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Disability, Health Insurance and Psychological Distress among US Adults: An Application of the Stress Process

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Abstract

Structural resources, including access to health insurance, are understudied in relation to the stress process. Disability increases the likelihood of mental health problems, but health insurance may moderate this relationship. We explore health insurance coverage as a moderator of the relationship between disability and psychological distress. A pooled sample from 2008–2010 (N=57,958) was obtained from the Integrated Health Interview Series. Chow tests were performed to assess insurance group differences in the association between disability and distress. Results indicated higher levels of distress associated with disability among uninsured adults compared to their peers with public or private insurance. The strength of the relationship between disability and distress was weaker for persons with public compared to private insurance. As the Affordable Care Act is implemented, decision-makers should be aware of the potential for insurance coverage, especially public, to ameliorate secondary conditions such as psychological distress among persons who report a physical disability.

Research consistently demonstrates that physical disability is associated with mental health (Breslin et al. 2006; Okoro et al. 2009; Okoro 2010; Turner and Noh 1988; Turner and McLean 1989; Turner and Beiser 1990; Kemp 2006; Turner, Lloyd, and Taylor 2006). Physical limitations have been conceptualized as a ‘potent stressor’ (Bierman 2012): 48), a source of chronic strain that taxes mental health because such limitations make it difficult to do many daily activities, and perform social roles (Kemp 2006; Turner and Noh 1998; Yang 2006; Turner, Lloyd, and Taylor 2006; Turner and McLean 1989; Bierman 2012). Much of the literature that adopts a stress-process formulation to understand risk of mental health problems among persons with physical disabilities focuses on resources that may reduce the effects of such stress. For example, researchers have investigated psychosocial resources such as social support, marital status, and religiosity as potential mediators or moderators of the effect of disability on mental health outcomes (Bierman 2012; Brown and Turner 2010; Caputo and Simon 2013; Cummings, Neff, and Husaini 2003; Russell, Turner, and Joiner 2009). Few studies look at the role of external, structural resources in the stress process. To begin to address this gap, this paper explores the role of health insurance in the relationship between disability and poor mental health. We argue that health insurance is a protective factor, buffering the effects of disability and resulting stressors on mental health through

access to medical care. A better understanding of the role of structural factors like insurance coverage should advance specific efforts of policy-makers and clinicians to improve the overall health of individuals with disabilities.

Disability, Mental Health, and the Role of Insurance

A number of cross-sectional studies find that psychological distress, depression, and other mental health problems are associated with disability (Brenes et al. 2008; Merikangas et al. 2007; Okoro et al. 2009; Wells 1989). For example, in the classic Medical Outcomes Study, Wells and colleagues (1989) found that persons with depressive symptoms had worse physical, social, and role functioning, and more bed days than individuals with many other chronic conditions such as diabetes, hypertension, or back problems. Moreover, having mental health problems or elevated psychological distress may increase the level of disability associated with chronic conditions such as asthma or diabetes (McKnight-Eily et al. 2009).

While there continues to be debate about the causal direction of the relationship (Bruce and Hoff 1994; Bruce et al. 1994; Bruce et al. 1994; Callahan et al. 1998; Kempen et al. 1999; Koenig and George 1998; Ormel et al. 2002; Prince et al. 1997; Von Korff et al. 1992), research supports the hypothesis that disability increases risk of mental health problems. In a longitudinal analysis using data from Ontario, Turner and Noh (1988) found that physical disability significantly increased the risk of depression across different age groups. Bruce and Hoff (1994) documented similar results using data from the New Haven site of the Epidemiologic Catchment Area (ECA) study. They found increasing depressive symptoms with increasing levels of disability. A catchment area cross-sectional survey of adults 65 and older in London found up to 24 times higher odds of depression among adults with impairments and disabilities (Prince et al. 1997). Gayman and colleagues (2008) also demonstrated that while physical limitations predicted depressive symptoms over a three-year period, there was no evidence that depressive symptoms predicted later physical limitations.

Much of the work arguing that disability increases the risk of poor mental health is based on a stress process formulation (Bierman and Statland 2010; Brown and Turner 2012; Caputo and Simon 2013; Turner and Wood 1985; Turner and Beiser 1990; Turner and Noh 1988; Turner, Lloyd, and Taylor 2006). The stress process distinguishes between life events and chronic strains. Life events are discrete life changes that have negative consequences on health, for example, an accident, the death of a spouse, or job loss. Chronic strains are enduring problems that undermine well-being, for example, a serious chronic illness or living in poverty (Pearlin 1989; Pearlin 1999; Turner and Avison 2003).

We adopt Turner and Noh's (1988) conceptualization of physical disability as "a significant chronic strain. It is a strain, because disability, by its nature, involves lasting difficulties in managing necessary instrumental and social activities." (p. 25). There are a number of sources of stress associated with disability. First, persons with disabilities are at greater risk for structural disadvantages reflected in lower educational attainment, lower family income, and greater risk of poverty than their counterparts without disabilities (Erickson, von

Schrader, and Lee 2012; Sommers 2006). Persons with disabilities are more likely than their counterparts without disabilities to say they are experiencing financial strain or are “struggling to get by” or “living paycheck to paycheck” (Taylor, Krane and Orkis, 2010). Persons with disabilities are also more likely to be unemployed than persons without disabilities; in 2010, the employment rate for working-aged persons with disabilities was only 34 percent compared to 75 percent for persons without disabilities (Erickson, von Schrader and Lee 2012). Moreover, many persons with disabilities report discrimination at the workplace, such as being paid less than other workers (Taylor, Krane and Orkis, 2010). Socio-economic disadvantage, such as that experienced by persons with disabilities, is a well-documented risk factor for negative mental health outcomes (Aneshensel, Rutter, and Lachenbruch 1991; Aneshensel 1992; Hudson 2005; Schnittker 2012).

Chronic strains also come from the nature of the disability - limitations in the ability to perform activities and manage the underlying primary conditions, as well as secondary conditions such as fatigue, pain, and obesity (Kinne, Patrick, and Doyle 2004; Rimmer and Rowland 2008). Additionally, persons with disabilities are more likely than persons without disabilities to report difficulties fully participating in public life. In a recent survey, persons with disabilities were less likely to indicate that they went out to restaurants, attended religious services, or that they socialized with friends, relatives or neighbors at least twice a month than were persons without disabilities. They also were more likely to report basic problems in finding adequate transportation (Taylor, Krane and Orkis, 2010).

According to the Stress Theory, exposure to such strains should directly predict distress (Pearlin et al. 1981; Pearlin 1989; Pearlin 1999). The stress process paradigm, however, also acknowledges the importance of psychosocial resources, such as social support and mastery - the sense of control over one's life circumstances and outcomes - which are protective and buffer the impact of stressors and chronic strains on mental health. In the literature about the relationship between disability and mental health, the search for moderators has generally focused on resources such as social support, marital status, mastery, or religiosity, and has yielded mixed results (Brown and Turner 2010; Chan et al. 2011; Chao 2012; Cummings, Neff, and Husaini 2003; Russell, Turner, and Joiner 2009; Caputo and Simon 2013).

We propose that insurance status may be an additional moderator in the stress process. Insurance may be a moderator of the effect of disability on mental health for a number of reasons. First, it may increase the financial well-being of families who can use the resources they would have spent on health care for other needs (Finkelstein et al. 2012) and decrease risk of catastrophic medical expenses (Baicker et al. 2013) that may be associated with having a severe disability. Second, having insurance may increase access to services (Baker, Shapiro, and Schur 2000; Newacheck et al. 1998), which, in turn, can make existing problems easier to manage. For example, persons with disabilities who have private insurance or Medicaid are less likely to say they do not have a regular doctor, spend more out of pocket, have problems paying for care, or that they postponed care or went without needed services compared to their counterparts who lack health insurance (Hanson et al. 2003; Sommers 2006).

Increased access to care can help to reduce the development of secondary disabling conditions, which may be brought about by difficulty in accessing care (Meyers et al. 2000; Breslin and Yee 2009). In a randomized control study assessing the effects of health care benefits on the health of Social Security Disability Insurance (SSDI) beneficiaries between the ages of 18 to 54 years, SSDI beneficiaries who received health care benefits reported significantly better overall health and mental health compared to the control group. They were also less likely to report unmet medical needs due to costs, or unmet need for prescriptions (Michalopoulos et al. 2012). Moreover, persons with disabilities who report difficulty accessing health care are more likely to report depression than those without difficulty accessing healthcare (Mitra et al. 2005). Finally, to the degree that insurance provides access to assistive technologies such as hearing aids or wheelchairs and personal assistance services, it may reduce limitations and increase self-reliance (Field and Jette 2007; Pendo 2010; Verbrugge, Rennert, and Madans 1997).

In the United States (U.S.), many persons with disabilities qualify for either Medicaid or Medicare depending on severity of disability and work history. Medicaid alone pays for about 40 percent of all disability-associated health care expenditures (Anderson et al. 2011). Because of greater access to public insurance, persons with a disability are more likely to be insured than persons without a disability; in 2010 rates of insurance for working-aged adults were about 82 percent for persons with a disability compared to 79 percent for those without a disability. However, only about 35 percent of persons with a disability have private coverage through an employer, compared to 63 percent without a disability (Erickson, Lee and von Schrader, 2012). While persons with disability are more likely to be insured than those without disability, public insurance typically provides much more generous coverage such as durable medical equipment and habilitative services (Smith et al. 2013).

In this study, we explore the relationship between disability, insurance and psychological distress. Two hypothesis guide the analysis: 1) Persons with a physical disability will have higher psychological distress than persons without a disability; and 2) the association between disability and psychological distress will be weaker for persons with health insurance than the uninsured. This research is timely given that implementation of the Patient Protection and Affordable Care Act (ACA) will increase access to insurance among persons with disabilities.

Methods

Data

Data were obtained from the Integrated Health Interview Series (IHIS). The IHIS is an online resource of harmonized data from the National Health Interview Survey (NHIS) covering 1963 to the present (Minnesota Population Center and State Health Access Data Assistance Center 2012). The NHIS is a cross sectional, nationally representative survey collected annually by the Centers for Disease Control. A sample adult and sample child are also randomly selected from each family. Only sample adults were asked questions that assess psychological distress.

We pooled the 2008 to 2010 samples to increase the precision of estimates and used the IHIS-created sample person weight. This weight harmonizes the final annual sample adult and sample child weights in the NHIS. We then created an analytical weight by dividing the sample person weight by three to represent the population for the three-year period from 2008–2010 (Minnesota Population Center and State Health Access Data Assistance Center 2012). In the NHIS, respondents were asked to indicate the conditions that caused their limitation. Based on this information, we excluded persons who reported their disability to be caused by behavioral, mental, cognitive, drug, or alcohol problems from our sample. The goal of excluding respondents with psychiatric disabilities is to reduce endogeneity that might result from common-method variance, that is, disability being associated with distress because both disability and distress are caused by psychiatric problems. We also excluded persons who were 65 or older at the time of the survey because of their eligibility for Medicare. Our final analytic sample consisted of 57,958 U.S. adults, 18 to 64 years of age.

Measures

Psychological Distress—We employed a summative measure of distress based on respondents' Kessler-6 (K6) score (Kessler et al. 2002; Kessler et al. 2003). The K6 consists of six questions that ask how often, during the past 30 days, the respondent felt: 1) so sad that nothing could cheer you up; 2) nervous; 3) restless or fidgety; 4) hopeless; 5) that everything was an effort; and 6) worthless. Response options range, on a five-point scale, from “none of the time” to “all of the time”. Summed scores on the K6 scale range from 0 to 26, with higher scores indicating higher levels of distress.

Disability—The NHIS provides measures of limitations in basic activities (e.g. movement or difficulty seeing or hearing) and complex activities (e.g. work, social participation or self-care) (Altman and Bernstein 2008). Respondents are also asked the reason for the limitation, and as mentioned we excluded limitations due to psychiatric reasons. Persons were categorized as having a disability if they reported considerable difficulty or an inability to perform in at least one of the five areas: self-care (limitation in performing one or more activities of daily living, or one or more instrumental activities of daily living), social participation (unable to go out, participate in social activities, or do things to relax), work (unable to work or limited in the kind or amount of work), movement difficulty, and sensory difficulty (difficulty in hearing or seeing). An interval measure of disability based on the number of areas where the respondent reported a limitation was created and ranged from 0 to 5; a higher score indicates greater disability and higher chronic strain.¹

The number of areas where respondents meet criteria for disability captures a dimension of severity. Recent work demonstrates that health outcomes are worse among persons who report two or more limitation types compared to their peers with one area of limitation (Horner-Johnson et al. 2013). Similarly, when assessing severity, disability is most severe

¹Using this measure of disability, there is the possibility that 0–1 is conceptually different from 1–2, 2–3 etc. We recomputed the analyses using a dichotomous variable for disability (a limitation in at least one area versus no limitation). The results were similar. Distress scores were higher for persons with a limitation in at least one area compared to persons with no disability. Likewise, the relationship between disability and distress was strongest for uninsured persons and stronger for persons with private compared to public coverage.

among persons who report a combination of basic and complex limitation types than among their peers with either basic or complex limitation types, and persons with no limitations (Horner-Johnson et al. 2014). Since having several types of limitations is potentially more stressful than just one, and having one is more stressful than not having any, we assumed that the greater the number of areas for which limitations were reported, the greater the severity.

Insurance—In the NHIS, respondents are asked whether they are covered by any kind of health insurance or some kind of health care plan. If an affirmative response is provided, they are then asked to select health care plans from a card listing various types of insurance coverage. Respondents can also mention health plans not listed on the card. From these responses, we constructed three insurance categories: public insurance coverage (coverage through Medicaid, Medicare, other government-sponsored programs, or a military health plan), private insurance coverage (coverage through the workplace, union membership, or purchased directly), and uninsured (no public or private coverage). Following the approach of researchers at the National Center for Health Statistics, persons who reported both private and public insurance were categorized as having private insurance (Driscoll and Bernstein 2012).

Covariates—Covariates include several socio-demographic characteristics that are associated with disability and mental health outcomes (Bierman 2012; Bierman and Pearlin 2011; Brown and Turner 2010). Demographic variables included race and ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, Asian, and all others), age (18–25, 26–45, 46–64), gender, and marital status (single/never married, divorced/separated/widowed, married). Socio-economic variables included education (less than high school, completed high school, some college, college degree and higher), employment status within the past two weeks (employed full time or part time, unemployed or not in the labor force), and annual household income (from less than 100% of the Federal Poverty Line (FPL) to 400% or more of the FPL). Two measures of health status were also included in the analyses as they may covary with disability and distress. These measures are self-assessed health (fair/poor or good/very good/excellent) and chronic conditions (no chronic condition or at least one chronic condition). Persons who reported having hypertension, any heart condition (including angina, heart attack, coronary heart disease), cancer (except for skin cancer), diabetes (except if borderline), asthma, kidney disease, emphysema, or chronic bronchitis were classified as having a chronic condition (Freid, Bernstein, and Bush 2012).

Analyses

We describe bivariate differences in socio-demographic characteristics, health status, health insurance, and distress between persons with a disability (limited in one or more domains) and persons without a disability (not limited in any domain). Significant differences were assessed using chi-square and t-tests. Ordinary Least Squares (OLS) regressions were computed to identify correlates of psychological distress. Models were built sequentially starting with the unadjusted model, then adding socio-demographic variables, health status, and health insurance. We used the Chow test (Chow 1960) to assess whether the relationship between disability and psychological distress might operate differently across insurance

groups.² In all analyses, sampling weights were used to account for non-response and the differential probability of selection.

Results

As shown on Table 1, 17.2 percent of working-aged adults have a physical disability. Respondents report limitations in an average of 1.6 domains. Average scores on psychological distress are twice as high for persons with disabilities than persons without a disability. Persons with a disability face greater socio-economic disadvantages including lower educational attainment and lower employment rates than persons without a disability. The percentage of individuals with family income below 100% of the FPL is almost twice as high for persons with disabilities compared to persons without a disability (19.1% versus 10.9%). Persons with disabilities are also significantly older on average, and are in worse physical health (on self-rated health or presence of a chronic condition) than persons without a disability. Finally, public insurance rates are almost four times higher among persons with disabilities compared to persons without a disability (26.2 % versus 7.3%). However, rates of uninsurance are similar for both groups (20.7% and 21.2%).

The results of linear regression models identifying factors associated with distress are shown on Table 2. As shown in Model 1, every one unit increase in the number of domains for which limitation is reported is associated with a 1.5 point increase in predicted distress score. In the second model, holding socio-demographic factors constant reduces the strength of the association between disability and distress. Black and Asian respondents, and persons of Hispanic ethnicity have significantly lower levels of distress scores compared to non-Hispanic Whites. Being married is associated with lower levels of distress and females have higher distress scores than males. As the levels of education and family income increase, predicted distress scores significantly decrease. In addition, predicted levels of distress are lower among employed persons compared to unemployed persons.

Health status and health insurance coverage are both associated with distress (Model 3). The predicted levels of distress among persons who rated their overall health as good, very good, or excellent is significantly lower than among their counterparts who had fair/poor self-rated health. Similarly, the presence of at least one chronic condition is associated with higher distress scores. Additional analysis (not tabled) indicated that it was the inclusion of the health variables (not health insurance) in Model 3 that accounted for the reduction in predicted levels of distress associated with disability. Adults with public or private health insurance plans have significantly lower distress scores ($b = -0.32$, $p = 0.000$ and $b = -0.45$, $p = 0.000$, respectively) than adults without health insurance.

Chow tests confirmed significant differences in the association between disability and distress across insurance groups. Therefore, we present stratified analysis in Table 3. As shown, the association between disability and psychological distress is strongest among persons without insurance ($b = 1.42$), compared to persons with public coverage ($b = .92$) or

²We restricted our sample only to persons with disabilities (those who reported at least one type of limitation) and recomputed the analyses. Similar results were obtained.

private coverage ($b=1.12$). The coefficient for disability among the uninsured is significantly higher than the two other groups and the coefficients for disability among the publicly insured is also significantly lower than the coefficient for the privately insured.

Discussion and Implications

Our results suggest that approximately 17% of working age adults have a physical disability. This is lower than other national estimates (about 27%) because we exclude disability associated with a mental health problem or cognitive impairment (National Center for Health Statistics 2013). It has long been recognized that disability is not a static state, but rather is a dynamic process - the degree an underlying condition is “disabling” depends on personal, social, and environmental conditions (Nagi 1976; Verbrugge and Jette 1994; Whiteneck 2006; World Health Organization 2001). Such a conceptualization is consistent with our understanding of disability as a chronic strain under a “stress-process” framework. Here, we found that physical disability was associated with an increased risk for a secondary condition, psychological distress (Kemp 2006). We found that the association of disability with distress is partially explained by economic disadvantage and health problems faced by persons with disabilities. Efforts to increase the socio-economic well-being of persons who have limitations in a one or more areas of functioning, including access to education and accommodations that facilitate the integration of working-age people with disabilities into the workforce (Burkhauser and Stapleton 2004) may reduce the risk of psychological distress. We also found that poor health status partially mediated the relationship between disability status and distress. We do not know if the health conditions considered here are the primary sources of disability, comorbidities, or secondary conditions arising from the original disability. However, the results suggest that reducing the poor health outcomes associated with having a disability would also reduce the risk of distress.

A second central premise of the stress process model is that the degree that any chronic stressor leads to negative mental health outcomes varies substantially (Longest and Thoits 2012; Thoits 1994; Thoits 1995). Variation in response to chronic stressors is partially explained by the availability of resources. Much of the attention in prior research has been given to psychosocial resources. Here, we argue for the importance of a structural resource - health insurance - that moderates the association of disability with higher levels of distress.

While the majority of persons with disabilities have some form of health insurance, our analyses show that about a fifth of this population is uninsured. Research suggests that high uninsurance rates are common among individuals with moderate or less severe disabilities because they are more likely to “fall through the cracks” between employer-sponsored insurance plans and Medicaid or Medicare (Sommers 2006). Uninsured persons are less likely to access preventive services, more likely to postpone care, and have higher rates of emergency room visits (McWilliams 2009; Pauly and Pagán 2007). These challenges are even more salient for individuals with disabilities because of the “thinner margin of health”, where the presence of limitations makes them more vulnerable to other health problems (Institute of Medicine 1991; Iezzoni, Frakt, and Pizer 2011; Pizer, Frakt, and Iezzoni 2009).

Implementation of the ACA will increase access to insurance through Medicaid expansions, mandates for insurance coverage and subsidies for lower income persons to buy insurance in the newly created health insurance exchanges. Levy and colleagues (2012) using a simulation model based on health reform in Massachusetts to predict the impact of the ACA argue that if fully implemented, the ACA will bring more than 2 million people with disability to insurance (Levy, Bruen and Ku 2012). The optimistic estimates provided by Levy and colleagues, however, are tempered by reality that many states have declined to participate in Medicaid expansions; as of October 2013, 25 states are not moving forward with such expansions (Smith et al. 2013). Moreover, some states such as Texas that have explicitly rejected Medicaid expansion have the highest rates of uninsurance in the U.S. In states that decide not to implement Medicaid expansions, estimates suggest that as many as 5 million working-aged adults living in poverty will not qualify for tax credits to buy insurance on the private market and will remain uninsured. In addition, some states such as Kentucky and Louisiana are restricting Medicaid eligibility for certain groups previously covered, such as working persons with disability, with the expectation that these people will be eligible for subsidies to buy insurance in the private health exchange markets (Smith et al. 2013).

In sum, while the ACA will expand access to insurance for persons with disabilities – the net effect will depend upon decisions around implementation – but it is likely that millions of Americans will still be left without insurance. Our results indicate that access to either public or private insurance is critical and is associated with lower distress among persons with disabilities. Moreover, public insurance appears to moderate the association between disability and psychological distress to a greater degree than private coverage. For most working adults younger than 65, out-of-pocket expenses are the lowest among those covered by Medicaid; possibility due to limitations on cost sharing (Hwang et al. 2001). Public coverage may therefore reduce the financial strain from obtaining needed care to a larger extent than private coverage.

The stronger association between public insurance and lower distress may also be due to the fact public insurance has traditionally provided more generous coverage of an array of services from transportation, to medical equipment and habilitative services such as speech and physical therapy than offered in private plans (Smith et al. 2013). Under the ACA, rehabilitative and habilitative services and devices are one of the ten Essential Health Benefits that must be offered by the private health insurance exchanges and to newly eligible Medicaid enrollees. However, states have considerable latitude to define these benefits. If they benchmark these services against existing private plans, the services covered will be much less comprehensive than has been traditionally the case with Medicaid. Thus, persons with disabilities newly covered by public insurance under Medicaid expansions may not have coverage for a range of important services.

Of course, just having access to insurance is not sufficient to ensure access to adequate, quality health care. Persons with disabilities report a wide range of barriers to care from transportation to how health care providers deliver services (e.g., disability literacy) (Scheer 2003). Even among persons with insurance, many persons with disabilities report unmet medical needs and cost-barriers to care (Hanson et al 2003). Access to high quality,

affordable care may be a stronger buffer of the effects of disability on psychological health than merely having insurance - a possibility we could not explore here. It is also probable that insurance may moderate the strain associated with some types of disability more strongly than other types. For example, access to insurance may reduce the strain associated with mobility impairments (through coverage for mobility aids) to a greater extent than the strain associated with work-related disability. While beyond the scope of the current paper, future research should examine the association between insurance and the stress associated with different types of disability.

Findings in this study should be considered in light of important caveats. First, our sample is limited to non-institutionalized populations, leaving out individuals in institutions such as hospitals, group homes and prisons that might have a significant number of persons with disabilities. Second, the use of cross-sectional data does not permit us to assess the directionality of the association between disability, insurance and psychological distress. Longitudinal data would increase confidence in the findings, but would not resolve the causal relationship. Even with longitudinal data, there is the problem of unmeasured confounders. We tried to minimize the possibility of endogeneity by restricting the definition of disability to persons who did not indicate that the cause of their disability was emotional or mental health problems. However there are likely differences between individuals with and without a disability that select them into different insurance arrangement and are associated with health outcomes. While we cannot resolve the issue of causality, we do rely on prior research on the stress process that conceptualizes exposure to stress as leading to outcomes and prior work about insurance that shows insurance does positively impact health outcomes (Feeman et al. 2008). Third, ideally, we would like more comprehensive measures of specific chronic strains such as difficulties in relationships and discrete life events such as job loss. Such measures would allow us to better understand how disability affects exposure to different types of stress. The results do however suggest that economic strain and health problems may be particularly important as they partially mediate the relationship between disability and psychological distress. Fourth, our measure of disability assumes that the stress associated with having a limitation in each area is additive - for example, having three types of limitations is more stressful than just one. At best, this measure only approximates severity. Severity may depend on the nature and source of a limitation. An alternative analysis was performed without any assumptions regarding the severity of disability. A binary measure was used where persons who endorsed at least one type of limitation were categorized as having a disability. Findings were similar. The fact that findings were the same with this measure gave us confidence in our results. However, further research on disability as a potential source of stress should investigate the nature and source of the disability. Finally, stress research increasingly recognizes the importance of the timing of events on outcomes (Bierman and Pearlin 2011; Bierman and Statland 2010; Pearlin 2010). Measures of age at onset and duration of disability would have also strengthened our application of the stress process.

Conclusion

This study makes important contributions to disability and mental health scholarship. Mental health problems are a significant issue for persons with disabilities (Cummings et al. 2003;

Okoro et al. 2009; Russell 2009; Turner and Noh 1988; Turner and McLean 1989; Turner et al. 2006). Psychosocial factors previously explored have a profound role in reducing mental distress, but the formation of these resources may primarily be achieved through interventions at the individual level. Conversely, expanding access to public insurance programs to improve care for the uninsured and reducing barriers to care for those with private coverage, such as high cost-sharing and lower availability of services can be resolved by state and federal policy decisions, and can significantly improve the lives of persons with disabilities.

How the ACA will play out in improving access to insurance for persons with disability is still unknown. Early indications are that many states, especially those with high rates of uninsurance are choosing to opt out of Medicaid expansions, which will leave millions uninsured. Decisions about how to define essential health benefits such as habilitative services will be critical in determining whether access to insurance provides the range of services most important for persons with disabilities. With the ongoing implementation of the ACA, an important research agenda will be to assess how benefits provided with plans in the health insurance exchanges and for new enrollees in Medicaid plans meet the needs of persons with disabilities.

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REFERENCES

- Altman, Barbara M.; Bernstein, Amy B. Disability and Health in the United States, 2001-2005. Department of Health and Human Services, Centers for Disease Control and Prevention. National Center for Health Statistics. 2008. Retrieved January 8, 2013. (www.cdc.gov/nchs/data/misc/disability2001-2005.pdf)
- Anderson, Wayne L.; Wiener, Joshua M.; Finkelstein, Eric A.; Armour, Brian S. Estimates of National Health Care Expenditures Associated with Disability. *Journal of Disability Policy Studies*. 2011; 21:230-240.
- Aneshensel, Carol S. Social Stress: Theory and Research. *Annual Review of Sociology*. 1992; 18:15-38.
- Aneshensel, Carol S.; Rutter, Carolyn M.; Lachenbruch, Peter A. Social Structure, Stress, and Mental Health: Competing Conceptual and Analytic Models. *American Sociological Review*. 1991; 56:166-178.
- Baicker, Katherine; Taubman, Sarah L.; Allen, Heidi L.; Bernstein, Mira; Gruber, Jonathan H.; Newhouse, Joseph P.; Schneider, Eric C.; Wright, Bill J.; Zaslavsky, Alan M.; Finkelstein, Amy N. The Oregon Experiment-Effects of Medicaid on Clinical Outcomes. *New England Journal of Medicine*. 2013; 368:1713-1722. [PubMed: 23635051]
- Baker, David W.; Shapiro, Martin F.; Schur, Claudia L. Health Insurance and Access to Care for Symptomatic Conditions. *Archives of Internal Medicine*. 2000; 160:1269-1274. [PubMed: 10809029]
- Bierman, Alex. Functional Limitations and Psychological Distress Marital Status as Moderator. *Society and Mental Health*. 2012; 2:35-52.
- Bierman, Alex; Statland, Denise. Timing, Social Support, and the Effects of Physical Limitations on Psychological Distress in Late Life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2010; 65:631-639.

- Bierman, Alex; Pearlin, Leonard I. SES, trajectories of physical limitations, and change in depression in late life. *Society and Mental Health*. 2011; 1:139–152.
- Brenes, Gretchen A.; Penninx, Brenda W.; Judd, Patricia H.; Rockwell, Enid; Sewell, Daniel D.; Wetherell, Julie L. Anxiety, Depression and Disability Across the Lifespan. *Aging and Mental Health*. 2008; 12:158–163. [PubMed: 18297491]
- Curtis, Breslin F.; Gnam, William; Franche, Renée-Louise; Mustard, Cameron; Lin, Elizabeth. Depression and Activity Limitations: Examining Gender Differences in the General Population. *Social Psychiatry and Psychiatric Epidemiology*. 2006; 41:648–655. [PubMed: 16721501]
- Breslin, Mary L.; Yee, Silvia. The Current State of Health Care for People with Disabilities. National Council on Disability. 2009. Retrieved May 24, 2013. (<http://www.ncd.gov/publications/2009/Sept302009>)
- Brown, Robyn L.; Turner R, Jay. Physical Disability and Depression: Clarifying Racial/Ethnic Contrasts. *Journal of Aging and Health*. 2010; 22:977–1000. [PubMed: 20194683]
- Brown, Robyn L.; Turner, RJ. Physical Limitation and Anger Stress Exposure and Assessing the Role of Psychosocial Resources. *Society and Mental Health*. 2012; 2:69–84.
- Bruce, Martha L.; Hoff, Rani A. Social and Physical Health Risk Factors for First-Onset Major Depressive Disorder in a Community Sample. *Social Psychiatry and Psychiatric Epidemiology*. 1994; 29:165–171. [PubMed: 7939965]
- Bruce, Martha L.; Seeman, Teresa E.; Merrill, Susan S.; Blazer, Dan G. The Impact of Depressive Symptomatology on Physical Disability: MacArthur Studies of Successful Aging. *American Journal of Public Health*. 1994; 84:1796–1799. [PubMed: 7977920]
- Burkhauser, Richard V.; Stapleton, David C. The Decline in the Employment Rate for People with Disabilities: Bad Data, Bad Health, Or Bad Policy. *Journal of Vocational Rehabilitation*. 2004; 20:185–201.
- Callahan, Christopher M.; Wolinsky, Fredric D.; Stump, Timothy E.; Nienaber, Nancy A.; Hui, Sui L.; Tierney, William M. Mortality, Symptoms, and Functional Impairment in Late-Life Depression. *Journal of General Internal Medicine*. 1998; 13:746–752. [PubMed: 9824520]
- Caputo, Jennifer; Simon, Robin W. Physical Limitation and Emotional Well-being Gender and Marital Status Variations. *Journal of Health and Social Behavior*. 2013; 54:240–256.
- Chan, Angelique; Malhotra, Chetna; Malhotra, Rahul; Østbye, Truls. Living Arrangements, Social Networks and Depressive Symptoms among Older Men and Women in Singapore. *International Journal of Geriatric Psychiatry*. 2011; 26:630–639. [PubMed: 20677171]
- Chao, Shiau-Fang. Functional Disability and Psychological Well-being in Later Life: Does Source of Support Matter? *Aging & Mental Health*. 2012; 16:236–244. [PubMed: 21780958]
- Chow, Gregory C. Tests of equality between sets of coefficients in two linear regressions. *Econometrica: Journal of the Econometric Society*. 1960; 28:591–605.
- Cummings, Sherry M.; Neff, James A.; Husaini, Baqar A. Functional Impairment as a Predictor of Depressive Symptomatology: The Role of Race, Religiosity, and Social Support. *Health & Social Work*. 2003; 28:23–32. [PubMed: 12621930]
- Driscoll, Anne K.; Bernstein, Amy B. Health and Access to Care among Employed and Unemployed Adults: United States, 2009–2010. US Department of Health and Human Services, Centers for Disease Control and Prevention. National Center for Health Statistics. 2012. Retrieved May 25, 2013. (<http://www.cdc.gov/nchs/data/databriefs/db83.htm>)
- Erickson, William; von Schrader, Sarah; Lee, Camille. 2010 Disability Status Report, United States. 2012 Retrieved May 27, 2013. (<http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1561&context=gladnetcollect>).
- Field, Marilyn; Alan, Jette, editors. The Future of Disability in America. Washington DC: National Academies Press; 2007. Retrieved May 25, 2013(www.nap.edu/catalog/11898.html)
- Finkelstein, Amy; Taubman, Sarah; Wright, Bill; Bernstein, Mira; Gruber, Jonathan; Newhouse, Joseph P.; Allen, Heidi; Baicker, Katherine. Oregon Health Study Group. The Oregon Health Insurance Experiment: Evidence from the First Year. *The Quarterly Journal of Economics*. 2012; 127:1057–1106. [PubMed: 23293397]

- Freeman, Joseph D.; Kadiyala, Srikanth; Bell, Janice F.; Martin, Diane P. The causal effect of health insurance on utilization and outcomes in adults: a systematic review of US studies. *Medical care*. 2008; 46:1023–1032. [PubMed: 18815523]
- Freid, Virginia M.; Bernstein, Amy B.; Bush, Mary A. Multiple Chronic Conditions among Adults Aged 45 and Over: Trends over the Past 10 Years. Hyattsville (MD): National Center for Health Statistics; 2012. Retrieved May 25, 2013 (http://www.nap.edu/openbook.php?record_id=11898)
- Gayman, Mathew D.; Turner R, Jay; Cui, Ming. Physical limitations and depressive symptoms: exploring the nature of the association. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2008; 63:S219–S228.
- Hanson, Kristina W.; Neuman, Patricia; Dutwin, David; Kasper, Judith D. Uncovering the Health Challenges Facing People with Disabilities: The Role of Health Insurance. *Health Affairs (Project Hope)*. 2003; W3:552–565.
- Horner-Johnson, Willi; Dobbertin, Konrad; Andresen, Elena M.; Iezzoni, Lisa I. Breast and Cervical Cancer Screening Disparities Associated with Disability Severity. *Women's Health Issues*. 2014; 24:e147–e153. [PubMed: 24439941]
- Horner-Johnson, Willi; Dobbertin, Konrad; Lee, Jae Chul; Andresen, Elena M. Disparities in chronic conditions and health status by type of disability. *Disability and Health Journal*. 2013; 6:280–286. [PubMed: 24060250]
- National Center for Health Statistics. Health United States, 2012: With Special Feature on Emergency Care. Hyattsville, MD: 2013. Retrieved October 13, 2013. (<http://www.cdc.gov/nchs/data/healthstats/us12.pdf>)
- Hudson, Christopher G. Socioeconomic Status and Mental Illness: Tests of the Social Causation and Selection Hypotheses. *American Journal of Orthopsychiatry*. 2005; 75:3–18. [PubMed: 15709846]
- Hwang, Wenke; Weller, Wendy; Ireys, Henry; Anderson, Gerard. Out-of-Pocket Medical Spending for Care of Chronic Conditions. *Health Affairs*. 2001; 20:267–278. [PubMed: 11816667]
- Iezzoni, Lisa I.; Frakt, Austin B.; Pizer, Steven D. Uninsured Persons with Disability Confront Substantial Barriers to Health Care Services. *Disability and Health Journal*. 2011; 4:238–244. [PubMed: 22014671]
- Pope, A.; Tarlov, A., editors. Institute of Medicine. Disability in America: Toward a National Agenda for Prevention. Washington, D.C.: National Academy Press; 1991. Retrieved February 13, 2013. (<http://www.nap.edu/openbook.php?isbn=0309043786>)
- Kemp, Bryan. Depression as a Secondary Condition in People with Disabilities. In: Field, MJ.; Jette, AM.; Martin, L., editors. Workshop on Disability in America: A New Look - Summary and Background Papers. Washington, DC: The National Academies Press; 2006. p. 234-250.
- Kempen, Getrudis; Mark Sullivan, IJM.; van Sonderen, Eric; Ormel, Johan. Performance-Based and Self-Reported Physical Functioning in Low-Functioning Older Persons: Congruence of Change and the Impact of Depressive Symptoms. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 1999; 54:380–386.
- Kessler, Ronald C.; Andrews, Gavin; Colpe, Lisa J.; Hiripi, Eva; Mroczek, Daniel K.; Normand, Sharon-Lise T.; Walters, Ellen E.; Zaslavsky, Alan M. Short Screening Scales to Monitor Population Prevalences and Trends in non-Specific Psychological Distress. *Psychological Medicine*. 2002; 32:959–976. [PubMed: 12214795]
- Kessler, Ronald C.; Barker, Peggy R.; Colpe, Lisa J.; Epstein, Joan F.; Gfroerer, Joseph C.; Hiripi, Eva; Howes, Mary J.; Sharon-Lise, Normand T.; Manderscheid, Ronald W.; Walters, Ellen E. Screening for Serious Mental Illness in the General Population. *Archives of General Psychiatry*. 2003; 60:184–189. [PubMed: 12578436]
- Kinne, Susan; Patrick, Donald L.; Doyle, Debra L. Prevalence of Secondary Conditions among People with Disabilities. *American Journal of Public Health*. 2004; 94:443–445. [PubMed: 14998811]
- Koenig, Harold G.; George, Linda K. Depression and Physical Disability Outcomes in Depressed Medically Ill Hospitalized Older Adults. *American Journal of Geriatric Psychiatry*. 1998; 6:230–247.
- Levy, Alice R.; Bruen, Brian K.; Ku, Leighton C. The potential employment impact of health reform on working-age adults with disabilities. *Journal of Disability Policy Studies*. 2012; 24:102–112.
- Longest, Kyle C.; Thoits, Peggy A. Gender, the Stress Process, and Health: A Configurational Approach. *Society and Mental Health*. 2012; 2:187–206.

- McKnight-Eily, Lela R.; Elam-Evans, Laurie D.; Strine, Tara W.; Zack, Mathew M.; Perry, Geraldine S.; Presley-Cantrell, Letitia; Edwards, Valerie J.; Croft, Janet B. Activity Limitation, Chronic Disease, and Comorbid Serious Psychological Distress in US adults-BRFSS 2007. *International Journal of Public Health*. 2009; 54:111–119. [PubMed: 19421709]
- Merikangas, Kathleen R.; Ames, Minnie; Cui, Lihong; Stang, Paul E.; Ustun, TB.; Von Korff, Michael; Kessler, Ronald C. The Impact of Comorbidity of Mental and Physical Conditions on Role Disability in the US Adult Household Population. *Archives of General Psychiatry*. 2007; 64:1180–1188. [PubMed: 17909130]
- Meyers, Allan R.; Mitra, Monika; Walker, Deborah K.; Wilber, Nancy; Allen, Deborah. Predictors of Secondary Conditions in a Sample of Independently Living Adults with High-Level Spinal Cord Injury. *Topics in Spinal Cord Injury Rehabilitation*. 2000; 6:1–8.
- Michael, McWilliams J. Health Consequences of Uninsurance among Adults in the United States: Recent Evidence and Implications. *Milbank Quarterly*. 2009; 87:443–494. [PubMed: 19523125]
- Michalopoulos, Charles; Wittenburg, David; Israel, Dina A.; Warren, Anne. The effects of health care benefits on health care use and health: A randomized trial for disability insurance beneficiaries. *Medical Care*. 2012; 50:764–771. [PubMed: 22643198]
- Minnesota Population Center and State Health Access Data Assistance Center. Integrated Health Interview Series: Version 5.0. Minneapolis: University of Minnesota; 2012.
- Mitra, Monika; Wilber, Nancy; Allen, Deborah; Walker, Deborah K. Prevalence and Correlates of Depression as a Secondary Condition among Adults with Disabilities. *American Journal of Orthopsychiatry*. 2005; 75:76–85. [PubMed: 15709852]
- Nagi, Saad Z. An Epidemiology of Disability among Adults in the United States. *The Milbank Memorial Fund Quarterly. Health and Society*. 1976:439–467. [PubMed: 137366]
- Newacheck, Paul W.; Stoddard, Jeffrey J.; Hughes, Dana C.; Pearl, Michelle. Health Insurance and Access to Primary Care for Children. *New England Journal of Medicine*. 1998; 338:513–519. [PubMed: 9468469]
- Okoro, Catherine A.; Strine, Tara W.; Balluz, Lina S.; Crews, John E.; Dhingra, Satvinder; Berry, Joyce T.; Mokdad, Ali H. Serious Psychological Distress among Adults with and without Disabilities. *International Journal of Public Health*. 2009; 54:52–60. [PubMed: 19363587]
- Okoro, Catherine A. Prevalence and Correlates of Depressive Symptoms among United States Adults with Disabilities using Assistive Technology. *Preventive Medicine*. 2010; 50:204–209. [PubMed: 20100508]
- Ormel, Johan; Rijdsdijk, Fröhling V.; Sullivan, Mark; van Sonderen, Eric; Kempen, Gertrudis I. Temporal and Reciprocal Relationship between IADL/ADL Disability and Depressive Symptoms in Late Life." *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2002; 57:338–347.
- Pauly, Mark V.; Pagán, José A. Spillovers and Vulnerability: The Case of Community Uninsurance. *Health Affairs*. 2007; 26:1304–1314. [PubMed: 17848441]
- Pearlin, Leonard I. The Sociological Study of Stress. *Journal of Health and Social Behavior*. 1989:241–256. [PubMed: 2674272]
- Pearlin, Leonard I. Stress and Mental Health: A Conceptual Overview. In: Horwitz, A.; Scheid, T., editors. *A handbook for the study of mental health: Social contexts, theories, and systems*. New York, NY: Cambridge University Press; 1999. p. 161-175.
- Pearlin, Leonard I. The life course and the stress process: Some conceptual comparisons. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2010; 65:207–215.
- Pearlin, Leonard I.; Menaghan, Elizabeth G.; Lieberman, Morton A.; Mullan, Joseph T. The Stress Process. *Journal of Health and Social Behavior*. 1981; 22:337–356. [PubMed: 7320473]
- Pendo, Elizabeth. Reducing Disparities through Health Care Reform: Disability and Accessible Medical Equipment. *Utah L.Rev*. 2010; 4:1057.
- Pizer, Steven D.; Frakt, Austin B.; Iezzoni, Lisa I. Uninsured Adults with Chronic Conditions or Disabilities: Gaps in Public Insurance Programs. *Health Affairs*. 2009; 28:w1141–w1150. [PubMed: 19843552]

- Prince, Martin J.; Harwood, Rowan H.; Blizard, A.; Thomas, RA.; Mann, AH. Impairment, Disability and Handicap as Risk Factors for Depression in Old Age. The Gospel Oak Project V. *Psychological Medicine*. 1997; 27:311–321. [PubMed: 9089824]
- Rimmer, James H.; Rowland, Jennifer L. Health Promotion for People with Disabilities: Implications for Empowering the Person and Promoting Disability-Friendly Environments. *American Journal of Lifestyle Medicine*. 2008; 2:409–420.
- Russell, David; Turner, R Jay; Joiner, Thomas E. Physical Disability and Suicidal Ideation: A Community-Based Study of Risk/Protective Factors for Suicidal Thoughts. *Suicide and Life-Threatening Behavior*. 2009; 39:440–451. [PubMed: 19792985]
- Scheer, Jessica; Kroll, Thilo; Neri, Melinda T.; Beatty, Phillip. Access Barriers for Persons with Disabilities. The Consumer's Perspective. *Journal of Disability Policy Studies*. 2003; 13:221–230.
- Schnittker, Jason. The Proximity of Common Unhappiness and Misery. *Society and Mental Health*. 2012; 2:135–153.
- Smith, Vernon K.; Gifford, Kathleen; Ellis, Eileen; Rudowitz, Robin; Snyder, Laura. Medicaid in a Historic Time of Transformation: Results from a 50-State Medicaid Budget Survey for State Fiscal Years 2013 and 2014. Kaiser Family Foundation. 2013 Retrieved on October 22, 2013. (<http://kaiserfamilyfoundation.files.wordpress.com/2013/10/8498-medicaid-in-a-historic-time-of-transformation.pdf>).
- Sommers, Anna S. Access to Health Insurance, Barriers to Care, and Service use among Adults with Disabilities. *Inquiry*. 2006; 43:393–405. [PubMed: 17354373]
- Taylor H, Krane D, Orkis K. The ADA, 20 years later. New York: Harris Interactive (conducted for the Taylor, Krane and Orkis and National Organization on Disability). 2010 Retrieved May 25, 2013. (<http://www.2010disabilitysurveys.org/octsurvey/pdfs/surveyresults.pdf>).
- Thoits, Peggy A. Stressors and Problem-Solving: The Individual as Psychological Activist. *Journal of Health and Social Behavior*. 1994; 35:143–159. [PubMed: 8064122]
- Thoits, Peggy A. Self-Labeling Processes in Mental Illness: The Role of Emotional Deviance. *American Journal of Sociology*. 1995; 91:221–249.
- Turner, R Jay; Beiser, Morton. Major Depression and Depressive Symptomatology among the Physically Disabled: Assessing the Role of Chronic Stress. *The Journal of Nervous and Mental Disease*. 1990; 178:343–350. [PubMed: 2140853]
- Turner, R Jay; Wood, William D. Depression and Disability: The Stress Process in a Chronically Strained Population. *Research in Community & Mental Health*. 1985; 5:77–109.
- Turner, R Jay; Beiser, Morton. Major Depression and Depressive Symptomatology among the Physically Disabled: Assessing the Role of Chronic Stress. *Journal of Nervous and Mental Disease*. 1990; 178:343–404. [PubMed: 2140853]
- Turner, R Jay; Lloyd, Donald A.; Taylor, John. Physical Disability and Mental Health: An Epidemiology of Psychiatric and Substance Disorders. *Rehabilitation Psychology*. 2006; 51:214–223.
- Turner, R Jay; McLean, Peter D. Physical Disability and Psychological Distress. *Rehabilitation Psychology*. 1989; 34:225–242.
- Turner, R Jay; Noh, Samuel. Physical Disability and Depression: A Longitudinal Analysis. *Journal of Health and Social Behavior*. 1988; 29:23–37. [PubMed: 2966841]
- Turner, R Jay; Avison, William R. Status variations in stress exposure: Implications for the interpretation of research on race, socioeconomic status, and gender. *Journal of Health and Social Behavior*. 2003; 44:488–505. [PubMed: 15038145]
- Verbrugge, Lois M.; Jette, Alan M. The Disablement Process. *Social Science & Medicine*. 1994; 38:1–14. [PubMed: 8146699]
- Verbrugge, Lois M.; Rennert, Catherine; Madans, Jennifer H. The Great Efficacy of Personal and Equipment Assistance in Reducing Disability. *American Journal of Public Health*. 1997; 87:384–392. [PubMed: 9096538]
- Von Korff, Michael; Ormel, Johan; Katon, Wayne; Lin, Elizabeth HB. Disability and Depression among High Utilizers of Health Care: A Longitudinal Analysis. *Archives of General Psychiatry*. 1992; 49:91–100. [PubMed: 1550468]

- Wells, Kenneth B.; Stewart, Anita; Hays, Ron D.; Burnam, MAudrey; Rogers, William H.; Daniels, M.; Berry, Sandra H.; Greenfield, Sheldon; Ware, John E. The Functioning and Well-being of Depressed Patients. Results from the Medical Outcomes Study. JAMA. 1989; 262:914–919. [PubMed: 2754791]
- Whiteneck, Gale. Workshop on disability in America: A new look. Washington DC: The National Academies Press; 2006. Conceptual models of disability: past, present, and future; p. 50-66.
- World Health Organization. International Classification of Functioning, Disability and Health. Geneva, Switzerland: World Health Organization; 2001. Retrieved May 27, 2013. (<http://www.who.int/classifications/icf/>)
- Yang, Yang. How Does Functional Disability Affect Depressive Symptoms in Late Life? The Role of Perceived Social Support and Psychological Resources. Journal of Health and Social Behavior. 2006; 47:355–372. [PubMed: 17240925]

Table 1

Descriptive Statistics by Disability

	Disability (N=10,325, 17.2%)			No Disability (N=47,633, 82.8%)			Total (N=57,958)		
	N	%	SE	N	%	SE	N	%	SE
Number of limitation types ($\bar{x}$)	10,325	1.6	0.0	47,633	0.0	-----	57,958	0.3	0.0
K-6 scores ($\bar{x}$)	10,325	4.3	0.0 ***	47,633	1.9	0.0	57,958	2.3	0.0
Race									
Non-Hispanic White	5,884	67.7	0.7	26,189	65.6	0.4	32,073	66.0	0.4
Non-Hispanic Black	2,153	15.1	0.5	7,117	11.5	0.3	9,270	12.1	0.3
Hispanic	1,672	12.2	0.4	10,192	16.0	0.3	11,864	15.3	0.3
Asian	321	2.4	0.2	3,324	5.4	0.2	3,645	4.9	0.2
Other	280	2.6	0.2	748	0.5	0.1	1,028	0.6	0.1
Age ($\bar{x}$)	10,325	46.5	0.2 ***	47,633	39.1	0.1	57,958	40.3	0.1
Gender: Female	6,116	55.1	0.6	25,411	49.4	0.3	31,527	50.4	0.3
Marital status									
Single/Never married	2,679	23.6	0.6	15,859	30.9	0.4	18,538	29.7	0.4
Sep/Div/Wid	3,435	24.5	0.5	8,678	12.9	0.2	12,113	14.9	0.2
Married	4,180	51.9	0.7	22,976	56.1	0.4	27,156	55.4	0.4
Education									
Less than High School	2,128	29.0	0.6	6,271	11.6	0.3	8,399	12.9	0.3
Completed High School	3,158	31.7	0.6 **	11,519	25.1	0.3	14,677	26.2	0.3
Some college	2,119	20.5	0.5	9,782	21.1	0.3	11,901	21.0	0.3
College degree+	2,873	27.8	0.6 ***	19,865	42.2	0.4	22,738	39.9	0.4
Unemployed	5,200	48.0	0.7 **	11,045	22.6	0.3	16,245	27.0	0.3
Poverty									
Less than 100% FPL	2,572	19.1	0.5	6,903	10.9	0.3	9,475	12.3	0.3
100–199% FPL	2,483	22.8	0.5	8,412	15.9	0.3	10,895	17.1	0.3
200–299% FPL	1,684	17.4	0.5	7,580	15.7	0.2	9,264	16.0	0.2
300–399% FPL	1,174	12.7	0.4	6,280	13.9	0.2	7,454	13.7	0.2
400%+ FPL	2,412	28.1	0.6 ***	18,458	43.6	0.4	20,870	40.9	0.4

	Disability (N=10,325, 17.2%)			No Disability (N=47,633, 82.8%)			Total (N=57,958)		
	N	%	SE	N	%	SE	N	%	SE
Health status									
Poor/Fair health	3,691	32.7	0.6 ***	2,243	4.1	0.1	5,934	9.0	0.2
1+ Chronic conditions	6,183	57.9	0.7 ***	14,177	30.1	0.3	20,360	34.9	0.3
Health Insurance									
Uninsured	2,178	20.7	0.5	10,812	21.2	0.3	12,990	21.1	0.3
Public insurance	3,010	26.2	0.6 **	4,241	7.3	0.2	7,251	10.6	0.2
Private insurance	4,906	53.1	0.7 **	31,843	71.5	0.4	36,749	68.4	0.4

*
p .05;

**
p .01;

p .001, significant differences between persons with disability and persons without disability.

Note: Chi-square test for differences between groups for categorical variables; t-test (two-tailed) for differences in mean age and mean K-6 scores.

Table 2

OLS Regressions of Psychological Distress on Demographics, Socioeconomic Characteristics, Health Status, Health Insurance and Number of Limitations Types

	Model 1		Model 2		Model 3	
	Coef.	SE	Coef.	SE	Coef.	SE
Number of limitation types	1.52***	0.04	1.39***	0.04	1.12***	0.04
Demographics						
Race (ref: White)						
Non-Hispanic Black			-0.40***	0.05	-0.46***	0.05
Hispanic			-0.39**	0.05	-0.43***	0.05
Asian			0.02	0.14	-0.06	0.14
Other			-0.56***	0.06	-0.50***	0.06
Age (ref : 18–25)						
26–45			0.12	0.06	-0.01	0.06
46–64			-0.28***	0.06	-0.53***	0.06
Female (ref: male)			0.28***	0.06	0.30***	0.03
Marital Status (ref: never married)						
Sep/Div/Wid			0.16*	0.06	0.12	0.06
Married			-0.34***	0.04	-0.31***	0.04
Socioeconomic characteristics						
Education (ref: less < High School)						
Completed High School			-0.13	0.07	-0.03	0.07
Some college			-0.10	0.07	0.01	0.07
College degree and higher			-0.31***	0.07	-0.13*	0.06
Employed			-0.27***	0.04	-0.14***	0.04
Poverty (ref: <100% of FPL)						
100–199% FPL			-0.23***	0.07	-0.20**	0.07
200–299% FPL			-0.51***	0.07	-0.37***	0.07

	Model 1		Model 2		Model 3	
	Coef.	SE	Coef.	SE	Coef.	SE
300–399% FPL			–0.70***	0.07	–0.50***	0.07
400%+ FPL			–0.82***	0.06	–0.58***	0.06
Health Status						
Good self-rated health (ref: fair/poor)					–1.37***	0.09
1+ Chronic conditions					0.55***	0.03
Health Insurance (ref:uninsured)						
Public					–0.32***	0.07
Private					–0.45***	0.04

* p .05;
** p .01;
*** p .001

Separate Regressions of Psychological Distress on Demographics Socio-economic Characteristics, Health Status and Number of Limitation Types by Health Insurance Status

Table 3

	Uninsured		Public		Private	
	Coef.	SE	Coef.	SE	Coef.	SE
Number of limitation types	1.42***	0.10	0.92***	0.05	1.12***	0.05
Demographics						
Race (ref: White)						
Non-Hispanic Black	-0.43***	0.13	-0.82***	0.12	-0.41***	0.06
Hispanic	-0.70***	0.10	-0.54**	0.12	-0.20***	0.05
Asian	0.51	0.33	-0.23**	0.31	-0.27	0.16
Other	-1.02***	0.16	-0.96**	0.23	-0.37***	0.07
Age (ref : 18–25)						
26–45	-0.15	0.12	0.10	0.13	0.10	0.07
46–64	-0.83**	0.13	-0.81***	0.16	-0.32***	0.07
Female (ref: male)	0.3	0.08	0.24***	0.08	0.29***	0.03
Marital Status (ref: never married)						
Sep/Div/Wid	0.20	0.12	0.24	0.13	0.01	0.06
Married	0.34***	0.10	-0.08*	0.04	0.37***	0.05
Socioeconomic characteristics						
Education (ref: less than High School)						
Completed High School	0.15	0.14	-0.17	0.12	-0.19*	0.07
Some college	0.09	0.14	-0.12	0.11	-0.04	0.09
College degree and higher	0.01	0.14	-0.57**	0.11	-0.21*	0.09
Employed	0.40***	0.09	-0.06	0.10	-0.05	0.04
Poverty (ref:< 100% of FPL) 100–199% FPL	-0.16	0.12	-0.32***	0.11	-0.15	0.11
200–299% FPL	-0.34*	0.13	-0.58***	0.16	-0.33***	0.10
300–399% FPL	-0.43**	0.16	-0.66***	0.22	-0.50***	0.10

	Uninsured			Public			Private		
	Coef.	SE		Coef.	SE		Coef.	SE	
400%+ FPL	−0.33	0.14	*	−0.97	0.19	***	−0.59	0.10	***
Health Status									
Good self-rated health (ref: fair/poor)	−1.63	0.19	***	−1.62	0.13	***	−1.09	0.11	***
1+ Chronic conditions	0.85	0.13	***	0.82	0.10	***	0.42	0.04	***

* p .05;
** p .01;
*** p .001