



Research paper

The influence of geographic variation in socio-cultural factors on length of work disability

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ABSTRACT

Background: Previous research has largely concentrated on how individual-level factors explain work disability duration. However, growing evidence suggests socio-cultural factors may significantly influence length of work disability.

Objective: This study examined whether socio-cultural factors that vary by location of residence influence length of disability.

Methods: This study utilized 216,162 non-work-related disability claims from a private US insurance company and matched these data with socio-cultural factors at the census tract level. OLS regression was used to model findings.

Results: Higher unemployment rates, greater median household income, increased poverty status, increased length of the work commute, lower educational attainment, lower percentage of residents living alone, higher percentage of residents age 55 and older, higher percentage of disabled adults (35–64), a lower percentage of whites, and a larger Hispanic population were associated with a longer length of disability.

Conclusions: The findings showed that socio-cultural factors varying by location were associated with the length of disability, suggesting that the socioeconomic context of the areas in which individuals reside are likely to influence the work disability process.

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The prevalence of work disability in the United States is an area of concern for both employers and employees. It has been estimated that over half of adults will experience an episode of work disability between the ages of 25 and 60, with a quarter of adults reporting that the work disability is severe.¹ Much of the previous research on the predictors of work disability has focused on individual level factors such as age, gender, job type, or psychosocial factors.^{2–12} However, there is increasing evidence that socio-cultural and geographic factors that vary by location of residence, such as poverty level and access to jobs, can significantly impact disability outcomes.^{13–16} In the International Classification of Functioning, Disability, and Health (ICF), which was first introduced by the World Health Organization (WHO) in 2001 as a classification system, as well as a guiding framework in understanding function and disability, environmental factors, such as geography, play a key

role.¹⁷ The model illustrates how health conditions and environmental and personal factors influence functioning, defined by body functions and structures, activities, and participation. Disability occurs when functioning is compromised (i.e., impairment of body functions and structure, activity limitations, and participation restrictions).^{18,19} This framework may be helpful in illustrating how the length of work disability is influenced by environmental factors following a health condition, which results in the temporary loss of work participation.

Under the ICF framework, a health condition that prompts short- or long-term work disability is associated with body function and structure impairment, activity restriction, and participation limitations (i.e., disability). Not only is the level of impact on these factors influential in determining the length of work disability, personal and environmental factors also play a significant role. While a large body of research highlights the role of personal factors on the length of work disability, less attention has been given to the impact of environmental factors. However, external influences to the individual may also be important factors in

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impairment and participation limitations. Environmental factors may serve as facilitators or barriers by either helping or hindering activities and participation.²⁰ The aim of this study is to gain better insight into how these environmental factors impact the length of work disability even after controlling for other known influencing factors.

Several different methods have been proposed for studying the impact of environmental factors within the ICF framework. Among them is the use of geographic information software (GIS) techniques.²⁰ The use of GIS techniques allows for the measurement of environmental factors that are acquired independent of their direct impact on functioning, such as measuring the unemployment level of an area as opposed to using a self-report of unemployment from a disabled individual. One advantage of GIS techniques is that it allows for access to measures of environmental factors that are publicly available and may be matched to an individual through geocoding (e.g., use of a street address or census tract).

Previous studies have documented relationships between environmental factors that could be assessed with the use of GIS techniques and work disability outcomes. For example, areas of low socioeconomic status, which are often deficient in healthcare resources (i.e., all persons, materials, and monetary assets related to the provision of healthcare), have been shown to be associated with non-work related sickness absence¹³ and receiving a disability pension.²¹ Additionally, areas with access barriers to hospitals and general practitioners are associated with poorer health status among residents.²² A recent study found that local variations in job opportunities and other factors significantly influence the onset of restriction in work ability in arthritis patients.¹⁵ Regional unemployment rate has also been shown to be positively associated with work disability.^{21,23,24} Mean annual income of the region was found to be negatively correlated with disability pension in this study. A Norwegian longitudinal study examined the impact of regional deprivation on the risk of disability pension.²⁵ Deprivation was defined using an ecological deprivation index and was comprised of the following indicators: prevalence of low educational attainment, low median income, prevalence of permanent work disability, unemployment rate, population decline, and distances to services (i.e., education, work, community organizations). Results indicate that after controlling for personal factors, environmental factors were also important. Specifically, the findings showed those residing in areas of high or intermediate deprivation were at a higher risk of disability pension compared to residents in low deprivation regions.

Urbanization and population density are additional environmental factors that may impact the prevalence of work disability. One study found an interaction between rurality, healthcare utilization, and work disability. Individuals with low health care utilization had less time off work if they lived in a rural area; individuals with high health care utilization were absent from work less if they resided in an urban setting.¹⁴ Delleve and colleagues found an association between disability pension and population density among home care workers in Sweden.²⁴ Disability pension was positively associated with residing in sparsely populated areas and negatively associated with residing in metropolitan areas.

Work-commute is another factor shown to impact length of work disability (LOD), with workers traveling farther distances associated with an increased LOD.¹⁶ In addition, a recent study examined the impact of geographic variation in local and regional policy, economic and other factors on RTW in low back pain workers' compensation claims. Results indicate that, after controlling for individual factors, the number of MRI facilities by state, the average income by state, the median household income by census tract, and the waiting period before benefits start by state explain much of the variance in the LOD at both the state and local

level.^{26,27} In another study, there was a positive association between permanent work disability and the proportion of older residents (85 + years of age).²⁴

Using the ICF as a framework for understanding the importance of environmental factors on participation, the goal of the current study is to expand the research on the role of socio-cultural and geographic factors on work disability in a large, national database for work disability claims for non-work-related reasons. In this study, we will examine how the length of disability is influenced by factors at a geographic level beyond individual influences, by utilizing publicly available information at the census tract level in order to include a more comprehensive set of environmental factors impacting work disability.

Methods

This study utilized multiple sources of data. As the goal of the current study was to integrate geographically varying socio-cultural information and claims level information to predict claimant's length of disability, information from various sources was combined. The data sources included information at the claims level and geographic information measured at the census tract level.

Claims level data

The first source of data represented the claims level information. This data came from the short-term (STD) and long-term (LTD) disability claims database of a private US insurance company (N = 216,162). The dataset covers the time period from January 1, 2008 to December 31, 2012. STD and LTD insurance covers wage replacement for individuals on disability as a result of non-work-related causes. STD insurance is a benefit that is often provided to employees through their employer without paying a premium, whereas LTD insurance is usually an optional coverage for which employees pay a premium. STD and LTD insurance is for wage replacement only and does not cover any type of medical costs associated with the cause of the disability. Similar to Workers' Compensation insurance, STD and LTD often only cover a portion of a worker's wage, such as 60%. There is no standard coverage rate that is state mandated, as in Workers' Compensation, rather the coverage varies from plan to plan. The variables included within this STD and LTD dataset were obtained by claims managers following conversations with disability claimants, as well as personal data obtained from claimant's employers. Claims were followed for one year from the initiation of work disability. The database covers claims from a wide variety of organizations representing various industries and business sizes. There is good variability in the occupations in which claimants work. Additionally, while workers' compensation insurance covers work-related injuries which usually include acute onset conditions, STD and LTD insurance are used for work disability as a result of chronic health conditions. As part of the collection of administrative variables in the STD and LTD process, information about the claimant's address, including street address, zip code, city, and state, is also gathered which allows for geocoding of the database.

This dataset represents a good distribution of ages from age 25 to age 65 which was the primary age range in our analyses. The dataset was restricted to those over the age of 25 given that younger individuals are most likely still in school or training for their future careers. We excluded claimants over the age of 65 because after this point, the measurement of LOD becomes unreliable due to the reduction in benefits that occurs on a plan by plan basis at this age and competing retirement options that become available at age 65 in the US.

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