and an inadequacy

to meet the day to day needs of life. Rockman (2005) defines this divide as a product of capitalism whose very structure relies upon a class division of workers who lack legal freedom or social equality, to the wealth of some and the impoverishment of others.

Legislative action can dramatically improve the lives of immigrants, through the provision of efficient health care policies and work organization in immigrant jobs. Access to health care, health insurance and workers' compensation are still an acute problem for immigrants in the United States despite a 1939 health proposal by "The Committee on the Cost of Medical Care" who viewed poor health, not only a problem of inability to afford care but as a systemic problem of the underlying economic structure (Ross 2002, Fairchild et al. 2010) Recent problems also stem from the decrease in the regulated manufacturing sector due to outsourcing and the increase of employment in the service sectors. This has led to rise in the informal job sectors largely outside of regulatory control which, in general, provide less occupational health services to its workers and little access to union memberships (Lipscomb 2006). It is conceivable that new health policies sought by the current Obama administration would not improve health care access to many immigrants, for example, by further restricting access to public benefits, and limiting access to safety-net provisions for unauthorized immigrants contributing to higher occupational health fatalities and morbidities.

Research on Immigrant Work and Health

Immigration in the 21st century has its own distinctive patterns compared to the earlier forms. The immigration channels are wider than ever before. The reconfiguration of the labor system from local trade to the global trade, free market, and freedom from boundaries have resulted in massive widespread labor migration where immigrants function as the basic commodities in the labor export and import policies (Sassen-Koob 1981).

Migration largely follows specific trends in the capitalist systems that have resulted in specific forms of labor scarcities. Successful working class organization and access to welfare benefits acts as an alternative to low-wage jobs in the industrialized countries and have created a shortage of cheap, powerless labor (Sassen-Koob 1981). Low-wage labor sectors feature low job security, obsolete and hazardous equipment and shift based or informal work. Immigrant workers are claiming these jobs, a larger share of which are in the urban service sector, jobs that cannot be exported unlike manufacturing, which can be outsourced. These changes pose new challenges for the occupational health status of the immigrant workforce. This massive phenomenon of ever changing labor migration has been studied very little in terms of the occupational background, welfare and health of these immigrants.

Immigrants are a hard to reach population. For example, a study done by Franzini and Fernandez-Exquer (2004) demonstrated that Spanish speaking immigrants

had lower levels of trust and higher levels of perceived victimization than the English speaking native born. This exacerbates the problem of understanding the occupational health risks of immigrants. Even in countries with a long history of immigration, occupational health in immigrant groups has been poorly managed and studied (Ahoenon et al. 2007). Accessing appropriate and accurate immigrant occupational health data is a huge challenge for researchers. A lack of validated surveys designed for this population, difficulties accessing the population, informal work arrangements, transient and informal employment, concerns about confidentiality, absence of ethnicity data and the lack of representation of small businesses in Workers' Compensation records have limited the assessment of occupational risk factors (McCauley 2005). Azaroff et al. (2003) in comparing self reported cases, Workers' Compensation records and hospital records found that none of the data sources were complete in recording the occupational and illness cases in the immigrant population and that resource-intensive household surveys captured cases otherwise absent from existing data sources. Azaroff and colleagues describe the factors that hinder the reporting of working conditions, occupational injuries and illnesses. These include the growing difficulty in documenting the etiology of work related conditions, accessing Workers' Compensation, partial wage replacement for occupational health problems and the broad governmental reforms that tend to gloss over the working conditions of immigrant workers.

The majority of the studies that link work, health and immigrant groups have come from high immigrant receiving countries - United States, Australia, Canada, Spain, and Sweden (Ahonen et al. 2007). Immigrants have been shown to be employed in more hazardous occupations or assigned to more dangerous tasks within the job and tend to work in poor environments (Richardson 2004, Bollini and Siem 1995, Brunette 2005, McCauley 2005, Azaroff 2004, Wu et al. 1997, delPinal 1996). Immigrant workers have been shown to be more tolerant of jobs in less than ideal situations than non-immigrants and prefer working in non-optimal work environments than be unemployed (Rosmond et al. 1998). Another study has shown that undocumented workers work in poorer conditions than documented immigrants (Ahonen et al. 2009). In a survey done in low income immigrant communities in Chicago the researchers found that the probability of US citizens working in sweatshop conditions were 27% which increased to 37% among permanent residents and 70% for non immigrants in this immigrant community (Levin and Ginsburg 2000). A German study reported that unemployed immigrants reported more chronic health problems than unemployed non – immigrants (Elkeles and Seifert 1996). This disproportionate representation of immigrants working in poor conditions has been identified by Ahonen (2009) to be due to deficient language skills, the non transferability of their education and training from their country of origin, immigrant status and economic need.

Higher rates of fatal occupational injuries among immigrants have been well documented. Studies conducted in the United States show that fatal occupational

injuries increased among immigrants throughout the U.S, even as they decreased among native born (Loh and Richardson 2004). Many recent studies show that Hispanics (Richardson 2004, Dong 2004, Mulloy et al. 2007) and other immigrants (Peek Asa 1996) have higher rates of occupational fatalities. Ahonen et al. (2006) in a study done among insured workers in Spain found increased risk of both fatal and non-fatal occupational injury among immigrant workers in every age group and gender compared to the native born Spanish workers.

Robinson (1989) in assessing the relative risk of exposure to occupational injuries and illnesses in California found that Hispanic males suffered higher risks of exposure to all hazards compared to Blacks and non-Hispanic Whites after adjusting for education and years of work experience. Bollin and Siem (1995) in their multi location study in France, Netherlands, Germany and Switzerland concluded that foreign workers are twice as likely to be occupationally injured than native workers. The results concerning non fatal injuries were not as consistent as fatal injuries among immigrants. Some studies in Australia and Sweden show that occupational injuries among immigrants were elevated only in certain occupations (Corvalan 1994, Doos 1994). In the United States, a foreign born worker is more likely to be injured in an industrial or construction work setting (Sinclair 2006).

Two recent studies in the United States and one in Singapore reported that immigrants had a lower overall rate of work related injury compared to US-born

workers but showed that immigrants suffered more severe injuries; more often resulting in hospitalizations and six or more days of missed work. (Zhang 2009, Strong and Zimmerman 2005, Caragan 2004) However, this could be because immigrant workers are not reporting their injuries due to immigration status, precarious employment status, or lack of health insurance. Immigrant workers may utilize health services only in the case of severe injuries and suffer increased risk for prolonged disability (Bollini and Seim 1995, Seim 1997). This demonstrate some of the challenges found in studying and documenting occupational health issues among immigrants as well as limitations in national or government based studies in reporting occupational health issues among immigrants (Azaroff, 2003).

Community based studies, household surveys and qualitative surveys, though often not broadly representative, have provided otherwise unavailable occupational health data for immigrant workers. Pransky et al. (2002) reported that Hispanic immigrants in non agricultural occupations had a higher injury rate of 12.2 than the national averages of 7.1 injuries/100 full time workers in the United States. A survey among middle school students who were migrant farm workers showed that they were twice as likely to be injured at work as their non-immigrating working school mates. The risk increased four times among migrant high school students (Cooper 2005). Franzini and Fernandez –Exquer (2004) and showed that Spanish speaking immigrants self reported a higher occurrence of general health problems than U.S. born or foreign born English speakers.

Common work related health concerns and hazards reported among immigrants include chemical exposure, physical risks such as falls, cuts, fallen objects, tools, carrying heavy objects, poorly maintained equipment, excessive noise, repetitive and awkward movement, standing for long time and extreme temperatures, and work load, with excessive pressure to work faster which increases the potential for accidents (Ahonen 2009, Pransky 2002). Though there might be general hazards that immigrants face at work, the hazards at work are mostly related to the type of work.

Demographic studies in Australia show differential occupational patterns between natives and non-native groups (Corvalan 1994). Common occupations among low income immigrants include agriculture, production, construction, cleaning and maintenance and food service (Cho et al. 2007, Pransky 2002, Ahonen et al. 2009). Data from the United States indicate that agriculture, construction, services, and the manufacturing industry are known for their heightened risks and employ a high proportion of immigrant workers (McCauley 2005). Bonauto et al. (2006) identified construction and transportation industry as the high risk industries in the state of Washington. Moure-Eraso and Friedman-Jimenez (2004) show that Latino's in the United States are disproportionately represented in highly hazardous job categories such as janitors, laborers and cooks. However, research which adequately characterizes jobs commonly populated by immigrant workers is relatively scarce and lacking in completeness.

Studies among immigrant restaurant workers show musculoskeletal sprains, soreness, strains, numbness, tears, cuts, burns and falls (Webster 2001, Hsin-ChunTsai 2009). Acute trauma rates were found to be elevated among kitchen workers by Buchanan et al (2010).

Construction is one of the largest industries in the U.S and one of the most dangerous (Brunette 2004). A study of occupational fatalities among construction workers found Hispanic workers were twice as likely to be killed by occupational injuries compared to non-Hispanics. The high risk occupations in the construction sector were helpers, roofers, carpenters and construction trades (Dong et al. 2004). Another study showed that non-white construction laborers have a 27% higher occupational fatality rate than whites. (Ore and Stout 1997) Construction laborers, roofers and carpenters account for the greatest medical treatment costs according to Workers' Compensation data. Construction occupations had a high percentage of alternative workers and high cost of work injury (Waehrer et al. 2007). Hispanic construction workers were 46% less likely to receive payment for medical costs from Workers' Compensation (Dong et al. 2007) A study on construction projects conducted at the Denver International Airport reported that slips and trips made up 25% of the Workers' Compensation payments (Lipscomb et al. 2006, Lipscomb et al. 2003).

Housekeeping, an industrial sector dominated by immigrant Hispanic women, does not rank as a major cause of fatalities, yet demonstrated increased risk of

occupational illness (Zock et al. 2007, 2009). In a study in the US hotel industry Buchanan et al. (2009) found that the overall rate of injury was high among Hispanic housekeepers in particular and that acute trauma and musculoskeletal disorders were high among housekeepers in general. Using bleach, in particular, was associated with less atopic sensitization, and elevated lower respiratory tract symptoms (Zock et al. 2009). The regular use of cleaning sprays was associated with asthma and wheezing (Zock et al. 2007).

Two thirds of hired farm workers are foreign born. Farm work accounts for 13% of the workplace fatalities while it employs just less than 3% of the U.S workforce (McCauley 2005). Chemical exposure is pervasive in farming jobs. Only 3.7% of the agricultural migrant farm workers, mostly being Hispanic, could name any chemicals used where they worked, even though U.S. law requires that employers provide this and other important safety- related information in a central place accessible to workers (Arcury et al. 1999). Six out of eight commonly used agricultural pesticides was found in 95% of the homes that were sampled for “take-home” and drift agricultural and residential applications among Mexican farm workers (Quandt et al. 2004, McCauley et al. 2001). Pesticide toxicity among farm workers causes an estimated 313,000 cases of illness and 1000 deaths annually (Mc Cauley 2005).

Hazardous working conditions among southeast Asian workers, 40% of whom who work in electronics and computer assembly, consist of exposure to soldering

fumes, inadequate ventilation, prolonged sitting and standing, unguarded machinery, long hours and pressure to produce quickly with health problems ranging from sprains and strains, to headaches, dizziness and flulike symptoms (Azaroff et al. 2004). Behrens et al. (1994) in their analysis of the prevalence of certain occupational health conditions in the US working population found back pain common among truck drivers, mechanics and repairers of heavy equipment. A study among Vietnamese nail salon workers reported the hazards of poor air quality, dusts and offensive odors, musculoskeletal disorders, skin problems, respiratory irritation, and headaches (Roelofs et al. 2008).

In addition to work related physical hazards low income immigrant workers are shown to experience higher rates of social hazards - work place abuse, sexual harassment and discrimination (Krieger et al. 2006, Barbeau et al. 2007) which are often found to be more common than accidents and injuries. A study that looked into worker complaints at an interfaith worker center addressing labor rights and worker issues found that the referrals for discrimination and complaints of wage and hour abuse were more frequent than those of workplace safety and health (Cho et al. 2007). The Department of Labor (DOL) reports show that 100% of the poultry processing plants and 67% California garment factories violate the federal wage and hour laws (DOL 2001). In Finland, discrimination at work has been widely reported in applying for jobs, getting promoted, getting paid for the hours worked, being fired and general harassment (Jsinckaja-Lahiti et al. 2007). deCastro (2006) in his qualitative study finds that work organization - how jobs

are designed, managed and assigned -impacts worker rights violations, injury, illness, job loss and worker actions. Job insecurity is an omnipresent reality among immigrant workers; as they are twice as likely to be working in multiple jobs as United States born workers. In many cases, job blackmail is a common practice where employers threaten to fire workers or report them to immigration if they report violations relating to hazardous working conditions or ask for a raise (Brown et al. 2002, Scherzer et al. 2005, Levinstein et al. 2000). Linda Rae Murray (2003) concludes that discrimination in the workplace may result in job ghettos and disproportionate exposure to certain hazards. A study based in the greater Boston area with a cohort of 1,202 predominantly Black, Latino and White women and male low-income union workers show that while immigrants face high social hazards they are also least likely to report that abuse. Latino workers were less likely than Black or White workers to report abuse (Krieger 2006).

In some cases these social hazards have been shown to be associated with somatic health hazards. Marin et al. (2009) reported that among workers in poultry plants abusive supervision and organizational injustice resulting from power differences may promote worker injuries and illness particularly in women. This study also showed that discrimination at work can be a decisive factor in access to health care services.

Many researchers have explored the links between discrimination at work and mental health (Agudelo-Suarez et al. 2009, Gee et al. 2007, Krieger et al. 2006) and there is evidence that work stress is related to mental disorders (Wang et al. 2008), that increased work hours, heavy commuting, and job insecurity increases the prevalence of common health problems such as pain, fatigue and depression (Barnes 2008). In a study done in Sweden, immigrants reported a lower degree of life satisfaction and a higher degree of melancholy than the native population (Rosmond et al. 1998). However, for many of these workers job security is of greater concern than the possible health risks (Barnes 2008).

The nature of work explains only one facet of understanding workplace injury and disease. Immigrant workers suffer higher fatality and disease not just because of their dominance in low wage hazardous occupations but also because of their varying socio-demographic, economic and political background. Lax and Klein (2008) shows that employment and working conditions in the formal or informal economy are also dependent on other important variables including working hours, salary, health and safety training, health benefits, workers compensation and other workplace policies. Oh and Shin (2003) did not find differences in nonfatal injury by race but rather by level of education, work experience and job tasks. Immigrants and especially recent immigrants are more likely to be in poverty (Clark and King 2008) In a study conducted in the greater Boston area among union employees in various industries, those with lower wages were more likely to report hazardous exposure and musculoskeletal difficulties such as

chemical exposure, back strain, repetitive hand motions, and heavy lifting; while those with higher wages were more likely to report simply dust and noise exposure (Quinn et al. 2007). Strong and Zimmerman (2005) showed that working late shifts were associated with an increased odds of an occupational injury or illness. Self employed foreign born workers were more likely to be fatally injured than native born workers (Loh and Richardson 2004, Mulloy et al. 2007)

Recent immigrants are also shown to suffer a greater number and severity of occupational injuries (Djordjevic 1979, Corvalan 1994). Corvalan (1994) and his colleagues show that recent immigrants had higher risk than more established immigrants who have been in residence in Australia for over five years. The study suggested that the diminishing fatality rate with time of residence in the country may be related to upward mobility, language acquisition and acclimatization to the host society and culture.

Many studies have touched on occupational health issues due to lack of language proficiency (Premji 2008, Dong et al. 2004, Corvalan 1994, Pransky et al. 2004). Premji et al. (2008) in a study in a garment factory employers in Montreal reveal that lack of language proficiency in an official language, or the inability of the workers to understand and communicate and form supporting relationships, can affect work-related health.

Lack of occupational training was an issue noted by several authors (O'Connor 2005, Giizey 1979, Pransky et al. 2002, McDermott and Lee, 1990). Pransky et al. (2004) and his colleagues found that only 31% of the Hispanic workers reported having had any job safety training, and a quarter of them received the training in English. However no relationship was found between training and injuries among recent immigrants. O'Connor (2005) found that 72% of the immigrant Latino construction workers received training; however the duration of training was limited to an hour and that those with lower English proficiency received less training. Sokas and colleagues (2009) in their intervention study among construction workers found measurable improvement after three months in both knowledge and attitude following a one hour safety class in both Mexican immigrants and U.S born workers. Awareness of the importance of linguistic and culturally appropriate safety training and intervention methods is increasing as evidenced by the growing number of training and health education interventions provided in different languages (Quandt et al. 2001, Pun et al. 2004).

Lack of health insurance and Workers' Compensation has been the most significant policy dilemma in terms of immigrant occupational health rights lately in the U.S. Over half of the immigrants have no health insurance. This is three times higher than the experience of native born citizens. Recent immigrants and undocumented immigrants are more likely to be uninsured and rely on alternate sources to cover their emergency health needs (Ku 2006, Terrazas and Batalova 2009) Pransky et al. (2002) reported that only 20% had personal health insurance

and about 60% did not file for Workers' Compensation even though entitled to do so. Similar results were reported by other researchers (Azaroff 2004, Jacobs et al. 2002, Clark and King 2008). Rosenman et al (1997) in a case control study found that only 25% of the individuals with work related musculoskeletal disorders filed for Workers' Compensation. Such problems are heightened for immigrant workers, a large proportion of who are employed in informal jobs with questionable benefits and eligibility. Immigrant workers face significant barriers to access Workers' Compensation. Their problems range from immigration status, type of job, economic situation, administrative delays, denial of claims and lack of knowledge about workers compensation to cultural and language barriers, and fear of reprisal (Dembe 1999, Pransky et al. 2002, Azaroff et al. 2004). It is important to note this lack of access to care likely suppresses the reporting of occupational health problems among this population (Dembe 1999).

This occupational health disadvantage among the immigrant population is shown to be not solely related to the complexities at the work site but is considered part of a larger socio-political and cultural issue in general that affects not only the workers but their families and community environments (Dembe 2001, Lipscomb et al. 2006). Many researchers emphasize the importance of addressing and limiting not just the root causes of exposures and injuries but advocate macro approaches to introducing improvements to occupational safety that would require a comprehensive understanding of the socio-cultural, political, historical and ethical contexts of communities and the workplace (Brunette 2004, Lipscomb et

al. 2006).

While there is enough evidence that the immigrant populations across the U.S are at a disadvantage and are disproportionately susceptible to occupational hazards, fatal and non-fatal injuries and illness, initiatives to address and tackle the issue have been scanty partly due to the difficulty in accessing this vulnerable population. Studies are needed that simultaneously assess, document and address immigrant occupational health issues and implement interventions at the community level to yield the most effective changes. The community based participatory research (CBPR) process has shown promise in the study of occupational health issues among immigrant workers (Minkler et al. 2010, Israel et al.2005, Arcury et al. 2001).

This dissertation has arisen out of the interest to understand and address the occupational health and safety issues in the immigrant population at the community level in Somerville, Massachusetts. In Chapter 2, I describe a community based approach to implement culturally appropriate methodological approaches to address and initiate an immigrant occupational health and safety study in Somerville, Massachusetts. In Chapter 3 I report the baseline results of the occupational health survey we conducted among workers who identified themselves as immigrants in Somerville, Massachusetts. This study identifies the occupational health disparities as seen primarily among the three main immigrant groups in the Somerville community – Brazilians, Haitians and El Salvadorans by

their years in the US and English proficiency. Chapter 4 explores the burden of occupational health outcomes among immigrant workers in this same community. Chapter 5 reports a comparative study of the occupational disparities found among the common low wage occupational categories based on the occupational survey data. Common immigrant occupations such as cleaning, construction work, food service work, cashier/baggers and factory related workers are the subject of Chapter 5. In Chapter 6 I explore the occupational health issues among women in unstable low skilled employment. In the concluding Chapter 7, I offer concrete recommendations, occupational health initiatives and suggested policy changes needed to address the immigrant occupational health issues found in Somerville, Massachusetts but having implications for similar populations throughout Massachusetts and the United States.

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II: Immigrant Occupational Safety and Health in Somerville, MA: Community Based Participatory Research Study Design and Methods

ABSTRACT

Objective: Immigrants employed in informal job sectors and arrangements are often difficult to reach and access. In this paper we focus on the strategies used to reach out to and gather data on immigrant workers living or working in Somerville, Massachusetts. We will focus in particular on the formation of a community coalition, the overall study design, outreach activities, and data collection strategies initiated through community collaboration. This paper will also assess the challenges, limitations and added value fostered by these approaches.

Methods: Community based participatory research (CBPR) was employed to study immigrant workers in Somerville, Massachusetts. Our project represented a healthy mix of community initiatives and research. The project was very successful in initiating a number of meaningful community outreach efforts through the Teen Educators, the administration of community occupational health fairs and the establishment of Vida Verde Co-Op. We used a cross-sectional design for data collection and gathered both quantitative and qualitative data which included an immigrant occupational health survey, focus group interviews with immigrant workers, in-depth interviews with immigrant women workers in unstable occupations, and Key Informant interviews with immigrant services

providers.

Results: By partnering with five community organizations each with access to different ethnic groups or specific expertise, our project benefitted greatly from the level of trust, interaction and effective communication enjoyed by these organizations. Despite this highly beneficial collaboration, we experienced challenges to study participation, selection bias and data quality. We found that private and relaxed settings to conduct surveys and interviews, matching the recruiters by race/ethnicity, gender and age, improving trust by establishing a good outreach plan by working with trusted community partners, and providing care, information or compensation for their time may improve study participation. Selection bias may be unavoidable in conducting survey dependent methodologies among hard to reach populations. Greater innovation and creativity such as developing more effective communication with such demographic groups are required to access this population and thus to reduce selection bias. Of particular interest to our research team is how to ensure that the most marginal elements of sampled populations are in fact represented among the respondents. Community based interventions may be an effective strategy to access this population who suffer from very poor access to occupational health resources. Data quality as elicited through the occupational health and safety surveys can be improved by having more structured questions with multiple choices that would reduce incomplete and vague responses. Training interviewers in the conducting of open ended questions to better elicit detail in occupational risks would also

improve data quality. Future studies can benefit from considering these strategies for immigrant occupational health research.

Conclusions: The study among immigrant workers in Somerville, MA is valuable despite its limitations. This is the first study, to our knowledge, to attempt a concurrent assessment of multiple immigrant populations in a given community and to document the occupational health experience of specific immigrant populations such as Brazilians, Salvadorans and Haitians and in turn compare it with other immigrant groups in the same local milieu.

INTRODUCTION

Immigrants constitute a sizable, and growing, portion of the US labor force. A large number of the immigrants work under situations of terrible vulnerability - they are young, poor, often lack higher education and English language skills. They are disproportionately represented in low wage sectors and perform labor intensive, high risk, dangerous jobs (Mulloy et al. 2007). The concept of a defined and consistent workplace is also becoming ephemeral for some of these workers. An increasing number of immigrant workers are in unstable work situations such as temporary work, part time work, day work, and contract work (Barten et al. 2008, Benach et al. 2002, 2010). This “informal” service economy is often unregulated by the government, and is non unionized, small-scale, with some common outlets being home-based small businesses offering services such as food and beverage commerce, cleaning and domestic service and auto and electronic repair (Barten et al. 2008). They work in de-centralized sites of employment, possess little formal training, and lack skill-based certifications, they are often not in employer databases, and are not privy to the policies and practices of large employers, labor laws, or workers' organizations to coordinate their employment practices (Lipscomb et al. 2006, Mattingly 1999, 2001). Although a few of their basic needs are met, most workers in these situations do not have health insurance and other work benefits (Dembe et al. 2002, Bollin and Siem 1995). Occupational health scholars have termed this employment state to be “precarious” as a result of the following attributes: instability, lack of bargaining power, vulnerability, low or insufficient wage level, long work hours, reduced

rights and benefits, and capacity to exercise rights (Tompa et al. 2007, Cranford and Vosko 2006, Porthe et al. 2010, Benach et al. 2002, 2010).

Many studies have shown higher injuries, and fatalities among these immigrant groups than the native population (Tompa et al. 2007, Cranford and Vosko 2006, Ahonen et al. 2007, Pransky et al. 2002, Dong et al. 2004, Loh and Richardson 2004), yet they remain a poorly understood population. Traditional research approaches are often ill equipped to interact with participants who are simultaneously challenged by language, cultural barriers, discrimination, and are employed in multiple informal jobs, have poor access to occupational benefits such as Workers' Compensation and unionization, and are underrepresented in a variety of national, state and local data bases. This exacerbates the problem of understanding the occupational health risks among immigrants and raises new challenges for researchers interested in tracking patterns of occupational injury and illness in these populations.

Accessing appropriate and accurate data constitutes a serious challenge for immigrant occupational health researchers. Even in countries with a long history of immigration, the occupational health of immigrant groups has been poorly managed and studied (Ahonen et al. 2007). Azaroff et al. (2003) in comparing self reported cases, Workers' Compensation records and hospital records found that none of the data sources were complete in recording occupational morbidity in immigrant populations and that resource-intensive household surveys often

captured cases otherwise absent from existing data sources. A substantial proportion of injuries treated under free care programs are not entered in surveillance systems which describe industrial accidents. Lowry et al. (2010) shows that trauma registry and medical records have severe limitations including missing, incomplete, and inconsistent work information and regards community surveys as an effective surveillance tools to record injuries among day laborers. The U.S. Bureau of Labor Statistics reports that up to 69% of workplace illnesses and injuries in the U.S workforce are not captured in public records (Souza et al. 2010). Other studies show that workers may be more hesitant to report injuries and illnesses due to fear of retribution by employers (Brown et al. 2002, McCauley 2005, Scherzer et al. 2005). Other studies indicate that immigrant populations are more reluctant to be part of research initiatives. A study performed by Franzini and Fernandez-Exquer (2004) demonstrated that Spanish speaking immigrants had lower levels of trust and higher levels of perceived victimization than English speaking native born workers. Innovative approaches for improving the surveillance of occupational health disparities include gathering appropriate ethnicity data, conducting household surveys, performing community based surveillance, and the conducting of non-workplace-based longitudinal studies to obtain information about these hard to reach populations (Souza et al. 2010).

There is a lack of culturally appropriate community based studies that document immigrant occupational health issues. Our study on immigrant occupational

health has been conducted based on the Community Based Participatory Research (CBPR) principles of equitable participation between partners in both research and action (Israel et al. 1989, 2005). The primary immigrant groups studied in our work include the Brazilian, Haitian and Salvadoran populations in Somerville, Massachusetts. Our project was conducted between 2006 – 2010. The objectives of the project included developing a strong community-university-health partnership aimed at building capacity in community organizing, outreach, research, and advocacy regarding immigrant occupation health. In this paper we focus in particular on the formation of the community coalition, the overall study design, outreach activities, and data collection strategies initiated by the partnership. This paper will also assess the challenges, limitations and value-added contributed by this project.

Study Setting

Somerville is one of the leading continuous “gateway” communities in the Greater Boston area, Massachusetts (Singer 2004, Muro et al. 2007). Just two miles north of Boston, Somerville is contained within four square miles and is home to 74,554 residents of which 29.3% of the total population is foreign born compared to 12.2% in Massachusetts and 11.1% in U.S. (American Community Survey (ACS) 2009, City of Somerville 2008). Somerville has seen a steady growth in the immigrant population especially over the past thirty years. Once a nearly all white working class community, Somerville has been transformed into an ethnically, racially, linguistically, and socio-economically diverse community.

Over half of its foreign born population (53%) entered Somerville in 2000 or later (ACS 2008). The majority of Somerville's foreign population came from Latin America (38%), Europe (26.7%) and Asia (26%) (ACS 2006-2008).

Brazilians are one of the largest recent immigrant populations in Massachusetts. Since 2000, one out of five new residents in Massachusetts came from Brazil (City of Boston 2007, Almeida 2009, Marcelli 2009). (See Tables 2.1 - 2.2 for immigrant demographics and occupational details) Maxine Margolis, an anthropologist, has referred to Brazilians as the "Invisible Minority" as they are misrepresented as being Spanish-speaking Hispanics in the U.S. Census when they are neither Spanish speaking nor Hispanic (Margolis 1998, Siqueira and de Lourenco 2006, Marcus 2003, Almeida 2009, Besserra 2007, Sales 2004). The Brazilian Immigrant Center estimates that there are approximately 250,000 Brazilians in Massachusetts, a much higher total when compared to the ACS estimate of 75,000 (Belanger 2006, Marcus 2003, Lima and Siqueira 2007). It has been estimated that over 70% of the Brazilians in Massachusetts are undocumented (Marcelli 2009). Brazilians are over represented in service, sales, and construction jobs (See Table 2.2 for occupational detail). Brazilians are also highly entrepreneurial and are nearly three times more likely than the other foreign born individuals to be self employed. (City of Boston 2007, Lima and Siqueira 2007)

Somerville is one of the top five municipalities in the U.S for Haitians to reside according to the 2000 U.S. Census. Haitians comprise 14% of the Black population in nearby Boston. Haitians have been shown to have lower educational attainment than American born Blacks in Boston. However, Haitians in Somerville were shown to be slightly better educated than the Haitians in Boston. A slightly higher number of Haitians are represented in the labor force than the American born Blacks and Haitians were likely to be less poor than American born Blacks. (See Tables 2.1- 2.2 for additional demographic details) Haitians are employed most frequently in the service sector followed by management, professional occupations and sales and office occupations (Jackson 2004). (See Tables 2.1 -2.2 for demographics and occupational details)

The American Community Survey (ACS) count shows that 6,692 Latinos were living in Somerville between 2005 – 2007. The Latin American population includes El Salvadorans, Colombians, Mexicans, Hondurans, Puerto Ricans and Guatemalans. The largest Latino group in Somerville is Salvadoran. Somerville is one of the top three municipalities in terms of Salvadoran residents in Massachusetts. A little over 12% of the Salvadorans in Massachusetts live in Somerville. The U.S. Census 2000 shows that Latinos in Somerville in general had lower education compared to the total population. However a breakdown of the Latino population in Massachusetts shows that Salvadorans have lower education when compared to other Latinos. A higher proportion of the

Salvadorans work in service sector jobs followed by production and sales jobs (Uriarte 2003). See Tables 2.1 and 2.2 for additional detail.

Other marginalized groups in Somerville include immigrants from Asia, Africa and the Middle East. Asians are the fastest growing population of the total foreign born population in Massachusetts that grew from 9% in 1980 to 23% of foreign born in 2000 (Sum 2005). The 2007 American Community Survey showed 4,357 Asians living in Somerville. According to the report by the Institute of Asian American Studies (2005) based on the 2000 U.S. Census, China (37%) and India (27%) form the two largest Asian American subgroups in Somerville. Other prominent Asian groups in Somerville include Korean, Vietnamese, Japanese, and Filipino. The most recent Asian immigrants in Somerville are from Nepal. Most Asians in Somerville are foreign born (78%), however, unlike the other immigrant groups, they had higher education and less than 15% did not speak English. Asians in Somerville were slightly over represented in professional occupations, the food service sector, sales and production work compared to other ethnic groups (Institute of Asian American Studies 2005).

Marked occupational health disparities have been reported among the immigrant populations nationally (Lipscomb et al. 2006). Locally, the Massachusetts AFL-CIO (2005 - 2009) reports that over 20% of occupational deaths occur each year among immigrant workers when these workers constitute only 17% of the workforce. In Somerville alone, occupational fatalities have claimed the lives of

17 workers between 1986 - 2008 (MA AFL-CIO 2009). Avoidable accidents are the most common causes of these deaths. In 2004, two 35 – year- old Vietnamese floor sanders died in Somerville from burns and two were seriously burned while they were refinishing wood floors in a three family house in Somerville. The house caught fire while the workers were applying a lacquer sealer that was ignited by a pilot light on a gas hot water heater (OHSP 2006). In 2008, a 47- year- old, Somerville resident born in Brazil was electrocuted while performing demolition work at a construction job in Walpole. Prior to starting the demolition work he was told by the onsite electrical contractor that there were no live wires in the area where he was working. (MIRA 2008, MA AFL – CIO 2009) State based surveillance of Massachusetts Fatality Assessment Control and Evaluation (FACE) programs have identified an increase in fatalities particularly among Brazilian workers who dominate the construction industry in Massachusetts (MADPH 2009).

On the job injuries are far more common than deaths. Hospital based data in Massachusetts from Emergency Department visits for work related injuries and from work related hospitalization data by race and ethnicity show an overrepresentation of immigrant workers (MADPH 2007, Hunt 2005). A number of community based studies in Massachusetts also demonstrate that immigrants are overrepresented in low skilled, hazardous occupations. These jobs exhibit an elevated work-related injury rate and also report increased workplace abuse, low access to health services, occupational training and Workers' Compensation

benefits (MDPH 2006, COBWEB 2008, Marcelli 2009, Marlin 2008). However these studies are limited as they have not analyzed the occupational health risks by ethnicity or occupation.

As a result of the disparities in race, ethnicity, work and health outcomes suffered by immigrants and the limitations of the existing databases to understand immigrant occupational health issues the development of alternative approaches to better understand this experience are warranted. We now turn to a discussion on the CBPR methodology implemented in our study which recognized and assessed immigrant occupational health risks among immigrants in Somerville, Massachusetts.

Study partners

To design and implement a CBPR study on ‘Assessing and Controlling the Occupational Health Risks to Immigrants in Somerville’, Massachusetts, a community, university, health and work partnership was formed in 2004. The partnership included the Immigrant Services Providers Group/Health (ISPG/H), the Community Action Agency of Somerville (CAAS), the Haitian Coalition (HC), the Brazilian Women’s Group (BWG), the Massachusetts Coalition for Occupational Safety and Health (MassCOSH), Tufts University, Environmental Health Program in the Department of Civil & Environmental Engineering, and the Department of Public Health and Family Medicine at Tufts University Medical School, and the Occupational Health Clinic at the Cambridge Health Alliance (CHA). The study was funded by the National Institute of Occupational Safety

and Health (NIOSH) in 2006 for four years. A no cost extension carried the work into a fifth year.

The ISPG/H has been working to unite the immigrant service providers in Somerville to address the immigrant health needs and concerns since 2003. The ISPG/H also provided the coordination of the community partners in this study, with many of the participating organizations in this study were and continue to be members of the ISPG/H.

CAAS was founded in 1981 and initially functioned as the anti-poverty agency for Somerville. More recently, CAAS initiatives have focused on the low income immigrant communities in Somerville. As a result the Latina Coalition and the Haitian Coalition were created to address needs in these respective populations. While the Latina Coalition still works within CAAS, the Haitian Coalition formed its own organization in 1992 to enlarge the opportunities for Haitians in Somerville and in neighboring cities and towns.

The BWG is a women's support group which was created in 1995, to provide networking, support and educational opportunities for Brazilian women. It is headquartered in Allston, a neighborhood of Boston, but finds many of its members among individuals who live or work in Somerville.

MassCOSH is an established worker center and has long been a regional advocate

for occupational safety and health and brings together residents, community groups, and health, safety, and legal professionals to promote safe, healthy working conditions and communities. MassCOSH focuses on immigrants and people of color employed in the lowest paid and highest risk jobs. MassCOSH provided the technical support and guidance on occupational health and safety for the project.

The CHA is the central provider of health care in Somerville. CHA operates Somerville Hospital, the primary hospital in Somerville and four different health centers in Somerville – Union Square Family Health Clinic, Broadway Health Center, Somerville Primary Care on Central Street and East Somerville Health Center. CHA also runs the only occupational health clinic in Somerville, Everett and Cambridge in the Assembly Square section of Somerville. The Occupational Health Clinic at CHA served as the site of one of the occupational health fairs conducted in this project.

Since there were no existing Asian community organizations in Somerville, our programming and Occupational Health Survey did not access this emerging population and hence data gathered in the course of this project does not reflect the Asian population in Somerville. Lately, this influx has been most pronounced from Nepal and Tibet. More community outreach and organizing are necessary to achieve a better understanding of this emerging population. In the future, outreach to these populations would be important.

Our community partner organizations enjoy good visibility and have been among the leading voices in addressing immigrant health issues in Somerville. All of these organizations have been working both interactively and individually to solve pressing immigrant health needs in Somerville. The majority of the community partners organizations the CAAS, HC, and the ISPG/H have not previously been engaged in academic research. The goals of the project were shaped by these organizations and featured the establishment of a peer-based sustainable community capability for gathering and disseminating information on work and health among the immigrant populations in Somerville. The community partners have played an important role in defining, designing and conducting the research and intervention activities described here.

In addition to the partnership, an Advisory Committee was formed to further the discussion and scholarship on immigrant occupational health issues. The Advisory Committee met once a year. The members included other migration scholars, occupational health researchers and immigrant rights activists in Massachusetts and included other occupational health projects such as the Dorchester Occupational Health Initiative (DOHI), and the Collaboration of Better Work Environment for Brazilians in Massachusetts (COBWEB). One of the key events that came about as a result of the advisory committee gatherings was an environmental justice summit conducted in the second year (2007) of the project. This event brought youth workers from the different projects (DOHI and COBWEB) and encouraged dialogue and discussion between them on key

occupational health issues.

Project planning

The early discussions on the Somerville immigrant occupational safety and health project began at the monthly meetings of ISPG/H. The BWG, CAAS, and the Haitian Coalition were active members of the ISPG/H. Our project thus benefited from a preexisting network of organizations with a high level of trust, interaction and communication. We also sought to leverage the existing capacity, strengths and provision of service to the immigrants in the community so as to better understand the occupational needs, and health concerns in our target populations. The death of the two immigrant floor sanders in Somerville in September 2004 (already alluded to) garnered much attention and promoted interest in understanding the occupational health issues in immigrants in Somerville (OHSP 2006). Efforts were already under way to address the occupational health issues among Vietnamese floor sanders through the efforts of another federally funded Environmental Justice project, the Dorchester Occupational Health Initiative (DOHI) (Azaroff et al. 2006). The increasing rate of immigrant worker fatalities already mentioned was also increasing concerns in the community and within the immigrant populations in Somerville. These issues were discussed at the meetings organized by the ISPG/H.

Within the ISPG/H group members, the BWG was interested in reducing toxic exposures tied to traditional house cleaning products in the Brazilian community.

They had already developed green cleaning products with an earlier Environmental Justice grant obtained from the National Institute of Environmental Health Sciences. This was done in conjunction with the Collaboration of Better Work Environment for Brazilians, COBWEB project based at the University of Massachusetts Lowell. The BWG was interested in developing and launching a green Co-Op for Brazilian house cleaners. The Haitian Coalition and CAAS had existing peer youth and adult educational training and advocacy programs for immigrants, which they thought might be adapted to perform an immigrant occupational health survey and awareness program. As the project was shaped by the needs of these community members more players joined in, MassCOSH offered technical support through the training of the Teen Educators regarding the basics of occupational health and survey design. The CHA's Occupational Health Clinic was also interested in hosting occupational health fairs as a means of creating greater awareness among workers regarding common preventable occupational hazards. Five of the community partners completed ethics training and received designation from the Tufts Institutional Review Board (IRB) as Independent Investigators within the scope of our project. This was an important increase in community based expertise with regards to the conducting of research in the field.

The next section will discuss the specific outreach methods used to foster participation among the immigrant populations living and working in Somerville regarding issues of occupational safety and health.

Outreach Methods

The outreach initiatives included three different but related activities. All activities were geared towards developing the capacity of the community organizations to access the immigrant populations and disseminate occupational health information. The Teen Educators Program and the sponsoring of occupational health fairs specifically served this purpose. In addition, the Vida Verde Green Cleaning Co-Op, performed additional outreach by recruiting new members through a community-based outreach program which offered training in occupational safety and health. The goal here was to foster interest in individuals to join the Co-Op who would work towards the implementation of women owned and run green economic business models (Gute et al. 2009).

Teen Educator Program

The Teen Educator component was developed based upon the existing capacity of two of the community partners in this project CAAS and the HC – which had successfully run youth programs to establish and maintain community networks in the areas of tobacco control and raising awareness concerning environmental health issues in the community. Capitalizing on this positive previous experience of successfully reaching out to immigrant communities, the project partners proposed to use the youth programs to gain the trust of and interact with the hard-to-reach immigrant communities to initiate conversations on occupational health and safety. The Teen Educators performed a variety of tasks spanning outreach,

and gathering and disseminating information on work and health among immigrant populations. The information was gathered through the creation of an anonymous immigrant occupational health survey (see Appendix for the full survey instrument).

Over the course of five years from 2006 – 2010, 36 teens participated in the program from HC and CAAS. The first year eight teens joined the Teen Educators program, the second year ten teens participated, the third year eight teens participated in the study and the last year ten members comprised the Teen Educators. Some of these teens participated in the group for multiple years. The Teen Educators who participated in the project were bilingual and were proficient in English and either in Spanish or Haitian Creole. They were between the ages of 13-18 and received consent from their parents to join the study. More females were Teen Educators than males. The Teen Educators were compensated via stipends for their programmatic and training activities. During the school year their time commitment to the project averaged 10 hours per week.

Through an initial training program under the guidance of MassCOSH– with additional content being supplied by staff of the Massachusetts Department of Public Health (MADPH) Occupational Health Surveillance Program and the Tufts faculty associated with the grant, the Teen Educators developed a 23 question survey. The Teen Educators were further trained in the techniques of survey administration and received instruction on the IRB process of obtaining oral

consent from survey respondents before the interview to protect the rights of the participants (Hyatt et al. 2009). All items of the protocol reported here were submitted and approved by the Social Behavioral & Educational Research IRB of Tufts University. In addition to this initial training and survey development, the Teen Educators participated in additional training on an annual basis. The annual trainings were provided by MassCOSH on occupational health and safety. In years 1 and 3, the Teen Educators received intensive training on survey administration, including informed consent, research ethics, followed by submissions of the revised survey instrument of study protocol (as required) to the IRB. In addition, the Teen Educators received training on public speaking in the first year. They also participated in training sessions on child labor laws, youth immigrant occupational health and safety, youth training and outreach throughout the project period.

The involvement of the Teen Educators was formulated with an interest in shaping the development of the participants as future advocates of social change in their own communities. Throughout the duration of the project the Teen Educators participated in a number of events such as the environmental justice youth summit in 2007, the NIEHS/NIOSH national grantee meeting held in Boston in 2007, and in two teen empowerment peace conferences held in 2008 and 2009. At these events the Teen Educators presented their work. These empowerment events were conducted under the guidance of MassCOSH and drew participants from other similar youth organizations such as Viet-Aid from the

DOHI and COBWEB. The Teen Educators were also involved in delivering community presentations in communities and churches, met with other youth and parent groups and acted as leaders in promoting teen occupational health and safety. They prepared two pamphlets on occupational health and safety for adults and teen employment and occupational safety and health.

Occupational Health Fairs

In years 3 – 4 the project organized dedicated immigrant occupational health fairs in the community, one in October 2008 at the CHA Occupational Health Clinic in Assembly Square and the other in July 2009 at the Clarendon Hill public housing development. The occupational health fairs were held in conjunction with the CHA and offered free health screenings, occupational/health counseling, and dispensed occupational health risk education materials and safety equipment (i.e. hearing protection) to all fair attendees. Both fairs occurred in proximity or with access to two different immigrant communities (day laborers and the Haitian community) in Somerville and were well attended. These events proved to be effective venues for raising awareness concerning occupational health problems in the immigrant community. These events also served as a venue for allowing the Teen Educators to collect data through the administration of the occupational health surveys.

The complement of health services offered at the health fairs benefitted from additional questions incorporated into the occupational health survey. These

additional questions elicited information on health needs of the immigrant community. This half page survey posed questions (see Appendix 2 for these questions) on the health information or initiatives the immigrant respondents felt were needed most. These options included information on preventing chemical exposures, preventing and treating exposure to lead paint, preventing and treating body pain or strain, information on nutrition and weight control, blood pressure check, blood sugar check, information about the rights provided under Workers' Compensation, and how to obtain a primary health care provider at the Cambridge Health Alliance.

At the health fair the participants were provided with free health screenings which assessed blood sugar, blood pressure check-ups, cholesterol, vision screenings, and one-on-one consultations on nutrition, pain management techniques, and health insurance information. In addition, the participants were introduced to various health and occupational health charts and were provided fliers on different occupational health hazards and how to prevent them. Besides the partner organizations, many other community organizations and state agencies participated in the event.

In total, 87 people were screened at the health fairs. Over half of the people attending the fairs were male (55%) and 45% were female. The majority of the population (64%) who participated in the occupational health fairs had health insurance. The health screening tests as performed by the staff of the CHA

included screening for blood sugar, blood pressure and cholesterol.

Vida Verde Cleaning Co-op

The foundation for the Vide Verde cleaning Co-Op was laid by the Brazilian Women's Group (some of whom were housecleaners) in 2003 in partnership with the University of Massachusetts Lowell. In this programmatic phase, community members and prospective members of the yet to be formed Co-op were trained regarding occupational safety and health practices and engaged in developing their own green cleaning products (Gute et al. 2009). The Vide Verde Co-Op was officially launched in December, 2006 with the support of the work reported on here. The Co-Op was intended by the leadership of the BWG, "to be a culturally appropriate intervention that would engender participatory decision-making and collective benefits and address locus-of-control issues that define work as a housecleaner". (Gute et al. 2009) The initial Vide Verde cohort was comprised of 10 women and 1 man, all Brazilians, who were recruited from the cadre of participants in the training sessions. Co-Op members received training and skill building through classes featuring content such as learning business English, computer use, workplace health and safety, and leadership development.

The Co-Op, besides being well established in the Brazilian community, has attracted concerted media attention with prominent coverage in both the print (Abraham, 2007) and the electronic media (National Public Radio's "Living on Earth", originally broadcast on June 15, 2007), and other news outlets. This

success has provided access to a wide clientele spreading out of Somerville and Boston to the surrounding suburbs. Training programs were also designed and implemented to further propel the Co-Op forward from a start-up organization to an on-going commercial enterprise. This phase included the development of a formal business plan as produced by the ICA, a nationally recognized consulting firm, which specializes in the development of cooperatives. In-depth interviews were performed with Co-Op members to assess their motivation to join the Co-Op, the utility and success of the green cleaning products, and the manner in which membership in the Co-Op affected their quality of life. Evidence of the success of the project also comes from the results and the benefits reported by the Co-Op members - independence and autonomy, confidence, direct contact with clients, ability to acquire fair compensation, and market appeal benefits from the use of green cleaning products (Gute et al. 2009).

The Co-Op regularly meets two times a week and more as needed. Co-Op members widely participated in the health fairs, and other public events, talks in the radio and newspaper to promote their mission, work and products. Heloisa Galvão, President of the Brazilian Women's Group, believes that the most successful feature of this initiative is that it has become a model for others. The most challenging part of recruitment into the Co-Op is to help women understand that the Co-Op is not simply a business that one joins just to make money but that it is based upon a commitment to the development of a sustainable model that seeks to empower the worker. This is achieved by having members improve their

potential to solve their own problems as well as to serve as a model to strengthen immigrant communities.

DATA COLLECTION

Research Project Design

This study is grounded in the socio-ecological model that examines the interactions between a nested set of factors - from individual traits, such as age, race, sex, and biological factors, to social and community networks, living and working conditions, and, at the outermost level, the broad socioeconomic, cultural, and environmental conditions and policies that help shape and determine the occupational health status of immigrants in Somerville (Gebbie et al. 2003, Sallis et al. 2008, Minkler et al. 2010).

Using the socio-ecological framework, we examined multiple levels (individual, work setting, community, and policy level) of influence on immigrant workers' health. At the individual level we examined worker demographics, their health, their views on work, and their health status. At the level of employment we examined work environment, work organization, relationships between employees and employers, and work related experiences such as discrimination and abuse and community related experiences such as xenophobic influences. At the community level, health care access, worker services and facilities available, and social infrastructure present for immigrants in Somerville were examined. Finally, at the policy level we examined awareness of labor laws, enforcement of

workplace safety regulations, and immigration policy. Please see Figure 1 for a schematic of the conceptual model for our research study design and how these various approaches aided our data collection.

This multi-level information was gathered using a variety of quantitative and qualitative methods. Data collection methods included an immigrant occupational health survey, focus group interviews with immigrant workers, in-depth interviews with immigrant women workers employed in unstable occupations, and Key Informant interviews with immigrant service providers. The immigrant occupational health surveys, focus groups and in-depth personal interviews studied the immigrant population at the individual, work and community level. The key informant interviews with the immigrant service providers examined the immigrant occupational health issues at the larger community level. Additionally, an evaluation was conducted with members of the initial cohort of the Vide Verde Co-Op, as well as annual surveys were conducted among the Teen Educators who participated in the program.

Occupational Health Survey: Design, and Data Collection

The immigrant occupational health surveys were administered to gather descriptive data to better understand the socio-demographic characteristics of immigrants living or working in Somerville. The surveys also attempted to gather information on their occupational backgrounds and to identify needs regarding occupational health and safety. The occupational health survey comprised a single

page of structured questions. (Please view the survey in Appendix 1) The survey was divided into four segments –basic demographic data, occupational information, access to health care and identifying health risks. The demographic variables included country of birth, years in the US, English proficiency, gender, and age. The occupational variables included type of work, occupational classification and work training received. Access to health variables included health and safety training, knowledge of the existence of Workers’ Compensation, as well as access to health insurance. The health risk variables included self reported hazards at work, and self reported injuries suffered at work. The survey was modified in November 2008 to include additional health questions such as ‘Do you have a doctor?’, but also questions to assess the basic health needs of the immigrant community to implement at the immigrant occupational health fairs conducted as part of the project. (See Appendix 2)

Questions concerning immigration status were not included in this survey or in any of the other data-gathering activities. This decision was made and supported by all project partners (academic, clinical, and community).

All of the data collection was performed in Somerville, MA. The data collection ran for three years from June 2006 to July 2009. The Teen Educators administered the surveys under the supervision of IRB certified adults including community member partners or Tufts faculty.

Not all the Teen Educators involved in the study participated in conducting the survey. Twenty two teens participated in conducting the survey. The Teen Educators involved in administering the survey interpreted the questions into the appropriate target language (Spanish and Haitian Creole speakers) in real time and were allowed to discuss and clarify the questions with the respondent rather than simply reading the survey instrument verbatim. In a few instances IRB certified Tufts University students administered the surveys. Since the Teen Educators primarily targeted Haitian Creole and Spanish speakers, a graduate student who was working with the Vida Verde Co-Op and proficient in Portuguese participated in gathering surveys among the Brazilian population.

Our data collection strategies were designed to be perceived as non invasive, and built upon existing resources in the community to encourage acceptance and confer greater benefit on the community partners. The surveys were only administered at venues associated with events sponsored by the community partners (Haitian Coalition, CAAS, ISPG/H, CHA), at flu clinics, community events or health fairs. The flu clinic was an example of our project benefitting from assisting at events sponsored by our partner organizations. The flu clinics were annual events co-sponsored by the ISPG/H and the Somerville Health Department.

Surveys conducted at such events constitutes a convenience sample. Additionally, at these events the Teen Educators did not have sufficient capacity to interview all

attendees but rather interviewed as many attendees as possible. The original plan for the Teen Educator surveys was to combine these types of formal event venues with door-to-door and person-in-the-street formats. These were piloted and the decision was reached to forgo them due to concerns about the safety and comfort level of the Teen Educators.

The survey participants were (18+) adults who either lived or worked in Somerville. 67% of the respondents reported living in Somerville. All participants provided a verbal consent prior to the interview. The survey guarantees complete anonymity because names and identification information were not collected. In total we collected 405 face-to-face Surveys with the self-identified immigrant workers. To calibrate the penetration of our sample this total constitutes roughly two percent of the estimated total immigrant population in Somerville.

Focus Groups

Focus groups were found to be invaluable in gathering greater detail on occupational health issues prevalent among the immigrant population in Somerville. These sessions also helped to overcome shortcomings in the survey data, largely due to insufficient detail on job related tasks and duties and specific occupational health risks. Focus groups also acted as an ad hoc worker support group which offered the opportunity to mount discussions on the participant's work conditions and health concerns related to work.

The focus groups were held in three different immigrant neighborhoods of West Somerville, East Somerville, and Prospect Hill. West Somerville is home to most of the Haitian community in Somerville and the Prospect Hill and East Somerville is home to the Hispanic and Brazilian communities in Somerville. The focus groups were performed with the aid of the community partners at the HC, the Head Start program at CAAS, the Welcome Project, ISPG/H and MassCOSH. The Welcome Project is an agency which provides direct services to public housing residents in Somerville and is not a formal community partner of our funded project. The focus groups were conducted in Haitian Creole, Spanish and Portuguese, appropriate to the language requirements of the participants.

Focus group questions were related to and resembled the survey questions. These questions were translated into Haitian Creole, Spanish, and Portuguese and then certified by interpreters of the Translation Service Department at the Cambridge Health Alliance and approved for use by the Tufts University IRB board. The community members were instrumental in setting up and encouraging participants to attend the focus groups and often acted as the lead translators for the focus group. We also solicited participants to the focus group by distributing flyers at a variety of public locations including the Mystic Avenue Public Housing complex, through the CAAS and the Head Start offices and at Foss Park, a Somerville location frequented by day laborers. We also approached established and ongoing programs such as English as a Second Language (ESL) and Head Start programs to serve as fulcrums for generating interest in the holding of focus groups. We

were successful in holding focus groups at the ESL program at the Haitian Coalition and the Welcome Project. We also successfully utilized the Parent Association at the Head Start of CAAS for a focus group. In the case of the HC, the ESL teacher at Haitian Coalition co-led and translated for the focus group. The coordinator at Head Start, CAAS translated for both the Head Start and Welcome Project focus groups. Besides these venues we conducted focus groups with day workers nearby to Foss Park with the help of the ISPG/H and MassCOSH. Five focus groups were conducted between March 2008 and December 2008. In total 48 people participated in the focus groups.

After the focus group interviews, the participants also completed the immigrant occupational health surveys. We requested verbal consent from all participants before conducting the focus groups for both their participation and the audio-taping of the discussion. The focus groups participants were given gift card of \$15 for approximately one hour of participation.

All the focus groups were audio recorded and translated at the time of the interview by the community-leaders who are all native speakers of Haitian Creole, Spanish and Portuguese. The audio recordings were transcribed by native speakers who also translated these interviews. After transcription, the tapes were erased to maintain confidentiality. The audio-tapes were shared only with project staff.

In-Depth Interviews with Recent Immigrant Women Workers in Unstable Occupations

This part of our work was a pilot initiative aimed at understanding the risks borne by recent immigrant (less than three years in the US) women who work in unstable occupations or as day laborers in the greater Boston area. Women day laborers in this study are comprised mainly of helpers, temporary workers, contract workers who are in the job market without a permanent occupation but who go from job to job depending on what is available. Most of these jobs are obtained through word of mouth by friends, agencies and even churches. Given the low numbers of women day laborers and the difficulty of recruiting them the inclusion criteria of either living or working in Somerville as used in the occupational health survey was relaxed.

An open ended semi-structured interview was conducted with women in these unstable occupations. Some site observations of the locations at which the women were hired were also conducted by the author. The interview structure included a brief personal history of each participant, their work history, information on the hiring agency or the day work site, the risks and hazards encountered at work, concerns about gender issues and social hazards as presented within the job setting.

The participants were identified through the extensive connections of our community partners. The participants were notified and invited for the study via telephone or email or via a staff member of a community partner organization. The interviews were conducted with the help of staff from MassCOSH and Brazilian Women's Group who were proficient in Spanish or Portuguese. No interviews with recent Haitian women were conducted. The interviews ranged in duration from one to three hours. The interviews were conducted at a location chosen by the participant where they felt comfortable and where confidentiality could be insured. All the interviews were conducted by the author with a translator and performed in a variety of venues which ranged from churches, to community offices and homes. A verbal informed consent was obtained at the time of the interview for both the interview as well as for audio-recording the interview. To maintain confidentiality of the participants a pseudonym was used instead of the name of these participants. The participants were compensated at the rate of \$50 per person. All interviews were audio recorded and translated. Detailed field notes were taken by the author which allowed for the noting additional observations and non-verbal cues.

Eight women from diverse backgrounds were interviewed. The women interviewed came from Brazil, Honduras and Columbia. No Haitian subjects participated in these interviews. These women were very new to the country, residing in the US for less than two months and up to three years. The women interviewed were between the ages of 30 - 52. The occupations of respondents

were cleaners, a worker for a thermoset molding company and a packaging company. These interviews were performed over a period of year and a half (2008-2009). These interviews constituted an ethnographic approach with more than one interview being performed per respondent when possible. (Certain subjects were lost to follow up.)

Key Informant Interviews

The key informant interviews on immigrant occupational health were conducted with the community groups, worker centers, health service providers, unions, employers, state agencies and faith based groups that provide services to immigrant workers in and around Somerville, Massachusetts.

All the interviews were semi-structured and featured open ended questions which created the opportunity for in-depth follow-up questions. The Snowball sample technique was used to recruit prospective interview subjects. The key informants were initially selected with the help of the community members and later by means of a “referral system” of key informants who had completed interviews. The key informant interview included questions on the organization which employed the key informant, about the immigrants in the community, the occupational and health issues observed among the immigrant population and the interventions and policies in place or needed to improve health conditions among immigrant workers. Written consents were obtained before each interview. All interviews were conducted in English for a duration of less than an hour. These

interviews were conducted in English and transcribed by Tufts University student research assistants and checked by the author for accuracy.

Interviews were conducted with seven community groups, three work centers, four union members, three faith based groups, nine City, state, and federal employees, four company owners and nine health care workers. A worker center is a collaborative organization that unites immigrant workers to take action to end dangerous conditions and exploitation (MassCOSH, undated). The primary community partners of our collaborative were also interviewed as Key Informants on an annual basis to assess changes, develop issues and to assess progress. The main goal of the Key Informant sequence of interviews was to have an understanding across multiple stakeholders on the perspectives of occupational risks among immigrants in Somerville and to have a better understanding of the occupational health and safety service infrastructure available to immigrants in Somerville, Massachusetts.

In addition, Key Informant interviews were also conducted to gather background information on the women involved in unstable employment in the Boston area. We performed additional key informant interviews with community members aware of women day laborers and temporary agencies who employed women in unstable employment contexts. The author interviewed eight community key informants representatives and three temporary labor agencies in the Boston area

regarding women day laborers. These interviews were semi-structured and conducted via both open ended and in-depth questions. The key informant interview included questions on immigrant women workers. The questions sought information on their job search practices, recruiting process, hiring agency trends and services, employment trends and practices and occupational health concerns among women in unstable employments. Written consents were obtained before each interview.

All of the key informant interviews were conducted in English for a duration of less than an hour and these interviews were transcribed by a student researcher and reviewed by the author for accuracy. In total 50 key informant interviews were conducted over a three year interval for these two series of Key Informant interviews.

DISCUSSION

Study Challenges

Even with extensive community collaboration we found that collecting a representative study sample, controlling for selection bias and maintaining data quality quite challenging. In this section we will explore these main challenges in depth within the context of Somerville Immigrant Occupational Safety and Health study.

Study participation and sample size: We obtained a sample of 405 surveys over a period of three years, and of 8 recent immigrant women who agreed to lengthy in-depth interviews, and a focus group sample of 48 immigrant workers within a year. The response rates in surveys among immigrant populations are known to be inherently lower as the immigrant population are known to be more careful about disclosing information due to their status and because of other possible repercussions involved in divulging sensitive work information (Brown et al. 2002, McCauley 2005, Scherzer et al. 2005). Our sample size is comparable to other survey efforts reaching out to similar populations. A door-to-door immigrant occupational health study performed by community health educators over a year yielded 427 survey participants (Pransky et al. 2002). A six-member Restaurant Worker Leadership Group (RWLG) gathered 433 surveys of restaurant workers through networks at wide range of venues as local community-based organizations, churches, ESL classes, popular parks, community gatherings, hospitals and clinics (Minkler et al. 2010)

One of the most ambitious surveys with a sizable sample from an immigrant occupational health study was conducted by the Massachusetts Department of Public Health (MADPH) occupational health surveillance program. The study was conducted at several community health centers waiting rooms between 2002 and 2003 and collected 1428 responses. These surveys were orally administered as in our study in English, Spanish, Vietnamese, Portuguese, and Verdean Creole and Khmer by trained interviewers while the participants were waiting for the

appointments or after they were done. These surveys were twice as long as ours with 57 questions. However, the participants were given a gift voucher of \$5 for their time (MADPH 2007b).

Comparing these studies, major differences in approach exist in the survey design and recruiting techniques. In the MADPH study, the participants were compensated for their time which may have encouraged participation. Surveying at busy events and abruptly seeking participation in a survey on a rather personal work and health details as opposed to doing them while waiting for an appointment as in the MADPH study or via a door to door format as in the case of Pransky et al (2002) may have improved the level of participation and the level of information a participant discloses. Our surveys were a convenience sample conducted mostly at public events sponsored by our grant or its partners such as the flu clinics, occupational health fairs, and other community events. These were not markedly different from the approach of Minkler et al (2010), however their recruitment team included adult members from the Restaurant Worker Leadership Group. The primary issues of concern in these cases include lack of privacy, or the need for a private space to conduct such interviews and the choice of the interviewers, such that the immigrant participants will feel comfortable.

Gaining trust is a significant problem particularly in immigrant populations. A study done by Franzini and Fernandez-Exquer (2004) demonstrated that Spanish speaking immigrants had lower levels of trust and higher levels of perceived

victimization than the English speaking native born. We can only speculate on the importance of documentation status in affecting our results reported here.

Strategies known to improve recruitment include face to face recruitment, culturally matching participants and recruiters by age, gender, and race (Gilliss et al. 2001, Gavalier et al. 1999, Blumenthal et al. 1995, Moorman et al. 1999).

While we dealt relatively efficiently with the language and cultural barriers through the use of Teen Educators of Hispanic and Haitian origin that possessed language proficiency, we did not match the interviewers by age of the participant. This may have made it uncomfortable for the participants to talk to and disclose and discuss personal occupational and health information with a teenager. Since we had no Brazilian Teen Educators, the community members and Tufts University researchers proficient in Portuguese helped gather the Brazilian surveys. The Brazilians were well represented in the survey suggesting efficiency of using adult community based participants as interviewers and data collectors.

Socio-political factors can also impede data collection. We undertook our study during a difficult phase of economic recession and widespread xenophobia.

Accessing immigrants has been especially noted as problematic since 9/11 and in a more local context harder after the New Bedford (MA.) Immigration Customs Enforcement raids. Over eighty people were arrested in raids in Massachusetts including Somerville (Pramas 2008, Hassett 2007). In a Cambridge Health Alliance (CHA) provider survey conducted in 2008 on the health of immigrant clients, 58% of the respondents reported that local enforcement of federal

immigration policies contributed to reducing access to health services among the immigrant community. 44% of the providers reported an increase in the number of missed appointments without follow up among immigrant patients. The survey also reported that immigrant patients were unwilling to provide contact or personal information due to fear of possible deportation. As a result, providers often did not have access to the patient to provide test results or to relay other urgent health information as well as to confirm appointments. Patients also feared involvement with law enforcement and possible deportation as a result of simply going to a health center (Marlin, CHA, 2008).

Improving response rates in surveys is an inherent challenge. Lee and Krause (2002) note that an outreach plan was necessary to mobilize workers, union based room cleaners to gather after work at locations away from the job site and to spend an hour filling out a questionnaire. In their case, they said they waged a “mini-campaign” to aid the productivity of the research. While the rate of union membership is low among immigrant workers, the use of trained adult leaders from different immigrant occupations might have been an effective strategy to improve survey enrollment as well. Training/educational materials presented at interviews have also been shown to stimulate participation and discussions on work practices and health concerns (Lee and Krause 2002, Arcury et al. 1999). In our study, we were successful in establishing good outreach by means of collaborating with the community partners and by providing training and educational materials especially at the occupational health fairs. We also

compensated the recently immigrated women interviewees and male day laborers for their time and participation. These strategies may have improved participation in our study.

Studies have shown that modes of gathering data are important to consider in performing immigrant occupational health studies. Lowry et al. (2010) noted that a one-on-one approach, approaching workers individually while they were waiting for work was an effective strategy to capture injury experiences. The one-on-one format holds promise of offering such improvements although this might have posed other issues of having our relatively young interviewers alone with subjects in our study.

In essence, strategies to improve data collection include offering a private and relaxed setting to conduct surveys and interviews, matching the recruiters by race/ethnicity, gender and age, improving trust by establishing a good outreach plan by working with trusted community partners, and providing care, information or compensation for their time have shown to be helpful (Lowry et al. 2010, Gilliss et al. 2001, Gavalier et al. 1999, Blumenthal et al. 1995, Moorman et al. 1999, Lee and Krause 2002, Arcury et al. 1999).

Selection bias: The survey respondents were obtained from convenience samples, which drew upon a source population of people who attend flu clinics, and health fairs. About half the population in the survey was reached by these means

whereas; the other half was reached through the participating community groups and through focus groups conducted within the respective communities. One concern here is that because the respondents were known to and reached by our community based partnering organizations our respondents may well constitute a more “mainstream” subsection of the overall ethnic group. Following this line of reasoning we may have failed to interact with the most vulnerable segments of the immigrant communities found in Somerville.

Selection bias may also have been potentiated as a result of the use of Teen Educators in the field to conduct the occupational health and safety survey reported on here. The Teen Educators may have unconsciously sought participation from the younger strata of the population. The age distribution of the survey population might reflect the overt or subtle choices made by the Teen Educators in terms of their own comfort level with regards to interacting with potential respondents. The age distribution of the participants in the survey show that 16% of the participants were between the ages of 18-20 years which suggest a possible over-selection of younger respondents. Such selection factors may extend to social class of the subjects and gender as well.

The reported prevalence estimates are not necessarily generalizable and may in fact be conservative. Selection bias may be unavoidable in projects such as this that study hard to reach and access populations. More innovative and creative solutions are needed to access this population to reduce selection bias.

Community based and intervention based approaches are an effective strategy to access this population who suffer from very poor access to occupational health resources.

Data quality: Many gaps were observed in the survey data dealing with questions on their occupation and health. Structured questions had better response rates than the open ended questions. Structured questions such as, ‘Did you receive training for your job?’ (84.4%), injuries (86.9%) received a higher completion rate compared to the open ended and descriptive questions such as, ‘What is your primary job? (83.5%), secondary job (24.9%), past profession (48.9%), and descriptions of hazards.

The quality of the descriptive variables in the survey, in addition to the completion rates of the variables, further added to our concerns regarding data quality. The descriptive variables were sometimes vague and incomplete, for example, responses to primary occupation included descriptions such as, “fold clothes, stack, airline (security)”, etc. We also realized some of the participants were reluctant to disclose their work details in a survey.

Some of the pitfalls associated with the classification of health and occupation is that the reported occupation title may not adequately capture the principal work related functions or duties of the respondent. Most immigrant workers have multiple jobs and short term, temporary jobs. Short term employment which

possibly exposed the worker to high concentrations of harmful agents will likely be not reported in a survey focused on the present occupations. The intricacies of a varied work history and the holding of multiple jobs will also be not captured. This adds to the difficulty in understanding the occupational categories as reported by immigrant workers and estimating the hazards in their work settings.

The health outcomes in this study are also self reported and thus the results may contain some undetermined degree of inaccuracy. Worker expectations about their own health may also contribute to recall bias of health-related events. Many of the respondents, perhaps because of the lack of well developed health literacy have difficulty in relating health problems they experience with work. We found that some members of the immigrant communities we interacted with did not necessarily make a clear distinction between a health issue and an occupational health issue unless there was a broader awareness of the occupational hazard such as exposure to lead in painting, etc. So, a person with a bad back might blame it on many things and not think about the relationship to standing all day at work or the person with a skin problem might think that it is due to something other than chemicals used at work.

Compared to the administration of the survey, we found that the qualitative modes of inquiry were more efficient in capturing the broad overview of occupational health themes as well as in selected cases allowing for a detailed understanding of specific risks. We found that focus groups were more effective at facilitating

immigrant worker participation in a dialogue on occupational health issues. The major difference between the quantitative and qualitative studies were that the community partners organized and moderated most of these focus groups or the interviews which may have aided participation and participation engagement and allowed for lengthier and richer discussions. Performing surveys in conjunction with the focus groups (as we did) might be an effective approach to continue in the future to enhance the quality of both quantitative and qualitative data.

In addition, the question of error and misclassification may arise from incorrect interpretation of the information on the part of the interviewer, different nuances of meaning in translation while conducting surveys, variability in communicating the questions between interviewers, and reticence among study participants to discuss occupational and health issues with the recruiters. Hence, potential exists for slight differences in translation to interfere with the precision of responses. We are not sure if the maturity of the interviewer is a factor that would inhibit both the response rate and what is disclosed by participating respondents during the surveys. Among this population ability to discuss concerns and the information was vital to participation (Barata et al. 2006). Some Teen Educators were not entirely comfortable in their “home” country languages which may have added more complexity to translating key occupational health terms.

We provided training to the Teen Educators on survey design, the interview process, and the protection of confidentiality of human subjects. But specialized

and more in-depth training on the conducting of open ended questions with respondents would be a useful future addition. Perhaps fewer open ended questions aimed at identifying more precise information, or even multiple choice questions on occupational details and precise health outcomes would have improved data quality.

Study accomplishments

Our study had many limitations due to low study participation, selection bias and data quality. Still, the study is valuable despite these limitations. This is the first study to attempt a concurrent assessment of multiple immigrant populations in a given community and to document the occupational health experience of specific immigrant population such as Brazilian, Salvadoran and Haitian and in turn compared it with other immigrant groups in the same local milieu.

Our project was not solely a dedicated research initiative. Rather it reflected a balance including both community outreach and education and the development of an enhanced capacity on the part of community partners to provide services and information regarding immigrant occupational health issues of importance. Accordingly, our project represented a healthy mix of community initiatives and research. The project was very successful in initiating a number of meaningful community outreach efforts through the Teen Educators, the administration of community occupational health fairs and the establishment of Vida Verde Co-Op. We used unconventional methods (Teen Educators) to engage our populations of

interest. We are not aware of other projects which have employed youth to work directly with adult workers.

Predominant responsibility for outreach fell along the ethnic affiliations of our project partners. The HC provided entry and access to the Haitian population. The CAAS helped to reach the Hispanic population and the BWG facilitated contact with the Brazilian population in Somerville. Two Teen Educator groups organized by HC and CAAS succeeded at many levels, to gain trust and break through the difficult barriers of language and social distance in accessing key immigrant populations in Somerville. Conducting the study via the Teen Educators required certain adjustments on the part of the research team to see the world through their eyes and to simplify the survey instrument, which was done by involving them in designing the survey. This benefited the project by producing a survey instrument that was more readily understood, and more easily communicated to the immigrant workers. We believe that this process would have also prepared the Teen Educators to conduct the survey with greater confidence and may have stimulated more conversation and trust between the study subjects and the Teen Educators. The Teen Educators in turn were also able to raise occupational health awareness in the community. The BWG's Vida Verde Co-Op as a result of attracting wide media attention became a celebrated initiative in the community which further increased the visibility of the entire project throughout Somerville and in contiguous areas.

CONCLUSION

An important set of challenges to overcome in the work reported here was the sensitive and personal nature of several of our study variables (ethnicity, occupational details and work hazards) coupled with risk that workers may face as a result of identifying potentially hazardous workplace conditions and their work status in the case of undocumented workers. Gathering data and assuring adequate representation of immigrant workers given these characteristics, is a daunting task and data quality (accuracy, validity, completeness) is of concern in studies such as this.

In this research initiative, we were able to achieve meaningful participation despite the presence of these complex challenges by using a collaborative strategy that was formulated to address some of these problems and perceived obstacles. Our project through a combination of academic and community resources enhanced our collective capacity and leveraged prior connections to the community. By partnering with five community organizations enjoying access to different ethnic communities our project greatly benefitted by earning it a higher level of trust, interaction and success in communication. The community groups that participated valued our project's ability to gather information on immigrant workers so that these workers would be better served.

We relied heavily on our project partners for data collection and outreach. The

project was successful in initiating a number of meaningful community outreach efforts and research initiatives. By collaborating with communities we were able to gain access to immigrant workers that many might deem “hard to reach” and pursue the investigation of work related health problems. Our study participants reflected a large proportion of immigrant groups employed in a range of industries and occupations that pay low wages.

By partnering with five community organizations each with access to different ethnic groups or specific expertise, our project benefitted greatly from the level of trust, interaction and effective communication enjoyed by these organizations.

Despite this highly beneficial collaboration, we experienced challenges to study participation, selection bias and data quality. We found that private and relaxed settings to conduct surveys and interviews, matching the recruiters by race/ethnicity, gender and age, improving trust by establishing a good outreach plan by working with trusted community partners, and providing care, information or compensation for their time may improve study participation.

Selection bias maybe unavoidable in data samples such as this that studies hard to reach population. More innovative and creative solutions such as developing more meaningful communication with this demographic group is needed to access this population to reduce selection bias. Community based interventions maybe an effective strategy to access this population who suffer from very poor access to occupational health resources. Data quality among the immigrant surveys maybe improved by having more structured questions with multiple choices that would

reduce incomplete and vague responses. Training interviewers in conducting open ended surveys would also improve the data quality. Future studies can benefit from considering these strategies for immigrant occupational health research.

The study of immigrant workers in Somerville, MA is valuable despite its limitations. This is the first study to attempt a concurrent assessment of multiple immigrant populations in a given community and to document the occupational health experience of specific immigrant population such as Brazilians, Salvadorans and Haitians and in turn compare it with other immigrant groups in the same local milieu. Such calibration is an important step forward in terms of providing greater depth of the context of occupational health safety issues which arise in immigrant populations.

Table 2.1 Demographics by immigrant groups in Somerville, MA based on U.S Census 2000

| | Population | % in Somerville | Male | Female | College educated | English Proficiency | Poverty |
|-------------|------------|-----------------|------|--------|------------------|---------------------|---------|
| Haiti | 2,168 | 5% | 54% | 46% | 15% | 55% | 13% |
| El Salvador | 2,075 | 12% | 58%* | 42%* | 8%* | 54% | 21% |
| Brazil** | 17,000 | 23% | 51% | 49% | 19% | *** | |
| Hispanic | 6,786 | 6% | 51% | 49% | 16% | 80% | 15% |
| Asia | 4,900 | 3% | 51% | 49% | 27% | 80% | 18% |

* in Massachusetts

** Represents Brazilians in the Boston and North Shore area: Somerville, Allston/Brighton, Medford, Everett, Malden, Chelsea and East Boston.

*** Marcelli (2009b) reported that 25% of the Brazilians speak English very well

Table 2.2 Occupation by Immigrant groups in Somerville, MA based on U.S. Census 2000

| | Labor force | Services | Sales | Construction | Management/ professional | Production | Un-employment |
|-------------|-------------|----------|-------|--------------|--------------------------|------------|---------------|
| Haiti* | 61% | 40% | 19% | 4% | 21% | 16% | 15% |
| El Salvador | 71% | 41% | 15% | 6% | 7% | 31% | |
| Brazil* | 72% | 46% | 16% | 14% | 14% | 8% | 4% |
| Hispanic | 79% | 25% | 22% | 6% | 23% | 23% | 5% |
| Asia | 70% | 12% | 24% | 6% | 53% | 8% | 4% |

* The above % represents Brazilians In Boston and the North shore area which includes Somerville.

Table 2.3: Immigrant occupational health survey data collection methods

| Full Survey | n | % |
|----------------|-----|-----|
| Teen Educators | 284 | 70% |
| Researchers | 24 | 6% |
| Health Fairs | 49 | 12% |
| Focus Groups | 48 | 12% |
| Total | 405 | |

APPENDIX

Appendix 2.1 Somerville Immigrant Occupational Health and Safety Survey

Appendix 2.2 Occupational Health Fair Survey

Somerville Immigrant Occupational Health & Safety Survey

These questions will help us better understand the safety and employment needs of our community members. You will not be asked to sign your name or identify yourself. You can stop the survey anytime you want.

Thank you for taking the time to answer these questions.

BACKGROUND

1. In what country were you born? (write in) _____
2. How long have you lived in the United States? (check one):
 Less than 1 year 1-3 years 4-6 years 7-9 years 10-12 years 13-15 years More than 15 years
3. In what country or countries were your parents born? (write in): _____
4. What language do you use at home most of the time? (write in, one language only): _____
5. What other languages do you speak?:
 Spanish Portuguese Haitian Creole English Other (write in) _____
6. Are you... (check one) Male Female
7. How old are you? (check one) 18-20 21-30 31-45 46-54 55-65 66-79 Over 79
8. In what city or town do you live now?(write in): _____

OCCUPATION:

9. Who do you work for? (check one):
 One Regular employer (boss) Many different employers Self employed Currently unemployed
10. Do you work at one job or more than one job? (check one): One job More than one
11. What kind of work do you do at your primary job? (examples: teacher, janitor, manual labor: packaging, painter, cleaner etc) (write in) _____
12. If you work more than one job, what other kind of work do you do? (write in): _____
13. Did you receive any type of training for your job or jobs? (check one): Yes No
14. If you have a profession that you cannot currently practice, what is it?: _____

HEALTH AND SAFETY

15. Did you receive job training that was specifically about health and safety? (check one): Yes No
16. A hazard is anything that can harm you, injure you or affect your health. Are there hazards in the work you do?
 Yes (write in type of hazard, use back of sheet if necessary): _____ No Don't Know
17. Are you covered by any form of health insurance or health plan? Plan name: _____ No Don't know
18. Do you know your rights under Massachusetts Workers' Compensation laws? (check one): Yes No
19. Have you ever been injured at work? Yes, once Yes, more than once No (if no, end interview now, otherwise)
20. Was the most recent injury officially reported? (check one): Yes No
21. For the most recent injury, did you receive treatment? Yes No
22. For the most recent injury where do you go for treatment? be specific, if possible): _____
23. If yes, how did you pay for treatment? Workman's Compensation Self Employer

Somerville Immigrant Occupational Health & Safety Survey

24. Do you have any health problems that you think are work related?

Yes No

If yes, please describe:

25. Do you have a doctor?

Yes No

If no, why not?

26. If we held a free worker's health clinic what health conditions would you like help with?

| | Very Interested | Interested | Not Interested |
|---|--------------------------|--------------------------|--------------------------|
| Preventing and treating lower back pain or strain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Preventing and treating shoulder, elbow, wrist pain or strain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Preventing and treating knee, foot, ankle pain or strain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Preventing chemical exposures | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Preventing and treating lead paint exposure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Nutrition and weight control | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Blood pressure check | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Blood sugar check | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Workshop on workers compensation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Workshop on health access and free health care | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Other: _____

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III. Ethnicity, Years in the US, and English Proficiency and Occupational Health and Safety Outcomes Among Self-identified Immigrant Workers Living or Working in Somerville, Massachusetts

ABSTRACT

Objective: To describe the occupational health disparities among Haitian, Salvadoran, and Brazilian immigrant communities living or working in Somerville, Massachusetts.

Methods: In this community based research initiative, we employed a survey instrument developed and administered by bi-lingual Teen Educators in assessing occupational health risks among immigrants living or working in Somerville, MA. This is a novel technique designed to overcome barriers posed by a lack of trust and cultural differences between researchers and immigrant workers.

Results: The immigrant worker groups displayed significant variability in their years in the US ($\chi^2 = 67.8$, $p = 0.045$). Significant positive associations were found between the number of years the immigrants have been in the US and the occupational sector they work in ($\chi^2 = 58.3$, $p = 0.040$), health and safety training ($\chi^2 = 13.0$, $p = 0.014$), knowledge of Worker's Compensation ($\chi^2 = 11.4$, $p = 0.004$), health insurance ($\chi^2 = 31.8$, $p = 0.001$), access to doctor ($\chi^2 = 5.4$, $p = 0.056$), and a negative association with injuries at work ($\chi^2 = 7.1$, $p = 0.035$). Significant associations were also found between English proficiency among immigrant groups and health and safety training ($\chi^2 = 10.8$, $p = 0.001$), knowledge of Worker's Compensation ($\chi^2 = 22.4$, $p = 0.001$), health insurance ($\chi^2 = 16.8$, $p = 0.001$), access to doctor ($\chi^2 = 6.3$, $p = 0.012$), hazards at work ($\chi^2 = 4.1$, $p = 0.050$) and injuries at work ($\chi^2 = 5.3$, $p = 0.021$).

Conclusion: We found no conclusive evidence of variability on most outcomes of interest among the immigrant groups but found variability by the number of years they have been in the US and their English proficiency. Further studies with larger sample sizes are recommended.

INTRODUCTION

One of the central features of the contemporary US workforce is that it is increasingly diverse and complex. As the labor force in the US is profoundly segregated, the working conditions, occupational hazards, benefits and level of personal protection provided on the job have also been shown to vary by demographic characteristics. Such characteristics include race, ethnicity, years in the United States, English proficiency and immigrant documentation status (Ahonen 2009, Murray 2003, Lipscomb 2006). Many studies show that immigrants tend to be employed in more hazardous occupations or are assigned to more dangerous tasks and tend to work in risky work environments than native workers (Richardson 2004, Bollini 1992, Brunette 2005, McCauley 2005, Azaroff 2004, Wu et al. 1997, delPinal 1996). Immigrants have also been shown to suffer higher rates of fatal occupational injuries (Loh and Richardson 2004), non fatal occupational injuries (Bollini and Seim 1995, Ahonen et al. 2006) and severe injuries and prolonged disabilities resulting in missing more days off work than the native born (Zhang 2009, Strong and Zimmerman 2005, Caragan 2004). The dynamics of occupational health disparities among immigrants is further complicated by a myriad of factors ranging from work place discrimination, ineffective work training, lack of literacy and other language barriers and unequal access to health care (Dembe 2001).

Given this preponderance of evidence that immigrants are disproportionately exposed to occupational hazards and risks it is noteworthy that little effort has gone into understanding the differences that may exist among and between various immigrant groups. The majority of immigrant occupational risk studies conducted in the United States have focused on Hispanic workers (Richardson 2004, Pransky et al. 2002, Dong et al. 2004, Moure-Eraso 2004, Goodrum and Dai 2005, Robinson 1987, 1989, Vasquez and Stalnaker 2004), however, immigrant groups are varied and prominent differences exist between immigrant groups and even within the Hispanic groups. Maxine Margolis, an anthropologist, has referred to Brazilians as the “Invisible Minority” as they are misrepresented as being Spanish-speaking Hispanics in the U.S. Census when they are neither Spanish speaking nor Hispanic (Siqueira and de Lourenco 2006). There are many differences between the immigrant groups which are reflected in their distinct histories, the circumstances under which they left, migration, resettlement, the ways they assimilate in the new place, find work and build their economic status (Uriarte et al. 2003, Guarnizo et al. 2003). Further health disparities have been documented within the immigrant population by their years in the United States (Glazier et al. 2004, Seitia et al. 2011, Asanin and Wilson 2008, de Castro et al. 2008) and English Proficiency (Bonauto et al. 2009, Smith et al. 2009, Premji et al. 2010).

There are limitations to existing data collection techniques as conducted by the state and Federal agencies as they do not allow adequate representation or

description of immigrant characteristics at the community level. This often leads to an inadequate understanding of the socio-cultural background that shapes occupational risk in these populations. The most recent national report authored by the United States Bureau of Labor Statistics show that a third of the respondents did not disclose their race or ethnic origin (BLS 2009). This incomplete characterization of race and ethnic origin of workers and other demographic characteristics in existing occupational health surveillance systems in particular, has been noted by other scholars (Azaroff 2004, Souza et al. 2009, Lowry et al. 2010), and highlights one of the central difficulties in understanding the occupational health burden among immigrant workers.

There is a lack of culturally appropriate community based studies that document the occupational health experiences among different immigrant groups by ethnicity, their years in the US and English proficiency. The lack of comprehensive information on the immigrant occupational health experience is acutely felt by both community and regulatory agencies that promulgate occupational health standards (Azaroff 2004). This restricts conceptualization of successful interventions and the implementation of appropriate preventive measures to be delivered at the work site or at the community level. Community based participatory research (CBPR) that attempts to gather data at the community level has been identified as a preferred methodological approach to study immigrant groups and to understand their occupational health experiences (Minkler et al. 2010; Israel et al. 2005).

This study highlights in particular the occupational health experience of the predominant immigrant groups in Somerville, Massachusetts – Brazilian, El Salvadoran and Haitian by their years in the US and English proficiency.

METHODS

Study Location

The Boston Metropolitan Area, which includes Somerville is termed as a ‘continuous’ immigrant gateway (Singer A, 2004). Somerville has witnessed a steady growth in its immigrant population over the past three decades. Once a nearly all white working class community, Somerville has been transformed within the past thirty years into an ethnically, racially, linguistically, and socio-economically diverse community. According to the American Community Survey (ACS 2008), Over a quarter of Somerville’s residents (25.2%) are immigrants. This is substantially greater than the US immigrant proportion of 12.5%. One-third of the foreign born population entered Somerville in 2000 or later. Latinos (9.5%) comprise the largest immigrant group in Somerville followed by Asians (6.7%), and others (5%). The most prominent immigrant groups in Somerville originate in El Salvador, Haiti, Brazil, Mexico, Guatemala, Honduras, China, India, Korea, Vietnam, and Nepal.

Study Design and Data Collection

One of our project goals was to establish a community capability for gathering and disseminating information on work and health among the immigrant populations in Somerville. The project relied upon a core group of community based partners Immigrant Services Providers Group/Health (ISPG/H), Community Action Agency of Somerville (CAAS), Haitian Coalition (HC), Brazilian Women's Group (BWG) and their ability to identify immigrant populations. The Haitian Coalition predominately provided access to the Haitian population, CAAS to the Hispanic population and the Brazilian Women's Group to the Brazilian population. Since there were no Asian community organizations of sufficient scale in Somerville, our work did not target this at risk population. For additional detail on methodology please consult Chapter 2.

A survey was designed and administered by a group of bi-lingual (English and the target languages of our populations of interest) Teen Educators who were recruited and supervised by the Haitian Coalition and CAAS. The bilingual Teen Educators interpreted the questions for non-English speakers and were encouraged to discuss the questions with the interview subjects. A total of 22 teens participated throughout the period of survey administration which began in 2006 and ended in 2009.

The survey was comprised of 23 structured questions. The survey was divided into four segments – basic demographics, occupation, access to health resources

and a concluding section on health risks. All the occupational variables were coded by employing the U.S. Bureau of Labor Statistics Standard Occupational Classification (SOC) system. An important structural element here is that one of the health variables, the presence of a regular doctor was only asked among a smaller portion of the respondents (n = 277 out of 405 total respondents). This question was added as a supplement to the original questionnaire in preparation for the holding of the occupational health fair at the Assembly Square Cambridge Health Association (CHA) location.

Data collection was performed in Somerville, Massachusetts. Convenience sampling was implemented by selecting participants and performing interviews at events that were sponsored by the partnering community based organizations such as at yearly influenza clinics organized by the ISPG/H and two occupational health fairs conducted in conjunction with the CHA. The survey participants included adults (18 years of age or greater) who either lived or worked in Somerville. Oral consents were obtained by the Teen Educators at the time of interview. No names were ascertained nor was documentation status asked. This was a deliberate methodological decision taken upon the strong and unanimous advice of the community based organizations involved in the work. As a means of increasing capacity for research within the community based organizations associated with our project the project coordinators were trained as Independent Investigators within the framework of the Tufts Institutional Review Board protocols. The benefits and challenges posed through such enhanced capacity

within the community based organizations have been described previously (Hyatt et al. 2009). The survey questionnaires and all study procedures were reviewed and approved by the Tufts University Social, Behavioral and Education Research Institutional Review Board (IRB).

Data Analysis

Statistical analysis was performed using SPSS 17.0. Data were analyzed at the level of ethnicity to understand occupational health disparities existing between different immigrant groups. The analytical plan included cross tabulations and chi square statistics to identify significant associations. Differences by ethnicity for any of the responses were considered statistically significant if the two-tailed p-value was less than 0.05.

This study sample (n = 405) numerically constitutes a little over two percent of the total immigrant population in Somerville as estimated by the 2000 U.S Census. The survey respondents were made up of individuals who self identified as immigrant workers who either lived or worked in Somerville. The survey participants, consistent with the U.S. Census data shows a very diverse population with respondents from 34 different countries including the United States. The respondents who answered affirmatively to a question of being US born (n = 59) were removed, even if some of their parents were born outside of US, to ensure we only analyzed the immigrant population in our sample (n = 346).

In this analysis, the country of birth categories were Haiti, El Salvador, Brazil, Other Hispanics and Others. The category Other Hispanics includes respondents born in Puerto Rico, Mexico, Belize, Honduras, Guatemala, Colombia, Peru, Venezuela, Ecuador and Dominican Republic. The category Others includes immigrants from Asia, Africa and Portugal. Recent immigrants were defined as immigrants who have been in the United States for less than 10 years. Established immigrants were defined as immigrants who have been in the US for over ten years at the time of their participation in the survey.

Three major immigrant groups are represented in the survey based on their country of birth; Brazil (n = 98, 28%), Haiti (n = 83, 24%), and El Salvador (n = 74, 21%). The Other Hispanics category (n = 40, 12%) and the Others category (n = 51, 15%) completed the categorical data .

RESULTS

Analysis by Country of Birth

Demographics: Table 3.1 shows the results of the country of birth and demographic findings. Country of birth was significantly correlated with the number of years in US ($\chi^2 = 67.8$, $p = 0.045$). Brazilians respondents were in the US for the shortest time with 8% in the US over 15 years. Salvadoran respondents were in the US longest, with 34% in the US for over 15 years.

Occupation: Table 3.1 shows no statistically significant differences were observed between the immigrant groups and the type of work they do, their occupations or work training

Access to occupational health services: Table 3.1 shows the differences observed between the immigrant groups and occupational health services (health and safety training, knowledge of Workers' Compensation Law, health insurance, and access to doctor) and health risks (hazards at work, health problems due to work and injuries at work). None of the comparisons was statistically significant.

Analysis by Years in the United States

Demographics: Table 3.2 shows the results for years in the US and demographic variables. The years an immigrant has been in the US was significantly correlated with English Proficiency ($\chi^2 = 21.3$, $p = 0.001$), and Gender ($\chi^2 = 8.4$, $p = 0.010$). English proficiency largely increased with the number of years in the US. Half of the recent immigrants did not speak English while 81% of the immigrants who have been in the US over 15 years spoke English. Most of the recent immigrants were also male.

Occupation: The number of years in the US did not seem to significantly influence the type of work among immigrants or work training however, Table 3.2 shows a significant relationship between the number of years they have been in the US and the occupational sector they work in ($\chi^2 = 58.3$, $p = 0.040$). Recent

immigrants were more likely to be employed in construction and to report being unemployed. Recent immigrants under three years in the US were more unlikely to be in professional jobs and production jobs.

Access to occupational health services: Table 3.2 shows significant associations between the number of years an immigrant has been in the US and health and safety training ($\chi^2 = 13.0$, $p = 0.014$), knowledge of Worker's Compensation ($\chi^2 = 11.4$, $p = 0.004$), health insurance ($\chi^2 = 31.8$, $p = 0.001$) and access to doctor ($\chi^2 = 5.4$, $p = 0.056$). Recent immigrants who have been in the US for less than three years seemed especially vulnerable and were, in particular, less likely to report health and safety training, knowledge of Workers' Compensation, health insurance, and access to doctors as compared to the immigrants who have been in the US over three years.

Health risks: Table 3.2 shows a negative association between years in the US and injuries at work ($\chi^2 = 7.1$, $p = 0.035$). Immigrants who have been in the US for over fifteen years were almost twice as likely to be injured at work compared to those who have been in the US for less than fifteen years.

Analysis by English Proficiency

Demographics: No statistically significant associations were found between English proficiency, ethnicity, and gender.

Occupation: English proficiency was significantly associated with the occupational sector ($\chi^2 = 15.9$, $p = 0.001$) and work training ($\chi^2 = 8.3$, $p = 0.004$). English proficiency did not seem to influence the type of employment; single employer, many employers, self employed or unemployed. The majority of the construction workers had no English proficiency. More immigrants with professional jobs and sales workers spoke English. Immigrants who were proficient in English were more likely to have received work training (69%) than those who did not speak English (52%). Table 3.3 shows the results of English proficiency and occupation.

Access to occupational health services: Table 3.3 shows significant associations between English proficiency among immigrant groups and health and safety training ($\chi^2 = 10.8$, $p = 0.001$), knowledge of Worker's Compensation ($\chi^2 = 22.4$, $p = 0.001$), health insurance ($\chi^2 = 16.8$, $p = 0.001$) and access to a doctor ($\chi^2 = 6.3$, $p = 0.012$). Immigrants who were less proficient in English were likely to have reported less health and safety training, knowledge of Workers' Compensation, health insurance, and access to a doctor compared to the immigrants who are proficient in English.

Health risks: Table 3.3 shows that English proficiency among immigrant population was significantly associated with hazards at work ($\chi^2 = 4.1$, $p = 0.050$) and injuries at work ($\chi^2 = 5.3$, $p = 0.021$). Immigrants who were not proficient in

English reported more hazards at work and injuries at work.

DISCUSSION

In this study, we find that a nested set of demographic factors that are part of the immigrant experience may explain the occupational health disparities among immigrants in Somerville. Ethnic differences alone did not explain the reported occupational health outcomes between the immigrant groups, but the years an immigrant has been in the US and English proficiency may explain some of the occupational health disparities among immigrants.

In this study, significant differences between immigrant groups were observed only by the number of years these groups have been in the United States.

Brazilians were the most recent immigrants in the study and were the least proficient in English which is consistent with the Immigrant Learning Center report on ‘Massachusetts immigrants by numbers ‘and the City of Boston Statistics on immigrants in Boston (ILC 2010, City of Boston 2007). Salvadorans reported being in the U.S. longest, but their English proficiency was low as in Brazilians. Uriarte (2003) further showed that Salvadorans had the lowest educational background among the Hispanic population in Boston.

The immigrant groups had no significant differences in type of occupation, access to health services and health outcomes. This lack of significant association

might be due to sample size. However, certain trends in English proficiency, occupation, and access to different occupational health services were noted by country of birth though these observations were statistically insignificant. Over half of the Brazilians and Salvadorans did not speak English compared to the other groups. Several occupational trends of interest were identified among the immigrant populations. Haitians reported the highest number of a single employer as compared to the other immigrant groups. Brazilians reported higher self employment than the other immigrant groups in our data set with one-quarter of this group being self employed. High unemployment was reported among Salvadorans. Unemployment was most uncommon among Brazilians. Occupation, when viewed across major job categories, showed variation between ethnic groups. Less than 10% of the immigrant population in the study had professional jobs. Brazilians dominated the construction industry. Salvadorans were represented most heavily in the production jobs. There was also a notable difference in work training between the Brazilians and other immigrant groups. Brazilians respondents were twice as likely to have received no work training, and have health insurance and no access to a doctor than Haitians. Also, the Brazilian and Hispanic populations reported less access to a doctor than Haitians, 98% of whom had access to a doctor. Few studies have looked into the occupational and health experiences among Brazilian, Haitian and Salvadoran groups at the community level. This makes it difficult to compare these results with other studies. Haitian respondents reported higher access to all the occupational and health services than did Brazilians and Salvadorans. Haitians in Somerville have

shown to be better educated than African Americans (Jackson 2004). More studies are required to understand why Haitian respondents, who on average have been in the United States a shorter period of time than Salvadorans respondents, reported better access to occupational health and safety services.

Recent immigration and lack of English proficiency influenced occupational outcomes in this study. Likewise, in Smith et al. (2009) and Premji et al. (2010) recent immigrants with less proficiency in English were more likely to be employed in occupations with higher physical demands in Canada. Construction, a noted high risk industry (Nissen et al. 2008) was the most common occupational sector among immigrants who have been in the US for less than three years. The majority of the construction workers (70%) in this study were Brazilians. Recent immigrants and immigrants reporting less proficiency in English also had lower access to occupational health services. Consistent with our study, Setia et al. (2011) and Asanin and Wilson (2008) show that recent immigrants were less likely to have a doctor and low knowledge of Workers' Compensation laws. This observation is also consistent with the lower access to occupational health services among Brazilians who are recent immigrants with the least English proficiency (MADPH 2007). In comparing our study with studies among the Brazilian population in Massachusetts (Siqueira and de Lourenco 2006, Marcelli 2009, COBWEB 2008) we find that Brazilians were primarily employed in service and construction sector, and had the least amount of work and health and safety training (COBWEB 2008). In our study 68% of the Brazilian Workers'

received no health and safety training compared to 80% in the COBWEB report while Marcelli reported 75% with no health insurance as compared to 60% in our survey.

Glazier et al. (2004), using the Census and hospitalization data in Toronto showed that hospital use and serious morbidity were highest in areas with high rates of recent immigration. de Castro et al. (2008) found stronger adverse health outcomes among recent Filipino immigrants with regard to the impact of work on their well-being. However our study showed that recent immigrants reported fewer injuries at work than established immigrants. The immigrant group in our study that has been in the US longest is Salvadorans. They also had poor access to doctor though they had been health and safety training and health insurance than Brazilians. While recent immigration in this study negatively influenced injuries, English proficiency positively influenced health outcomes. In this study lack of English proficiency was shown to increase the risk of hazards at work and injuries at work as in Smith et al. 2009, Premji et al. 2010, and Bonauto et al. 2009 that reported employment in jobs with higher physical demands and poor disability outcomes among people not proficient in English. Interestingly, at odds here is that both Brazilians (recent immigrants) and Salvadorans (established immigrants) reported poor English proficiency, though English proficiency significantly increased with the number of years in the US. Salvadorans, being established immigrants, should have had fewer injuries but years in the US was negatively associated with injuries and Salvadorans reported the highest injuries at work

compared to the other immigrant groups though this observation was not significant. Lack of English proficiency among Salvadorans might explain these higher rates of injury and lower access to doctor among this group. There are very few occupational health studies done among Salvadorans (Pransky et al. 2002) which makes it difficult to validate this finding. Alternatively, this could be explained as a 'healthy immigrant effect' where a consistent decline in health status has been observed among immigrants the longer they remain in the US (McDonald and Kennedy 2004, Abraido-Lanza et al. 1999, Stephen et al. 1994, Sobralske 2006). Antecol and Bedard (2006) show that the immigrants converge to American standards within ten to fifteen years. The slight increase in injuries among the more established immigrants could also be because of the cumulative burden of exposures that the established immigrants have had after longer duration of exposure or longer work experience. Further studies are required to assess whether Salvadorans constitute a particularly vulnerable group requiring special social support to prevent downward mobility and occupational health disparity.

Limitations

The results of this survey are subject to potential sources of error and misclassification. These limitations include a relatively small sample size, and an unknown but likely variable reluctance on the part of some respondents to disclose information regarding health and occupation. A study done by Franzini and Fernandez-Exquer (2004) demonstrated that Spanish speaking immigrants

had lower levels of trust and higher levels of perceived victimization than the English speaking native born. We can only speculate on the importance of documentation status in affecting our results reported here.

Another potential issue is the quality of the data gathered. Though these surveys were conducted in an interview format by bi-lingual Teen Educators working in their respective communities, the question of error and misclassification may arise from incorrect interpretation of the information on the part of the interviewer, variability in communicating the questions between interviewers, and reticence among study participants to discuss occupational and health issues. Another potential limitation is selection bias. The age distribution of the survey population might reflect the overt or subtle choices made by the Teen Educators in terms of their own comfort level with regards to interacting with potential respondents. The age distribution of the participants in the survey show that 16% of the participants were between the ages of 18-20 years which suggest an over-selection of people their own age. (Please see Chapter 2 for a fuller discussion of these points).

Some of the pitfalls associated with the classification of health and occupation is that the reported occupation title may not adequately capture the principal work related functions or duties of the respondent. Most immigrant workers have multiple jobs and short term, temporary jobs. Short term employment which possibly exposed the worker to high concentrations of harmful agents will likely

be not reported in a survey focused on the present occupations. The intricacies of a varied work history and the holding of multiple jobs will also be not captured. This adds to the difficulty in understanding the occupational categories as reported by immigrant workers and estimating the hazards in their work settings. The health outcomes in this study are also self reported and thus the results may contain some undetermined degree of inaccuracy. Worker expectations about their own health may also contribute to biased recall of health-related events.

The survey respondents were obtained from convenience samples, which drew upon a source population of people who attend flu clinics, and health fairs. About half the population in the survey was reached by these means whereas; the other half was reached through the participating community groups and through focus groups conducted within the respective communities. One concern here is that because the respondents were known to and reached by our community based partnering organizations our respondents may well constitute a more “mainstream” subsection of the overall ethnic group. Following this line of reasoning we may have failed to interact with the most vulnerable segments of the immigrant communities found in Somerville.

Hence the reported prevalence are not necessarily generalizable and may in fact be conservative. However, the information reported here and the process set in motion has value despite these limitations. This is one of the few studies which attempt to provide a concurrent assessment of multiple immigrant populations in a

given community. This is one of the few studies that have documented the occupational health experience of specific immigrant population such as Brazilian, Salvadoran and Haitian and in turn compared it with other immigrant groups in the same local milieu.

Strengths and Contributions

Immigrants in informal job sectors and job arrangements are hard to reach. They may not be willing to participate in research studies due to concerns over documentation status, and possible employer reprisal (McCauley 2005). We were able to overcome some of these obstacles due to a collaborative strategy which fully engaged our community partners in the development and implementation of the survey. Our data collection strategies were designed to minimize respondent burden. We benefited from the deep community knowledge possessed by our partners in fashioning outreach initiatives. Overall, the employing of the Teen Educators was successful in the breaking down of barriers that historically have made immigrant workers a hard-to-reach population.

The Teen Educators, in turn, were also able to spread more occupational health awareness in the community as part of their activities and also made contributions to their broader community as a result of engaging in advocacy activities and community outreach. We also launched the Vida Verde Co-Op, a cooperative of Brazilian housecleaners using green cleaning products, which received substantial media publicity and further increased our visibility in the community and raised

occupational health and safety awareness among the immigrant community. The combination of these resources and capacities greatly benefited our project through the creation of a high level of trust, interaction and communication. See Chapter 2 for additional details.

CONCLUSION

This community based survey portrays the occupational health disparities found among the immigrant population living and working in Somerville, MA by ethnicity, years in the US and English proficiency. The results reported here are based on cross-sectional, community-based surveys. While ethnicity did not explain variability among immigrant groups, years in the US and English proficiency showed significant associations with occupation, access to occupational health services and health risks. We recommend the initiation of larger studies to confirm these differences and to further explore these hypothesis.

Few studies have documented and compared the concurrent occupational health experience among different immigrant groups in the same local milieu.

Understanding these socio-cultural and occupational dynamics are important to understanding the occupational health risks these immigrants face. A combination of factors such as English proficiency, years in the U.S, educational status and poverty might play a part in understanding these questions. To effectively reduce the occupational health disparities, interventions must be designed and targeted considering immigrant specific risk factors at the community scale.

**Table 3.1 Cross-Sectional Survey Results Obtained from Self Identified Immigrant Workers, Somerville ,
Massachusetts- 2006-2009**

| | Haitian | El Salvador | Brazil | Other Hispanic | Other | χ^2 <i>p Value</i> |
|--|----------|-------------|----------|-------------------|----------|----------------------------|
| years in US | | | | | | |
| 1 - 3 yrs | 11 (14%) | 5 (7%) | 31 (32%) | 9 (23%) | 10 (20%) | |
| 4 - 9 yrs | 29 (36%) | 26 (35%) | 52 (54%) | 10 (25%) | 18 (36%) | 67.8 |
| 10 - 15 yrs | 29 (36%) | 18 (24%) | 5 (5%) | 8 (20%) | 17 (34%) | (0.045) |
| > 15 yrs | 12 (15%) | 25 (34%) | 8 (8%) | 13 (10%) | 5 (10%) | |
| Occupational Classification | | | | | | |
| Management & Professional | 5 (6%) | 2 (3%) | 8 (8%) | 2 (5%) | 3 (6%) | |
| Sales & Office | 13 (17%) | 2 (3%) | 5 (5%) | 4 (10%) | 10 (20%) | |
| Service | 32 (41%) | 32 (44%) | 35 (37%) | 19 (48%) | 15 (30%) | 131.9 |
| Production & Transportation | 10 (13%) | 21 (29%) | 1 (1%) | 4 (10%) | 4 (8%) | (0.700) |
| construction & Maintenance | 2 (3%) | 4 (6%) | 44 (46%) | 4 (10%) | 3 (6%) | |
| unemployed | 16 (20%) | 11 (15%) | 3 (3%) | 7 (17%) | 15 (30%) | |
| Work Training | | | | | | |
| Yes | 50 (76%) | 39 (64%) | 37 (39%) | 22 (65%) | 34 (85%) | 34.8 |
| No | 16 (24%) | 22 (36%) | 57 (61%) | 12 (35%) | 6 (15%) | (0.981) |
| Health and safety training | | | | | | |
| Yes | 41 (58%) | 35 (51%) | 29 (32%) | 16 (42%) | 29 (69%) | 19.9 |
| No | 30 (42%) | 33 (48%) | 61 (68%) | 22 (58%) | 13 (31%) | (0.981) |
| Knowledge of Massachusetts Workers Compensation Law | | | | | | |
| Yes | 39 (53%) | 29 (41%) | 30 (33%) | 17 (46%) | 28 (68%) | 16.9 |
| No | 35 (47%) | 42 (59%) | 62 (67%) | 20 (54%) | 13 (32%) | (0.324) |
| Health insurance | | | | | | |
| Yes | 55 (72%) | 38 (56%) | 32 (34%) | 20 (59%) | 29 (74%) | 48.7 |
| No | 11 (15%) | 23 (34%) | 56 (59%) | 13 (38%) | 5 (13%) | (0.786) |
| Don't know | 10 (13%) | 7 (10%) | 7 (7%) | 1 (3%) | 5 (13%) | |
| Access to Doctor | | | | | | |
| Yes | 44 (98%) | 38 (70%) | 25 (68%) | 23 (72%) | 33 (81%) | 15.3 |
| no | 1 (2%) | 16 (30%) | 12 (32%) | 9 (28%) | 8 (19%) | (0.113) |
| Injured at work | | | | | | |
| Yes | 16 (24%) | 22 (36%) | 28 (30%) | 12 (32%) | 6 (15%) | 6.8 |
| No | 52 (77%) | 39 (64%) | 66 (70%) | 25 (68%) | 35 (85%) | (0.420) |

Table 3.2 Years in the US and Demographic, Occupation and Health Outcomes Obtained from Self-identified Immigrant Workers, Somerville, Massachusetts 2006-2009.

| | 1 - 3 years | 4 - 9 years | 10 - 15 years | > 15 years | χ^2 <i>p Value</i> |
|--|----------------|----------------|------------------|------------|----------------------------|
| English proficiency | | | | | |
| Yes | 33 (50%) | 65 (48%) | 48 (62%) | 51 (81%) | 21.3 (0.001) |
| No | 33 (50%) | 70 (52%) | 29 (38%) | 12 (19%) | |
| Gender | | | | | |
| Male | 41 (62%) | 62 (46%) | 28 (41%) | 24 (39%) | 8.4 (0.010) |
| Female | 25 (38%) | 72 (54%) | 40 (59%) | 37 (61%) | |
| Occupational Classification | | | | | |
| Managerial/Professional | 1 (1%) | 7 (5%) | 5 (7%) | 7 (11%) | 58.3 (0.040) |
| Sales & Office | 6 (9%) | 16 (12%) | 7 (9%) | 5 (8%) | |
| Service | 19 (29%) | 53 (40%) | 36 (49%) | 24 (39%) | |
| Production/Transport | 1 (1%) | 12 (9%) | 14 (19%) | 13 (21%) | |
| Construction/Maintenance | 24 (36%) | 26 (20%) | 4 (5%) | 1 (2%) | |
| Unemployed | 15 (23%) | 17 (13%) | 8 (11%) | 11 (18%) | |
| Health and safety training | | | | | |
| Yes | 15 (27%) | 65 (54%) | 36 (52%) | 32 (54%) | 13.0 (0.014) |
| No | 41 (73%) | 56 (46%) | 33 (48%) | 27 (46%) | |
| Knowledge of Massachusetts Workers Compensation Law | | | | | |
| Yes | 16 (27%) | 57 (47%) | 36 (52%) | 32 (53%) | 11.4 (0.004) |
| No | 44 (73%) | 65 (53%) | 33 (48%) | 28 (47%) | |
| Health insurance | | | | | |
| Yes | 21 (33%) | 62 (51%) | 50 (78%) | 39 (66%) | 31.8 (0.001) |
| No | 35 (56%) | 44 (36%) | 12 (19%) | 15 (25%) | |
| Don't know | 7 (11%) | 16 (13%) | 2 (3%) | 5 (8%) | |
| Access to Doctor | | | | | |
| Yes | 20 (62%) | 65 (78%) | 47 (82%) | 28 (82%) | 5.4 (0.056) |
| No | 12 (38%) | 18 (22%) | 10 (18%) | 6 (18%) | |
| Injured at work | | | | | |
| Yes | 13 (23%) | 30 (25%) | 16 (24%) | 24 (42%) | 7.1 (0.035) |
| No | 43 (77%) | 88 (75%) | 50 (76%) | 33 (58%) | |

**Table 3.3 English Proficiency and Occupation and Health Outcomes
Obtained from Self-identified Immigrant Workers, Somerville,
Massachusetts 2006 – 2009**

| | Yes | No | χ^2 <i>p Value</i> |
|--|-----------|----------|----------------------------|
| Occupational Classification | | | |
| Management & Professional | 16 (8%) | 4 (3%) | |
| Sales & Office | 24 (12%) | 10 (7%) | |
| Service | 76 (40%) | 57 (40%) | 15.9 |
| Production & Transportation | 21 (11%) | 19 (13%) | (0.001) |
| Construction & Maintenance | 22 (12%) | 35 (24%) | |
| Unemployed | 33 (17%) | 19 (13%) | |
| Work Training | | | |
| Yes | 118 (69%) | 64 (52%) | 8.3 |
| No | 54 (31%) | 59 (48%) | (0.004) |
| Health and safety training | | | |
| Yes | 103 (56%) | 47 (37%) | 10.8 |
| No | 80 (44%) | 79 (63%) | (0.001) |
| Massachusetts Workers' Compensation Law | | | |
| Yes | 105 (57%) | 38 (29%) | 22.4 |
| No | 81 (43%) | 91 (71%) | (0.001) |
| Health insurance | | | |
| Yes | 117 (65%) | 57 (43%) | 16.8 |
| No | 46 (26%) | 62 (47%) | (0.001) |
| Don't know | 15 (9%) | 14 (11%) | |
| Access to Doctor | | | |
| Yes | 101 (84%) | 62 (70%) | 6.3 |
| No | 19 (16%) | 27 (30%) | (0.012) |
| Hazards at work | | | |
| Yes | 71 (40%) | 59 (49%) | 4.1 |
| No | 76 (43%) | 50 (42%) | (0.050) |
| Don't Know | 29 (17%) | 11 (9%) | |
| Injured at work | | | |
| Yes | 40 (23%) | 44 (35%) | 5.3 |
| No | 135 (77%) | 82 (65%) | (0.021) |

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IV. Occupational Health Outcomes Among Self-Identified Immigrant Workers in Living and Working in Somerville, Massachusetts 2006-2009

ABSTRACT

Objective: This study examines the burden of occupational health risks among a convenience sample of individuals self-identifying as immigrant workers in Somerville, Massachusetts.

Methods: In this community-based research initiative, logistic regression is used to analyze immigrant occupational health survey data from 2006 – 2009. We explore the health outcomes by ethnicity, years in the United States, age, English proficiency, occupation, and access to occupational health services.

Results: In these data, ethnicity, years in the US, English proficiency, age, occupational classification and health insurance were found to be better predictors for occupational health risks compared to gender, work and health and safety training, knowledge of Massachusetts Workers' Compensation Law and access to doctors in this study. Hazards at work were reported more often by Brazilians (OR: 3.3, 95%CI: 1.1 - 10.1), immigrants who were less proficient in English (OR: 2.2, 95%CI: 1.0 – 4.8), immigrants who have been in the US over 15 years (OR: 0.28, 95%CI: 0.10 – 0.76) and workers between the ages of 46 – 65 (OR: 2.2, 95%CI: 1.0 – 11.0). Injuries at work were significantly associated with lower English proficiency (OR: 1.8, 95%CI: 1.1 – 3.0). Immigrants who have been in the US for over 15 years, workers between the ages of 46 and 65 (OR: 2.7, 95%CI: 1.0 – 7.0), service workers (OR: 13.8, 95%CI: 1.8 – 105.2), production workers (OR:10.8, 95%CI: 1.3 – 90.1), construction workers (OR:

21.7, 95%CI: 2.8 – 170.9) and immigrants with no health insurance (OR:1.8, 95%CI:1.0 – 3.1).

Conclusion: This study suggests that health disparities among the immigrant population may be affected by ethnicity, years in the US, English proficiency, age, occupational classification, and health insurance. Further studies with sample sizes which better assure representativeness are required to explore these hypotheses.

INTRODUCTION

It is well recognized that working conditions affect human health. The most recent national report authored by the United States Bureau of Labor Statistics show that three to four million cases of nonfatal occupational injuries and illness are reported each year. Close to half of these were serious cases which required days away from work (BLS 2009). About a quarter of these cases were reported as occurring to minority workers, with 14% occurring among Hispanics. A third of the respondents did not disclose their race or ethnic origin (BLS 2009). This incomplete characterization of race and ethnic origin of workers in existing occupational health surveillance systems in particular, has been noted by other scholars (Azaroff 2003, Souza et al. 2009, Leigh et al. 2004, Lowry et al. 2010), and highlights one of the central difficulties in understanding the occupational health burden among immigrant workers.

Multiple risk factors are associated with the increased incidence of work related fatality and illness. Socio-demographic characteristics including race, ethnicity and gender have been shown to strongly influence health disparities (Clark and Berkowitz 2008). The more hazardous working conditions that many minorities and immigrant workers are exposed to also increase the risk of work-related injuries, illnesses, and fatalities (Loh and Richardson 2004, Richardson 2004, Dong 2004, Mulloy et al. 2007, Peek Asa 1996, Ahonen et al. 2006, Bollini and Seim 1995, Pransky et al. 2002, Cooper 2005, Franzini and Fernandez –Exquer

2004). In job settings common among immigrant and minority workers, hazards are generally not controlled, the enforcement of safety regulations is often lax and workers often do not receive proper job training and health and safety training (O'Connor 2005, Pransky et al. 2002, Anderson et al. 2000) and are offered minimal, if any, health care benefits (Valdez et al. 1993, Dembe 1999).

Immigrants are further disadvantaged by their deficient language skills, non transferability of their education and training from their country of origin, their immigrant status, discrimination and economic need (Ahonen 2009, Cho et al. 2007, Jsinskaja-Lahiti et al. 2007). Due to their need for work, immigrant workers have also been shown to be more tolerant of working in jobs with less than ideal conditions than non-immigrants rather than be unemployed (Rosmond et al. 1998).

Interventions designed to address these issues have been unsuccessful partly due to the difficulty in obtaining access to these vulnerable populations (Souza et al. 2010). Studies are needed that simultaneously assess, document and address immigrant occupational health deficits at the community level in order to better conceptualize and implement interventions of increased efficacy.

In this community based study (the setting for which is described in Chapter 2) we explore the occupational health burden among self identified immigrant workers living or working in Somerville, Massachusetts. The primary goals of

the research was to investigate the source and identify the different patterns of occupational risks and hazards among immigrant workers in the Somerville community. We explored a range of variables including socio-demographic characteristics, occupational backgrounds and access to occupational health resources that could influence health outcomes of the immigrant workers that comprise the study population.

METHODS

Study Design and Data Collection

In this cross sectional community based research, surveys were designed and administered by trained bi-lingual Teen Educators who administered an in-person survey instrument among immigrant workers who either lived or worked in Somerville, Massachusetts. The Teen Educators were assisted in the preparation of the survey with regards to technical aspects of occupational safety and health by staff from the Massachusetts Coalition for Occupational Safety and Health (MassCOSH) and the Massachusetts Department of Public Health. The Teen Educators were also assisted by input and instruction from community based organizations and Tufts University faculty. The Teen Educators were supervised by their mentors at the Haitian Coalition, Community Action Agency of Somerville (CAAS) and the Immigrant Services Providers Group/Health (ISPG/H) during the administration of the surveys. The surveys were administered at events sponsored by the participating community organizations and included an annual influenza clinic, community occupational health fairs and

other community events which sought to engage the principal immigrant communities in Somerville. Administration of the surveys started in 2006 and ended in 2009.

The data presented here are based on a convenience sample. Eligibility criteria were limited to informed consent and at least 18 years of age. No compensation was offered for participation. The survey was targeted towards people who self-identified as immigrant workers and who either lived or worked in Somerville, Massachusetts.

The survey was comprised of 23 questions. The survey was divided into four segments: socio-demographic variables, occupation, access to health services variables and health risks encountered on the job. The demographic variables included country of birth, years in the US, English proficiency, gender, and age. The occupational variables included type of work, occupational classification and presence or absence of job training. All the occupational classification data were coded by the author according to the U.S. Bureau of Labor Statistics, Standard Occupational Classification (SOC). Access to health variables included work training, health and safety training, knowledge of Workers' Compensation, access to health insurance and access to a doctor. The variable 'access to doctor' was added when the survey was revised in year two to incorporate some more questions to facilitate our environmental health fairs. Only a portion of the respondents have been asked this question (n = 277 out of 405 total respondents).

The health risk outcomes assessed in the survey included self reported hazards at work, self reported health problems due to work and self reported injuries incurred at work.

The bilingual Teen Educators interpreted questions into the appropriate target language as required. In addition the Teen Educators were allowed to clarify the questions with respondents rather than simply read them. For additional detail on the recruitment, training and characteristics of the Teen educators please see Chapter 2.

Data Analysis

Statistical analysis was performed using SPSS 17.0. Data were analyzed for each of the three health outcomes - hazards at work, health problems due to work and injuries at work. The basic analytic plan included univariate descriptive analysis and bivariate analysis. Univariate descriptive analysis estimated both the percentage and proportion of binary and categorical variables and the bivariate analysis consisted of cross tabulations and chi square statistics. The variables that were significant were examined further with binary logistic regression to determine odds ratios (ORs) with 95% confidence intervals (95% CIs). All statistical tests were considered statistically significant if the two-tailed p-value was less than 0.05. For the bivariate regression analysis, the reference group for ethnicity or country of birth is Haiti; for number of years in the US the reference group is >15 years, for age it is 18 – 20 years, for occupation it is professional and

management jobs or sales jobs, and for type of job it is working for a single employer .

For the analysis of occupational health disparities based on ethnicity, the main country of origin categories were Haiti, El Salvador, Brazil, Other Hispanics and Others. The Other Hispanics category includes respondents born in Puerto Rico, Mexico, Belize, Honduras, Guatemala, Colombia, Peru, Venezuela, Ecuador and Dominican Republic. The “Others” category include respondents born in Asia and Africa.

The survey questionnaires and the oral consent protocol for study participants were reviewed and approved by the Tufts University Social, Behavioral & Educational Research Institutional Review Board (IRB). All participants in the Survey provided oral consent to participate. No names were ascertained nor were potential subjects asked about documentation status.

RESULTS

Descriptive Analysis

The survey data is comprised of 405 respondents who either live or work in Somerville. For this analysis on health outcomes among immigrants, all the non immigrants in the study were removed. The remaining immigrant population (n =

346) reflect a diverse population from 33 different countries.

The health outcomes recorded in this study included self reported hazards at work, self reported health problems at work and self reported injuries suffered at work. The completion rate for the question which asked about self reported hazards at work was 86% (296/346). Of the 296 people who responded to hazards at their work space, 130 or 44% indicated the existence of hazards at work, 43% said that there were no hazards at work and 13% said that they did not know if there were any hazards at work. The respondents provided additional detail on hazards which included accident prone conditions at work such as the listing of working from heights, unstable ladders, slippery floors, chemicals, unsafe working conditions or tasks, such as lifting heavy objects and being exposed to unprotected machinery and physical hazards such as heat and cold. A lack of safety equipment was also reported. Chemical hazards (43%) accounted for the largest share of the hazards followed by physical hazards (38%), material handling and repetitive hazards (14%) and hazards due to psychological hazards such as work pressure or long work hours (6%).

The completion rate for the question which addressed self reported health problems was 59% (204/346). The percentage of respondents reporting injuries and illnesses may be an underestimate as many respondents may not have associated their health problems with work. Of the 204 people who responded to the question, only 43 workers or 21% reported health problems due to work. The

reported health problems included back pain, allergies, eczema, neck and wrist problems, high blood pressure, stress, skin problems, dizziness, shortness of breath, eye strain, headaches, nervousness, nose bleeding, depression, jaw and tooth pain. Of those who reported their health problems related to work, 31% complained about musculoskeletal problems, psychological stress (23%), or recurring injury related problems (22%).

The completion rate for the question which asked about self reported injuries was 87% (301/346). Of the 301 people who responded to the question, 84 workers or 28% of the respondents reported being injured at work, 6% reported being injured multiple times. Of those injured, 42% indicated they reported their injury to authorities at work, and 52% said that they received some treatment at either an emergency room, a hospital, or a chiropractor. Some of those who did report their injury self medicated themselves with over the counter drugs obtained from a pharmacy, or received care at home. Of those injured at work, 70% (n = 45) reported that they paid for the treatment themselves, while 17% (n = 11) received care which was paid by the employer and 13% (n = 8) received care that was covered by Workers' Compensation.

Bivariate analysis

Analysis by health outcome

Country of birth was not significantly correlated with any of the health outcomes.

All the immigrant groups reported roughly comparable presence of hazards at work, health problems at work and injuries. Haitians reported fewer health outcomes than Salvadorans, Brazilians and Other Hispanics. Salvadorans reported a slightly higher proportion (36%) of injuries than the other immigrant groups.

Table 4.1 shows that Years in the US was significantly correlated with injuries at work ($p = 0.035$). Immigrants who have been in the United States for over fifteen years were more likely to report negative health outcomes. Close to 42% of those who have been in the US for over 15 years reported injuries at work compared to more recent immigrants.

A higher proportion of non English speakers reported more health disparities. The lack of English proficiency was significantly related to reports of hazards at work ($p = 0.05$) and injuries related to work ($p = 0.021$). Close to half of the workers who spoke no English reported hazards at work compared to 40% of those who speak English. Non English speakers were more likely to report health problems due to work (26%) and report injuries at work (35%) than those who do speak English (18% for health problems and 23% for injuries at work). Age was correlated with injuries at work ($p = 0.028$). The age group 45-65 reported the highest collective burden of health outcomes (hazards at work, health problems due to work and injuries at work).

Table 4.2 shows that occupational classification was highly correlated with all the health outcome variables, hazards at work (p value = 0.001), health problems due to work (p value = 0.003) and injuries at work (p value = 0.001). Construction workers reported the higher proportion of hazards at work, health problems due to work and injuries at work followed by workers in service work and production and manufacturing jobs. When compared to professional workers (25% hazards at work, 15% health problems, and 0 reports of injuries at work) construction workers were over twice as likely to report hazards at work (60%), health problems due to work (40%) and injuries at work (44%). Service sector workers (33%) and production workers (28%) were also over twice as likely to report injuries at work compared to professional workers.

While no statistically significant observations were observed, immigrants with multiple employers reported more negative health outcomes than immigrants with a single employer. Over half (58%) of the workers with many employers reported hazards at work. They also reported the most injuries at work (37%) compared to those who reported a single employer (26%) or who reported being self employed (21%).

Table 4.2 shows that none of the access to health service variables (presence of health and safety training, knowledge of Workers' Compensation Law, access to health insurance, and access to a doctor) were associated with negative health outcomes. A slightly higher proportion of the respondents who received work

training, and health and safety training, reported more hazards at work but less injuries at work and health problems due to work. A higher proportion of people who did not know about Workers' Compensation Law, access to health insurance and access to doctors reported more hazards at work, and health problems due to work and injuries.

Logistic Regression

After examining descriptive statistics and the results of the correlation analyses, work proceeded to logistic regression. Variables of interest were entered one at a time and each model was assessed using Nagelkerke's r-square, classification tables and, for the variables themselves, changes in the beta coefficients (and their standard errors) and p-values.

The regression results were found to be generally consistent with the descriptive and bivariate results. Table 4.3 shows that ethnicity or country of birth, years in the US, English proficiency, age, occupation and access to health insurance were predictive of selected health outcomes. Brazilians were three times more likely to report hazards at work compared to other immigrant groups (OR = 3.3, 95% CI: 1.1 – 10.1).

Immigrants in the United States over 15 years reported more hazards and injuries at work. Immigrants in the United States for 10 – 15 years were less likely to

report hazards at work (OR: 0.28, 95%CI: 0.10 - 0.76) than those who have been in the United States for over 15 years. Immigrants in the United States for less than three years (OR: 0.42, 95%CI: 0.18 - 0.94), between 4 – 9 years (OR: 0.47, 95%CI: 0.24 - 0.92) and 10 – 15 years (OR: 0.20, 95%CI: 0.20-0.95) also reported fewer injuries.

Immigrants who were not proficient in English reported more hazards at work (OR: 2.2, 95%CI: (1.0 – 4.8) and injuries at work (OR: 1.8, 95%CI: (1.1 – 3.0).

Workers between the ages of 46 – 65 years were three times more likely to report more hazards at work (OR: 3.3, 95%CI: 0.99 – 10.9) and twice as likely to report injuries at work (OR: 2.7, 95%CI: 1.0 – 6.9) compared to younger (18-20 years) respondents.

Table 4.3 shows that construction workers (OR: 21.7, 95%CI: 2.7 – 170.9), service workers (OR: 13.8, 95%CI: 1.8 - 105.2) and production workers (OR: 10.8, 95%CI: 1.3 – 90.1) were significantly more likely to report injuries at work compared to sales workers. Immigrants who had no access to health insurance were also more likely to report injuries at work (OR: 1.8, 95%CI: 1.0 – 3.1).

DISCUSSION

This study describes the burden of occupational health risks among self-identified immigrants who either lived or worked in Somerville, MA and identifies

characteristics associated with an increased reporting of occupational health risks. Ethnicity, years in the US, English proficiency, age, occupational classification and health insurance were significant predictors of occupational health risks while gender, access to work and health and safety training, knowledge of Massachusetts Workers' Compensation Law and access to doctors were not significantly associated or predictive of any occupational health risks in our sample. Hazards at work were predominately reported by Brazilians, immigrants who were less proficient in English, immigrants in the US over 15 years and workers between the age of 46 – 65. Injuries at work were significantly correlated with workers who had no English proficiency, immigrants in the US for over 15 years, workers between the ages of 46 and 65, service workers, production workers, construction workers and immigrants with no health insurance.

None of the country of birth categories exhibited statistically significant odds ratios for injuries at work and health problems due to work. This might be due to the small sample size. Alternatively, it could be the result of a structural limitation of this survey given its desire to capture the experience of multiple immigrant populations in a concurrent manner).

Brazilians reported significantly more hazards at work compared to the other immigrant groups. This is an interesting observation because people who received more work and health and safety training also reported more hazards at work.

However, our prior analysis (Chapter 3) shows that Brazilians received less health and safety training compared to all other groups. This suggests that, in our sample, Brazilians might be more aware of the hazards at work but this speculation, even if true, does not indicate that they do not require occupational health and safety training.

Immigrants who have been in the US longer reported hazards at work significantly more often than more recent immigrants, suggesting the possibility that risks did not change with the duration of residency in the US. Recent immigrants have been shown to incur more occupational injuries in some studies (Djordjevic 1979, Corvalan et al. 1994), however, our study did not show such associations which might imply a lack of upward mobility in the immigrant population who have been in Somerville over fifteen years (Corvalan et al. 1994). Alternatively, the frequent reporting of injuries among more established immigrants might be because they have been working longer than recent immigrants. Our research did not look at those injuries which occurred within the past work year which somewhat constrained our ability to assess the relationship between work injuries and length of time in the US.

Workers who were not proficient in English reported significantly more hazards at work and injuries at work which is consistent with other studies (Dong et al. 2004; Bollini and Siem 1995; Corvalan et al. 1994). Age was correlated with both hazards at work and injuries at work. The older working population, especially the

workers between the ages of 45-65, were especially likely to report increased hazards at work and injuries at work. In some other studies, the median age for the highest burden of injuries among immigrants was in the younger age group of < 36. (Pransky et al. 2002). Consistent with our results, BLS data show that workers aged 45-54 had the highest occupational injury and illness rate (2009). A study done in New Mexico found higher fatality in workers over 65 (Mulloy et al. 2007) and a study conducted with immigrant workers in Spain showed increased fatalities and non fatal injuries in workers 45 – 54 years of age and over 55 years of age (Ahonen et al. 2006). Associations between age and injury in our study could have been influenced by the duration of employment. Our survey did not ask the workers to report injuries within a defined period of time (e.g. within the past year). It could be that our results reflect greater years of service in a particular industry sector in our older respondents. Another possible explanation is that the morbidity and injuries enumerated in our survey are age dependent.

Workers with many employers were more likely to report hazards at work than respondents reporting a single employer. Though this was not a statistically significant association, the association appears to be potentially large enough to be of importance. While immigrants with single employers, self employed and unemployed reported hazards in the range of 40% - 42%, 58% of the immigrants with multiple employers reported hazards at work. Similarly, only 26% of the single employers reported injuries, while 37% of the immigrants with multiple employers reported injuries. Few studies addressing immigrant workers have

evaluated the impact of multiple jobs or employers. Benavides et al (2006) showed that temporary employment and occupational injuries were associated, with temporary workers twice as likely as non-temporary workers to report injuries. Strong and Zimmerman (2005) showed that workers who had two jobs reported fewer injuries. The “self employed” category in the work of Strong and Zimmerman also reported higher hazards at work than those who had a single employer but they did not report higher injuries and health problems due to work. Mulloy et al. (2007) found that those workers reporting to be “self employed” in New Mexico had one third higher average annual mortality rates than found among wage and salary workers. More studies are needed to understand how the type of employment influences occupational risks among immigrant workers in low wage and often unstable employment situations.

Occupation and self reported injuries at work were correlated. But this observation was mostly driven by the construction workers and service workers who reported higher injuries at work than the other occupational categories. The highest proportion of health problems was reported by workers in the construction industry followed by the service and production industry. Prior studies have shown that employment in certain industry sectors highly influences the risk of occupational injuries and many studies have identified the construction and service industries as particularly high risk industries (Pransky et al. 2002, Sinclair 2006, Mulloy et al. 2007, Strong and Zimmerman 2005, Corvalan 1994, Doos

1994). This pattern is also consistent with Massachusetts studies with some slight variation (MDPH 2006, COBWEB 2008, MA-AFLCIO 1995 - 2009).

Consistent with Pransky et al. (2002), our study found that training on the job did not significantly correlate with the rate of injuries at work, though a higher percentage of untrained respondents did indicate higher injuries and lack of knowledge of Workers' Compensation Law. Access to a doctor also was not associated with self reported injury at work. Lack of health insurance was significantly related to an increased reporting of injury in our sample in contrast to findings in Pransky et al. (2002).

Some of the important socio-economic drivers such as level of education, poverty status and work experience were not assessed in our study. While poverty level and education was not assessed in Pransky et al. 2002, work experience was an important variable in their study. Previous work has demonstrated that occupational health disparities can be partially explained by differences in socioeconomic status – education and income differences between immigrant groups and also the manifestation of occupational discrimination towards immigrant workers (Strong and Zimmerman 2005, Robinson 1989, Clark and King 2008, Oh and Shin 2003, Quinn et al. 2007).

Study Limitations

The limitations of this study, include those that are inherent in any cross sectional

study design, such as recall bias, sampling bias (as the work reported here constituted a series of convenience samples that drew upon the standing and trust engendered by the community based organizations that were part of the research effort), and the lack of consistency in the interview format as the survey was verbally translated to the respondents by the Teen Educators while interacting with study participants. An additional limitation that would result in underestimates of the actual hazards at work and injuries and illness is the relative lack of awareness among respondents as to which health issues are likely to be caused by a work related source. For example, a person with a bad back might blame it on many things and not think about the relationship to standing all day at work or the person with a skin problem might think that it is due to something other than chemicals used at work. The magnitude of the effect of the results in this study are uncertain due to the wide confidence intervals. While precision is low, a robust sample size could better substantiate these results.

A critical issue to any discussion of limitations of the work reported here is the representativeness of the sample reported relative to the source populations from which these immigrant populations were drawn. Given that the majority of the respondents were obtained as a result of the respondents participating in events either sponsored or endorsed by our community partner organizations, it is likely that our results reflect the experience of that portion of the immigrant population that is more acculturated as evidenced by their interaction with established immigrant service organizations in Somerville. We believe that, with the

exception of certain targeted outreach efforts (e.g., one Health Fair which drew heavily from day laborers), that our respondents should not be considered representative of the more marginal segments of the immigrant population living or working in Somerville. As a consequence of this assessment, we advance the idea that the findings reported here should be considered a conservative estimate of the underlying relationship between work and health among immigrants in Somerville, Massachusetts. It is likely that among more marginal sectors of the immigrant population the health and access outcomes will be more pronounced. These issues limit the generalizability of our results. (Please see Chapter 2 for additional discussion of these points).

Study Strengths

The strengths of this study include successfully interacting concurrently with hard to reach immigrant populations in order to obtain information about a sensitive topic in a time period in which immigrants are sometime reluctant to interact with any research oriented activity. Immigration Customs Enforcements (ICE) was aggressively implemented during the study period. These widely publicized events only increased anxiety and added further complications to recruiting respondents to interact with our research effort. We feel it is important to highlight that our outreach and sampling strategies encompassed the simultaneous interaction with the three principal immigrant populations in Somerville. This offered the rare opportunity to concurrently measure the relative occupational health burden in three distinct immigrant populations within the same social

milieu. Due to our collaborative partnership with the community partners we were able to establish trust and also broaden the awareness and enhance the capacity in the community organizations regarding occupational health issues. Some of the limitations mentioned above should be tempered by our ability to reach out to and gain the trust of populations of interest to our work. This study also effectively addressed the need for descriptive research regarding immigrant occupational health in the community after the community based organizations voiced interest in such an effort following the deaths of immigrant floor sanders in an explosion in Somerville in 2005. The project also succeeded in developing awareness of immigrant occupational health issues in the community through broad media outreach and other interactive activities.

CONCLUSIONS

More studies are required to supplement the hypotheses raised in this study and to better calibrate occupational health disparities which may exist between individuals from different countries of origin, by their length of residence in the United States, age, and presence of multiple employers. Occupational health studies conducted among immigrants need to be strengthened through improved understanding of the occupational trends of a work force that is increasingly placed in unstable jobs. Questions that remain to be answered in future research include: Do people with multiple jobs face more health risks? Do recent immigrants experience more adverse health outcomes than established immigrants? Does access to occupational health services reduce health risks? It is

through the seeking of answers to such questions that improved awareness and the configuration and delivery of occupational health resources may be more effectively implemented.

Table 4.1 Demographics of Somerville Immigrant Workers by Health Outcomes 2006-2009

| | Hazards at work | Health problems due to work | Injured at work |
|----------------------------|------------------------|------------------------------------|------------------------|
| Ethnicity | | | |
| Haitian | 23 (38%) | 6 (14%) | 16 (23%) |
| El Salvador | 30 (46%) | 14 (26%) | 22 (36%) |
| Brazil | 45 (50%) | 10 (27%) | 28 (30%) |
| Other Hispanic | 19 (50%) | 8 (25%) | 12 (32%) |
| Other | 13 (33%) | 5 (12%) | 6 (15%) |
| Years in the US | | | |
| 1 - 3 yrs | 21 (40%) | 6 (19%) | 13 (23%) |
| 4 - 9 yrs | 49 (43%) | 19 (24%) | 30 (25%) |
| 10 - 15 yrs | 24 (36%) | 9 (16%) | 16 (24%) |
| > 15 yrs | 34 (58%) | 9 (27%) | 24 (42%) |
| English Proficiency | | | |
| Yes | 71 (40%) | 21 (18%) | 40 (23%) |
| No | 59 (49%) | 22 (26%) | 44 (35%) |
| Gender | | | |
| Male | 63 (46%) | 16 (18%) | 42 (29%) |
| Female | 63 (43%) | 26 (25%) | 41 (28%) |
| Age | | | |
| 18 - 20 | 1 (42%) | 9 (21%) | 7 (18%) |
| 21 - 45 | 78 (43%) | 20 (17%) | 49 (27%) |
| 46 - 65 | 33 (52%) | 11 (32%) | 24 (37%) |
| > 66 | 3 (30%) | 1 (17%) | 3 (37%) |
| Type of Work | | | |
| one employer | 72 (42%) | 25 (21%) | 48 (26%) |
| many employers | 28 (58%) | 6 (22%) | 18 (37%) |
| self employed | 13 (41%) | 2 (15%) | 7 (21%) |
| unemployed | 14 (40%) | 10 (26%) | 12 (31%) |
| Occupation | | | |
| Professional | 5 (25%) | 2 (15%) | 0 |
| sales | 9 (32%) | 2 (9%) | 1 (3%) |
| service | 58 (47%) | 18 (25%) | 42 (33%) |
| Production | 17 (44%) | 8 (26%) | 10 (28%) |
| Construction | 32 (60%) | 10 (40%) | 24 (44%) |
| Unemployed | 6 (24%) | 3 (9%) | 6 (21%) |

Table 4.2: Occupational and Health Characteristics of Self-identified Immigrant Workers by Health Outcomes, Somerville Massachusetts: 2006-2009

| | Hazards at work | Health problems due to work | Injured at work |
|--|------------------------|------------------------------------|------------------------|
| Work training | | | |
| Trained | 78 (46%) | 24 (20%) | 41 (24%) |
| Untrained | 44 (43%) | 14 (29%) | 35 (33%) |
| Health and safety training | | | |
| Trained | 64 (46%) | 20 (21%) | 33 (24%) |
| Untrained | 63 (44%) | 22 (26%) | 45 (31%) |
| Knowledge of Massachusetts Workers Compensation Law | | | |
| Yes | 52 (41%) | 17 (18%) | 31 (23%) |
| No | 69 (45%) | 24 (28%) | 48 (32%) |
| Health Insurance | | | |
| Yes | 64 (42%) | 24 (23%) | 37 (24%) |
| No | 47 (49%) | 11 (21%) | 37 (36%) |
| Don't Know | 6 (23%) | 2 (11%) | 5 (21%) |
| Doctor | | | |
| Yes | 56 (42%) | 33 (21%) | 33 (25%) |
| No | 20 (49%) | 10 (22%) | 14 (36%) |

Table 4.3. Odds Ratios of Health Outcomes by Ethnicity, Years in the US, Language, Age, Occupation and Health Insurance Among Self-Identified Immigrant Workers: Somerville, Massachusetts: 2006-2009

| | Hazards at work | Health problems due to work | Injured at work |
|----------------------------|---------------------------|-----------------------------|---------------------------|
| Ethnicity | | | |
| Haitian | Ref | Ref | Ref |
| El Salvador | 1.6 (0.55 - 4.79) | 2.1 (0.75 - 6.2) | 1.8 (0.85 - 3.9) |
| Brazil | 3.3 (1.0 - 10.1) | 2.2 (0.72 - 6.9) | 1.4 (0.67 - 2.8) |
| Other Hispanic | 4.1 (0.80 - 21. 2) | 2.0 (0.62 - 6.5) | 1.56 (0.64 - 3.8) |
| Other | 0.40 (0.14 - 1.16) | 0.86 (0.24 - 3.1) | 0.56 (0.20 - 1.6) |
| Years in the US | | | |
| 1 - 3 yrs | 1.1 (0.28 - 4.1) | 0.64 (0.19 - 2.1) | 0.42 (0.18 - 0.94) |
| 4 - 9 yrs | 1.0 (0.35 - 2.9) | 0.89 (0.36 - 2.2) | 0.47 (0.24 - 0.92) |
| 10 - 15 yrs | 0.27 (0.09 - 0.76) | 0.52 (0.18 - 1.48) | 0.44 (0.20 - 0.95) |
| > 15 yrs | Ref | Ref | Ref |
| English Proficiency | | | |
| No | 2.19 (1.0 - 4.8) | 1.6 (0.83 - 3.2) | 1.8 (1.1 - 3.0) |
| Age | | | |
| 18 - 20 | Ref | Ref | Ref |
| 21 - 45 | 2.1 (0.82 - 5.5) | 0.74 (0.31 - 1.79) | 1.6 (0.68 - 3.97) |
| 46 - 65 | 3.3 (0.99 - 10.9) | 1.7 (0.63 - 4.9) | 2.7 (1.0 - 6.9) |
| > 66 | 0.90 (0.12 - 6.4) | 0.73 (0.08 - 7.1) | 2.7 (0.53 - 14.3) |
| Occupation | | | |
| Professional | 0 | Ref | 0 |
| sales | Ref | 0.55 (0.07 - 4.5) | Ref |
| service | 1.9 (0.53 - 7.4) | 1.8 (0.36 - 8. 9) | 13.8 (1.8 - 105.2) |
| Production | 1.2 (0.28 - 5.6) | 1.9 (0.35 - 10. 6) | 10.8 (1.3 - 90.1) |
| Construction | 3.5 (0.74 - 17.1) | 3. 7 (0.67 - 20.2) | 21.7 (2.7 - 170.9) |
| Health Insurance | | | |
| No | 1.8 (0.74 - 4.5) | 0.89 (0.40 - 2.0) | 1. 8 (1.0 - 3.1) |

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V. Characterizing the Low Wage Immigrant Workforce: A Comparative Analysis of the Health Disparities Among Selected Occupations in Somerville, Massachusetts

ABSTRACT

Objective: This study estimates job-related risks among the most common low wage occupations held by predominately Haitian, El Salvadoran, and Brazilian immigrants living or working in Somerville, Massachusetts. The most common occupations performed by immigrant workers in our sample are cleaning, construction, food service, cashier/baggers and factory workers. The identification of trends and self-reported health disparities within and between these low skilled occupations is the main objective of this analysis.

Methods: We used data from the cross sectional survey on immigrant occupational health conducted between 2006 – 2009 to assess the job-related risks among the most common low wage occupations. The data analysis included chi square analysis, and multinomial logistic regressions for three measures of health outcomes (hazards at work, injuries at work, and health problems due to work) and five measures of access to occupational health services (work training, health and safety training, knowledge of workers compensation, health insurance and access to doctor). These analyses were controlled for years in the US (if they are recent or established immigrants) and English proficiency.

Results: Construction workers reported significantly higher health problems due to work and injuries at work, and lower access to occupational health services

than cashiers and the other low income jobs explored in this study. Cleaners reported significantly lower access to work training, health and safety training and knowledge of workers compensation than cashiers and factory workers reported significantly lower work training than cashiers in this study. Cashiers/baggers had higher access to occupational health services and reported the least health risks compared to other occupations in the study.

Conclusion: We found significant differences in access to occupational health services and health risks among these common low wage immigrant occupations. While ethnicity, English proficiency and years in the United States are variables of importance influencing occupational health risks, we found that occupation independently contributes to elevated risks in specific settings, especially in construction, cleaning and factory work. Further studies with samples of greater representativeness are required to validate the finding of occupation as a major factor contributing to health disparities among immigrant workers.

INTRODUCTION

Macro-forces in the political economy and other socio-cultural factors have resulted in the creation of a number of ethnic and “racial job ghettos” (Murray 2003). For minority and immigrant workers these niches have predominately been in low wage, labor-intensive, high risk jobs (McCauley 2005, Lipscomb 2006, Brunette 2005). New immigrants tend to be “funneled” into certain occupational sectors in a “frictionless space” based on their number of years in the United States, English proficiency, education and the presence of social networks (Parks 2005, Ellis et al 2007) but also based on ethnicity. Common occupational niches among low income immigrant workers include cleaning and maintenance, production, transportation, construction, and food service in urban areas and mining and agriculture in non urban settings (Cho et al. 2007, Pransky et al. 2002, Mulloy et al. 2007).

It is known that certain occupations carry with them greater exposure to physical, chemical, biological and social hazards in the workplace (Dong et al. 2004, Pransky et al. 2002, Zock et al. 2009, Webster 2001, Quandt et al. 2004, Krieger et al. 2006, Barbeau et al. 2007). Data from the United States indicate that the agriculture, construction, services and the manufacturing industry sectors display heightened health risks and also are populated with high concentrations of immigrant workers (McCauley 2005). Bonauto et al. (2006) identified the construction and transportation sectors as high risk industries in the state of Washington. Moure-Eraso and Friedman-Jimenez (2004) show that Latinos in the

United States are disproportionately represented in the most hazardous job categories such as janitors, laborers and cooks. The latest U.S. Bureau of Labor Statistics (BLS) data identify construction, manufacturing, services industry and transportation to be the most hazardous sectors with a higher incidence of falls, exposure to harmful substances and environments, and accidents (BLS 2007).

Many recent research studies evaluating immigrant health disparities highlight differences in health largely related to race, ethnicity, socioeconomic status, and gender (Williams and Mohammed 2009). Often ignored in these discussions on health disparities is the complex role of work – the occupational exposures, working conditions and the benefits associated with work as factors that induce health disparities (Lipscomb 2006). Very little is known about these low wage, low-skilled occupational categories. Measuring occupational health disparities is often more complex than merely measuring the morbidity and mortality related to work but it also involves understanding the myriad of contributing factors that heighten health risks, such as the demographic characteristics of the human capital, job structure, the work-related benefits, and workers' access to health services (Lipscomb et al. 2006, Muntaner 1994).

A set of formidable challenges confront researchers interested in gathering this wide range of occupational health and safety information. Many of these jobs are precarious, decentralized and not concentrated in specific industries. In addition, some of these jobs are very unstable, often temporary, and with work locations

being highly transient. The net effect is that these workers are thought of as being dispensable (Tompka et al. 2007, Porthe et al. 2010). Some of the low wage jobs are performed on a contract basis and function under informal labor market settings, some of the people in these occupations are undocumented and define themselves as either self employed or unemployed and work many jobs and long hours for compensation which is paid in cash on a weekly or even daily basis (Clinton 1997, Barten et al. 2008, NIOSH 2002). Within these highly fluid work settings, occupational monitoring and gaining access to these immigrant workers is often difficult. This greatly complicates the understanding of the occupational hazards in this workforce. Community based study models have been shown to offer greater reliability for accessing such hard to reach minority populations by performing research with the community groups that provide services to minority populations (Minkler 2003, 2010).

A community based participatory research (CBPR) model was used in this study to conduct a cross sectional survey concerning immigrant occupational health conducted between 2006 – 2009. Common immigrant occupations in this survey included cleaning, construction work, food service work, cashier/baggers and factory related workers, these were also the most commonly reported occupations within the survey. The identification of trends and self-reported health disparities within and between these low skilled occupations is the main objective of this analysis.

METHODS

Study Setting

This study estimates job-related risks among the most common low wage immigrant workers in Somerville Massachusetts, a “continuous” gateway community where over a quarter of its population is comprised of immigrants (US Census 2008). Massachusetts is more dependent on new immigrants for its population and labor force growth than the nation as a whole. The net new immigrant share of the population growth was 327% percent in Massachusetts between 2000 and 2005 as compared to 42% United States average, 240% in New York state and 96% in New Jersey (Sum 2006). New immigrants in Massachusetts are represented more frequently than in any other state in occupations such as professional and scientific work and in occupations such as cleaning, food service work, personal care, and sales work (ILC 2009). That is, in Massachusetts, more immigrant workers are employed in these categories as compared to the rest of the nation. Nearly a quarter of the new immigrants work in the service industry in Massachusetts (Sum 2006). A recent Immigrant Learning Center ILC (2009) report shows that new immigrants are over three times more likely to be represented in cleaning occupations, and over two times more likely to be in food service occupations and construction and production industry than the native born population. The most common immigrant jobs reported among immigrants in Massachusetts are construction, cleaning, restaurant work, cashiers, nursing aides, machine operators (Hunt et al. 2005).

Study Design and Data Collection

We employed a survey instrument developed and administered by bilingual Teen Educators to assess occupational health risks among self-identified immigrants living or working in Somerville, Massachusetts. (See Chapter 2 for additional detail on the study methodology). The survey was comprised of 23 questions which asked about the demographic details of the participants, their occupational backgrounds and the self- perceived and self-reported health outcomes and hazard details related to employment. The study participants were over 18 years of age. The surveys were conducted in conjunction with events either sponsored by partnering community based organizations (the Haitian Coalition, the Immigrant Service Providers Group/Health (ISPG/H) and the Community Action Agency of Somerville (CAAS), or at health fairs held in Somerville. In total, 405 surveys were completed.

In this study we examine the most common low wage occupations reported by the immigrant population in Somerville, Massachusetts. Majority of the respondents (80%) disclosed their occupation. Very few people (3%) did not disclose what their primary or secondary occupation was and 17% reported being unemployed.

Problems were encountered in the coding of occupation. In a number of cases, in response to the question, “What is your primary job?” the survey respondents only identified the name of the company, restaurant, or the task they did such as waiting or washing. The occupation was ascertained, in those cases, by additional

details supplied in the open ended occupational questions as well as by benefitting from the local knowledge supplied in part by the community partners to identify named business organization as to type and industry. We used the 2007 Bureau of Labor Statistics (BLS) Occupational Classification System to code the occupational title. Although the occupational classification system offered an exhaustive range of categories, it was necessary to create an additional set of *a priori* project-specific codes to capture the desired information. For example, in the occupational classification system devised by the BLS no codes were found for baggers. Since most of the baggers work in retail industry and also work as cashiers, we have grouped them with cashiers, although these two occupational titles comprise different work tasks. Respondents who specified working in a packaging company as packers were categorized under factory workers as they work in factory and production settings. We also combined occupations that are related and have similar job-related exposures such as construction and maintenance work related to construction; and factory related work and machine related or production based work.

Occupations analyzed in this study include cleaning, construction work, food service work, cashier/baggers and factory related workers. After excluding the non immigrants in the study and all the other occupations besides cleaning, construction work, food service work, cashier/baggers, and factory related workers, we analyzed a sample of 212 workers. All questions reported here are based on a sample of 212, except the variable ‘Do you have a doctor?’ which is

based on a sample of 127 responses. This question was added at the end of the second year of survey administration to plan the occupational health fairs and since it is pertinent to understanding the participants' access to health services, we have incorporated it in this analysis.

The survey questionnaires and all study procedures were reviewed and approved by the Tufts University Social, Behavioral and Educational Institutional Review Board (IRB). All participants in the survey provided oral consent to participate. No names were ascertained nor was documentation status asked.

Data Analysis

The survey data was analyzed using the statistical software, SPSS 17.0. We first performed a descriptive analysis looking at demographic background, the availability or use of occupational and health services and the health risks in each of the occupational groups of cleaning, construction work, food service work, cashier baggers, and factory workers. Secondly, we examined patterns of occupational health risk by occupation. The descriptive analysis included chi square analysis.

In addition a series of logistic regressions for each of the following three health outcome indicators was performed:

1. Self perceived and reported hazards at work
2. Self perceived and reported health problems due to work

3. Self reported injuries suffered at work.

In addition five access to occupational health variables were evaluated. These included:

1. Work training
2. Health and safety training
3. Knowledge of the Massachusetts Workers' Compensation Law
4. Health insurance
5. Having a doctor.

These analyses were also controlled for the years the immigrant has been in the US (if they are recent or established immigrants) and English proficiency. A recent immigrant is an immigrant who has been in the United States for less than 10 years and an established immigrant is an immigrant who has been in the United States for over 10 years. Differences were considered statistically significant if the two-tailed p-value was less than 0.05.

Cashier/baggers are the reference group in each model. This selection is predicated on the observation that the occupational category of cashier/baggers had the least occupational health burden as demonstrated in the descriptive analysis.

RESULTS

A total of 212 cases were coded for this occupational comparative analysis. Five of the most common low wage occupations among immigrants were cleaning (n = 62, 29%), construction (n = 56, 26%), food service (n = 31, 15%), cashiers and baggers (n = 28, 13%), and factory and machine workers (n = 35, 16%).

Before turning to regression analysis where we adjust for socio-demographic factors, it is useful to examine the unadjusted differences in occupational health status among the occupational categories.

Bivariate Analysis

Cashier: Cashiers represent 13% (n = 28) of the workers in this analysis. The subjects who are listed as cashiers described themselves as either cashiers, taking care of customers, as working at the cash register, as bagger and packing at a sales agency. In this study most cashier baggers were from Haiti. Over 50% of the cashiers in this study have been in the US between 4 -7 years. Cashier baggers had better English proficiency than cleaners, construction workers and factory workers. Close to 64% of the cashier baggers spoke English. The majority of cashier/baggers are females (64%) and a sizable majority (61%) is between the ages of 18-20, thus suggesting that some of these respondents are still in school.

The majority of the cashiers worked for one regular employer (70%).

Cashier/baggers reported the most access to occupational health services (work training, knowledge of Workers' Compensation, health insurance and having a doctor) and the least occupational health risks (Hazards at work, health problems due to work and injuries related to work) compared to other occupations (See Table 5.1). However the cashier baggers reported receiving lower health and safety training than food service workers. Descriptions of hazards at work among cashiers/baggers included heavy lifting. Self reported health problems by cashier baggers included musculoskeletal problems such as wrist pain and back pain (See Table 5.2). Musculoskeletal problems, physical hazards and allergies were the most important health concern for cashiers.

Cashier baggers were chosen as the reference category in this analysis because they reported better access to occupational health resources and had the lowest self reported health outcomes.

Cleaners: Over a quarter (n = 62, 29%) of the respondents in the analysis worked as cleaners. The cleaners in the survey cleaned a variety of places such as homes, hospitals, hotels, offices, restaurants, laboratories, and construction sites. The majority of the respondents in the cleaning industry were from Brazil (48%), El Salvador (26%) and Haiti (21%). Over 50% of the cleaners in the study have been in the US for less than ten years with little English proficiency. Women (84%) dominated the cleaning job. There was also a gender based difference in the

cleaning operations performed by males and females. While more women cleaned homes and offices, more men worked as janitors and also did cleaning related to construction work. It is not unusual to find construction workers in cleaning jobs in the winter when construction work is very slow. Cleaning is a means of employment that offers low barriers to entry, as it requires few skills and training.

While most of the cleaners had a single employer, over a quarter of the cleaners were self employed. Most of the self employed cleaners were from Brazil. Some of the cleaners also had a second job most commonly in construction, as cashiers and baby sitters. Cleaners were less likely to have received work training, health and safety training, knowledge of Workers' Compensation, health insurance and access to a doctor compared to cashiers, food service workers and factory workers.

About half of the cleaners reported hazards at work, 35% reported health problems due to work, and 34% reported injuries at work higher than reports among cashiers, factory workers and food service workers. Reported hazards at work included exposure to chemicals, musculoskeletal problems from lifting beds and heavy objects, other physical hazards including slips and falls from wet floors or needles in the trash. Table 5.2 shows that half of the chemical hazards reported were among cleaners. Highest reports of allergies, musculoskeletal problems and psychological hazards were also reported by cleaners. Cleaners also reported the least physical hazards compared to other occupations. The self reported health problems among cleaners included back, neck and shoulder pain, body pain, skin

rash, nose bleeding, depression, stress, and throat irritation. (See the demographic, occupational and health characteristics of cleaners in Table 5.1).

Construction: In our sample, a quarter (n = 56, 26%) of the respondents worked in construction. Construction work includes all respondents who worked on such categories as carpentry, construction, painting, cutting wood and metal, manual labor, maintenance, and demolition. Over 75% of the respondents in the construction sector are from Brazil, 7% from El Salvador, and 7% are Other Hispanics (Guatemala, Honduras, Puerto Rico and Mexico). The majority of these workers are recent immigrants, only 9% of the construction workers have been in the U.S for over 10 years. The majority of the people in the construction trade spoke very little English (37%). The construction industry was significantly male dominated (97%).

Close to half of the construction workers had a single employer, 30% reported having multiple employers, 12% reported being self employed and 9% of the construction workers reported being unemployed but still indicated working in construction. We have noticed that some people who work as day laborers are not entirely sure how to list their occupational status and in a number of places have listed themselves as either unemployed or self employed. Construction workers in this survey also received the lowest amount of work training, health and safety training, had little knowledge of Workers' Compensation, health insurance and access to a doctor compared to other occupations analyzed in this survey.

Construction work is also highly cyclical dependent on the economy and season of the year. Those who reported having health insurance reflected a range of specific types of access ranging from Mass Health to free care.¹

Construction workers reported the highest health risks (self reported hazards, health problems and injuries related to work) than other occupations analyzed in this survey. Hazards at work and the hazards ranged from working in high places (altitude), exposure to paints/chemicals, cutting tools, falls from ladders and roof, heavy lifting, and shoulder pains. Construction workers reported more physical hazards than other occupations, they also reported higher chemical hazards and allergies than food service workers, cashiers, and factory workers (See Table 5.2). Health problems due to work reported include allergies, back pain, high blood pressure, breathing problems, and cuts that took a long time to heal because of self medication and now requires surgery. Other problems include emotional problems, headaches, and jaw and tooth pain. Also more emergency department visits were noted among construction workers than reported for the other

¹ MassHealth is a program that provides free health insurance to eligible low and moderate income families and individuals. Immigrants with documentation, and undocumented immigrants whose deportation is withheld or are granted parole are eligible for certain health insurance benefits without fear of deportation. With the passing of the Welfare Reform Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) and the Illegal Immigration Reform and Immigrant Responsibility act in 1996, the legal immigrants arriving after August 1996 lost eligibility for safety-net programs (SSI, Food Stamps, TANF, housing benefits and Medicaid) for the first five years they were in the U.S. MassHealth is a reaction to this enactment and a provision at the state level for state-funded Medicaid (or MassHealth). But MassHealth has been greatly curtailed in the 2004 yet when compared to norms in other states there may be more accessibility in Massachusetts than in other areas. (Uriarte, 2006).

occupations.

Food Service: Food service industry represented 15% (n = 31) of the sample. The major work tasks of respondents in this industry included baking, cooking, serving and waitressing in a variety of locations including restaurants, hotels, hospitals, school cafeterias. The majority of food service workers in the study were Haitians (32%) and Salvadorans (29%). The majority of the respondents in the food service industry (60%) have also been in the US for over 10 years. Close to three quarters of the food service workers were proficient in English and this population was largely male (69%). (See Table 5.1)

The majority of the food service workers had a single employer, 23% had many employers, a slightly larger percentage than for the cleaners and factory workers. Food service workers reported better work training, health and safety training, knowledge of Workers' Compensation, after cashiers. However, the food service workers had comparable levels of health insurance to cleaners and factory workers and their access to a doctor was worse than among cashiers, cleaners and factory workers.

Over half of the participants in the food service industry reported hazards at work, roughly equal to the reports among construction workers. Only 9% of the food service workers reported health problems due to work which was just slightly lower than the cashiers but 31% of the food service workers reported

injuries. The food service respondents described a variety of job-related hazards including physical hazards such as burns, cuts, exposure to cold temperatures, machines, fire, hot oil, and wet floor and cleaning products. Food service workers reported a high prevalence of physical hazards compared to cleaners, factory workers and cashiers. They also reported musculoskeletal problems and psychological hazards but these were lower than reports from other occupations except cashiers (Table 5.2).

Factory and machine related work: Factory and machine related workers represent 16% (n = 35) of the workers in our sample. The subjects who are listed as factory related workers described doing machine work, working in packaging companies, recycling, or doing repetitive work such as separating or folding clothes at commercial laundries. Over half of the factory workers were from El Salvador (60%), and 17% from Haiti. Factory workers, as a group, have been in the US longest compared to the other groups of workers. However, only half of the factory related workers (49%) were proficient in English, while 74% of the food service workers and 64% of the cashiers who are more recent immigrants were proficient in English. The majority of factory related workers are female (58%).

The majority (67%) of the factory related workers had one regular employer. The factory workers reported better work training, health and safety training, and knowledge of Workers' Compensation than cleaners and construction workers

and comparable health insurance as cleaners. Close to half (47%) of the factory workers reported hazards at work, 27% reported health problems at work, and 28% reported injuries at work. Hazards at work included work pressure, injuries with sharp objects, bleach and other cleaning chemicals. Factory workers, like cleaners, reported the highest prevalence of psychological hazards resulting from stress, and work pressure. They also reported higher musculoskeletal problems than construction workers, food service workers and cashier/baggers (Table 5.2). The self reported health problems ranged from back pain, to skin problems, stress, headaches, foot problems and aches, and high blood pressure.

Multivariate Analysis

Access to occupational health services by occupation

The observed health disparities persist between occupation once group differences in immigrant status (recent immigrant or established immigrant) and English proficiency were controlled. Construction workers, cleaners, and factory worker had significantly lower access to occupational health services than cashier/baggers. Construction workers had the least access to occupational health services (work training, health and safety training, knowledge of worker's compensation, health insurance and having a doctor).

No Work training: Table 5.3 shows that cleaners (OR: 6.0, 95% CI: 1.8 – 20.1), construction workers (OR: 14.0, 95% CI: 4.1- 48.0), and factory related workers

(OR: 3.6, 95% CI: 0.97 – 13.3) had significantly low work training than cashiers after controlling for English proficiency and immigrant status. After controlling for immigrant demographic factors, the odds of not receiving work training for cleaners were six times high, for construction workers fourteen times high, and for factory related workers three times higher than for cashiers.

No Health and safety training: Table 5.3 shows that cleaners (OR: 2.8, 95% CI: 1.0 – 7.4), and construction workers (OR: 5.6, 95% CI: 2.0 – 15.5) had significantly lower odds of receiving health and safety training than cashiers.

Controlling for demographics, the odds of not receiving health and safety training were over two times higher for cleaners and over five times higher for construction workers. Factory workers were over two times more likely to have not received health and safety training but this observation was insignificant.

Food service workers were over 30% more likely to have received health and safety training than cashiers.

No Workers' Compensation: Table 5.3 shows that Construction workers (OR: 7.2, 95% CI: 2.4 – 21.7), cleaners (OR: 2.8, 95% CI: 1.0 – 7.4), and factory workers (OR: 3.2, 95% CI: 1.0 – 10.4) were significantly less likely to know about Workers' Compensation than the workers in other occupations. Construction workers were over seven times more likely and both cleaners and factory workers were over three times more likely to have no knowledge of Workers' Compensation Law than cashiers.

No Health insurance: Table 5.3 shows that construction workers (OR: 6.9, 95% CI: 2.3 – 20.6) had the least access to health insurance. Construction workers were over six times more likely to have no health insurance than cashiers and the other occupations in the study.

No Access to doctor: Table 5.3 shows that constructions workers (OR: 28.8, 95% CI: 3.2 – 256.5) and food service workers (OR: 21.3, 95% CI: 2.1 – 214.1) had significantly lower access to doctors than cashiers and other occupations in the study. After controlling for immigrant demographics, construction workers had 28 times less likely to have a doctor than cashiers. Food service workers were 21 times lower odds of having a doctor. Cleaners and factory workers too were three times less likely to have access to a doctor than cashiers but this observation was not significant. (Table 5.3)

Occupational health risks by occupation

Hazards at work: Table 5.3 shows that after controlling for demographics, no significant difference was observed for hazards at work between occupations. Construction workers and food service workers were two times more likely to report hazards at work than other occupations though this observation was not statistically significant.

Health problems due to work: Table 5.3 shows that construction workers (OR: 5.2, 95% CI: 0.97 – 28.3) reported significantly more health problems due to

work than cashiers. Construction workers were over five times more likely to report health problems due to work after controlling for years in the US and English proficiency. Both cleaners and factory workers were three times more likely to report health problems as well however this observation was not significant. English proficiency and years in the US may have influenced these results among cleaners, and factory workers in reporting health problems.

Injuries suffered at work: Construction workers (OR: 8.6, 95% CI: 1.8 – 41.5) reported significantly more injuries at work than cashiers and other occupations in Table 5.3. Construction workers were over eight times more likely to report injuries at work than cashiers. Both cleaners and food service workers were four times more likely to report injuries and factory workers were close to three times more likely to report injuries but this observation was not statistically significant. Years in the US may and English proficiency have significantly influenced these results.

DISCUSSION

The study provides a cross-sectional perspective of the five dominant low wage occupations performed by self-identified immigrant workers living and working in Somerville, MA. Low-wage, low-skilled immigrant occupations are difficult to document as most of these jobs are unstable and are seldom permanent. Our survey sheds light on this hard to reach population but has certain structural limitations. These limitations include a relatively small sample size, and the use

of a trained cohort of bi-lingual Teen Educators as interviewers (this approach is discussed in greater details in Chapter 2). We consider the results reported here to be exploratory in nature. We believe that this study has provided important information about workers employed in these low wage occupations and the attendant health exposures and health risks found in such employment. In comparative studies such as this, there is tendency to rank. This poses a real problem especially in this study as each of the occupation presented may have elevated risks and lower access to occupational health services which warrants attention. This study's strength is found in its concurrent descriptive analysis of the five dominant low wage occupations in a given community across the major immigrant populations. It offers a valuable introduction to the general characteristics of each job which carries real benefit to inform the design of interventions at the community level.

The results in this study are consistent with the studies conducted earlier. Our data finds that 44% of construction workers self reported injuries, 34% among cleaners, 28% among factory workers and 31% among food service related workers. Consistent with these results, the COBWEB study (2007) conducted among Brazilians in Massachusetts show that construction workers were the most affected by work-related injuries and diseases responsible for 45% of the cases. Janitors and housecleaners, landscapers, and food and restaurant workers (cooks, dishwashers, and bakers) represented 26.5% of the cases (Collaboration for Better Work Environment for Brazilian Immigrant Workers COBWEB 2007). The lack

of factory related workers in the COBWEB report also highlights the smaller number of Brazilians working in this occupation as was found in the Somerville data.

The results in our study show that construction related occupations are a high risk category. Construction workers reported significantly lower access to occupational health services and reported higher occupational injuries at work and health problems related to work compared to cashiers. There are no surprises in this claim; many of the comparative occupational studies that record fatal occupational injuries show that construction workers suffer a larger number of occupational injuries, illness and fatalities of any industrial sector (Buskin and Paulozzi 1984, Ringen et al., 1995; Sorock et al., 1993). Sorock et al. (1993) reported a threefold increase of fatal injury in the construction industry compared to all the other industries. The highest risk was found to be among Hispanic construction workers when compared to other ethnic/racial groups (Sorock et al., 1993, Fabrega and Starkey 2001; Anderson et al. 2000; Brunette 2004). Other studies have shown that Hispanic construction workers are more likely to be male, of relatively younger age on average, and more recently arrived in the United States, as was found in our study (Dong and Platner 2004; Fabrega and Starkey 2001). Consistent with our study Waehrer et al. (2007) showed that the construction sector demonstrated a high percentage of temporary or contract workers. Previous studies have also suggested that language barriers and training may be significant factors that contribute to the burden of occupational risks seen

among immigrant construction workers (Sorock, 1993; Dong and Platner 2004; Platner 2000). In our work, Brazilian men who were the most recent immigrants and were the least proficient in English dominated the construction industry consistent with Marcelli (2009) and Siquera (2008).

Equally important are significant observations of poor access to occupational health services (work training, health and safety training, knowledge of workers compensation) among cleaners in this study compared to cashiers. The cleaning industry were more likely to be Brazilians, Salvadorans, and Haitians in our study. In Massachusetts cleaning is one of the leading occupations among Hispanics and is the second most common job among Blacks (Hunt 2006, COBWEB 2007). Higher rates of cleaners in either self employment or working on a contract basis with multiple employers and self reported high health risks among cleaners have been observed in other studies by Mattingly (1999), Lee and Kraus (2002), (2010) and Buchanan et al. (2009). The self reported major hazards in our study included exposure to chemicals, musculoskeletal problems and psychological hazards which were also recorded in Buchanan et al. (2009) and Ahonen et al. (2010). Self reported use of bleach and Clorox in our study is also shown by Zock et al. (2009; 2007) to be associated with respiratory tract symptoms. Consistent with this observation, a few cases of breathing problems, allergies and skin problems were also been noted in our study. Hunt (2006), MADPH (2007) and COBWEB (2007) also show that access to occupational health resources such as work training, health and safety training, knowledge of

Worker's Compensation, health insurance and access to a doctor among cleaners are low. However, cleaners had better access to doctors than construction workers and food service workers which could be because the cleaning industry is dominated by females who, in general, access health services more than men (Kosiak et al. 2006).

Studies conducted among food service workers are few. Most food service workers in this study were from Haiti and El Salvador as was also reported by Hunt et al. (2006). Previous reports concerning immigrant restaurant workers show musculoskeletal sprains, strains, numbness, tears, cuts, burns and falls as in our study (Webster 2001, Tsai 2009). Food service workers reported the highest frequency of health and safety training compared to other occupations in this study. This group of workers also had one of the most stable work structures compared to factory workers, cleaners and construction workers and in addition that they were the most proficient in English as compared to the other workers.

Little is known about immigrant factory/ machine workers in Massachusetts. Over half of the factory workers (60%) in our sample were from El Salvador. Majority of the factory workers were female and had a single employer compared to the other occupations in this study. Factory workers have also been in the United States longest but this did not correlate with improved English proficiency in this occupational group; a little over 50% could not speak English. Language proficiency has been previously shown to influence work relationships and work

related health issues (Premji et al. 2008). The occupational category factory/machine workers also reported relatively poor work training and health and safety training, knowledge of Workers' Compensation, health insurance and increased presence of health problems due to work as compared to food service workers and cashiers. However they had fewer injuries at work and hazards at work than construction workers, cleaners, and food service workers but they reported more health problems at work when contrasted with food service workers and cashier/baggers, these observations were not significant.

The cashiers in this study was a young group, 61% were in the 18 – 20 age group, they also had the most stable job structure with 70% having a single employer. They were also more likely to be from Haiti, or from Asia and Africa. They also had better access to occupational health services and reported the lowest level of health risks compared to other occupations in the study, this could be because many of them do this as a part-time job and are still under parental care or parental benefits such as health insurance.

Limitations of Study

This pilot study has some major shortcomings due to its small sample size and the accompanying lack of precision. The very wide 95% CIs in the estimated odds ratios complicates the interpretation of some of the results. Finding a representative sample for the target populations in this study and within these occupations is difficult. Some of the respondents in these occupations self report

their employment status as being either “self employed” or “unemployed” and work multiple jobs. Many of these jobs are primarily comprised of newer immigrants - some of whom are potentially undocumented, hence this group of low income jobs has been traditionally hard to access and research. Under these circumstances, obtaining a representative sample of the population in these small scale low wage industries such as cleaning, construction, food service, cashiers and baggers and factory, machine and maintenance workers was not possible.

Another problem that is inherent in studying such groups where the workers are easily expendable is that it is hard to associate a particular risk to an occupation unless you also capture occupational history. Some of the workers do different kinds of jobs, and often do not have one primary occupation or there is little distinction between their secondary occupation and primary occupation. In this study many of the workers had multiple jobs, some in construction and cleaning or in food service industry. For example, empirical observations in our study locale show that construction workers had limited job opportunities in the winter and in the slow months for construction workers they tended to work as cleaners or maintenance workers, or in food delivery business. In some cases when jobs are hard to come by in the summer or because of a slow regional economy as seen throughout our study period the same forces are at work. The people who work in the food industry and as cleaners largely stay within the same profession even if they change jobs frequently. Hence associating a particular occupation to specific health outcomes is fraught with difficulty particularly for immigrant workers

because of the number of jobs they perform and the transitory nature of their jobs.

We found that the occupational descriptions and health issues were sometimes left blank, incomplete and/ or were answered in vague terms. Probing into some of the gaps in the survey we found that some members of the immigrant communities we interacted with did not necessarily make a clear distinction between a health issue and an occupational health issue unless there was a broader awareness of the occupational hazard such as exposure to lead in painting, etc. We also realized that some of the participants were reluctant to disclose their work details in a survey.

Another potential limitation in this occupational analysis is the lack of data on socioeconomic status and education. We did not ask about the socioeconomic backgrounds of respondents or about the educational backgrounds of the workers. These variables have been strongly associated with potential health outcomes (Clark and King 2008).

Selection bias may also have been present particularly as a result of the use of Teen Educators in the field to conduct the occupational health and safety survey reported on here. The Teen Educators may have felt more comfortable approaching respondents in an age profile similar to their own thus perhaps accounting, in part, for the finding that 61% of the cashiers reported ages between 18 – 20. Alternatively, this finding may reflect the demographics for this job in

our study area. (Please see Chapter 2 for additional detail on these points).

We also employed public events sponsored by our community partners for immigrant clients as a primary venue for accessing this population and conducting survey interviews. Such a strategy may limit the participation of certain immigrant populations who do not have time for such gatherings due to the multiple jobs they perform or due to them being unaware of such events. More systematic methodologies are needed to access this population to improve the representativeness of the data. Intervention based approaches are an effective strategy to access this population who suffer from very poor access to occupational health resources. This is particularly true if the goal of the research is to capture results from the most marginal elements of a population at risk. Here because our respondents were interacting with established community based organizations we would speculate that our results are conservative in that they reflect the experiences of a more established portion of the immigrant population in Somerville.

Strengths of Study

This study is a valuable initial step in characterizing occupational health risks for the commonly held low wage occupations among immigrant workers in Somerville, MA. Not all of the wage and salary jobs held by new immigrants will appear on most of the state and governmental labor databases. A number of these new immigrant workers appear to be employed as contract workers or work

within highly informal labor markets, which is compensated in cash on a weekly or daily basis (Clinton 1997; Barten et al. 2008). Azaroff (2004) show that surveys can capture cases missing from other existing sources of data. Hence, CBPR methodologies can contribute fundamental advantages in accessing these extremely hard to reach populations.

The use of the Teen Educators may have contributed to potential selection bias but an offsetting strength was found in our ability to overcome the tremendous gaps in trust and cultural competence which more traditional adult surveyors may have encountered. The Teen Educators also greatly contributed to our ability to reach the immigrant populations which we sought.

CONCLUSION

The concurrent analysis of common low wage jobs in a specific social milieu across major immigrant populations has largely been absent from the occupational health literature. We found significant differences in access to occupational health services and health risks among these common low wage immigrant occupations. We also found that the occupational differences alone contribute to the high risks present in these jobs, especially in construction, cleaning and factory work. More studies are needed on these immigrant occupations to validate these results. Very little information was available especially among immigrant factory workers and food service workers. Community-based interventions would be the most

effective way to reach this population and to understand the occupational health and safety issues among these immigrant occupational groups.

Table 5.1 Analysis of demographics, occupation, access to occupational health and safety and health outcomes among self-identified immigrant workers employed in low wage occupations: Somerville, Massachusetts, 2006-2009

| | Cashier/ Bagger | Cleaner | Construction Worker | Factory Worker | Food Service |
|---|--------------------|----------|------------------------|-------------------|-----------------|
| Country of Birth (n = 212) | | | | | |
| Haiti | 10 (36%) | 13 (21%) | 2 (4%) | 6 (17%) | 10 (32%) |
| El Salvador | 3 (11%) | 16 (26%) | 4 (7%) | 21 (60%) | 9 (29%) |
| Brazil | 4 (14%) | 30 (48%) | 43 (77%) | 2 (6%) | 0 |
| Other - Hispanic | 3 (11%) | 2 (3%) | 4 (7%) | 3 (9%) | 6 (19%) |
| Other | 8 (29%) | 19 (2%) | 3 (5%) | 3 (9%) | 6 (19%) |
| Years in the US | | | | | |
| 1 - 3 yrs | 5 (18%) | 9 (15%) | 24 (44%) | 1 (3%) | 2 (7%) |
| 4 - 9 yrs | 18 (64%) | 26 (42%) | 25 (46%) | 11 (31%) | 10 (33%) |
| 10 - 15 yrs | 4 (14%) | 17 (27%) | 4 (7%) | 10 (29%) | 13 (43%) |
| > 15 yrs | 1 (4%) | 10 (16%) | 1 (2%) | 13 (37%) | 5 (17%) |
| English Skill | | | | | |
| Yes | 18 (64%) | 28 (45%) | 21 (37%) | 17 (49%) | 23 (74%) |
| Gender | | | | | |
| Male | 10 (36%) | 10 (16%) | 54 (96%) | 13 (42%) | 20 (69%) |
| Who do you work for? | | | | | |
| One regular employer | 19 (70%) | 37 (62%) | 27 (48%) | 22 (67%) | 21 (70%) |
| Many employers | 7 (26%) | 5 (8%) | 17 (30%) | 3 (9%) | 7 (23%) |
| Self employed | 1 (4%) | 16 (27%) | 7 (12%) | 2 (6%) | 0 |
| Unemployed | 0 | 2 (3%) | 5 (9%) | 6 (18%) | 2 (7%) |
| Work Training | | | | | |
| Yes | 24 (86%) | 27 (48%) | 16 (30%) | 20 (59%) | 23 (74%) |
| Health and Safety Training | | | | | |
| Yes | 18 (67%) | 23 (40%) | 13 (25%) | 15 (44%) | 23 (74%) |
| Massachusetts Workers' Compensation laws | | | | | |
| Yes | 17 (68%) | 20 (33%) | 10 (20%) | 13 (41%) | 17 (55%) |
| Health insurance | | | | | |
| Yes | 17 (63%) | 33 (57%) | 9 (17%) | 20 (57%) | 15 (58%) |
| Access to doctor (n = 127) | | | | | |
| Yes | 19 (95%) | 24 (77%) | 9 (38%) | 22 (81%) | 12 (60%) |
| Hazards at work | | | | | |
| Yes | 9 (38%) | 30 (52%) | 31 (60%) | 16 (47%) | 15 (54%) |
| Health problems due to work | | | | | |
| Yes | 2 (10%) | 11 (35%) | 10 (40%) | 7 (27%) | 2 (10%) |
| Injuries at work | | | | | |
| Yes | 2 (8%) | 20 (34%) | 24 (44%) | 9 (28%) | 9 (31%) |

Table 5.2. Prevalence of the major self reported hazards and health problems among self-identified immigrant workers: Somerville, Massachusetts 2006-2009.

| Occupation | Physical hazards | Chemical hazards | Musculoskeletal problems | Psychological hazards | Allergies |
|---------------------|------------------|------------------|--------------------------|-----------------------|-----------|
| Cashier/bagger | 11% | 4% | 21% | 0 | 14% |
| Cleaner | 4% | 49% | 40% | 40% | 43% |
| Construction worker | 39% | 25% | 33% | 25% | 29% |
| Food service worker | 30% | 5% | 21% | 20% | 0 |
| Factory worker | 15% | 16% | 38% | 40% | 14% |

Table 5.3. Odds Ratios and 95% Confidence intervals of access to occupational health services and health outcomes among low wage occupations among self-identified immigrant workers in Somerville, Massachusetts 2006-2009*

| | Cashier/Bagger | Cleaner | Construction Worker | Factory Worker | Food Service |
|-------------------------------|----------------|-------------------------|---------------------------|--------------------------|---------------------------|
| No Work Training | Ref | 6.0 (1.8 - 20.1) | 14.0 (4.1 - 48.0) | 3.6 (0.97 - 13.3) | 1.9 (0.49 - 7.6) |
| No Health and Safety Training | Ref | 2.8 (1.0 - 7.4) | 5.6 (2.0 - 15.5) | 2.3 (0.76 - 7.0) | 0.77 (0.24 - 2.5) |
| No Workers' Comp | Ref | 4.3 (1.5 - 12.0) | 7.2 (2.4 - 21.7) | 3.2 (1.0 - 10.4) | 2.3 (0.71 - 7.3) |
| No Health Insurance | Ref | 1.6 (0.59 - 4.2) | 6.9 (2.3 - 20.6) | 1.9 (0.64 - 5.9) | 1.9 (0.59 - 6.1) |
| No Access to Doctor | Ref | 4.6 (0.49 - 42.8) | 28.8 (3.2 - 256.5) | 3.5 (0.35 - 35.5) | 21.3 (2.1 - 214.1) |
| Hazards at Work | Ref | 1.6 (0.61 - 4.4) | 2.4 (0.87 - 6.6) | 1.3(0.42 - 3.9) | 2.0 (0.60 - 6.2) |
| Health Problems | Ref | 4.4 (0.82 - 23.3) | 5.2 (0.97 - 28.3) | 3.1 (0.54 - 18.1) | 1.1 (0.13 - 9.6) |
| Injuries at work | Ref | 4.4 (0.93 - 21.4) | 8.6 (1.8 - 41.5) | 2.8 (0.51 - 15.2) | 4.1 (0.75 - 22.5) |

*All analyses control for English language skill and years in the US

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VI. “They See Us as Machines:” The Narrative of Recent Immigrant Women in the Low Skilled Informal Labor Sector

ABSTRACT

This study explores the job seeking patterns, employment outcomes, work organization and structure, and occupational health concerns as elicited from recently immigrated women employed in the informal work sector. The primary occupations represented in this study are cleaning and factory work. We have used a methodology which involves the obtaining of interview data from three distinct sources - 1. Interviews with immigrant women workers employed in the informal sector, 2. Interviews with community Key Informants and, 3. Interviews with representatives of temporary employment agencies. This triangulation is intended to increase our ability to more correctly identify the principal factors which shape the work experience of immigrant women in the informal, precarious, labor sector. In addition, we also compare our results with the existing literature as well as to a subsample, selected on job titles similar to our interviewees, from a community based occupational health survey (OHS) as conducted in Somerville, Massachusetts.

In our interview sample we find that recent immigrants reported that few employment choices were available to them and that these were characterized by poor working conditions which were often conducive to abuse and worker rights violations. A number of hazardous exposures and corresponding health effects

were noted in these jobs. These occupations did not benefit from adequate work safety measures and support systems which likely affected the physical and psychological health of these workers. The development of protective policies specific to informal labor markets are essential, as is the enforcement and the implementation of safety interventions to improve the quality of work and life for these workers.

INTRODUCTION

Female economic migrants are an increasing presence in urban labor markets throughout the United States (Kanaiaupuni 2000). There has been a sharp increase in women's migration worldwide over the last decade (Anderson 2001). There is also an increasing trend in women making such moves alone (Boyle 2002). The 2009 American Community Survey shows that 50% of the total foreign born population is female and 95% of them live in metropolitan areas (Kanaiaupuni 2000). Concurrent with the rise of immigration is the emergence of new forms of work organization, employment contracts, and temporary or flexible labor (Tompa et al. 2007). Benach et al. (2000, 2002) shows that the predominant characteristics of those in the flexible job market include lower educational credentials, low income, being female, a migrant, and a member of the non white racial category. While women contribute half of the working immigrant population, female immigrant workers have received less attention as compared to male immigrant workers (Messing et al. 1997, 2004, 2001, 2003). The industry sector and dynamics of immigrant women, especially in unstable or temporary, low-skilled employment is largely hidden. Significant differences exist between male and female migrant workers in temporary employment due to the differences in their patterns of migration, job seeking practices, forms of employment, work experiences and health status (Livingston 2006, Cranford et al. 2003, Parrado and Flippen 2005, Malmusi et al. 2010). The present study looks at the in-depth occupational health experiences of a small sample of recently arrived immigrant

women working in low skilled temporary jobs.

One of the main reasons that women migrate is to enhance their economic well being. Several pioneering studies have viewed migration as an emancipating experience for women that has led to greater personal autonomy, the formation of more egalitarian relationships at home, and increased independence due to improved employment and enhanced economic prospects (Grasmuck and Pessar 1991, Pessar 2003, Zentgraf 2002). Alternatively, other studies demonstrate evident segregation within occupations pursued by migrants and the existence of better economic and social prospects for males (Parrado and Flippen 2005, Hagan 1998, Gilbertson 1995, Malmusi et al. 2010). In addition occupational choices are less plentiful for women with fewer avenues for advancement, thus reinforcing inequalities which are present. Studies have also shown that even for migrant women of relatively high social status in their countries of origin migration usually leads to downward occupational mobility (Parrenas 2000, Bauder 2003, 2006, Meares 2010). In addition immigrant women and new immigrants remain more likely to be employed in part-time and temporary wage work or in the more precarious segments of the labor market as compared to men and native women (ILO 2003; Borak 2005, Cranford et al. 2003, Akhavan et al. 2007, Arat-Koc 1997, Bakan and Stasiulus 1997).

Migration scholars contend that this downward occupational mobility among women workers is gender specific (Vosko 2000, 2003) and that in many cases

occupation is not a matter of choice for immigrant women. Immigrant women, especially, are often trapped under patriarchal notions of women's work and are subjected to restrictive ties to their employer (Yeoh and Huang 1999, Hagan 1998). In a typical system within these work structures, entrepreneurs or even subcontractors are typically men, often immigrant men who employ women of the same ethnicity in informal work such as domestic work (Borak 2005, Morakvasic 1984, Pedraza 1991). This form of informal labor recruitment is one of the ways that immigrant men accumulate capital, which is constructed around the provision of competitive, and cheaper services often at the expense of its workers (Borak 2005, Light et al. 1999, Portes and Bach 1985, Zhou 2000). Hence, women immigrant workers are doubly affected by wage discrimination as a result of being both an immigrant and a woman.

Consistent with the existence of such system characteristics, the American Community Survey (2009) shows that women earn less than men despite the finding that women work more than men (Borak 2005). The United States Census (2009) shows that the median income among immigrant women was \$25,085 as compared to \$28,085 for men. Among immigrant women 23.8% in the US were below the poverty level while only 19% of the immigrant male group was below the poverty level. In addition, compared to immigrant male workers immigrant women were three times more likely to have part time employment; 21.3% of the women workers were employed in part time jobs, by comparison only 7.3% of

male workers were involved in part time employment.

The jobs that are most available to recent immigrant women are domestic work, jobs in the light manufacturing sector or other unregulated informal service work sectors that do not fall under national labor laws (Menjivar 1999, Akhavan et al. 2005). Research shows that domestic worker migration now accounts for the dominant source of migration as compared to professional migration (Gulati 1997). Demand for women workers in domestic services is increasing as the number of women employed in formal economies are rising (Boyle 2002). Such domestic services are increasingly sought by a growing number of less wealthy, upwardly mobile families (Cox 2000). According to migration scholars the low skilled domestic worker fulfills a special role in the “modernization projects” of nations (Boyle 2002, Chin 1998). Migrant women and women of color bridge the gap of service oriented work once fulfilled by women who stayed at home and now pursue careers similar to their male counterparts (Parrenas 2000). However, these migrant women workers are afforded fewer opportunities for advancement and for securing the promise of economic and upward mobility in these jobs (Hagan 1998).

It is only recently that the researchers have started to address the links between gender and immigration. Much of this research has come from immigration research and feminist scholarship (Hondagneu-Sotelo 2003, Pessar and Mahler 2003). In the field of occupational and environmental health, much of the focus

on immigrant health has been on male migrants, largely ignoring women migrant workers (Valenzuela, 2002, Eun-Ok 2000, Messing et al. 1997, 2001, 2003, 2004, Ahonen et al. 2010). This is similar to the omission of women from migration studies in the 1980s and for the early 1990s (Hondagneu-Sotelo 2003).

In some of these jobs, especially in occupations such as housekeeping and child care work, the women often work in isolation and are less likely to join unions, and to find other means of social supports. Understanding work abuse in such settings is difficult - freezing salaries and the failing to count hours worked accurately are frequently used by employers to challenge the wage claims of such marginalized workers (Pratt 1999). The isolation of women migrant workers at workplaces also increases the threat of monotony at work and sexual harassment (Ahonen et al. 2010).

The extent of hazards and health risks to immigrant women is largely unknown. Social hazards such as workplace abuse, harassment, work insecurity, long work hours, high work pressure, few breaks, high emotional demands, underpayment and discrimination (Krieger et al. 2006) are commonly reported among new immigrants workers (Akhavan et al. 2005, Ahonen et al. 2010). The experience of job insecurity has been associated with both poor psychological and somatic health (Tompa et al. 2007, Marmot et al. 2001, Ferrie et al. 2002). Precarious occupations and temporary workers are exposed to poor working conditions replete with exposure to vibration; excessive and loud noise, the repetitive

performance of defined tasks, and is often associated with fatigue, back pain and musculoskeletal injury (Benavides et al. 2000). Precarious jobs have also been associated with increased rates of injury and chronic disease from exposure to a variety of hazards (Quinlan et al. 2001, 1999).

There are few occupational health studies that have been conducted among immigrant women in the precarious informal labor markets such as cleaning and low skilled factory workers (Ahonen et al. 2010). A recent occupational health study among women household service workers identified deleterious health effects ranging from burning in the eyes and throat, watery red eyes, breathing difficulty, skin burns and irritation due to chemical exposures; back injury, lack of vitality and fatigue from their intensely physically demanding jobs; and stress, sleep deprivation and depression from psychosocial hazards (Ahonen et al. 2010). Respiratory concerns among household cleaners have been explored by several other scholars (Medina-Ramon 2003, 2005, 2006, Zock et al. 2001, 2007, 2009). Research shows that the probability of not receiving Workers' Compensation coverage was higher among women, new immigrants, and part-time or temporary workers (Smith et al. 2009, Quinlan and Mayhew 1999). While the occupational experiences of cleaners are better characterized, the experience of temporary women factory workers engaged in informal work is largely unknown. The current study will provide a glimpse into this sector.

Few reports have attempted to uncover the characteristic role that women play in the informal work sector and even fewer occupation health studies have been conducted in these populations (Ahonen et al. 2010, Messing 1997, Messing and Stellman 2005, Malmusi et al. 2010). The research reported on here explored the nexus between gender, recent immigration, job search patterns, the participation in low-skilled occupations and the resulting health status of the workers.

Many questions emerge regarding immigrant women engaged in informal employment: What are the modes of work seeking employed by recently arrived immigrant women in the informal work sector? What difficulties do women face in seeking employment? How are informal labor markets organized and how do they function specifically to accommodate immigrant women? Are there differences in employment outcomes based on race and age? What difficulties, risks and hazards do these women face in the informal sector? What factors keep them trapped in a low wage market? Documenting, exploring and analyzing these questions can provide needed information concerning women in such informal markets and offers the opportunity to inform our understanding of this complicated system.

In this study we analyzed the employment outcomes, job seeking patterns among immigrant women, the organization of such informal work sectors, and the occupational hazards and health status issues self reported by these women

workers.

METHODS

The present study utilizes qualitative approaches to explore these questions in a detailed consideration of a small sample of women workers employed in the informal or precarious employment sector. Migration and feminist research studies show that qualitative research plays a formative role in understanding the nuances in the work life that migrant women experience (Hondagneu-Sotelo 2003).

Study Design

This is a pilot study that is intended to be explorative and descriptive rather than quantitative or broadly representative. We have used the theoretical frameworks of earlier work on precarious employment experiences and health consequences (Tompa et al. 2010), and consulted both the work and health disparities conceptual model (Lipscomb et al. 2006) and the vulnerable population conceptual model (Flaskerud and Winslow 1998) to inform and organize this work. Precarious employment is defined as job situations which feature atypical work contracts, with limited social benefits, entitlements, job security, sporadic tenure, poor earnings and working conditions and high risks of ill health (Cranford et al. 2003). Such jobs are, however, not necessarily restricted to low income, low skilled jobs in the “new economy” which has emerged due to large scale organizational restructuring within many industry sectors. In this “new

economy” even “standard” work can exhibit characteristics that could be experienced as insecure and potentially detrimental to health and wellbeing (Tompa et al. 2007). The work and health disparities model discusses the complex role that work, including occupational exposures, working conditions and benefits associated with work, effects of work on families and communities and policies related to work all contribute to the existence of health disparities as much as race, ethnicity, socioeconomic status and gender. The vulnerable population conceptual model takes the position that society as a whole plays a part in the assurance of health, justice and human rights for the individual. Vulnerable populations are groups that lack sufficient resources and are at increased risk for increased morbidity and mortality. These models have been previously been applied to immigrant workers (Albarran and Nyamathi 2011, Cranford et al .2003). By combining these models we incorporate both the sociological and occupational health constructs in defining and exploring health disparities for recent immigrant working women. Our study shows that the demographic (country of birth, education, English proficiency, marital status, responsibilities) social (legal and institutional protection, social support/social capital, social oppression) and work attributes (rise in unconventional work domains, job insecurity, and work conditions among other factors) increases hazardous exposures and negative health outcomes.

Data Collection

We did not target a single industry sector in this study. Instead our goal was to

capture the experiences of recent immigrant women working in informal, precarious employment settings. Performing research among these immigrant woman is a challenging task. To begin with, women in such work (such as domestic cleaners or factory workers) are not highly visible. Second, even if one identifies them, many would not be willing to participate in a research activity out of concerns stemming from their documentation status or work status. In fact any activity which raises visibility to any official body or organization could be seen as a deterrent to participating in field research. The present work consisted of in-depth interviews with a small number of recent immigrant women from diverse backgrounds, and occupations to capture some of the diversity of job seeking patterns and occupational outcomes inherent in such a population. The in-depth interviews with immigrant women were further supplemented with interviews conducted among a group of community based key informants who were broadly knowledgeable of informal working systems in the Boston metropolitan area. Site observations of selected temporary agency sites, a women day labor pickup site and a thermoplastic molding company were conducted by the author. In addition, the results in the study were compared to other immigrant health research as well as an occupational health survey conducted among immigrant workers in Somerville, Massachusetts.

The specific methods implemented include: 1. An open ended semi-structured in-depth interview that was administered to women workers, 2. Open-ended interviews conducted with Key Informants employed by community-based

organizations providing services to immigrant women workers and by temporary employment agencies in the Boston metropolitan area 3. Site observations were conducted by the author. 4. A comparison of results from the activities listed above with those gleaned from a subsample of a Occupational Health Survey recently conducted among self-identified women cleaners and factory workers living or working in Somerville, Massachusetts.

In-depth Interviews with immigrant women: The in-depth interviews with immigrant women explored their demographic backgrounds, their operational details concerning finding jobs, the dimensions and structure of their employment and compiling self-reported hazards, health risks and social risks present at work. These interviews ranged in length between 1-3 hours. We approached ten potential participants and eight participated in the study. The participants were notified and invited to participate in the study via telephone or email or through a colleague working for one of the community based organizations associated with our research project. The women were given a day or two to consider their decision before making the decision to participate in the study. If the participant was willing to be interviewed, they were asked about their proficiency in English. If they preferred to be interviewed in another language an interpreter was provided.

The interviews were conducted in an informal, semi-structured, conversational style. This conversational style of interviewing (Kvale 1996) mirrored everyday

interaction and allowed the participant to assume an active partnership in shaping the conversation and share more narrative accounts or stories and ask follow-up questions.

The interviews were conducted at locations deemed to be comfortable and acceptable to the participants and where confidentiality could be ensured. To maintain the confidentiality of the participants a pseudonym was used instead of the name of the participant on the transcription. We sought and obtained verbal informed consent from the participants at the time of the interview both for the interview and for the audio taping of the conversations. The participants were compensated with a payment of \$50. Snacks and refreshments were also provided at the interview.

All interviews were performed by the author in conjunction with an individual from the community-based organization who translated and transcribed audiotapes once it was completed. Detailed field notes were taken by the author to capture additional observations and non-verbal cues.

Interviews were conducted with eight immigrant women who work in the informal work sector; six of whom were cleaners and two who worked in factory work (a thermoset molding company and a packaging company). See table 6.1 for a full presentation of the characteristics of the interviewees. The imbalance in the number of cleaners and factory workers was due to the difficulty in finding

women factory workers who are recent immigrants. No respondent was ever directly asked about their immigration status. Five of the women who were interviewed were undocumented and three were on visitor's visa. This information was voluntarily shared in the midst of the interviews.

Follow-up interviews were performed with many of the participants to record the changing dimensions in their work experiences. Three respondents were hard to reach or did not respond to telephone calls placed after the initial interview. We learned subsequently that these participants had returned to their home country. Also one of the community members who helped us with the interviews returned to her home country and another community member that we worked with lost her job which made it difficult to continue follow-up interviews on a more regular or uniform basis.

2. *Key Informant interviews:* The key informant interviews were performed with temporary agencies and community based organizations that work predominantly with immigrant women. We interviewed representatives of three temporary employment agencies in the Boston metropolitan area that serve the immigrant population. One of the women factory workers that we interviewed received her job from one of these temporary agencies. We also interviewed eight community workers from community-based organizations that serve immigrant workers. The community organizations included immigrant churches and agencies that provide a range of immigrant services including occupational health and safety, health

services, and other vocational services such as language and computer literacy training. The churches represented in our sample were three immigrant churches in the Boston Metropolitan area that serve a largely Hispanic or Brazilian population. All interviews were conducted starting in the fall of 2007 and extending until the end of 2008.

Interviews conducted at the temporary employment agencies explored the general outlines of hiring practices, the duties performed by hired workers, the background on their primary clients and customers, and the common occupational and health challenges encountered in these assignments. The Key Informant community interviews explored the primary occupational health concerns known to the Key Informants based on the experiences of their clients employed in the informal work sector. The Key Informant interviews ranged from 30 minutes to one hour in duration.

3. Site observations: Site observations were performed by the author and involved observing labor pick-up sites and also visiting a thermoset molding factory to understand the manufacturing processes employed at such a facility. The factory visit was prompted by the inability to obtain a clear understanding of the inherent occupational risks from the respondent employed in this setting. The author did not visit any of the workplaces of the women that were interviewed in order to maintain trust and to avoid any complications that could result from such an action. The factory the author visited was a facility similar to that worked in by

one of the respondents. It was located in Massachusetts but this facility was much bigger and better maintained than the facility in which the respondent worked.

4. Occupational *health survey*: In addition to compared our results with the existing literature we also compared our to information obtained from a community based occupational health survey (OHS) involving respondents who identified themselves as immigrant workers (n=405) living or working in Somerville, Massachusetts collected between 2006 and 2009. (The methodology employed in this survey is covered in detail in Chapter 2). The predominant occupations of the immigrant women in this survey included cleaning, factory or machine work, sales, and social services sector which encompasses the health care sector, community services and education. For the purposes of our comparison we selected a subsample of female respondents (n=72) from the OHS survey to better understand the occupational choices and work experiences of the immigrants who reported their occupation as cleaners (n = 55) or factory workers (n = 20). Many of the women represented in this subsample are not recent immigrants; hence there are limitations to such a comparison. However, it still enriches our knowledge of the context for immigrant women workers in the cleaning and low skilled factory work sectors.

Analysis plan

All interviews were audio-taped and transcribed and translated by bi-lingual community based translators. The qualitative methods of coding and categorizing

were used to condense the interviews and derive meaning and identify predominant themes and concepts (Kvale 1996). This research has focused on obtaining in-depth information from a small number of subjects rather than less detailed information from a larger sample (Dreher 1994). Table 6.2 outlines in a categorical manner via the representation of constructs, concepts and narrative examples found to be present in the responses of study participants. The form of presentation and approach illustrated in Table 6.2 represents a synthesis of the “vulnerable populations” conceptual model employed by Albarran and Nyamathi (2011) with the coding structure used by Valadez et al. (2006). Each category is followed by detailed descriptions of sub categorical concepts and selected portions of the narrative responses that capture the essence of each concept or theme.

The data collection strategy was designed to impose as limited a burden on respondents as possible. An attempt was made to leverage existing resources in the community to encourage both participation and acceptance by potential respondents. A verbal informed consent that outlined the purpose and potential dangers of the study was provided to the participant before the interview was conducted. The verbal briefing of consent at the beginning of the interview outlined the purpose of the interview, explained the use of the tape recorder, allowed participants to ask questions, and withdraw from the study at any point if they chose to. The participants were also encouraged to share concerns about the project, data collection and confidentiality of the interview. The survey

instruments and all study procedures were reviewed and approved by the Tufts University Social, Behavioral, and Educational Institutional Review Board (IRB). No names were ascertained nor was documentation status asked. All the study participants were (18+) adults.

RESULTS

Socio-demographic backgrounds of the interview respondents

Demographics: The participants in the in-depth interviews (n=8) ranged in age between 30 to 52. All the participants were recent immigrants who have been in the United States between 45 days and 3 years. Six women in this sample were from Brazil, one woman from Colombia and one from Honduras. Except one woman, none of the women in this sample had a college degree. None of the women were fully proficient in English, though three of them have had some proficiency as a result of English as a Second Language (ESL) training. (Please see Table 6.1 for additional detail).

Most of these respondents immigrated alone, and some already had family or friends here. The most recently arrived were generally living with acquaintances. Two people said that they had no relatives in the United States.

Reasons for moving to the US: All the women, except two, came to the United States for economic reasons. They all had specific economic aspirations and

goals. These economic aspirations were quite specific: to secure funds necessary for building a house, to secure a better future for their children, pay for medical school or help other family members. Six of the eight respondents reported providing financially for the family members back home. A cleaner from Brazil said that she has a small business at home, so she has no obligations to send money each month, but said that she does help occasionally. One Hispanic factory worker said that for two years she could not send any money and that her father and sister were paying for her health insurance in the United States.

Some also came to this country out of economic desperation and lack of jobs in their home country: “In my country (Honduras) my husband has not found a job after he became 35 years old. It is difficult to find a job after 35, that is why I have to come here”.

One woman said that she came to the United States seeking a broader experience:

“We had our daughters, who are older now and we wanted to travel, to learn English, we had the money, and wanted to see something more than Brazil”.

Another woman came due to political reasons.

Table 6.1: Demographic, educational, and occupational characteristics of the immigrant women in informal work sectors

Country of

| Origin | Age | Years in US | Education | Occupation in US | ESL training | Previous Occupation |
|---------------|------------|--------------------|------------------|--|--------------------------------|---|
| Brazil | 37 | 2 years | Middle School | Cleaning aid | No | House wife |
| | 30 | 3 years | High School | Cleaning aid | No | 8 th grade teacher |
| | 46 | 75 days | High School | Cleaning aid | Yes in Brazil | Stained glass business |
| | 38 | 3 years | Middle School | Cleaning aid | No | Housecleaner |
| | 34 | 3 years | Middle School | Cleaning aid | No | Housecleaner |
| | 46 | 45 days | High School | Cleaning aid | No | Artist |
| Honduras | 46 | 3 months | 6th grade | Factory work (Thermoset plastics company) | 3 Months (in Honduras) | House wife |
| Colombia | 52 | 3 years | PhD Env. Law | Factory work (Packaging factory) | 2 years (Community College) | Administrative job (18 years)at a university |

Table 6.2 Framework of work-related experiences and health of immigrant women in informal work sectors

| Constructs | Concepts | Narratives |
|-------------------------|------------------------------|--|
| Job search | Channels of Job Search | Friends, postings on the internet, and shops Church Formal temporary agencies Informal temporary hiring agencies |
| | Constraints | Education & language skills Years in the United States Hard to find stable jobs Few occupational choices for recent immigrants Transportation Other Constraints |
| Occupational Attributes | Work Organization | Work routine Cleaning work activities Thermoset molding activities Packaging activities Other Work Organization |
| | Occupational Health Hazards | Chemical exposures in cleaning Other unhygienic exposures due to cleaning Chemical exposures in thermoset molding Musculoskeletal risks Other hazards |
| | Social Hazards | Work disparity Wage inequality Lack of breaks Work pressure Threats Other Social Hazards |
| | Occupational Health Services | Inadequate work and health and safety training Inconsistent use of personal protective equipment No access to health care No knowledge of Workers' Compensation |
| Health Outcomes | Health Problems | Musculoskeletal problems Health problems due to chemical exposures Skin problems and allergies Psychological health problems Accidents and injuries Other health problems |

This Table was adapted from a synthesis of the “vulnerable populations” conceptual model employed by Albarran and Nyamathi (2011) with the coding structure used by Valadez et al. (2006).

Finding Work: Word of mouth, networks, churches, formal and informal hiring sites

Channels of job search: Respondents generally relied on informal channels to find work, through word of mouth, augmented via a web of relations consisting mostly of friends, even new acquaintances that they met. Besides these sources of referrals, community networks such as provided by churches also played a large role in finding jobs in both the Brazilian and Hispanic communities in the metro Boston area. In the Brazilian community most of the women relied on a friend based network to find jobs, some of them also relied on other sources occasionally such as immigrant run churches, postings at immigrant run stores and the internet in a few cases.

Finding jobs through church: Churches represented an excellent place to advertise for jobs and make new connections for both Brazilian and Hispanic workers in this study. These immigrant-run churches not only offer religious and spiritual services but also community events and social services for immigrants which allows them to become oriented within the community but also to find jobs. Services cater to specific ethnic communities and mostly to the needs of the members of the church. According to a community worker who works at an immigrant church about 80% of the people that they serve belong to the church:

There are a lot of people who are looking for jobs in our community and there are a lot of people who call for helpers. One lady, today in the morning, called me and said, I have a lot of table cloths to iron because I'm gonna do a party, and I need someone to come... and help me iron

these cloths. So, the job is just for three hours... maybe four hours not more than this, then I said ok, let me try to help you. Then I went to my books and I have some names... I called two people and I found one... So this is the way.

In the Brazilian community, day workers, are called 'helpers' who work a day or half a day cleaning a home, or moving things, doing yard work, babysitting, dog walking, or helping the elderly.

Finding jobs through formal temporary agencies: Alternatively, Hispanic women in this study largely used temporary agencies or hiring agencies to find work. None of the Brazilian women we interviewed did this. The Hispanic respondents also indicated that their friends referred them to these hiring agencies. The two hiring agencies that the women we interviewed work at were quite different from one another. One of the hiring agencies was a formal temporary agency that primarily served the immigrant population located in Somerville. The other was an informal hiring agency that lacked even an office but was simply a pick up site, where workers congregated and were picked up in a van and taken to the worksite. One woman said that she used to go to a day laborer site (the geographic location of site is not disclosed for purposes of confidentiality): "but now the police is there, and it is better to get out of there and look for a community center... and now it is prohibited to stand there". The community members said that the temporary agencies hire a lot of women for factory work.

At the formal temporary agency, people seeking employment are required to complete paperwork. One of the Hispanic workers we interviewed said that there

were a lot of questions in English that she did not understand and that her application was completed with the assistance of a young lady who speaks English. This agency has referred her to a number of jobs. The maximum length she has stayed with one company is four months. She has worked for the current company before and so they rehired her because she is a good worker.

The temporary agency official that we interviewed said that they usually give a 90 day contract to people. They hire a large number of day laborers and some skilled laborers. Most of the women day laborers they hire are sent to bakeries, farms, production work, box companies, plastics factories and outside work such as landscaping. The workers are expected to report to them between 5:30-6:00 AM in the morning to sign in, and are then taken to work. The temporary agencies indicated that they find their workers by word of mouth mostly, they advertise only when there is either a big job order, a shortage of workers or if they need workers possessing specific skills. Their customers often would place employment orders on very short notice and with only rudimentary requirements: “how many, what they need to do, and where they need to go, and what time”.

The temporary agencies said that they usually inform workers what to expect because if the workers do not do well it is going to reflect poorly on the agency. While a few of the workers are placed in Somerville and adjacent locations, most of the workers are placed farther to the north of Boston in locations such as Woburn, Winchester, Wilmington, Lynn, Reading, and North Reading.

Finding jobs through informal hiring agency: At the informal hiring site, the study participants said that each morning a van picks up anywhere from 25 to 35 people from a parking lot. The workers are then taken to a factory one to two hours away. At times there are four vans that pick up 80 to 100 people, 90% of whom are women. The name of the hiring agency nor the factory that she worked for was not known to the worker: “There are workers who have been going to this site for a few years but even they did not know the name of the employer. We are at times taken to different factories and are paid by the people who pick us up”. According to this informant, the hiring process starts with a verbal reference, with the hiring decision being performed by the person who picks them up: “Once you are in the list, and are perceived as a reliable worker, the chance of getting called again is high. If one is not a good worker, they are told in the evening that they need not return. It is hard to get hired if one goes to the site without an earlier reference”.

The people gather at the hiring site at pre-determined times, usually at 5:30 AM, and then in the evening for the later shift. The study participant said that at the time of hiring, the workers are not given any information about the job, or wages to be paid: “nothing, we do not know anything and there is nobody who can give you the information and if you talk to the person that pick you up they would say I was just instructed to pick you up, nothing else. There are weeks they would ask you to work every day, but then there is no guarantee that you will get called every day”. Such interruptions in working present difficulties to the women: “...

Well, I have to go back home mad for losing my morning, the time I was waiting over there... you feel humiliated like you are begging for a job then you go back home and your whole day is ruined”. This participant has also tried another hiring agency in Chelsea, but she said it was a similar experience: “The agencies covered by our work typically hire people at the same time so if potential workers do not get selected at one site, we do not usually have the option of going to another hiring site for the same shift”.

The Key Informant respondent concurred with these accounts on the operation of these informal hiring sites. The respondent indicated that most of the people who seek jobs at such agencies are Hispanic workers, some of whom are women. These women workers are afraid to talk to anyone and are very suspicious of people talking to them. There are three pickup shifts, the first one commences at 5:00 AM, the afternoon shift at 2:00 PM with the evening shift starting at 10:00 PM. The last shift is not regular, and there are very few people employed on the evening shift.

Both the community members and the temporary agencies said that work at the temporary agency requires submitting documentation concerning immigration status. But the community members said that there are some who do not ask for papers. One of the participants said that in some cases the temporary agencies will tell you how to get the documentation: “They say where to get it, who to talk to, or if they don’t know you they won’t say anything, but you know, they see where

you come from exactly”.

Constraints to finding work: Finding daily work is a continuing source of distress for many of these women – the options are few due to their educational backgrounds, documentation status, and language skills. One respondent reported that: “I have been looking for work but cannot find a stable job, ...it is such an unreliable situation, it is terrible and depressing”. Most prefer to have a ‘standard’ regular job but they also feel it is not always an achievable option due to their immigration status: “The American dream is not like as if you come here and you get a job and you are treated well, for me the American dream has become a nightmare... if you are not a citizen or a resident you do not have any rights here”...

For most immigrant women, day work or temporary work is their first job in the United States. One woman said that, “we do not choose jobs here, no, my job chooses me.” Most do what job they can find: “It is difficult to be a daily worker but if we do not have much education, we have to do what we can, what is easy for us”. The community worker said that most Brazilian women start as cleaners, because such an occupation does not require advanced education, but merely a detail-oriented and honest person. The only other job that the Brazilian women in the sample performed was babysitting, reported by only one respondent.

Transportation: Transportation is central to finding work and it is a major problem for most recently arrived immigrant workers. Immigrants who lack sufficient documentation status cannot obtain a driver's license. Transportation was mentioned as a huge challenge both among factory workers and cleaners. In both cases they relied largely on their employers for transportation, supplemented to a certain extent by public transportation.

Dependence on employer transportation: In the case of cleaners, there is no single work site that workers go to each day, but rather move from one cleaning site to another. Cleaners in this study relied heavily upon their employers for transportation. The employers picked up their helpers at home in some cases and at times the helpers went to the employer's house to obtain transport to the actual work sites. The distance to these work sites vary from a few minutes to two hours. Another worker, who has been in the United States for less than two months, said that it would be hard for her to get to work if she had not received rides from her employer.

Dependence on hiring agency vans: In the case of factory workers employed via hiring agencies, the companies or hiring agencies often supply transportation. One of the factory workers, relied on the company's transportation to get to work because there was no other choice available to get to work. She also mentioned that at times she was taken to different work places which she did not know about in advance. She also said that all the workers who work with her took the same

transportation; only the supervisors got to the workplace themselves. The hiring agency in general charge the workers for these services and deducts \$5 each day or \$25 each week for the provided transportation.

Respondents employed by the temporary agencies said that they provide transportation to work places that are more than 30 minutes up to one hour distant, unless the workplace is nearby or close to a subway stop. They said that they do try to place people at jobs which are relatively close to the residence of the worker. One of the temporary agencies indicated that they do not always provide transportation, and in such cases they said that they give monetary advances if the worker needs money to get to their work place, or they try to arrange car pools among the workers or encourage them to get to work on their own.

Dependence on public transportation: One cleaning woman who has been in the United States longer (approximately 3 years) gets to work on her own and takes a bus or receives a ride from a friend. One of the factory workers said that in her first few jobs she took the van from the temporary agency to work every day and back but that now she takes public transportation. She has to take two busses to get to her work, lasting up to one hour in duration in order to get to work. Her one advantage to taking public transportation and knowing how to get to her workplace without the aid of the temporary agency is that she could start her day

later than be at the temporary agency by 6:00 AM.

The reliance on employers for transportation is often seen as an impediment for the workers. If there is a problem at work and the worker is required to leave early, they often do not know how to get back. Also, at times they are not dropped off at the right place, or are dropped off at inappropriate hours in unsafe neighborhoods. Both of these scenarios pose a threat to the women's safety. One of the woman had to leave work because her boss was abusive and it took her about three hours to find her way back. Both workers from the temporary agency reported incidents where they were either not picked up on time or were not dropped off. One of the woman who worked at the formal hiring agency said that one time the driver was new and that he did not know his way back and that he dropped her at an unknown place and she had to find her own way back. This can be quite traumatic especially for recent arrivals to the country. Another time the driver did not show up and the respondent had to ask a coworker, who had been sexually harassing her, for a ride back.

The respondent who worked as an employee at the informal hiring agency said that it was harder to provide transportation during night shifts because at times they would finish work early but get picked up late and that they had to wait long hours to get picked up to get home: "We do not have transportation and we do not know where we are... If we finish at 12 (*midnight*) and they pick us up only at 1 or at 3 all these hours we are waiting in the cold and they don't pay us those

hours”. One time she was dropped off at an inappropriate time in an unfamiliar neighborhood: “I had no clue where they were leaving us, it was 2:00 or 3:00 AM and one time a man came to attack me, and I started to run and scream and I went all the way to Walgreens and a man there defended me”.

Work Organization

Work routine: There was no consistent time at which the cleaners and the factory workers started their work. Some started at 6:00 AM, while others started later at 7:00 AM or even 8:00 AM. Most of recent immigrants tended to find jobs with an earlier start while those who have been in the United States longer began work on a daily basis a bit later. The cleaners said that the start time and duration of work differs, depending on the number of clients their employers have. They said that the duration of these jobs were also hard to predict and depended on the difficulty of the cleaning as determined by the size of facility and its state of cleanliness. Some also said that some time is also lost due to travel time from house to house. Women cleaners said that even without counting the time spent traveling they work about 8 to 9 hours a day. This translates to cleaning four to five houses a day. Some also said that they wake up very early; at times as early as 5:00 AM, to prepare for work, make lunch, and get clothes ready. One woman said that they prepare at night before going to bed for the next day. Working overtime is quite common in this trade. One of the cleaning woman said that she has worked as late as 11:00 PM or midnight.

The factory worker said that although her day starts with waiting for the pick up at 5:30 AM the work itself does not start till about 8:00 AM. Her daily hours at work are counted only from when the work begins, and vary depending on the work load. At times the work ends at 3:00PM or as early as 11:00AM. The worker said that these shorter shifts, and not being able to rely on work hours is particularly hard if one is working at night: “for the night shift they pick you up at 5:30PM... and if the work starts at 8:00PM and if the material is over by midnight or 1:00AM we have to wait for them until they pick us up.” One of the other factory worker gets to her worksite by public transportation which enables her to get to work independently and on time.

The community key informant respondents concurred with this assessment: “in this area of work they know what time they are going to start but they don’t know what time they will leave. It’s very common, and sometimes they work in areas that are far away”.

Cleaning work tasks: The cleaners in this study have cleaned homes, offices, nursing homes, hotels and gyms. Some of the house cleaning work happens after a tenant moves out. Some of the cleaning jobs are post-construction cleaning. Some women get called to clean after parties. One woman said that houses are a bigger job than offices and that cleaning offices is easier because it is a less demanding environment as it does not need to be cleaned so thoroughly as houses. Cleaning involves dusting, moping, vacuuming, cleaning the bathrooms, kitchen,

doing laundry, folding clothes, making beds, and at times cleaning lamps and other objects. A few women said that they also clean the outside of the houses, clear the garden, wash the windows, remove cobwebs, and clean the garages.

Equipment necessary for the performance of the work is an important consideration. Some of the women bring in their tried and tested ways of cleaning that they used in their country or origin which they believe to be more efficient and environmentally conscious. The use of rags instead of paper and using warm water instead of spraying chemicals and wiping it off with paper are some of the practices that the women talked about. “I think that we carry this all the way from Brazil: The little rag for everything...so we use a rag...I noticed that the ladies stare at me and one came to me one day to say, you can use all the paper you want to use, okay! Then I show my little rag and how well I do with it and she says ok...so if this is better, do it”. The Brazilian cleaners found it difficult that there is very little water used in cleaning.

The cleaners also said that most of the clients believe in the products more than the skill of the worker. “I believe they trust the product to do the work and not us. I had a client that stopped to ask me why I was not using Windex to clean the windows. Then I showed her that the Windex was making skid marks... and demonstrated to her what I was doing using a rag with warm water, that it was much better...and so she said I trust your judgment”. Some women also said that

it was difficult for them in the beginning to get used to using vacuum cleaners.

Some of the arduous tasks in cleaning include cleaning the kitchen, bathroom, mopping the whole house and making beds. Cleaning the bathrooms and kitchen exposed respondents to more chemicals and also required greater physical exertion, to be on the floors at times on ones knees. Three of the cleaners said that they do not use a mop to clean the bathrooms, but bend down to scrub the floors. Kitchen cleaning includes cleaning the refrigerator, microwave, stove, counters, floors and windows. The women said that they needed a special cleaning product to clean stainless steel refrigerators. Many complained about the difficulty encountered in such cleaning. In the case of making beds, one woman said that it is more difficult for her to make beds than clean the bathroom, “yes all those sheets, plus the covers, blankets and pillows then we need to adjust and pull in every corner...we need to go under and pull everything to fit perfectly in the mattress and the mattress is so heavy”.

Thermoset molding work tasks: Factory workers were less clear in describing what they did, not because they did not want to share this information but because they could not adequately explain what they did, especially in the case of the woman who worked in a thermoset molding factory. This job site involved working with certain machine parts. The respondent could not explain what parts she was making nor what these thermoset molds were used for. “I do not know, I have asked but I do not really know, these are small pieces in the finishing area”.

She said that there are a lot of machines where she works. There is the production side and then the cleaning side and that she works in the cleaning area. She said her main tasks were making smaller parts of a larger object and cleaning parts of those objects. She said that she cleaned them with sharp tools such as little blades and files, and tweezers at times. “There are different tools, there are some round things...there are other long tools. This is hard to do. You need to scratch like that to clean”. She said that she also performed different work tasks such as removing molds coming out of the machines. She said that these objects were made of fiberglass but more research (performed by the author) on the company showed that the factory she worked at made thermoset plastic molds. Some of these were parts for medical devices and some were basic supplies and a very clean environment was required to reduce defects. “The job was to polish the edge of the part and it has to be very nice and polished. If the job is not polished properly the part is rejected and we get in trouble”.

This worker said that she sits while working and there are other people working with her, that four women work in one row. She thought the work place was too crowded. During our visit to site (just the outside, we did not go inside the facility) we found the place to be small from the outside, congested and without adequate ventilation. The place had a single shutter which was open but this small factory had few windows otherwise. The place also had a strong smell of chemicals.

Packaging work tasks: Both the women factory workers have worked at some point in their life in packaging. Packaging was the current job of one of the woman. Packing as a work task sounds deceptively simple even though in reality the tasks are often complicated. One of the women who works in the plastics company said she did it for one month and quit because the job was too difficult and that supervisors put a lot of pressure on workers to complete their tasks quickly.

Most of the packing jobs are done by women. There are some men involved who mostly carry heavy objects. The main tasks at the packaging company range from cutting cardboard boxes, lining items up, packing and the disposal of trash. The type of activity that each worker is assigned varies day by day. Some days it is packaging, other days it could be handling the boxes. Some of the cardboard the workers work with is precut. This requires the pulling of the edges, folding them, forming them and finally gluing them. The cardboard is often quite thick and is used at times to pack heavy things like cans of food. The worker stands up to perform much of this work and the boxes are made on the floor. “You have to use your back, your arms, and be in positions that is not comfortable to you. You must bend most of the time trying to fold with your knee, your foot, your hand. Gloves are not used in these tasks. At times after making the boxes they are put on the line on a belt and sent to another place to finish the job”. “This involves taking the cans from a smaller box, re-label and repack in another bigger box and sending them along in the line. There are about 50 cans in one box. Some of the products

packaged were coming from places like Canada and the workers were required to remove the labels on the cans or jars. The worker complained about the difficulty in doing this work at a pace sufficient to keep up with the conveyor belt.

The packaging jobs reported in our sample was performed in a huge warehouse. It has a door but no windows. About 60 to 80 people work in these warehouses. People work side by side and each are assigned a specific task which may vary from time to time.

Occupational Health Hazards at Work

Chemical exposures in cleaning: A great number of chemicals are used in the cleaning industry. The use of cleaning liquids varies according to the space or type of the objects being cleaned. The locations where the most chemicals are used are in the bathrooms and in the kitchen. Clorox is used mostly in the bathrooms and the kitchen and also in moldy areas and on black stains and spots. Since the bathrooms are often small enclosed spaces, the exposure from such chemicals may be high. The cleaning chemicals used ranged from Fantastic, Windex, Chlorox, Ajax, Tilex, Pledge and Easy Off. “Clorox-in the bathroom... I use it a lot but only in bathroom; in the Kitchen fantastic, Powder bleach; Windex for the windows, also soap, a scrubbing sponge and a little brush”. Depending on the house they are cleaning and the level of cleaning and polishing more chemicals maybe used, such as Pledge for polishing surfaces, bronze, silver etc. and Easy Off to clean stoves which accumulate grease and become stained. One

woman said that one of the bathrooms that she cleaned had bronze counters and that she had to use Brasso for that which turned her hands black since she did not have gloves. Most respondents said that Clorox, Tilex and Easy Off were the worst cleaning products to use. They said that the smell of these chemicals does not come off the hands for a long time. Another cleaner said that, “I breathe those bad fumes all day through my nose, I can smell the stuff all day long.”

Other unhygienic exposures: Besides chemicals they were also exposed to harmful unhygienic conditions, “I stayed one day working at a nursing home and it was really bad because I needed to go all day picking up dirty clothes, and I threw up because ...the smell...it was bad!”

Chemical exposures in factories: The potentially hazardous substances that the factory workers worked with were not clearly identified. The thermoset plastic worker reported that the operations at work created a lot of dust. “It is fiber and when we scratch it the dust comes out, it is fiberglass. We know this dust is dangerous and they give us masks”. She said that besides this dust (plastics) she did not work with any other chemicals. She also said that the product that she worked with “smells really bad”.

While the worker did not know much about the product she was working with. We do have knowledge about the wide variety of chemicals that are used in producing thermoset plastics (Lewis and Sullivan 2001). Thermoset plastics are

synthetic materials that are typically produced by heating liquid or powder within a mold, allowing the material to cure into its hardened form. These plastics can withstand heat. The heating process does not necessarily set the mold, but the chemical reaction between such specialized materials is the primary process behind curing the thermosetting plastics. These plastics cannot be reused or recycled once produced. Typical thermoset plastics are composed of the following classes of materials including synthetic epoxies, polyester, silicone or phenol-formaldehyde resins and polymers derived from crude oil and natural gas which may be further fabricated with a variety of additives such as colorants, plasticizers, biocides, antioxidants, flame retardants, silica, asbestos and other fillers. Limited toxicological information is available on many of these compounds. The health hazards of the resin compounds are similar to those of the petrochemical industry. The exposures may be from vapors and dust during, loading, mixing, pelletizing maintenance operations. Overheating of the compounds, cleaning and finishing operations may further expose one to thermal decomposition materials of the polymers, solvents and adhesives (Lewis and Sullivan 2001).

The woman who works at the packaging factory said that she does not work with any chemicals. She said that there are some unpleasant smells but she could not tell what it was, “there is food, and also glue and others”.

Musculoskeletal risks: The women who reported working at both factories and cleaning complained about the very physical nature of their work. Their concerns consisted of discomfort produced by standing all day, lack of breaks, fast paced work, and heavy lifting all of which makes one prone to severe back problems, and hand and leg strains. The packaging worker said that some of the boxes were heavy and that there was no assistive mechanical supports available to pick up the boxes. Most cleaners complained that the vacuums are heavy, especially when you have to lift it, especially out of the car or between the floors of a house or office. Most used vacuums that can be dragged along, and not the ones that can be carried on the back of the worker. They said that vacuuming is not the only thing they do, so they found it inconvenient to use the backpack model. They also complained about the heavy beds that they have to lift and also the difficult postures assumed while cleaning that yields hand strains, and back problems.

Other hazards: Other issues the workers talked about was the often harsh lighting in factory settings. The worker who worked at the packaging factory said that the lighting affected her vision and that it made her drowsy: “you can faint by looking at the light all day”.

Social Hazards - Work Place Pressures

Work disparity: One of the common findings elicited from cleaners, is that most employers (the cleaners who owned the house cleaning contracts) go with the helpers to job site. In most cases the helpers do the majority of the physical labor.

In one of the cases a cleaner said that the employer only performed the light work like dusting, vacuuming, and kitchen work while the respondent had to do all the difficult tasks associated with the cleaning such as the bathrooms, kitchens, and all of the activities that involved the use of traditional cleaning agents.

Wage inequality: It is often the case that while the helpers do much of the work, they are not fairly compensated. A cleaner said that for cleaning ten houses in two days her employer gets \$800 and even if she (the helper) does most of the work she gets only \$160. Community Key Informants noted that this is a fairly common practice: “some cleaning jobs are sold to others or sub contracted out to other cleaning services or helpers because they have more work than what they can handle”. So even if the helper cleans the whole house, the client pays the employer and the employer pays a fraction of that amount to the helper.

Wage abuse is common in these jobs. These workers are often paid less, and never paid for overtime. Most cleaners are paid by the day or for the whole job rather than by the hour. People get paid based on their work. But there is no fixed rate. Some contract owners pay only \$60, while others pay \$70 or even \$85 per day. Such sums may be for as much as 10 to 11 hours a day of work. Such a duration is considered “normal”. One woman said, “last week I went to help someone and the man picked me up at 10:00 AM and I worked till 6:00 PM and he gave me only \$25 dollars... but I did not say anything...you know. It was only one house but it was a big job. I thought it was too little but did not say a

word...It was frustrating, so I am not going again”.

The temporary agencies on the other hand pay their employees weekly. They pay a minimum wage but in most cases the travel expenses are taken out of the pay check and sometimes taxes are also deducted. One woman said that with such garnishment it results in less than the minimum wage. They said that they also do not get paid while they take a break. Lunch breaks and any other breaks are not usually counted towards the number of hours worked.

Lack of breaks: All the women respondents work long days often without breaks. In the case of cleaners the only time they stop is when they go from one place to the other, or rather rushing from one place to the other and that they mostly eat in between jobs and often in the car. One of the temporary worker said that she gets a 10 minute break in the morning and a half an hour break in the afternoon for lunch. Workers are cautious about taking such short personal breaks, “If you spend too much time in the bathroom they take the time out of your paycheck”. The woman who works at the packaging factory said: “we cannot even go to the bathroom because you know that they are working with a product that goes in the line, there are certain amount of boxes that needs to be done at certain time. Sometimes you cannot even go because they are checking the time, how many minutes, then you don’t go and when you finally go, it hurts for having retained so long”. One of the community Key Informants said that, not getting enough bathroom break time is a problem among women as many of these women hold

themselves longer than they should and self report health problems including bladder infections. The community group said that at many places, women don't drink water because they are not allowed to go to the bathroom until their break time, or the lunch time. They also said that at many places, they don't have access to food, so they are confronted by hunger and dehydration. One of the cleaning workers said that she gets very hungry because her work is physically demanding and if she doesn't eat, it makes her dizzy.

Work pressure: Many respondents report encountering work pressure and abuse which they find harder to endure than the work itself. The workers said that the employers do not care about health problems. The primary concern is getting the work done.

I started working with this Lady and she gave me only 20 minutes to clean the bathroom...and I could not finish a bathroom in 20 minutes ...and she was there looking at me...she stopped working and stood by the door to stare at me... that was terrible for me because besides telling me how long I should spend doing my work... she was like a vigilante staring at me all the time...

The work pressure is so high; she wanted me to clean two more houses at the end of the day while my whole body was aching with cramps.

The factory workers also worked under constant supervision and time pressure.

They treat you differently if you never speak and you do your work...then there is no problem. If they see you talking a lot she would ask you to be quiet, don't talk too much! Last time I got the wrong part in the side of the finished pieces and the supervisor took me to the boss. For a week he kept repeating "check, did you check?" yeah, he kept telling me that. Because they check like 7 or 8 times during the day checking every worker checking every work we do, different people.

Horrible, because they look at workers and they see us as machines.

Threats: Use of threats at jobs are not uncommon among recently immigrated workers, “One of my employers was very exploitative and treated me like a slave, I could not even drink water in between and she was very verbally abusive, not happy with anything I did. She also took my passport and started threatening me. When I realized that things were not going well with work, I stole my passport back from her bag before I left”.

Access to Environmental and Health Services

Inadequate Work and Health and Safety Training: None of the workers said that they received health and safety training. Both the factory workers said that they received work training but this was not the case with cleaners. One woman said that she was trained by the owner of the house but just so that her furniture was not ruined from scratches. One woman shared an experience where a lack of training resulted in a very harmful situation.

I had a problem... I started cleaning the bathroom and started having an allergic reaction...I was using other cleaning chemicals, bleach and ammonia together... no one has showed or explained anything to me about the cleaning products or anything... I cannot read the labels you know? I was wearing contact lenses and having problems... I was feeling so bad, I gave up in the middle of the work and left.

Use of bleach and ammonia are commonly reported causes of work related asthma (Medina-Ramon et al. 2006). The community Key Informants stated that most of the injuries they see among their clients is the result of lack of training and safety equipment. Employers don't provide the workers with training, so they

get injured.

Inconsistent use of personal protective equipment: Most cleaners mentioned some use of gloves, but this was not reported consistently. Only one cleaner reported using gloves regularly, three said they do not use them and two used them only occasionally. Some find it hard to use gloves when the work needs to be done quickly and the work pressure is very high. “I cannot get used to it, I can’t work fast as when I am wearing gloves so I don’t wear it”. Some women used gloves only for hygienic purposes. “Some houses were clean so I did not feel the need to use the gloves”. And another said “I have fear and think ...the chemical are dangerous...this one lady I went to work with she did not have gloves there because according to her the people over there were all very clean . She worked in nursing home place in which they did not provide gloves because the lady in charge told her that people over here are very clean”. One woman said that her use of gloves depended on what she did because the products destroyed her hands. Another woman said that she uses the gloves only in the bathrooms.

No consistent use of masks (reported as being paper masks) was mentioned by respondents even while cleaning tight spaces like bathrooms. One woman said that she tries to use masks when she uses products such as Easy Off. No one used any respirators or protection for the knees. One woman said that her knees turned black from prolonged kneeling.

In the case of the thermoset plastic worker she said that she used a plastic apron, gloves and a mask. However she said that, “Sometimes I use the mask, sometimes not”. She said that at her factory nobody likes to work with masks because it gets very hot there, but they use them at times to protect themselves. The woman who worked at the packaging factory said that she used no protection.

No access to health care: None of the respondents reported having health insurance. Two women said that they have utilized free care. One person said that she is going to get free care. Most workers reported self medication but there were instances where the employer also offered medicine for ailments. “They gave me some medicine but I do not know which kind of medicine they gave me”. Many have not seen a doctor recently.

No knowledge of Workers’ Compensation: None of the workers knew much about the Workers’ Compensation program. The woman who worked at packaging said that she wants to complain but she does not know where to go as she does not know who her employer is, “we don’t know them, we don’t know who is hiring us. When you ask for something, nobody answers, everyone sends you to another person, oh no that is not my responsibility, so we don’t know”. Another concern among workers related to complaining is the loss of job: “you have no right to complain because they may say this person should not comeback.

Health Outcomes

Health Problems due to Work: Two kinds of health problems were reported by the workers; ones caused by physical exertion and stress and the other as a direct result of hazards at work. The health effects reported by the cleaners included dizziness, headaches, nausea, shakiness, burning eyes, skin irritation, blisters, dry hands, itchiness, headaches, shoulder pain, and back pain.

Musculoskeletal problems: Most women reported considerable musculoskeletal problems that they described as aches and pains. Some cleaners said that her fingers get swollen, and that they hurt a lot in the morning.

The packaging worker talked about physical pain from doing the work which include body aches and pains- back pain, pain in arms and legs, and neck pain.

“Basically, packaging is standing up all day, is kind of hard and it is unhealthy because I suffered from a lot of pain in my legs. I hurt my spine, my back from standing too long. I also have poor blood circulation, and burning sensations. You finish one box you get up and the back pain, I had to miss eight days of work because the pain was so strong. My boss said it was lack of vitamins I suffer from headache from working at a stretch without any breaks, sometimes you want a break, even 5 min after working 5 hours”.

One woman said that she went to a doctor, but the doctor asked her to stop working, which she said was not a realistic option for her. All the women interviewed said that they have gone to work despite feeling sick because they could not afford to take the day off as they needed the money and was afraid of losing the job. “If you do not do the job correctly they might decide not to renew

my employment”.

Health problems due to chemical exposures: Some women talked about health problems related to some of the products they used. For example one woman said that she knows that she will get a headache whenever she uses a particular product. Another person said that smelling the chemicals for a long time gave her nausea. Most of the women said their eyes burned while using the strong chemicals especially in the bathroom. One woman said that she has felt suffocated and dizzy in closed spaces such as in a basement. One woman said that she has injured her eyes because she accidently mixed chlorine and ammonia (which is highly toxic), she did not know that this was harmful and the bathroom she was in had no windows so she said that this made her so sick that she had to leave early. None of the respondents reported any breathing problems or asthma.

Skin problems and allergies were also reported among cleaners, “sometimes my hand was full of little bubbly blisters much like chicken pox because of the allergy to the products. They were everywhere... my face was swollen ... the feeling was like having hot pepper in your face.. I ended up with this black spots I did not have this before. And our skin becomes so dry”... Another cleaner with an allergy said “My difficulty is with people that uses Easy-Off and also Tilex...I have allergy... I had serious problems with that product before...I went from doctor to doctor and had bad allergy to that...my face was swollen and it was bad...one doctor said you are prohibited to use that product...this is killing you...

my difficulty is to work with that and many people work with that...and it is hard because I need the money”. Some of these workers know the dangers of chemical exposures but find it hard to not be exposed to them.

The woman who works at the thermoplastic molding factory said that there is a lot of dust at her place and it itches, “It is something that makes the skin itch, the fiber. When I work at the machine I feel that it itches more. I know that it gets inside the skin because when I came out of work I clean my nose and white stuffs comes out of my nose”. She said that she washes up a couple of times during the day because it bothers her face. However, she has never suffered any other health problems like allergies or headaches and pain.

Psychological health: Most woman said that they suffered from stress, depression, excessive tiredness due to work pressures and job insecurity. One of the woman, who has been in the United States for less than two months and stated that she was close to 50 years of age and that it is hard to work continuously without stopping throughout the day, it is both physically, and emotionally tiring. “I started working for someone and went for 2 days and I am at home today because the work was so hard I could not go another day without resting first. I could not take it, I needed to rest”. The workers in the study also talked about difficulty sleeping, one woman said that she sleeps only four hours a night and at certain times only two hours a night.

Accidents and injuries: Injuries among this group of respondents were not common. A cleaner said that she hurt herself by bumping on the corners of the furniture all the time especially when rushing. One woman said that she cut her foot trying to save a lamp that was falling, so that she would not have to pay for it. The woman who works at the packaging factory said that paper cuts left her with many abrasions: “Cardboard, we end up without (finger) nails because paper cuts you a lot and we don’t have gloves or any other protection”.

DISCUSSION

Researchers have long lamented the lack of comprehensive examination of the related and often intertwined variables which shape the predominately female low-wage work sector and the health outcomes encountered as a result (Eun-Ok 2000, Messing 1997, 2003, 2005, Neysmith and Aronson 1997). This study explored the occupational and health experiences and job seeking patterns of newly arrived immigrant women in low-skilled temporary work. The immigration status of these women, xenophobic reactions since 9/11 and increased immigrant raids and deportations, and their often undocumented work status all may have posed a real barrier in their openness to discuss their occupational health experiences. As a result of rapport established through the intercession of our community partners, this study offers valuable insights into this particularly vulnerable and extremely hard to reach group of immigrants. In this study we analyzed the employment outcomes, job seeking patterns among immigrant

women, the organization of such informal work sectors, and the occupational and health issues as self-reported by the women workers.

The present study has limitations primarily due to its small sample size. The study results cannot be generalized. We have used a triangulation of sources as a means of improving our ability to correctly identify the principal factors which shape the work experience of immigrant women in the informal, precarious job sector. In addition, we also compare our results with the existing literature as well as to a subsample of results from a community based occupational health survey (OHS) . In this section, we analyze how personal, social and work experiences increased social hazards and occupational health and safety risks.

Employment Outcomes

Employment options for very recent immigrants are limited. The immigrant women in this study were exclusively employed in the low wage cleaning services and manufacturing sectors. Such occupational choices were commonly noted in a number of previous studies as well among Central American women from El Salvador and Guatemala in California and among women immigrants in Sweden (Menjivar 1999, Akhavan et al. 2005, Pransky et al. 2004). The occupational health survey results we conducted among self-identified immigrant workers living and working in Somerville show that the three primary occupations identified among this group was cleaning, factory related work, and cashiers. The cashiers in the survey were the most proficient in English compared to other low

wage immigrant jobs. Hence, cashier jobs are likely not a choice for women who lack sufficient documentation and English proficiency and perhaps is not a suitable entry level job for recent immigrants. Cleaners in the OHS survey were primarily Brazilians (51%) and majority of the women factory workers were Hispanic (74%). Cleaners were more recent immigrants compared to factory workers in the study, 15% of the cleaners have been in the US for less than three years compared to 5% of the factory workers. English proficiency among cleaners and the factory workers was low. Over half of both cleaners (57%) and factory workers (58%) in the survey did not speak any English.

Job seeking practices

Immigrant women like men, come to the United States to fulfill needs which include finding a means to support themselves, and providing aid to their family back home in most cases. Women generally start in the same way as men. The initial step is finding work through informal sources, and concurrently relying upon social networks to build connections and to obtain more permanent employment.

Many avenues exist for seeking employment among immigrant workers. The use of personal contacts to obtain work is shown to be fairly common among Latinos and immigrants in general (Elliot 2001, Smith 2000, Massey et al. 1987).

According to Livingston (2006) two broad categories exist - individual or non-network based job searches and network based job search methods. The latter

includes using personal social networks such as family based searching and friend based searching. Research shows the prevalence of network based searching is largely driven by the lack of English proficiency, insufficient education and the lack of legal documentation (Elliot 2001, Nee et al. 1994). In the present study the Brazilian women primarily used friend based networks or word of mouth to look for jobs. Besides the friend based methods for job searching among this group we have also observed community based networking for finding jobs such as through immigrant churches.

Latinas and immigrants are known to heavily rely on network based job search methods (Elliot 2001, Smith 2000). Contrary to this model, the two Hispanic women interviewed in the present study used non-network based methods or temporary agencies to look for jobs. The use of non-network based job searching techniques has also been observed among Hispanic immigrants as chronicled in a notable case of wage violations which occurred among 30 Hispanic restaurant cleaners in Boston all of whom used a cleaning agency or sub-contractors such as Coverall Cleaning concepts and Xcell Cleaning Corporation to locate employment (Goodman, 2008). A Community Key informant said that, “cleaning companies often hire workers through multiple sub-contractors, creating layers of companies and making it increasingly difficult for workers to locate those responsible for paying their wages.”

Both of the Hispanic women were more familiar with the work options in the United States than the Brazilian workers. One woman had been in the United States for three years and the other women had been in the United States only three months on a visitor's visa but had been to the United States before for work and had used the same temporary agency. Hence she was aware of a broader range of options. Research has shown that the reliance on finding jobs through personal contacts declines with the number of years in the United States and prior trips to the United States especially among women (Elliot 2001, Livingston 2006). This might explain the use of non-network based methods among Hispanics but still does not explain the use of network methods among Brazilians who have been in the United States for three years.

The reliance by Brazilian respondents on personal and community contacts is likely due to the flourishing Brazilian ethnic enclave in Boston. Brazilians in the Boston metro area have been characterized as being highly entrepreneurial (Lima and Siquera 2011, City of Boston 2006). Ethnic economic networks have been shown to enhance the economic opportunities of immigrant groups (Bonachich 1980, Light et al. 1999, Portes and Bach 1985). The large number of Brazilian-owned businesses in Boston creates a distinctive economic base offering opportunity for them. However, this also creates a possibility of indentured labor where the women work in an unstable job with variable pay that offers attractive and competitive rates for clients only achieved at the expense of workers (Borak 2005, Morakvasic 1984, and Pedraza 1991).

Compared to men, women have far fewer options to seek jobs due to the gender segregation of employment (Livingston 2006). While the traditional definition of day labor does not apply to these women, many of the interview respondents work in situations similar to day labor work where they work as either helpers or are picked up in vans at parking lots without much knowledge of the day's work. The major difference here is that the recruitment process is different as one often needs verbal references to be selected for such work. While there were no guarantees of getting work, once gaining a reference the chances of obtaining and maintaining employment is improved. A disquieting observation is that according to the informal temporary agency worker, no one knew who the employer was or where the company they were being taken to was, when they worked in factory settings.

In this study we also see how homogenizing the occupational histories of immigrant women is problematic. The women represented in this study are not a homogenous group, but are from diverse ethnic and national backgrounds. Focusing on differences in background may be important to discern salient differences (Menjivar 1999) in the job seeking patterns of such women .

Organization and Structure of Low Wage Informal Labor Markets

The temporary employment of the women in this study shares common characteristics with previous studies of precarious employment (Tompa et

al.2007). The similarities include the lack of work contracts or work term agreements, poor earnings and little security or benefits (Tompa et al. 2007, Marmot et al. 2001, Ferrie et al. 2002, Quinlan et al. 2001, 1999). In addition, these jobs were need based, fulfilling services when needed rather than seasonal as in the case of construction or farm work. Though these jobs were temporary the women often worked full time or even overtime in these jobs.

In some of these cases there is no direct employer - employee relationship. In the case of the factory worker who was picked up in a van at a parking lot, the worker did not know who her employer was. Most often the worker dealt with the middle man or a sub contractor, who defined themselves primarily as transporters or drivers. In such a case it is difficult to identify an individual with the appropriate authority to discuss the terms and conditions of work. In the case of helpers working in the cleaning sector, they often do not have any direct contact with the home owners (clients), the payment goes directly to the employer, or the cleaning company. In many cases these jobs were defined only by the employer with no input from the worker on either the wages or other conditions.

Gender segregation and immigrant status have relegated the respondents to jobs with temporary contracts. Immigrant women in this study were not seeking part-time or temporary jobs, as middle class women in the 1970s did, to fulfill the many roles that women play at home and in work life but these women were

seeking full-time standard employment with benefits.

The problems with the organization of the jobs held by these immigrant women were numerous. The women reported heavy workloads, physically demanding tasks, long hours at work, and were offered few, and often inadequate, breaks and received poor pay. Also commonly expressed by the subjects was that they received little information concerning the prevailing wage for a day's work before being hired, nor did they receive appropriate health and safety training. No consistent use of masks or safety protection was reported. Similar workplace conditions were also noted by Ahonen et al. (2010) in her study on domestic services workers in Spain; by Mattingly (1999) in her study on household workers in California; among room cleaners in San Francisco in Lee and Krause (2002) and in domestic cleaners in comparison to industrial cleaners in Arif et al. (2008) in Texas.

Comparing these results with a subset of respondents to the OHS survey ($n = 72$) for immigrant women cleaners and factory workers, we see that factory workers received more work training (68%) compared to cleaners (44%). However the factory workers did not report better health and safety training (43% among cleaners and 42% among factory workers), or knowledge of Workers' Compensation law (65% among cleaners and 71% among factory workers). Contrary to what might be expected more women factory workers (47%) did not have health insurance compared to cleaners (33%).

Occupational Health Risks

Multiple hazards were reported by women in these jobs. The cleaners said that they clean for lengthy intervals throughout the day and are exposed to chemicals for prolonged periods. The type of cleaning agents used were consistent with other studies and include detergents or surfactants employed to lower surface tension of water, water softeners, pesticides, alkaline agents, solvents, corrosion inhibitors, film formers, polishes and acids to dissolve and bind calcium, regulate pH, dissolve fatty substances, and disinfection agents to kill virus, bacteria and mold (Medina- Ramon 2005). Cleaners often work in confined spaces with little ventilation consequently increasing airborne exposure to these hazardous products. These jobs are also physically demanding and repetitive. Physical tasks entail handling work equipment, doing sweeping, mopping, vacuuming, as reported in other studies (Messing 2004, Artazcoz et al. 2007). The static postural load in these tasks are high. The self-reported health problems from the present study were many, ranging from pain, musculoskeletal problems, headache, allergy, skin rash, nausea, excessive tiredness, dizziness, shakiness, burning eyes, blisters, dry hands, itchiness, burning sensation on the hands, lack of sleep, swollen fingers in the morning, and drowsiness. Cleaners reported more health problems than factory workers. The high risks attributable to domestic cleaning are supported by results from several studies and case reports (Ahonen et al. 2009, Arif et al. 2008, Mattingly 19998, Lee and Krause 2002). Other health concerns related to cleaning include musculoskeletal problems due to repetitive movements (as in Messing 2004, Artazcoz et al. 2007), respiratory conditions (as

in Zock et al. 2001, 2007 Medina-Ramon et al. 2003, 2005, 2006), and psychosocial hazards (as in Artazcoz et al. 2007, Ahonen et al. 2009).

The two factory workers in the present study did not have sufficient understanding of the hazards at work. One of the workers was not knowledgeable about the substance she worked with (plastics) and had trouble explaining her work tasks. She didn't feel that chemical exposure was a concern for her even though she cleaned plastic molds and she reported strong smell at work. Further research on the OSHA records showed multiple reports of safety violations at the facility at which she worked. The lack of health and safety training among these workers coupled with little understanding of the substances that workers were handling is especially troubling. The thermoset worker complained about the presence of fiber dust, bad smells, but never equated it with chemicals. The health problems reported from factory workers ranged from pain, musculoskeletal problems, headache, itchiness, nausea, excessive tiredness, dizziness, cuts from paper and cardboard, lack of sleep. Many accounts of work pressure, work abuse and stress were also noted in both these jobs. However no serious acute injuries were reported among the women in this qualitative study.

Comparing the qualitative study with the OHS data, we see some similarities in the results. Cleaners reported comparable hazards at work, and higher health problems due to work than factory workers, while factory related workers reported slightly more injuries at work than cleaners.

CONCLUSION & POLICY RECOMENDATIONS

In defining the occupational health and safety risks that recent immigrant women workers in unstable occupations face requires a deeper understanding of the socio-economic and political background. Their experience of adverse occupational health and safety risks does not predominately result from characteristics such as low educational levels and lack of English proficiency that often limits occupational opportunities in the labor market, but rather it is because of the larger organizational structure of the immigrant labor market that forces such workers into a global market as a result of the collapse of vulnerable economies in the global south. Globalization and neoliberal policy has resulted in forced migration in the global south where not only men but also women must in their later years migrate to realize their extrinsic motivation of fulfilling their economic needs - to meet their familial obligations of sending kids to school, building a home, taking care of parents, and in some cases ensuring political security for themselves in the stable grounds of global north. The increasing demand for labor in the industry sectors with seasonal or variable demands for labor in the developed countries, since the relocation of manufacturing industries to China or India, have created a niche for low skilled immigrant labor force (Sassen 1998). The lack of documentation among some of these immigrants leaves them in a vulnerable position where they can be exploited in a host of ways, yet their presence is tolerated as they are integral to the commercial sector and economic activity. This susceptible population is under enormous pressure to

sustain a living wage and at the same time represents an attractive option for employers who seek access to a cheap and flexible pool of labor.

While global poverty and lack of documentation may constitute a basis for exploitation, corporate interests plays a role foremost in the wide variety of insults and social oppression these immigrant workers endure. This research agrees with previous work that has identified coercive practices in recruitment and employment. The employers, hiring agencies and businesses are irresistibly attracted by the opportunity to pay low wages for long hours of work , and also to avoid Social Security charges, taxes and overtime pay. Immigrants are disproportionately hired to perform jobs that are unwanted by the more stable and secure sections of the workforce, jobs that are dirty, dangerous and demanding or difficult. “At work, these migrant workers are exploited to an extent that is rarely acceptable among regular, legal employees” (Marfleet & Blustein 2011 p 284, Ahonen, Benavides & Benach 2007, Kempton 2002). The workers often do not have any control over the duties or structure of their work. The employers are also drawn to being able to dismiss workers at will or with minimum resistance, as immigrant workers seldom benefit from the protection of labor unions or the oversight of regulatory agencies . Some of these practices of exploitation and abuse are related to isolation and alienation. The precarious immigrant worker is in often placed in work settings where they need to move job sites often, or work in isolation, which creates instability in workplace relationships (Duke, Bourdeau and Hovey 2010, Hincapie’ 2009, Anderson & Rogaly 2005, Marfleet & Blustein

2011). The resulting isolation is further compounded by the inability of these workers to obtain a drivers license. The ability to drive is often severely restricted among undocumented immigrants thus limiting the range of work options available to them. These jobs also, in general, have little provision for advancement opportunities and upward mobility.

Many of the workers in this study had no relationship with their employer- they did not know their employers, have regular or any access to them, and nor could they communicate with them. The lack of a clear figure of authority hampers the rectification of the concerns of workers. This has resulted in a major shift in the dynamics of work in this new model of work organization in the labor market. With no authority figure being present, these work related problems are often quietly endured by the immigrants as part of their work. The responsibility of resolving these work abuses and concerns is often left to the immigrant workers. They often must take the initiative to seek justice with the help from human rights and worker groups in the community or state agencies. Such actions are often frightening for many immigrant workers who lack sufficient documentation status. A need for invisibility in the society to avoid deportations, imprisonment or forced dislocation (Ellerman 2009, Marfleet and Blustein 2011) limits the ability of these workers to seek the justice and make changes to their often harmful work situations and practices. This results in an cycle of increased work and social hazards. The lack of work and health and safety training, knowledge of Worker's Compensation program often prevents these workers from accessing the

social capital established to protect the rights of workers.

The “underground” or informal labor markets are also largely unregulated and with the relaxed oversight of OSHA the ability to protect the health and safety concerns among these workers is reduced. The hazards in these jobs are not fully characterized by either the workers or the research community. And the health outcomes of many of the chemicals that the workers deal with at work are unknown. The current US laws only requires the disclosure of active ingredients but are not required to disclose the other inert ingredient in consumer products to protect their trade secrets (EPA 2009). While some of the workers in this study knew the hazards of the products they were working with, their vulnerability keeps them in their present job thus exposing them to chemicals that can cause health problems. The exposure to many different hazardous chemicals and work tasks in these dirty, dangerous and difficult jobs coupled with the long latency period associated with disease manifestation and the inability of these workers to fully describe their harmful exposures and relate it to work experiences makes it very difficult for researchers to identify work related hazards and thus reduce hazardous exposures. Most of these workers are more concerned about losing an income and not being able to fulfill responsibilities at home than facing hazards at work or health effects.

Research also affirms that immigrants are vulnerable to exploitation due to various social barriers (Bloch, Sigona & Zetter 2009, Marfleet & Blustein 2011).

Multiracial and feminist theorists argue that race and gender are socially constructed; they not only influence individual identities but also provide principles of organization in the social system that are mutually constituted to produce and maintain social hierarchy (Collins 1999, Glenn 1999, Sassen 1988, 1998). At times of political instability and economic recession these undocumented immigrants are especially easy targets of xenophobic vitriol underscoring the precarious nature of their lives . Oppression of these selected racial and ethnic groups may become increasingly problematic as they are pointedly visible as a result of their physical appearance, language skills, and culture. In effect, the need for invisibility may hamper their efforts to associate and integrate with the community and seek social benefit, and to participate in their own cultural practices and that of the host community.

Many studies have shown that the “US economic sector has been using the vulnerabilities of this work group to their advantage without offering adequate protection to these workers” (Reed and Latorre 2009, Marfleet & Blustein 2011, p.384). Governments often lack the political will to change the regulatory structure in order to protect and empower migrant workers. For individuals with little to no volition in their decisions about their livelihood, the lack of support from government and unions leaves them very vulnerable to the adverse impact of social oppression (Marfleet and Blustein 2011).

Responses from the study participants show that low skilled temporary jobs are largely fashioned around constructs which meet the needs of the employer rather than the worker's needs. Within such constructs individual rights are often ignored, and the use of coercive power and the existence of other social hazards are all too common. It is further held that the government supports such an, "imbalanced power system within these jobs where workers rights are ignored" (Cranford et al. 2003). Most regulations, policies and labor laws are based on standard employment relationships or the upon the models of employment where a worker has a single employer, works full-time year round with full benefits on the employers' premises under his or her supervision (Cranford et al. 2003). Eligibility for certain programs, such as employment insurance, work benefits and union contracts are usually based on the permanency of work or as found in standard (more mainstream and traditional) jobs (Vosko 2003, Cranford et al. 2003). This reality persists even though Workers' Compensation is available to all temporary workers. Policy discussions too generally take place at the aggregate level thereby ignoring the experience of individual. Regulations and research have not been adequately articulated for non-standard forms of employment which must take into account the experience of immigrant workers. Without such consideration these workers and forms of employment are often at a great disadvantage without sufficient regulatory protection, adequate control over work, and, in general, the provision of good working conditions.

The structural differences in the forms of employment and the rising prevalence of non standard employment and temporary employment requires that policies or labor market legislation be revised to meet the needs presented by these rapidly growing forms of employment. Such workers require the protection of their individual needs and rights. Tompa et al. (2007) contends that if labor market changes are not adequately addressed, it may have long-term health, wellbeing and productivity implications for the broader society.

The development of policies, enforcement and interventions to improve worker safety and security are needed to improve the quality of life enjoyed by these workers employed in such informal and precarious labor markets. Women migrant workers should be entitled to equal and humane treatment similar to that received by native born workers with adequate provisions for obtaining stable jobs, opportunity for advancement, better compensation, overtime payments, better hours of work, access to transportation, paid breaks of adequate duration and frequency, paid holidays, health and safety training, better access to health information, provision of personal protective equipment (when appropriate), health insurance, better relationships with the employers, right to organize and unionize and any other conditions of work covered by national law and practice allowing them to escape the trap of economic inequality (Boark, 2005). In non unionized jobs like small-scale cleaning operations and factory work being part of a workers cooperative is perhaps an approach to secure such advantages. Language services, vocational training and other educational and social service

structures are also especially important in improving economic opportunities, and to fight human rights violation against immigrant workers. The workers' own voices perhaps best captures and expresses these needs:

“No they could pay more but also treat us better...always have gloves...for us to have access to information...about the products we are using. Knowledge about the product...But you know that, all the bathroom that do not have a window have a fan. As a helper I think nothing... I think that everybody should be treated better with more justice...that they always pay well”.

“I think the first thing we should know is where are we going... know what is the work, where is the job located, how much are they going to pay us. Know the basics and what labor laws we have, in a case of an accident, or an abuse case by any one”.

By focusing on empowering the individual worker, on how to promote and protect their human rights we can perhaps avoid some of the most egregious cases of abuse (Borak 2005). An important next step in developing theories, research models, and practices to foster transformations of immigrant occupational health and safety experience needs to encompass the community, government agencies, non-governmental organizations, the corporate sector, religious communities, informal social groups, etc. There is a real deficit in studies involving immigrant women workers in the United States or other industrialized nations that do light manufacturing work or assembly or packaging. Research can help to document how the migration process exposes people to oppression at work, and hazardous working conditions, and how the lack of support from one's community fosters greater and more pernicious abuses. Seconding Marfleet & Blustein 2011 (p.387), “By delineating the human costs of undocumented migration, research may have a greater impact beyond the confines of a scholarly community. Perhaps foremost

in the research-public policy agenda would be giving due weight to the circumstances, experiences and aspirations of undocumented immigrants by creating spaces for their voices’.

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VII Conclusion and Recommendations

The reasons for establishing sound occupational health and safety standards are based on moral, economic and legal advantages (Abrams 2001). Occupational safety and health policies vary enormously as a result of different economic factors and socio-political conditions at the level of the nation state. In the US, the Occupational Health and Safety Act (OSH) was passed in 1970. The OSH Act established for the first time a nationwide Federal program to protect a substantial portion of the workforce from work related death, injury and illness.

Many of the regulations promulgated by the Occupational Safety and Health Administration are applicable to most workers including immigrants. Immigrant workers are covered under the National Labor Relations Act and are entitled to organize a union to improve wages and working conditions. They are covered under the Federal minimum wage and overtime law and by an array of state laws. They are protected from workplace discrimination and can bring legal action. In most states, undocumented workers are entitled to a broad range of Constitutional and civil rights protections. Undocumented workers who are injured on the job are entitled to the protections of state Workers' Compensation laws (McCauley, 2005). Additionally, OSHA and other national stakeholders have developed labor-management health and safety committees and such concepts as "Right to Know," and at the community level, "COSH" (Community Occupational Safety and Health) groups have been set up in many locations to advocate for better worker

health protection (Abrams 2001). One of the key partners to our work, MassCOSH, is a Massachusetts representative among this group of organizations.

While some of the basic laws are in place to ensure the equal protection of immigrant worker health and safety, violations of some of these laws are rampant especially in the case of low income, low skilled jobs and small scale industries where a lot of the immigrants work. The enforcement agencies are not well equipped to monitor the violations especially in these trades and workplaces (Lipscomb et al. 2006). Workers employed in the informal economy have no protection under the government, their needs are not met also by the policies and practices that are common to large employers. In addition, for these informal jobs there are no personnel departments, formal training, skill certificates, centralized sites of employment, employer databases, labor laws, or workers' organizations to coordinate employment practices (Mattingly, 1999). Historically, there has been a reluctance to dedicate appropriate resources aimed at identifying workplace hazards and implementing remedies primarily due to the potential to adversely affect the profit margins of business (Lipscomb et al. 2006). In recent years Federal OSHA has emphasized a shift to voluntary industry standards and industrial consultation as opposed to the regulatory role it was established to serve (Lipscomb et al. 2006). The lack of enforcement on the part of the state and federal agencies leave it to immigrant workers and the organizations that advocate for them to take action.

The exploitation of immigrant workers occurs under the pretext that such workers are here for work and are desperate to retain employment. Manipulation of this core factor results in a range of unethical labor practices which are known to increase health hazards and safety problems. This exploitative labor hiring practice is extremely calculated. The status of temporary workers, their lack of familiarity with union politics, their segregation from other native workers both on the job and in location of residence, fear of losing employment and the associated income, employer retaliation, and deportation all combine to make immigrants unusually dependent on their employers and difficult to recruit in working class struggles or report violations. Sassen-Koob (1981) notes that, it is this powerlessness that makes immigrant workers exploitable. This leaves the worker in a vulnerable state potentially suffering widespread work abuse ranging from violation of minimum wage requirements for normal work hours and overtime work, discrimination, and lack of knowledge and access to work place benefits and Workers' Compensation laws.

Disparities in immigrant health are also exacerbated by the lack of adequate access to health care. Compounding this deficit is an attendant lack of culturally appropriate health care. The Personal Responsibility and Work Opportunity and Reconciliation Act (PRWORA) of 1996 deems all legal immigrants ineligible for non-emergency Medicaid services. The 1996 Illegal Immigration Reform and Immigrant Responsibility Act (IIRAIRA) made illegal immigrants ineligible for federal, state, and local public benefits. These legislative actions bar most future

immigrants from applying for federal public benefits for the first five years of their residence in the U.S. After five years, access to publically funded medical care is still not guaranteed to qualified aliens. Due to this, uninsured immigrants in particular and other qualified immigrants who cannot access primary care follow-up, or cannot be transferred to long-term care facilities and obtain medicine or treatment, rely largely on acute care facilities. Unnecessary health disparity is created through the lack of appropriate health infrastructure for these immigrant populations (Eamranond and Hu, 2008)

The political will to correct these labor and basic human rights injustices has been further weakened since 9/11 and with the growing economic recession both in the United States but also worldwide. Deep ethnic boundaries are present in communities. Immigrants have been increasingly exposed to xenophobic sentiments. There has not only been an increase in opposition against the immigrants but also an increase in the U.S Immigration and Customs Enforcement (ICE) raids, and deportations. Xenophobic rhetoric is common in popular mass media outlets such as FOX news which only deepens the process of ‘othering’ among immigrants in the community. Alba and Nee (1997) argue that the dynamics of ethnic boundaries is a larger social process where social distances are created, may become institutionalized and sustained through the practices of classifying and ranking – a stratification system that employs ethnic markers to determine differential access to opportunity structures. Social distance is also an underlying component of the segregation of minorities that impedes assimilation.

Assimilation is often seen as a one way process on the part of the immigrant as their responsibility to “get” assimilated to the new community and culture they are in. Whereas assimilation, is in reality, a two way process that is incumbent upon both the hosts and the new comers to accommodate and adapt to better realize cultural solidarity. Lastly, an effective immigration law or policy is important in improving employment conditions.

A new code of ethics that inspires and strengthen efforts to democratize the work environment is needed so that democratization can be brought to the workforce. National effort, a larger socio-political process is required to reduce the increasing xenophobic reactions towards immigrants, the elimination of job discrimination and job ghettos (Dembe, 1999). As the power of the immigrant employee in particular is limited, they require the protective policy measures to correct the unreasonable demands which the capitalistic system has exacted of labor. It is necessary to address the new demands posed by the changing face of labor. Labor legislation as well as wide ranging social activities are needed in mounting effective strategies that enforce a dynamic dialogue between hierarchical divides in the workforce – better understanding of the work organization and social contexts within which workplace deaths, disability, violence and discrimination occur is critical in developing public health interventions to prevent these fatalities (Dong and Platner, 2004).

Effective policies and initiatives are vital catalysts in obtaining action. As we draw this project to a close, we want to summarize our action-oriented policy and research suggestions. These suggestions will be valuable for the planning of future initiatives related to our findings and for future research projects which build upon the one we have just completed. These suggestions are drawn from a range of sources from our community discussions but also are drawn from other occupational health and policy studies.

Framing our future action-oriented recommendations are based on two principal realities that were uncovered in our work. The first is that there is too little information available on immigrant health and occupational health risks. We know that this information is difficult to gather due to worker self-identification and categorization, barriers to communication and comprehension, and fear of encountering legal issues surrounding immigration. This issue is compounded by the second reality that we found to be true: The existing data on immigrant health and associated occupational health risks consistently demonstrates extreme heterogeneity and range of differences found among immigrant populations (e.g. there is a huge difference in health issues in Haitian vs. Brazilian vs. Salvadoran populations.) This reality thus underscore how critically important such data are.

Policy measures, and broader community interventions, educational initiatives are essential to build appropriate interventions and precautionary measures and practices to avoid occupational illness and injuries. Three primary requirements to improve immigrant occupational health and safety are to 1. Promote safety

training and enforcement of safety requirements, 2. Strengthen access to medical treatment for injured or ill workers, and 3. Promote employment opportunities that are safe and healthy. We will now discuss specific measures that can be taken by state, local, and federal agencies and communities to ensure these fundamental rights to any worker and in particular immigrant workers. These specific measures were developed as a result of thorough discussions held within the project reflecting both community and university input. These recommendations were also circulated to the City of Somerville, Tufts University and the Cambridge Health Alliance prior to their presentation at a Community Meeting held on March 13, 2010 in Somerville, Massachusetts.

I. PROMOTE SAFETY TRAINING AND ENFORCEMENT OF SAFETY REQUIREMENTS:

A. Local policy suggestions:

A1. Train and deputize Somerville building inspectors to identify and refer to Federal Occupational Safety and Health Administration (OSHA) or the Massachusetts Division of Occupational Safety violations identified during building inspections.

A2. Promote safety in areas where the city has greatest oversight: municipal employees and city contractors. Examples include establishing health and safety program for municipal workers, issuing an executive order requiring the purchasing of only green (less toxic) products, and debarring contractors who

have a poor safety record.

A3. Institutionalize the successful teen safety training program piloted at the Somerville youth summer jobs orientation, making the training a requirement.

A4. Build upon effective worker safety training programs within the vocational education and establish worker safety education within the health education curricula.

B. State policy suggestions:

B1. Pass legislation that requires day labor employers to provide essential information to their workers about wages, safety training and workers compensation in writing in the appropriate language.

C. Federal policy suggestions:

C1. Make OSHA training funding flexible enough to support alternative training models, such as tail-gate safety training to day laborers by community organizations in multiple languages.

C2. The growing sectors of informal (contract jobs, temporary jobs and day laborer jobs) and small scale industries need better job and regulatory protection with a better enforcement of work and safety standards.

D. Suggestions for community-based organizations:

D1. Build on the successful efforts of the Somerville teen educators, promoting peer to peer young worker safety education.

D2. Integrate health and safety training that is linguistically and culturally sensitive that is conducted at workplaces but also at other community settings and on popular media (Murray 2003; Robinson 1987).

D3. Integrate health and safety education into English for Speakers of Other Languages (ESOL) and other adult education programs, building on the MassCOSH ESOL curricula, to educate workers about their rights to safe, healthy working conditions.

D4. Strengthen opportunities for day laborers to learn about job hazards such as lead, to be enrolled in health insurance, and to obtain lead testing through expanded collaborations between community organizations and Cambridge Health Alliance.

D4. Develop health and safety fact sheets in Portuguese (Specific topics to be identified).

II. STRENGTHEN ACCESS TO MEDICAL TREATMENT FOR INJURED OR ILL WORKERS

A. State policy suggestions:

A1. Develop measures that prohibit employers from deterring workers from reporting injuries and establish mechanisms to ensure that workers are informed about Workers' Compensation.

A2. Health insurance policies that extend equally to immigrants as well as the natives.

B. Local policy suggestions:

B1. Develop measures that require day labor employers to ensure that workers are informed about Workers' Compensation.

C. Suggestions for community-based organizations:

C1. Improve the knowledge of occupational illness among many physicians and other health care workers. More specific diagnosis and records of exposure histories are needed to better understand work related diseases.

C2. Workplace can be an effective entry point for health services delivery and to convey public health messages to migrant workers and their families. Community organizations could work with small scale industries to provide these services.

III. PROMOTE EMPLOYMENT OPPORTUNITIES THAT ARE SAFE AND HEALTHY

Given the nature of informal economy, an integrated rights-based approach of determinants at various levels and a more people-centered empowerment perspective is needed. Informal workers' representation, organization,

participation is important for ensuring the right to health of workers in the informal economy. Social mobilization may prove critical as it did in the past (Earmond and Hu, 2008) .

Unionizing is the best way to guarantee safer workplaces. Unionized construction workers are shown to have better health insurance coverage than non-unionized construction workers (Lipscomb et al. 2006). However, since unions are more and more uncommon in low income work settings, establishing community- based worker cooperatives could be a means to bring these disenfranchised workers together and provide the opportunity to develop a political voice to increase workplace safety and determine the rules and conditions of work, wage rates, and benefits.

A. Suggestions for community-based organizations:

A1. Building on the successful Vida Verde Co-Op, encourage the expansion of the worker cooperative model to other appropriate industry sectors.

A2. Investigate the feasibility of establishing a hiring hall to create a collective bargaining method to combat lack of power among workers as appropriate for particular industry sectors.

IV. SUGGESTIONS FOR FUTURE RESEARCH

The surveillance of immigrant occupational fatalities, injuries and disease is impaired by the lack of reliable data.

1. Collect appropriate ethnicity listings as there are distinct differences between ethnicities and this should be collected with socio--economic and educational backgrounds, as well as individual attributes and the family related aspects of work and health (Sexton et al. 1993).

2. Studies to understand the pathways, and mechanisms which potentiate the linking of immigrant workers health to employment such as occupational titles, place of work, shifts, number of jobs, industry and site-specific details, distinctive exposure related attributes to work hazards and health risks (Benach et al. 2010).

3. Studies that evaluate the effectiveness of immigrant occupational health services.

4. Further research could also include more sophisticated techniques as community based participatory research, more qualitative and ethnographic methods to gather comprehensive data that can be understood from the collective community standpoint.

5. Mechanisms to enhance improved information on the health of immigrant populations including the area of occupational health and safety.

6. Better understanding of risks is essential in the high risk occupations. Further descriptive study of the risks posed to day laborers, particularly female day laborers.

7. Assessing the feasibility of transferring the Co-Op structure of work organization to additional industry sectors.

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