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Bad Jobs, Bad Health? How Work and Working Conditions Contribute to Health Disparities

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Abstract

In this review, we touch on a broad array of ways that work is linked to health and health disparities for individuals and societies. First focusing on the health of individuals, we discuss the health differences between those who do and do not work for pay, and review key positive and negative exposures that can generate health disparities among the employed. These include both psychosocial factors like the benefits of a high status job or the burden of perceived job insecurity, as well as physical exposures to dangerous working conditions like asbestos or rotating shift work. We also provide a discussion of the ways differential exposure to these aspects of work contributes to social disparities in health within and across generations. Analytic complexities in assessing the link between work and health for individuals, such as health selection, are also discussed. We then touch on several contextual level associations between work and the health of populations, discussing the importance of the occupational structure in a given society, the policy environment that prevails there, and the oscillations of the macroeconomy for generating societal disparities in health. We close with a discussion of four areas and associated recommendations that draw on this corpus of knowledge but would push the research on work, health and inequality toward even greater scholarly and policy relevance.

Introduction

Work and working conditions are essential contributors to social inequality in health within and across generations, though they have received less attention from health disparities researchers than other aspects of socioeconomic position, such as education or income. In this review, we touch on a broad array of ways that work is linked to health for individuals and societies. Beyond the material and status rewards that come with paid work in a particular occupation, work also shapes individuals' exposure to a wide array of physical, environmental and psychosocial factors that can influence health. At the population level, the availability and arrangements of work and occupations across societies determine the opportunities for livelihoods and exposure to risk and contribute to health disparities within and between societies.

We review evidence mainly from studies of work done in exchange for wages or salary by adults in post-industrial economies. This means that we give only minimal attention to the conditions faced by workers across the world whose labor is informal, inconsistent, or unpaid. Other reviews that incorporate even broader issues faced across the world and

especially in less wealthy societies, such as bonded or child labor (for example, Muntaner et al., 2010), offer important additions to what we cover here. We consider a wide range of measures of health, reflecting the many physiological and psychological ways in which work can “get under the skin,” but remind readers to consider how diverse exposures and aspects of work operate through a range of mechanisms to influence specific health outcomes. We close with a discussion of four areas and associated recommendations that draw on this corpus of knowledge but would push the research on work, health and inequality toward even greater scholarly and policy relevance.

Work, Inequality & Health at the Individual Level

Scholars of stratification and inequality have long recognized the centrality of employment and working conditions as reflections and determinants of individuals' life chances. Employment is linked to health in positive ways, both as a predominant mode of earning income and other material benefits, and as a source of social integration, prestige and meaning. However, employment also exposes workers to potentially health-harming physical and psychosocial stressors. Below we discuss these positive and negative pathways, illustrating with empirical examples, and then discussing how they contribute to health disparities at a given point in time and across the life course.

Health-Enhancing Aspects of Work

Some of the most obvious evidence for the link between employment and health comes from studies that compare the health of those who work for pay and those who do not, or assess consequences of job loss and unemployment. A large body of research has shown that those who do not work for pay or are unemployed are less healthy than those in the paid labor force, based on their risk of mortality, self-rated health, and mental health (Krueger & Burgard, 2011; Rogers, Hummer, & Nam, 2000; Ross & Mirowsky, 1995). However, it is important to remember that there is variation among individuals who are not employed for pay. Those who have another source of material resources and do not work by choice, whether they are raising a family, attending school, or pursuing other activities, may not have worse health than those who work for pay (Pavalko, Gong, & Long, 2007).

Employment may enhance the health of workers through a series of mechanisms. First, employment status provides a critical link between educational attainment and earned income for the majority of adults (Mirowsky & Ross, 2003; Schoeni, House, Kaplan, & Pollack, 2008). Earnings from employment are the major source of financial resources necessary to purchase health-enhancing goods and services for most workers and their families. Evidence for the importance of these resources has been shown in studies that link unemployment to economic strain that can impact mental health as well as catalyzing an array of secondary stressors (Price, Choi, & Vinokur, 2002; Price, Friedland, Choi, & Caplan, 1998). In the United States, other essential material resources are also directly tied to employers, including pensions, health insurance coverage, and even eligibility for unemployment insurance.

While material benefits are obviously critical when considering its relevance for health, work is far more than a route to a paycheck. Individuals working in higher status occupations have substantially better health even after adjusting for their higher education and better pay, a finding famously demonstrated in the Whitehall study of British civil servants, who all have access to health care and decent working conditions (Marmot et al., 1998). U.S. workers with higher occupational status have a lower risk of mortality (Rogers et al., 2000), and other studies have shown a reduced risk of hypertension (Colhoun, Hemingway, & Poulter, 1998) and heart attacks (Möller, Theorell, de Faire, Ahlbom, & Hallqvist, 2005) among workers of higher status. While the association seems clear,

mechanisms underlying the protective aspects of occupational status have generated debate. Marmot (2004) argues that lower status workers compare themselves unfavorably to their higher status counterparts, generating harmful stress and potentially leading to risky health behaviors. However, other researchers have argued that extant studies focused on occupational status are actually capturing unmeasured physical and psychosocial job characteristics, other aspects of socioeconomic status, or health behaviors that are associated with occupational status and health (Erikson, 2006; Kaplan & Keil, 1993; Warren, Hoonakker, Carayon, & Brand, 2004).

Beyond the potential benefits of high status, other aspects of good jobs could enhance health. For example, access to creative work, generally more available to highly educated, higher status workers, has been linked to better health among U.S. adults even net of these other characteristics (Mirowsky & Ross, 2007). Creative self-expression at work could improve psychological well-being and cognitive function, and could reduce stress that can lead to deregulation of the hypothalamus-pituitary-adrenal (HPA) axis (Mirowsky & Ross, 2007), and all of these positive benefits could also improve chances for a positive career trajectory if they enhance work performance, creating a sustaining positive loop.

Health-Harming Exposures at Work

Despite its potential to enhance the quality of life via earnings and other rewards, a long line of social scientists from Marx (1992) forward have recognized that many aspects of modern labor are alienating, exploitive, and even dangerous. Considerable research in the social and health sciences since then has focused on negative exposures in the workplace that can harm health. Researchers have examined physical and environmental risk factors, such as those associated with a specific occupation, and increasingly have also addressed more commonly-experienced psychosocial stressors associated with work or with balancing paid work with other adult responsibilities. These types of exposures at work “get under the skin” to affect health in a variety of ways, ranging from inhalation of dust or physical contact with toxins to changes in levels of hormones in the body in response to stress, and subsequent HPA axis dysregulation and somatic disease and psychopathology.

Chemical and biological hazards and other physical dangers to workers have been the focus of a large body of research. For example, exposure to crystalline silica for workers in mining and those who do stone work or sandblasting increases the risk of silicosis-related mortality (Bang, Attfield, Wood, & Syamlal, 2008) and exposure to asbestos increases the risk of lung cancer (Yano, Wang, Wang, Wang, & Lan, 2001). Other exposures including noise, heat, vibration, and other chemical and physical hazards have also been the subject of occupational health research (Donoghue, 2004). Workplace and task arrangements associated with repetitive work have been linked to repetitive strain-related injuries (Silverstein, Viikari-Juntura, & Kalat, 2002), and are even more broadly relevant because they can affect workers in production as well as in service and professional occupations. Another aspect of work that has received attention is the timing and regularity of working hours and schedules. The rise in nonstandard work hours and the shift to a 24/7 economy have been linked to shift work sleep disorder and other physical health problems including coronary heart disease and peptic ulcer (Kawachi et al., 1995; Knutsson, 2003; Presser, 2005).

Because of changes in the occupational structure of post-industrial economies and the implementation of occupational health and safety regulations, many workers in wealthy societies escape the burden of most physical hazards at work, though repetitive strain and nonstandard work hours are broadly and increasingly relevant. However, contemporary workers in post-industrial and other economies face a variety of psychosocial stressors on the job. Examples of commonly-studied psychosocial stressors include job strain, job

insecurity, and negative spillovers from work to other domains. Job strain is the combined experience of too little task control and high levels of demand with little workplace social support (Karasek & Theorell, 1990), and has been associated with a range of health problems including psychiatric morbidity (Marmot, Bosma, Hemingway, Brunner, & Stansfeld, 1997; Stansfeld & Candy, 2006), musculoskeletal symptoms (Bongers, Ijmker, van den Heuvel, & Blatter, 2006), insomnia (Nomura, Nakao, Takeuchi, & Yano, In Press), and coronary heart disease (Bosma, Peter, Siegrist, & Marmot, 1998; Kivimaki et al., 2002). Some, but not all, of these associations have been validated using longitudinal data and objective measures of demands or control (DeSanto Iennaco et al., 2010). Other studies have used more objective measures of physiological change; job strain has been linked to certain neuroendocrine and cardiovascular reactions that over a prolonged period of time may lead to cardiovascular complications (Taylor, Repetti, & Seeman, 1997). Other research shows that women in jobs with high job stress or low support from supervisors exhibit higher levels of fibrinogen, which is also linked to increased risk for cardiovascular disease (Davis, Matthews, Meilahn, & Kiss, 1995).

In addition to these psychosocial stressors, insecure or precarious employment is an important component of risk in many economies as firms pursue leaner workforces and engage in outsourcing to less expensive labor sources. Workers who believe that they may lose their job in the near future have been shown to have worse mental and physical health (Sverke, Hellgren, & Näswall, 2002), even when adjustment is made for actual job losses or unemployment (Burgard, Brand, & House, 2009; Burgard, Kalousova, & Seefeldt, in press). Moreover, those undergoing firm restructuring or layoffs, and thus exposed to objective employment uncertainty, have also shown poorer biomedical indicators such as increases in blood pressure (Ferrie, Shipley, Stansfeld, & Marmot, 2002) and worse general health attributable at least partly to perceived job insecurity (Geuskens, Koppes, van den Bossche, & Joling, 2012).

Finally, research on the links between work and health has begun to extend beyond the workplace and the individual worker. As work and family conditions have changed and diversified in the latter half of the 20th century, there has been increasing interest in understanding how the intersection of responsibilities in both of these domains influences the health of workers and their families (Bianchi & Milkie, 2010). “Work-family conflict” or “negative work-family spillover” is a type of inter-role conflict that arises when responsibilities in one domain interfere with the ability to fulfill responsibilities in the other domain (Greenhaus & Beutell, 1985). Most extant research has focused on negative spillover’s association with mental health; cross-sectional studies have shown a positive association between negative work-family spillover and depressive symptoms (Allen, Herst, Bruck, & Sutton, 2000; Frone, Russell, & Barnes, 1996; Grzywacz & Bass, 2003), psychological stress and distress (Kelloway, Gottlieb, & Barham, 1999) and anxiety disorders (Frone, 2000). Studies have also found that increased exposure to work-family spillover is associated with poorer self-rated health, hypertension, obesity, and musculoskeletal problems (Frone et al., 1996; Grzywacz, 2000; Hammig, Knecht, Laubli, & Bauer, 2011; Winter, Roos, Rahkonen, Martikainen, & Lahelma, 2006).

Aside from, or as a result of the stress associated with these exposures, psychosocial stressors may influence health via increases in risky behaviors. For example, work-family negative spillover has been linked to greater use of tobacco (Frone, Barnes, & Farrell, 1994) and alcohol (Allen et al., 2000; Frone et al., 1996; Frone, Russell, & Cooper, 1997; Grzywacz & Bass, 2003), and lower levels of physical activity (Allen & Armstrong, 2005; Bellavia & Frone, 2005; Grzywacz & Marks, 2001). High levels of spillover may also decrease consumption of healthy foods or increase the intake of fatty foods, because struggles to balance work and family spheres may reduce time available to prepare healthy

meals (Allen & Armstrong, 2005; Devine, Connors, Sobal, & Bisogni, 2003). Evidence from intervention studies shows that flexible work policies that give employees control of their schedules can lessen work-family conflict and aid in promoting better health behaviors, such as getting more sleep and exercising regularly (Moen, Kelly, Tranby, & Huang, 2011).

While the evidence for links with poorer health continues to accumulate, measurement is a challenge in research on psychosocial stressors because at issue is the worker's appraisal of the situation, rather than the presence of an objectively measureable risk factor like low occupational status or asbestos exposure. In the case of psychosocial exposure, appraisal is what links a worker's environment to their physiological response, making researchers dependent on worker's own reports. However, many studies have relied on self-reported measures of these working conditions and of health, raising concerns about unmeasured characteristics that could account for an apparent link between exposure and outcome. Researchers have addressed this challenge with objective measurement of health, or by assigning individuals an average value of the psychosocial exposure for workers in their occupation/industry category (e.g., Amick et al., 2002). One recent study found some evidence that current job strain was associated with measures of cortisol, a biomarker of HPA axis activity marking stress, even though recent negative life events and childhood abuse were not associated (Holleman, Vreeburg, Dekker, & Penninx, 2012). A study that compared objective measures of job demands and control obtained from expert raters with respondents' own ratings of these measures found that both objective and self-reported demands were associated with worker depression, while only self-reported control showed an association (Rau, Morling, & Rosler, 2010). However, there is room for considerably more research to help us understand the strengths and limitations of varying measurement strategies. Moreover, it is important to develop reliable ways to measure emerging hazards at work, such as the exposures relevant for those who are telecommuting, or for those who are engaged even outside of work hours with social media or electronic communications for work reasons. Measures of demands in the job strain model, for example, were developed to apply to industrial settings, but may not be the most salient factors in service sector jobs, and should be accompanied by a broader array of measures of working conditions (Netterstrøm et al., 2008).

Causal, Reciprocal and Spurious Relationships between Work and Health

To this point we have implied that exposures and experiences associated with work impact subsequent health, the perspective often labeled “health causation.” However, another major perspective in the social sciences focuses on the reverse relationship: health as a personal resource that determines paid work engagement and quality, or “health selection.” Individuals with existing health problems may be more likely to be hired for a job with poor working conditions (Korpi, 2001; Schur, 2003), and their health outcomes could subsequently be worse because of earlier health deficits, not due to exposure to any particular working conditions. Moreover, employment status and working conditions can change multiple times over the career, and establishing temporal order between these exposures and changes in health as workers age is often difficult given the available data. A related concern for researchers is that unmeasured individual characteristics, such as difficulty delaying gratification, could lead to both poor employment histories as well as poor health, such that working conditions are not a direct cause of health (J. P. Smith, 1999). Another frequently unmeasured characteristic, health in early life, could also predict both earnings from paid employment and health, creating a spurious relationship between these adult characteristics (Haas, 2006; Hayward & Gorman, 2004).

To address these important concerns, some researchers have adjusted for early life health or other typically unmeasured characteristics, or have used longitudinal data and change models to eliminate the effect of stable individual characteristics that are difficult to

measure. Others have examined the health consequences of relatively exogenous shocks to employment. For example, studies have linked job displacement to heightened mortality risk even among those who lost jobs in mass layoffs and not because of health problems or other individual characteristics (Strully, 2009; Sullivan & von Wachter, 2009). Many researchers have begun to accept a model of reciprocal causation between work and other aspects of socioeconomic position like earnings on the one hand, and health on the other (Mulatu & Schooler, 2002). The causal directionality of the association might vary over the life course and across different health conditions, so it remains important to consider the contributions of health causation, health selection, and potentially spurious associations when assessing the links between work and health.

Unequal Work, Unequal Health? Inequality within Careers and Across Generations

The likelihood of being employed on the terms one prefers, of holding a high status job, of avoiding a host of negative exposures at work, and of having the opportunity for a positive career trajectory are differentially distributed across social groups, making work an important domain that can amplify health disparities through midlife (Lipscomb, Loomis, McDonald, Argue, & Wing, 2006). Key social identities in many wealthy economies that influence access to these aspects of healthy work include educational attainment, racial/ethnic group of membership, immigrant status, and gender. For example, because of the critical material benefits tied to employment, differences in the likelihood of experiencing job loss or unemployment across social groups plays an important role in explaining social disparities in health that are tied to income. Less-educated and minority employees are often at greater risk of job losses and trouble finding reemployment (Kletzer, 1998; Moore, 2010), though job losses and job insecurity are increasingly affecting higher status workers in places like the United States (Fullerton & Wallace, 2007).

Even among those who can obtain stable employment, there is unequal access to high quality work offering adequate wages and fringe benefits, hours, and other rewards (Kalleberg, 2011; Kalleberg, Reskin, & Hudson, 2000). In response to major macroeconomic and policy changes, since the mid-1970s many firms in wealthy economies have pursued more flexibility in their employment relationships, increasing the divide between core workers and a more peripheral group of workers who involuntarily or by choice take nonstandard contracts. Standard workers have full-time contracts with a fixed schedule and expectation of continued employment, while nonstandard work encompasses an array of alternatives from on-call workers to temporary help agency employment to independent contracting. Some scholars also include part-time work in otherwise “conventional” jobs and self-employment as nonstandard work (Kalleberg et al., 2000). Some nonstandard workers, particularly those working part-time or for temporary help agencies, earn lower wages, receive fewer fringe benefits, and face worse working conditions, including more job insecurity (Kalleberg, 2011). While there has been relatively little assessment of its association with health, and associations seem to vary depending on the voluntariness and specific conditions of the arrangements, nonstandard working arrangements have been linked to greater psychological distress and in some studies, poorer physical health (Dooley & Prause, 2004; Virtanen et al., 2005). Women are heavily overrepresented in nonstandard work, as are minorities and less-educated individuals (Nollen, 1996), suggesting its potential relevance for understanding the contribution of paid work to health disparities.

Beyond contractual differences, considerable evidence shows that less advantaged workers are more likely to be exposed to physically dangerous work (Lipscomb et al., 2006). Some studies also suggest that workers from lower status groups have more exposure to psychosocial stressors, as they are more likely to report low control or high strain at work (Brand, Warren, Carayon, & Hoonakker, 2007; Stradzins, D'Souza, Lim, Broom, &

Rodgers, 2004). By contrast, highly-educated individuals can achieve both autonomy and high levels of creativity on the job, both of which are associated with better health (Mirowsky & Ross, 2007). Nonetheless, more highly-educated workers could be at relatively greater risk of other kinds of psychosocial strain. One recently emerging argument, the “stress of higher status” hypothesis, suggests that some working conditions previously seen as resources for workers, such as autonomy or authority, may exacerbate the permeability between work and family domains. Increased permeability may lead to higher levels of spillover or interference between work and family domains, leading to higher levels of strain and negative spillover, and potentially worse health outcomes (Glavin, Schieman, & Reid, 2011; Schieman, Milkie, & Glavin, 2009).

Gender determines access to healthy work in ways that sometimes differ from or modify the influences of other social identities. Despite the rapid increase in the proportion of U.S. women involved in paid labor over the last half a decade, and in particular the participation of mothers in the paid labor force (Bianchi & Milkie, 2010), women still spend fewer of their adult years in full-time employment in many wealthy economies (DiNatale & Boraas, 2002; S. Jacobs, 1999). This holds even net of their socioeconomic, racial, immigrant and other identities because of the differential socialization of men and women and the traditional division of labor around paid market and unpaid household work. Furthermore, women are also differentially sorted into jobs within the occupational structure (Wooten, 1997), leading to differential exposures at work and varying total exposure over the career. On the one hand, women are disadvantaged at work in many ways, earning less than men and occupying fewer of the highest level positions in many organizations and occupations (Blau & Kahn, 1994; J. Jacobs & Gerson, 2005), and more commonly holding nonstandard employment contracts (Kalleberg et al., 2000). Moreover, women also often remain the primary caregivers in families, and thus take on a “second shift” of labor that may influence health (Hochschild & Machung, 2012). On the other hand, women are less likely than men to hold many of the most physically dangerous jobs, and spend less total time at work, which may lend a health advantage for women (Leeth & Ruser, 2006; Oh & Shin, 2003). As the gendered composition of the occupational structure and the gendered norms about balancing work and parenting continue to change, gender inequalities generated by differential exposure to working conditions will also evolve.

Beyond differential exposure to harmful working conditions, some scholars have found that women appear to be less affected by problems at work than men (MacIntyre & Hunt, 1997), and have speculated that their identities are not as strongly tied to their employment roles as men's. For example, studies have shown that the relationship between labor force participation and mortality is stronger for men than for women (Krueger & Burgard, 2011). However, others have found that women were more likely than men to encounter negative mental health consequences as the result of the guilt they feel when encountering work spilling over into family (Glavin et al., 2011), so the modifying effect of gender could depend on the work exposure and health outcome in question.

While they are important in the short run, all of these differences in access to healthy work can compound over adulthood, with implications for persistence or change in health disparities over the career. Opportunities for occupational trajectories offering stable job histories, improving wage and benefit profiles, and increases in status, safe and pleasant working conditions are determined in early adulthood on the basis of credentials, abilities, early workplace performance, and employer discrimination, and trajectories diverge throughout adulthood. Theories of cumulative advantage and disadvantage elaborate how initial disadvantages can render individuals ineligible for opportunities for advancement (Ferraro & Kelley-Moore, 2003), and how negative turning points, such as an involuntary job loss, can block further progress by “scarring” workers in terms of their wage trajectories

and opportunities for reemployment in similar jobs (Gangl, 2006). For example, job losses and unemployment spells are turning points that may create differences in material resources in the short and longer term that are important for health. Immediate consequences include the need to spend down any assets, which already tend to be lower for less advantaged workers. Interruptions in one's work history can also lead to foregone seniority and advantages within a given firm, the loss of pension and health care benefits coverage, and flatter wage trajectories that compound social disadvantage over the career (Brand, 2006; Jacobson, LaLonde, & Sullivan, 1993).

Unfavorable career trajectories have been shown to predict health change; one study showed a higher mortality risk for men who moved through a series of unrelated jobs and those who were successful in promotions early but not later in their careers, compared to those with more consistently successful career trajectories (Pavalko, Elder Jr., & Clipp, 1993). Other studies have shown that downward mobility in occupational social class between age 25 and age 50 was associated with poorer self-reported mental health in English men (Tiffin, Pearce, & Parker, 2005), and that among university-educated Canadians, those working in occupations for which they were overqualified had a significant risk of decline in their self-rated health over a four year period (P. Smith & Frank, 2005). Total exposure to negative conditions by those who are unable to advance into jobs with better working conditions over their careers could also have substantial effects on health; studies have shown links between persistent psychosocial stressor exposure at work and mental health (Godin, Kittel, Coppieters, & Siegrist, 2005) and mortality (Amick et al., 2002). Finally, trajectories of workplace exposures can condition the terms of retirement; less-advantaged workers who have borne the accumulation of unhealthy exposures are more likely to retire because they become disabled and unable to work (Hayward, Grady, Hardy, & Sommers, 1989), even though they may be most in need of the earnings late in life because they have not had access to ample pension benefits.

The influence of working conditions on health may extend beyond the individual worker to his or her children. Intergenerational transmission of health could occur if the physical or psychosocial experiences of parents at work are transmitted to their children, or if parent's jobs do not offer sufficient pay or benefits to support their children's health. There is considerable evidence that mothers' physical, chemical and psychosocial exposures at work can influence child development in utero, increasing the risk of problems that could influence childhood and later life health (Wigle, 2008). For example, working physically demanding jobs while pregnant, including standing for long hours during the day and lifting heavy objects, or working nights or on shift work schedules have all been linked to preterm births and low birth weight infants (Bonzini, Coggon, & Palmer, 2007; Cerón-Mireles, Harlow, & Sánchez-Carrillo, 1996; Mozurkewich, Luke, Avni, & Wolf, 2000; Saurel-Cubizolles et al., 2004). Additionally, women who are underemployed or involuntarily work part-time may also be at greater risk of delivering low birth weight infants (Dooley & Prause, 2005). Perhaps an even more obvious mechanism linking work to health in subsequent generations is material resources. Parents whose jobs offer low income and do not offer access to high quality health insurance coverage may be unable to provide an array of health-relevant resources their children need for optimal health.

Contextual Influences on Work, Health & Inequality

While much of the research on work and health is conducted at the individual level, other research examines the contextual influences that affect the health of individuals and differentiate the health of populations. Here, we discuss several key macro-level factors, including the occupational structure prevailing in a given society, which determines the availability and mix of good and bad jobs, and which has been changing recently in response

to globalization in ways that changes the risks and rewards available to workers across societies. We also touch on the ways that policy environments differentiate the consequences of particular working conditions across societies and over time, and also explore how the unemployment rate is associated with the health of the population in ways that may differ from the association between an individual's unemployment and his or her health.

Occupational Structures & Health

A society's occupational structure determines which jobs are available to workers, and thus determines the distribution of positive and negative exposures for the workforce. Some societies are characterized by post-industrial economies and are dominated by professional/managerial and service occupations that put workers at risk for psychosocial stressors but avoid most physical or environmental dangers. However, the majority of workers across the world live in less-wealthy societies where agricultural occupations prevail and production occupations are increasing. These workers face some of the same hazards at work as those in wealthier economies, such as job strain or job insecurity, but also bear additional risks associated with their different occupational mix, home production, weaker regulatory environments, and other factors (Rosenstock, Cullen, & Fingerhut, 2005). Many households in less-wealthy societies combine subsistence agriculture with various forms of home-based production or informal work on the street, none of which is subject to occupational health and safety (OHS) regulation. For example, work-related exposures to agricultural pesticides or to lead used to make batteries in home workshops occur at home and can affect the entire family's health (Rosenstock et al., 2005). Moreover, more of the household members in less wealthy societies may be engaged in work for pay, including children, who are often exposed to dangerous work like charcoal production in Brazil, fireworks manufacturing in Guatemala and Columbia, or gold mining in Indonesia and Zimbabwe (Bose-O'Reilly et al., 2008; Giuffrida, Iunes, & Savedoff, 2002; Salazar, 1998). Because of these large variations in occupational structures, regulatory environments and the way households spread work across family members, as well as in related differences in average household income distributions and levels of public health infrastructure, health profiles are likely to vary substantially across societies, generating global health disparities.

Occupational structures in different societies are increasingly connected with the emergence of multinational corporations, as work that can be outsourced is sent to wherever the costs of labor and production are most affordable. This has ramifications for the availability and quality of jobs in both sending and receiving societies, and thus has implications for health disparities within and across them as well. As societies transition to post-industrial modes of production, manufacturing and production jobs are often "exported" to societies with weaker OHS regulations and less expensive, less organized labor forces. While these new occupational opportunities can provide the potential for growth in household incomes and could have positive health benefits for some workers and their families, they also bring stressful and unsafe working conditions (Heymann, 2003).

Globalization of labor also means that average working conditions in wealthier nations could potentially be worse for workers than before because of polarization of the labor force and increasingly precarious employment on the bottom. Job creation in wealthier economies like the U.S. is occurring mainly in high-wage and low-wage service work (Autor, Katz, & Kearney, 2008; Blank, 1995), such that more of the workforce have access only to bad jobs. Importantly, the divide in working conditions is widening, with rising inequality in wages and non-wage benefits across the labor force in the United States, and a decline in opportunities for career advancement for lower wage workers (Blank, 1995; Farber, 1997). These changes are also weakening workers' sense of job security in some wealthy economies

(Geishecker, 2008), even among workers in otherwise good and historically more secure jobs.

Policy and Macroeconomic Environments & Health

As we have already begun to discuss above, societies vary in their level of economic development and stage of production as well as in their regulatory environments, influencing the jobs that are available and the protections for workers who hold those jobs. Additionally, the power of workers to demand healthy and well-paid work varies across societies depending on the success of worker organization in labor unions. Further, the consequences of employment problems depend on the broader “safety net.” In addition to these context-specific conditions, the oscillations of the macroeconomic environment influence policies and other conditions across many societies, and may have their own direct effects on health. Each of these factors will influence the health of the population overall and may modify the influence of employment on health for individual workers.

The globalization of production and the related weakening of labor unions in some wealthy economies has increased the insecurity and reduced the rewards of employment for many workers in these societies (Price & Burgard, 2008). These changes have decreased workers' ability to obtain good wage and benefit packages, particularly in manufacturing, because employers can threaten to move jobs elsewhere if their terms are not met. Decisions to deregulate markets and make other policy changes favoring business interests at the expense of worker protections have increased employers' ability to pursue nonstandard contracts and avoid health and safety regulations, worsening workers' relative power and potentially their health (Kalleberg, 2011).

Other aspects of the policy environment in a given society also contribute to global variation in worker and population health. These include the social safety net for individuals who are unsuccessful on the labor market, which could include unemployment insurance programs, worker retraining programs, and other public assistance programs to help those whose earnings have been interrupted or those whose skills have been rendered obsolete by changes in the occupational structure. For example, the health consequences of job losses and unemployment spells in a given society will be modified by the availability of these kinds of social benefits. Other social programs, such as income support for those with disabilities or those with young children, may also help to equalize the health of those engaged in paid work and those who are unable to work because of health problems or other obligations. The means by which individuals obtain their health care and retirement benefits, specifically whether these are tied to particular employers, also could modify the link between work and health.

A final contextual factor that has increased in salience due to the late-2000s global recession is the level of macroeconomic growth or contraction and the subsequent unemployment rate that these conditions generate. At the individual level, there is considerable evidence for an association between unemployment and poor health as discussed above, but economists have shown for a variety of societies that when the unemployment rate rises, average levels of population health improve on some dimensions. While historically, economic growth has led to improvements in population health (Preston, 1976), adult mortality from causes including traffic accidents, coronary heart disease, and cirrhosis in many wealthy societies now increases when the economy improves and decreases during downturns (Granados, 2008; Ruhm, 2007). Several mechanisms have been proposed, including less overtime work and commuting when the economy slows, reducing both traffic and air pollution, the reduction of some unhealthy consumption patterns and the increase of some health promoting treatments or improvement in health care (Ruhm, 2007; Stevens, Miller, Page, & Filipowski, 2011). While there may be a silver lining to recessions, not all population health

indicators improve when the unemployment rate goes up. Suicide mortality and deaths from diabetes and hypertension rise in recessions (Granados, 2008), and other research has shown that higher state-level unemployment increases the likelihood of regional and widespread influenza activity (Cornwell, 2012).

Transforming the Study of Work & Health

While researchers from across the fields of medicine, epidemiology, psychology and social demography have demonstrated important links between work and health at the individual and aggregate levels, we can continue to improve the evidentiary base for researchers and policy and intervention designers. To close, we detail four suggestions that build on these extant approaches and findings.

Improving Measurement of Working Conditions

Measurement of negative and positive working conditions could be expanded in multiple ways. Collection of actual stress responses using biospecimen collection or ambulatory monitoring of blood pressure at the workplace and at home, for example, could be combined more often with more typical questions about particular exposures at work to improve our understanding of which working conditions are actually “getting under the skin.” Even when these forms of monitoring are not possible, researchers should examine more than one working condition at a time to better understand which cluster, and what their independent and joint consequences are for health. This would mark a departure from the traditional approach in occupational epidemiology, which tends to focus on high quality measurement of a single type of exposure, whether asbestos, poor ergonomic conditions or perceived job insecurity, but cannot determine how negative conditions cluster and potentially have synergistic impacts. Such focus is an important limitation because research has shown, for example, that negative spillover from work to home exacerbates the negative effects of other working conditions on mental health (Glavin et al., 2011; Marshall & Tracy, 2009).

Workers are subject to an array of potentially harmful conditions at work, and these change over time. Moreover, health effects of workplace exposures may take some time to manifest in visible disease, necessitating a long term view. More longitudinal data collection tracking an array of indicators over time would improve our understanding of the cumulative burdens workers face at a point in time and over their careers, and how these may link to health problems that arise in the short or much longer run (see, for example Robone, Jones, & Rice, 2011). While costly, more longitudinal data collection would also offer several other benefits. First, such data allow assessment of how individuals respond to the negative aspects of their jobs or shocks to employment. Do they change jobs, or leave paid work altogether? For example, high levels of exposure to negative spillover has been shown to push individuals out of the labor force, which may have mixed effects on health (Bellavia & Frone, 2005; Bianchi & Milkie, 2010). While leaving the labor force may ease the burden of spillover on an individual, and thus mitigate some of the negative consequences of strain, leaving a job may deprive an individual of health enhancing social networks and activities (Pavalko & Smith, 1999; Williams, 2010), as well as influencing earnings and benefits trajectories. Understanding more about turning points and how workers respond would improve our understanding of the links between work and health. Longitudinal data may also improve assessment of the temporal ordering of changes in work, material resources, and health, strengthening inferences about their associations.

Broadening the Lens: Multilevel Studies of Work & Health

Improvements in measurement of working conditions and workers' responses to them would be most powerfully applied if researchers continue to develop a multilevel approach to the

determinants of health and health disparities. Pushing the analytic lens to encompass change over time and multiple levels of aggregation could better integrate the valuable findings we already have about work, health, and the persistence and transmission of inequality. This means using conceptual models that acknowledge intra- and inter-generational trajectories of workplace exposures and health, but also the embeddedness of workers in households, organizations, and societies subject to evolving occupational structures and policy and regulatory environments that are themselves responding to a changing macroeconomic environment. While it is unlikely that any one study could incorporate all of these dimensions, awareness of them could allow researchers to draw on findings that cover other portions of this broadened conceptual diagram to design stronger studies and make their results more useful to other researchers.

Taking Advantage of Comparisons across Societies & Time

Comparative studies provide exciting opportunities for those who study work and health. Existing research has shown that the policy environment and the availability of a social safety net modify the material consequences of job losses for workers (Gangl, 2006), but comparisons across different welfare state regimes could be more broadly applied to the study of health consequences of particular working conditions or employer-employee relationships. For example, some have studied cross national differences in the health consequences of nonstandard employment contracts (Kawachi, 2008) or job insecurity (László et al., 2010), but there is a need to consider other working conditions and to integrate a wider array of societies. Comparisons across time can offer other advantages, sometimes providing natural experiments that can help to identify the effect of a particular exposure of interest. Some contemporary examples could include comparing the health of individuals or populations before and after the onset of a major change in the employment rate, such as a major recession, or before and after a major policy change that alters the typical relationships between work and health, such as the implementation of the Affordable Care Act in the United States that will weaken the link between particular employers and having health insurance coverage.

Learning from Good Jobs and Good Workplaces

Finally, our understanding of the full scope of the association between work and health could be improved if researchers did not solely focus on exposures that harm health. Learning more about the positive aspects of work, whether they are specific working conditions or factors intrinsic to organizations or occupations, would make the findings even more useful for interventions. For example, positive spillover from work to home domains has been linked to better mental and physical health employees (Grzywacz, 2000), and to less depression for spouses (Hammer, Cullen, Neal, Sinclair, & Shafiro, 2005). In the realm of workplace conditions, some studies of specific organizations have explored the benefits of schedule flexibility for reducing work-family negative spillover (Moen et al., 2011), or have promoted work-family friendly policies for enhancing worker well-being (Williams, 2010). Others have examined how factors like supervisor support can modify the influence of stressful conditions at work for worker perceived load and anxiety (Kirmeyer & Dougherty, 1988). While quantitative studies of working conditions have been particularly useful in documenting the relationship between negative aspects of work and health, qualitative studies may be needed to document how these and positive, health-enhancing aspects of workers' experiences matter for health. While survey-based studies have shown the utility of supervisor support in the workplace, for example, in-depth case studies of workplaces or in-depth interviews with workers (e.g., MacIntosh, Wuest, Gray, & Cronkhite, 2010) could serve to highlight the mechanisms through which supervisor support and work-family friendly policies influence worker attitudes and stress, and eventually result in better employee health. A better understanding of aspects of work that can enhance health

or buffer the negative effects of more toxic exposures could add to future research using more comprehensive data and models to assess the links between work, working conditions, and health inequalities.

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