Disability, Health Insurance and Serious Psychological Distress among US Adults: Evidence from the IHIS

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Introduction

Research has consistently demonstrated the presence of a positive association between disability and various mental health outcomes (Breslin et al 2006; Okoro et al. 2009; Turner and Noh 1988; Turner and McLean 1989; Turner, Lloyd and Taylor 2006; Turner and Beiser 1990); suggesting that disability prevents individuals from performing social roles and participating in activities that improve their mental health. Disability is conceptualized as a source of chronic stress or a chronic strain that taxes mental health (Turner and Beiser 1990). As a result, much of the literature on mental health outcomes among individuals with disabilities has focused on resources that may reduce chronic stress. Social support, religiosity, self-esteem, coping, marital status, and access to other psychosocial resources have been investigated as mediators of the relationship between disability and mental health outcomes, and have been shown to reduce chronic stress (Bierman 2012; Brown and Turner 2010; Cummings, Neff and Husaini 2003; Russell 2009).

Fewer studies have looked at external and structural resources that may lie on the pathway between disability and mental health outcomes. To address this gap, this paper will explore health insurance as a moderator in the relationship between disability and poor mental health. Access to timely medical care may prevent people with primary disabling conditions

from developing additional physical ailments (secondary conditions) that could further compromise their ability to lead productive lives (Chevarley et al. 2006; Wilber et al. 2002). This is especially important because having a disability increases the risk of comorbid mental health problems (Cadman et al. 1987; Chevarley et al. 2006; Ormel et al. 1997; Prince et al. 2007). Finding ways to interrupt this pathway is essential for individual and population-level health (Wilber et al. 2002). And, a better understanding of the role of structural factors like insurance coverage could advance specific efforts of policy-makers and clinicians to improve the overall health of individuals with disabilities.

Disability and mental health

The relationship between disability and mental health is bidirectional and mutually reinforcing (Prince et al. 2007). In a longitudinal analysis using data from Ontario, Turner & Noh (1988) found that physical disability significantly increased the risk of depression across different age groups. Bruce et al. (1994) documented similar results using data from the New Haven site of the 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). Other than the stress associated with limitations, the presence of a disability may result in intermediary conditions and behaviors that lead to a decline in mental health (McKnight-Eily et al. 2009; Turner and Beiser 1990).

Other studies have provided support for the hypothesis that depressive symptoms lead to a decline in physical health and could either lead to functional and activity limitations or worsen ongoing disability over time (Brenes et al. 2008; Bruce and Hoff 1994; Gallo et al.1997; Gallo 2003; Jaffe, Froom and Galambos 1994; Penninx et al. 1999; Ware et al. 1999). Controlling for a

large number of self-reported and objective health conditions among adults aged 70- 79, Bruce and colleagues (1994) found that the onset of an activities of daily living (ADL) disability was predicted by baseline depressive symptoms. A prospective cohort study also found non-disabled older adults with depression to have four times greater risks of ADL disability (Penninx et al.1999). Depression is disabling and disability engenders depression. Sometimes these occur simultaneously such that delineating causal pathways is challenging (Bruce et al. 1994; Callahan et al. 1998; Kempen et al.1999; Koenig and George 1998; Von Korff et al.1992).

This current study does not attempt to provide support for one or both directions of the bi-directional causal pathway. Rather, we focus on a single polarity; from disability to psychological distress and assess how access to care moderates this relationship. One measure of mental health and psychological well-being is serious psychological distress (SPD). SPD is closely related to physical and mental disabilities and lower health-related quality of life (Shih and Simon 2008). Okoro and colleagues used data from the 2007 Behavioral Risk Factor Surveillance System (BRFSS) to examine the relationship between disability and SPD. They found that adults with disabilities were nearly seven times more likely to have SPD and that having both a disability and SPD put respondents at significantly greater risk of receiving care for a mental health problem (Okoro et al. 2009). Similar studies using the same data found SPD rates among adults with diabetes to be twice that of those without SPD (Li et al. 2009), and to be significantly associated with a history of cardiovascular disease (Fan et al. 2009). Other studies have found SPD to be related to disability from arthritis (Shih et al. 2006), prevalence of other chronic conditions (Shih and Simon 2008), and increased mortality risk (Pratt 2009).

Disability and access to care

Access to care has been studied among different populations. While the health care needs of individuals with disabilities are generally similar to those of persons without disabilities, the very presence of disability may increase the need for greater frequency of care and/or more specialized care (Drainoni 2006; Neri and Kroll 2003). As evidence of this, health care use and health care expenditures are both higher among people with disabilities than people without (Fried et al. 2001; Newacheck et al.1998; Newacheck, Inkelas and Kim 2004; Wisdom et al. 2010). And, as a group, people with disabilities may experience different barriers to health care. For example, Scheer (2003) identified environmental barriers (i.e. transportation) and barriers related to how health care providers deliver services (i.e. disability literacy) in addition to structural barriers like health insurance. Generally, people with disabilities have more unmet need for care because they are more severely affected by barriers to care or are lack comprehensive health care coverage (Beatty et al. 2003; Burns et al.1990; Kirschner, Breslin and Iezzoni 2007; Kroll et al. 2006; Long, Coughlin and Kendall 2002). Access to medical care or the lack thereof has consequences on both physical and mental health (Hagglund et al. 1999; Neri and Kroll 2003) and theoretically should affect the relationship between disability and mental health. While it does not overcome all of the structural barriers to receiving care, having high quality health insurance is one way to promote access to healthcare (Baker, Shapiro and Schur 2000; Newacheck et al. 1998), which, in turn, can help to reduce the development of secondary disabling conditions, including mental health problems for individuals with disabilities.

Current study

In this study, we continue to explore the relationship between disability and SPD. We describe the relationship between insurance and SPD for persons with and without a disability. We also examine whether insurance moderates the relationship between disability and SPD. To our knowledge, no study has explored how having health insurance coverage might affect the probability of distress among persons with disabilities. Our study therefore expands the literature on disability and mental health. Both disability and mental health problems significantly increase the burden of sickness and health care in U.S. As reviewed, previous studies have assessed the presence of mediating and moderating variables in the relationship between disability and different mental health outcomes, most of which have been psychosocial variables. While these studies are important and provide information on the nature of the relationship of interest, psychosocial mediators such as social support and coping skills are almost always the responsibility of persons with disability and their immediate family members. Conversely, insurance coverage can be improved by policy decisions that affect a large number of persons with disabilities.

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) from 1969 to present (Minnesota Population Center 2012). The NHIS is a cross sectional nationally representative dataset available for public use and collected annually in an ongoing process since 1957 by the National Center for Health Statistics. The NHIS uses a multi-stage probability sample frame to obtain data that represents the civilian non-institutionalized population of the United States. The NHIS utilizes a sampling frame that is based on geographical areas, and a

complex survey that incorporates both clustering and stratification. First, the United States is divided into primary sampling units (PSUs) by geography. PSUs are then stratified by socio demographic factors. Second, geographic segments are sampled from within each PSU. Third, segments sampled from each PSU are then divided into clusters. The clusters contain approximately 4-9 houses each. All eligible members of the housing units in the sample are invited to participate in a face to face computer-assisted personal interviewing in households. A sample adult and sample child are also randomly selected from each family (Minnesota Population Center 2012). NHIS uses expansion weights that also represent annual inflation factors. The weight of each person represents other individuals in the total US population for a given year.

We pooled samples from 2008 to 2010 and used the IHIS-created sample person weight which 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 3 to represent the population for the 3 year period from 2008-2010. We excluded respondents whose disability was caused by alcohol or drug problems, depression, anxiety and other emotional, behavioral or mental problems who, to reduce endogeniety between disability and SPD. 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 40, 171 U.S. adults.

Measures

Serious Psychological Distress (SPD): We classified respondents as having SPD based on their Kessler-6 (K6) score. The K6 score is a nationally validated instrument used for assessing non-specific serious psychological distress (Furukawa et al. 2003; Kessler et al. 2002). It 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 The score is created by assigning 0 to 4 points for each of these questions: - a score of 0 for "none of the time"; 1 for "a little of the time"; 2 for "some of the time"; 3 for "most of the time"; and 4 for "all of the time". These scores were summed to generate a K6 scale ranging from 0 to 24. Based on the literature, persons with a K-6 score of 13 or more are indicated to have SPD.

Disability: In this study, we measure disability using limitations regarding certain activities and tasks: activities of daily living (ADL) and instrumental activities of daily living (IADL). ADL assesses an individual's ability to take care of themselves, e.g. getting around inside the home, bathing, eating and dressing; while IADL evaluates the ability of individuals to be self-reliant in the context of a particular environment, e.g. preparing meal, shopping (Jette 1994; Spector et al.1987). However, from the perspective of the individual with disability, ADLs are not necessarily less instrumental than IADLs activities (Jette, 1994). Because ADLs and IADLs depend on fundamental mental and physical functioning (Verbrugge and Jette 1994), individuals who reported needing assistance with one or more ADLs or IADLs were classified as having a disability.

Insurance: We used three insurance categories; the uninsured, those with public insurance coverage (coverage through Medicaid, other-state sponsored or government programs) and those with private coverage (coverage through the workplace, union membership, or purchased directly.

Covariates: We included race and ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, American Indian and Alaskan Native, Asian, multiple or other), age (18-34, 35-44, 45-64), sex, marital status (single/never married, divorced/separated/widowed, married), education

(0-8 years, 9-12th grade, completed high school, some college, college degree, and graduate degree), employment status, annual household income (less than 100% of FPL,100–199% of FPL, 200-299% of FPL, 300-399% of FPL and 400% or more of the FPL) and self-rated health (0= fair or poor /1=good, very good , excellent) , as it may covary with disability and SPD.

Analysis plan

Bivariate analyses of association were performed to characterize the sample with no disability, and the sample with disability. These results are presented in tables and figures using percentages. We performed bivariate and multivariate logistic regressions to identify predictors of SPD in our sample. Models were built sequentially by starting with unadjusted models, then adding socio-demographic variables, health status and health insurance. Next, we included an interaction term between disability and health insurance (insured/uninsured) to examine whether insurance coverage moderates the relationship between disability and SPD. Finally, we limited our sample to those with insurance coverage and interacted coverage type (public/private) with disability. In both the bivariate association analyses and regression models, we used sampling weights to account for the differential selection probability and to guarantee that results correct the estimated variances. Standard errors for significance tests were constructed using Taylor Series Linearization in Stata 11. Results of logistic regression analyses are presented in odds ratios and corresponding standard errors.

Results

Table one presents the characteristics of persons without disability, persons with IADL and ADL disabilities. As shown, most persons with disability are likely to have SPD, and fall into the lower education, income, poor self -rated health and unemployment categories. The group without disability is significantly younger, with more structural advantages.

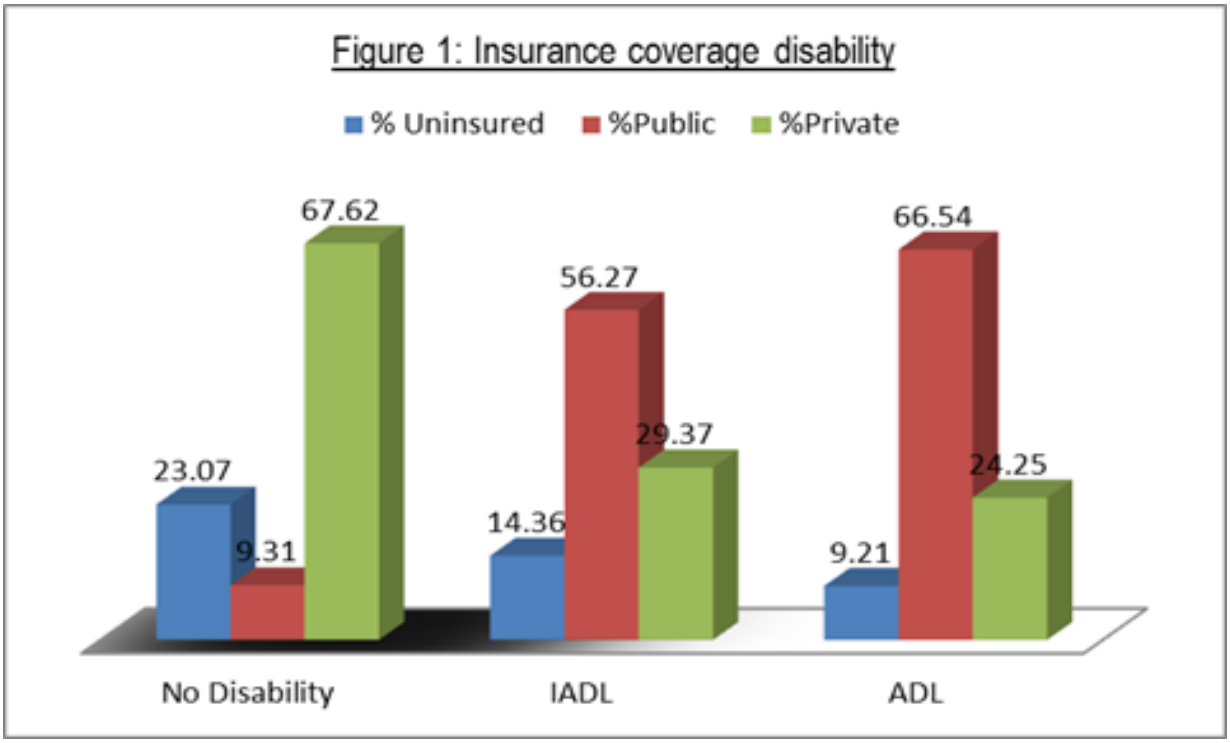
Table 1: Characteristics of sample by disability type (Weighted)

	No disability (n=38,838) (%)	IADL disability (n=788) (%)	ADL disability (n=545) (%)
SPD	2.8 [a,b]	14.6[c]	19.7
Non-Hispanic White	65.5	65.5	59.6
Non-Hispanic Black	11.7	17.5	23.7
Hispanic	15.9	12.2	10.7
AIAN	0.5	0.2	1.1
Asian	5.3	2.4	1.8
Other	1	2.2	3.2
Age	39.3 ($\bar{x}$) [a,b]	47.8($\bar{x}$)	48.1($\bar{x}$)
Male	50.2	44.3	49.1
Single/Never married	30.6	32.8	33.4
Separated/Divorced/Widowed	13.1	28.8 [b,c]	26.2
Married	56.3	38.4	40.4
8th grade	5.5	11.9	16.1
9th-12th grade	6.3	10.1	11
Completed High School	25.3	34.1	35.8
Some college	21.1	20.2 [b,c]	16.7
College degree	31.4	20.5	17.1[c]
Graduate degree	10.4 [a,b]	3.2	3.3
Employed	77.1 [b]	72.3 [b]	49.5 [a,c]
Less than 100% of FPL	11	28.5	33.6
100–199% of FPL	16.1 [a,b]	27.4	29.2
200-299% of FPL	15.8	15.7	11.4
300-399% of FPL	13.9	10.2	9.5
400% or more of FPL	43.2 [a,b]	18.1 [b]	16.3 [a,c]
Good/V.good/excel self -rated health	95.5 [a,b]	43 [b]	28.1 [a,c]

Superscript indicates difference between groups ($p<0.05$); a=different from group with IADL disability, b=different from group with ADL disability, c=different from group with no disability

As shown in figure 1, persons with ADL disability are more likely to have public than private coverage. As expected, private insurance coverage was greater among respondents with no disability. About 68% of respondents without disability had private health insurance coverage, almost three times the proportion of persons with ADL disability who report private

insurance coverage. However, uninsurance rates were comparatively lower among persons with IADL and ADL, and a rise in public insurance is seen among these groups.



The results of logistic regression models are shown on table 2. In model 1, we identify predictors of SPD in the entire sample. Although not shown, analyses were performed separately on the groups with disability and on the group without any disability. Predictors of SPD were similar in all groups. Model 2 assesses whether there is a significant two-way interaction between disability and insurance status. The final model, model 3 is restricted to persons who are insured. It examines whether the type of insurance coverage matters in the relationship between disability and SPD.

As expected, persons with ADL or IADL disabilities were significantly more likely to experience SPD compared to those who report no limitations in performing any ADLs or IADLS (OR= 5.30, C.I =3.9, 7.2). Females and persons who are separated, divorced or widowed also had greater odds of SPD, regardless of disability status. Although one might expect older

disabled persons to be more vulnerable to SPD, our findings show that persons between the ages of 55-64 are significantly less likely than younger persons (18-34years) to suffer from SPD (OR= 0.60, C.I=0.43, 0.81). Odds of SPD were also lower among non-Hispanic Blacks and Hispanics, compared to Whites; persons with advanced degrees, persons whose annual family income is 200% or more above FPL and persons who had health insurance coverage.

Table 2: Odds ratios from logistic regressions of SPD on disability

	All Sample				Insured Sample	
	Model 1		Model 2		Model 3	
	OR	SE	OR	SE	OR	SE
Disability (ADL or IADL)	5.30*	0.8	6.1*	1.7	3.19*	0.64
Black, non-Hispanic	0.68*	0.09	0.68*	0.09	0.64*	0.11
Hispanic	0.73*	0.1	0.73*	0.1	0.91	0.15
35-44 years old	1.12	0.16	1.22	0.15	1.23	0.2
45-54	1.07	0.15	1.07	0.15	1.21	0.21
55-64	0.60*	0.09	0.60*	0.09	0.64*	0.12
Female	1.28*	0.1	1.29	0.11	1.29*	0.14
Separated / div / widowed	1.42*	0.16	1.42	0.18	1.51*	0.22
Married	0.96	0.12	1	0.13	1.1	0.17
Good self-rated health	0.31	0.04	0.31	0.03	0.27*	0.04
9th-12th grade	1.07	0.2	1.07	0.21	0.97	0.26
Completed High School	1.01	0.16	1.01	0.16	0.92	0.19
Some college	1.16	0.18	1.16	0.19	1.19	0.26
College degree	0.81	0.15	0.81	0.15	0.77	0.18
Graduate degree	0.38*	0.1	0.38*	0.12	0.41*	0.15
Employed	0.73*	0.08	0.72*	0,08	0.73*	0.1161
100-199% of FPL	0.96	0.12	0.96	0.12	0.86	0.13
200-299% of FPL	0.7*	0.09	0.7*	0.09	0.631*	0.12
300-399% of FPL	0.54*	0.1	0.54*	0.1	0.53*	0.12
400% or more of FPL	0.47*	0.07	0.47*	0.07	0.417*	0.08
Insured	0.73*	0.04	0.74*			
Private					0.53*	0.08
Disability X Insured			0.86	0.2		
Disability X Private					1.98*	0.5

*Significant at p<0.05

We included a multiplicative interaction term in model 2 to assess whether the association of disability with SPD is moderated by insurance status. This interaction term was not significant; a change in the odds of SPD due to disability did not depend on whether the respondent had insurance coverage. Among persons who have health insurance, we assessed whether the effect of disability on SPD was conditional on the kind of coverage that was reported. We did in fact, find a significant interaction effect (OR=1.98, C.I. =1.1, 3.5). Persons with ADL or IADL disability on private insurance coverage had greater odds of SPD compared to others with disability that have public insurance coverage.

Discussion and Implications

Stressors such as unemployment, lack of higher education, and low family income are associated with SPD. These are exacerbated among people with disabilities. According to the Stress Theory, exposure to such stressors should directly predict distress but access to resources mediates or moderates this relationship (Pearlin et al. 1981; Pearlin 1989, 1999). Our analyses are consistent with this theory and with previous research (Okoro et al. 2009; Shih et al. 2006). Persons with disabilities occupy lower socio-economic positions than persons without disabilities. With lower SES increasing the risk of negative mental health outcomes (Aneshensel, Rutter and Lachenbruch 1991; Aneshensel 1992, 2009; Hudson 2005; Schnittker 2012), persons with ADL and IADL disabilities are more vulnerable to SPD. Structural advantages limit the degree to which chronic stressors affect mental health outcomes by shaping the appraisal of the stressor (i.e. disability), and preventing exposure to even more disabling conditions (Longest and Thoits 2012; Thoits1994, 2010). Although disability may limit the possession of certain structural advantages, efforts should be made to increase access to education and provide accommodations that facilitate the integration of working age people with

disabilities into the workforce (Burkhauser and Stapleton 2004). Increasing the quantity and quality of structural and psychological resources will go a long way to moderate the impact of disability on mental health (Brown and Turner 2010; Cummings et al. 2003; Russell 2009).

Even though access to health care is a multidimensional concept, health insurance coverage is an important measure of access. While the majority of persons with disability 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; Pagán and Pauly 2006; 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). Access to affordable health coverage among the relatively small proportion of persons with disability who are simultaneously uninsured should be improved.

Most individuals with disabilities are publicly insured. With low rates of labor force participation, individuals with disabilities are less likely to have employer-sponsored health plans and are more likely to participate in Medicaid or Medicare programs (DeJong, Palsbo and Beatty 2002). Fortunately, we found the odds of SPD to be lower among disabled individuals with public coverage than their counterparts with private coverage. Previous studies have suggested that compared to private insurance and Medicare, Medicaid provides the best coverage for services that are most needed by persons with disabilities (Anderson and Knickman 2001), and

that public insurance, in general, offers affordable access to health care services that are specific to the needs of individuals with disabilities (Kirschner, Breslin and Iezzoni 2007; Long, Coughlin and Kendall 2002), the majority of whom are unemployed. For most working adults younger than 65 years, out-of-pocket expenses have been predicted to be the lowest among those covered by Medicaid; possibility due to limitations on cost sharing (Hwang et al. 2001). Public coverage therefore improves access and expands range of coverage. For persons with disabilities, this directly decreases emotional stress that can be caused by the lack of health care, and prevents secondary negative health outcomes from unmet needs, ultimately reducing the odds of SPD.

Broadening eligibility criteria for Medicaid and other public health insurance plans could significantly reduce poor mental health outcomes among persons with disabilities. One of the mandates of the Affordable Care Act (ACA) is the expansion of Medicaid. The ACA obliges states to cover childless adults under the age 65 with yearly incomes up to 133% of the FPL through their Medicaid programs as of January 2014 (Ku 2010). Passage of the ACA might therefore provide significant mental and physical health benefits for people with disabilities.

Findings in this study should be considered in light of three important caveats. First, our sample is limited to non-institutionalized populations, leaving out individuals in nursing homes, hospitals, prisons and other institutions with disproportionate number of persons who might have disabilities or be uninsured. Second, we confined disability to limitations in performing ADLs and IADLs. Although these measures might assess degrees of functioning, they generally reflect activity limitations and do not take accommodations or the use of special equipment into consideration (Lynch, Brown and Taylor 2009). Third, cross sectional data does not permit us to assess the directionality of the association between disability and SPD.

Conclusion

Given that the absence of SPD is an indicator of good mental health, 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 are almost always the responsibility of persons with disability and/or their immediate family members, for example religiosity, partner status, level of physical pain, mastery, and perceived social support (Bierman and Statland 2010; Cummings et al. 2003; Fitzpatrick et al.1991; Gayman, Turner and Cui 2008; Norton et al. 2008). Conversely, expanding access to public insurance to address the high cost-sharing and limitations on benefits imposed by private plans are issues that can be resolved by state and federal policy decisions, and can significantly improve the lives of persons with disabilities.

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