

Disability, Obesity, and Employment: Exploring Nationally-Representative Data

Jennifer Tennant^{*} and Inas Rashad Kelly[†]

ABSTRACT

A recent report by the Office of Disability, Aging and Long-Term Care Policy of the U.S. Department of Health and Human Services stressed the need for a national disability survey. We examine differences in the wording of disability questions in two nationally-representative data sets, the Behavioral Risk Factor Surveillance System (BRFSS) and the National Health Interview Survey (NHIS). We link this information to information on obesity and employment for disabled persons in order to predict employment for these individuals using difference-in-differences models. Disabled individuals are significantly less likely to work, a trend that may change in light of the 2008 amendments to the Americans with Disabilities Act of 1990.

INTRODUCTION

It is estimated that the Federal Government spent \$357 billion in 2008 on programs that provide services to adults with disabilities (Livermore et al. 2011a). This is one of the reasons we need to better understand this group of individuals and have access to nationally-representative data sets that allow researchers to assess the needs of this population (Livermore et al. 2011b) and to predict the effectiveness of current and proposed policies.

A recent review of 40 national surveys highlighted shortcomings in existing data, including extreme variation in measures of disability (or no adequate measure at all) and insufficient sample sizes (Livermore et al. 2011b). A subsequent report by the Office of Disability, Aging and Long-Term Care Policy of the U.S. Department of Health and Human Services stressed the need for a national disability survey (Livermore et al. 2011c).

The Americans with Disabilities Act (ADA) of 1990 expanded employment opportunities for people with disabilities. The ADA expanded on a previous disability law that only covered public sector employees and applies to private employers, state and local governments, employment agencies, and labor unions. The ADA was signed into law in 1990 and enacted two years later. As of July 1992, employers with 25 or more employees were covered, while employers with 15 or more employees were covered starting July 1994.

Consequently, questions on disability began to become more prevalent in national surveys. In 1993, the Behavioral Risk Factor Surveillance System (BRFSS) began to ask question on limitations in work

^{*} Ithaca College, Department of Economics – Email: jtennant@ithaca.edu

[†] CUNY Queens College, Department of Economics – Email: inas.kelly@qc.cuny.edu

and activities due to physical and mental health problems. However, these questions were “module” questions rather than “core” ones, and thus only asked of a very limited subset of respondents. In 2001, questions on use of equipment and limitations in activity were asked in the “core” component of the BRFSS (and thus asked of most respondents).

Perhaps the best effort in existence for a national, large-scale collection of disability data is represented by the National Health Interview Survey of Disability (NHIS-D), conducted from 1994 to 1997 (Livermore et al. 2011b). More recent, comparable disability collection efforts do not appear to exist.

Of the surveys Livermore et al. (2011b) summarized:

The BRFSS, MEPS, NHANES, NHIS, PSID, and SIPP contain a substantial amount of information on health and disability, but even among these surveys the level of detail varies considerably. Some, like the BRFSS, collect relatively simple information on issues relevant to disability, such as functional limitations, use of special equipment, and need for assistance or care. At the other end of the spectrum, the SIPP and the NHIS contain numerous measures of health status and disability (p.5).¹

For this reason, we analyze data from the BRFSS from 1993 to 2008, and subsequently compare results with those from the 2008 National Health Interview Survey (NHIS), which contains much more comprehensive data on disability than does the BRFSS. One of the key advantages of the BRFSS is that state-level estimates can be made, with geographic information made publicly available.

Our aims are as follows: (1) To compare means between the 2008 NHIS and BRFSS data sets, (2) To predict employment for disabled individuals in the BRFSS and NHIS, using obese individuals as a comparison group in some models that utilize difference-in-differences (DD) analysis, and (3) To compare estimates using various different measures of disability. We also run some DD models using the full BRFSS and comparing pre- and post-1999, when some key ADA-related court cases took place.

WHAT QUALIFIES AS A DISABILITY?

The lack of consistency across data sets of the definition of a disability can be problematic, but more importantly, it is problematic when applying the ADA in court cases. Disabilities can include hearing impairments, vision impairments, physical disabilities, mental disabilities, self-care disabilities, and independent living limitations. Under the ADA, a disability is defined as: “(A) a physical or mental impairment that substantially limits one of the major life activities of such individual; (B) a record of such impairment; or (C) being regarded as having such impairment” (Thompson 2010). In order to be protected by the Americans with Disabilities Act, a person must be “qualified” (that is, able to meet the legitimate skill, experience, education, or other requirements of an employment position that he or she holds or seeks) as well as be able to perform the “essential functions” of the position either with or without reasonable accommodation.

In September of 2008, the Americans with Disabilities Act Amendments Act (ADAAA) was signed into law and became effective in January of 2009 (Thompson 2010). This act established that an “impairment,

which substantially limits a major life activity, need not limit other major life activities to be considered a disability” (p263). It provided two lists of major life activities under the headings of Manual Tasks and Major Bodily Functions.

Prior to these amendments to the ADA, two major court cases that severely limited the interpretation of the ADA and made it more difficult to file claims under the Act were *Toyota Motor Mfg., Ky., Inc. v. Williams* (2002) and *Sutton v. United Air Lines* (1999).² It is for this reason that we run DD models pre- and post-1999, where we limit “pre” years to those prior to 1999 and “post” years to those after 2002.

DATA

Behavioral Risk Factor Surveillance System (BRFSS)

As the largest telephone-based health survey available, the Behavioral Risk Factor Surveillance System (BRFSS) has tracked health conditions and risk behaviors for adults 18 years of age and older in the US for more than 20 years. The survey is conducted by state health departments in collaboration with the Centers for Disease Control. While only 15 states participated in 1984, the number grew to 33 in 1987, to 45 in 1990, and to all 51 states (including the District of Columbia) in 1996. These data are publicly available from the Centers for Disease Control at <http://www.cdc.gov/brfss>, and provide information on a variety of personal characteristics, including gender, age, education, marital status, family income, and state of residence. In addition, measures of general health and health limitations are included, as well as anthropometric measures such as weight and height. We use years 1993-2008 in our analysis, as data on general health and disability are not available prior to 1993.

National Health Interview Survey (NHIS)

The National Health Interview Survey (NHIS), conducted by the National Center for Health Statistics and initiated in 1957, is a nationally representative cross-sectional household survey providing information on the health of the civilian noninstitutionalized US population. It is used extensively by the Department of Health and Human Services to follow trends in illness and disability. The NHIS provides demographic and socioeconomic information on individuals, in addition to information on employment, health care coverage, and illnesses. While the survey was initiated in 1957, it has been updated since every ten to fifteen years, and underwent substantial changes starting with the 1997 survey. Weight and height are available starting 1976. Prior to 1997, information on insurance and access to health care was not collected in the core questionnaire. In our analysis, we use NHIS data from 2008.

Self-Reported Obesity

To mitigate error due to self-reports, all weights and heights used in this analysis are adjusted for self-report error. While opinions are mixed regarding the validity of self-reported data, it is generally agreed that men in particular tend to over-report height and women tend to under-report weight (Himes and Roche 1982; Kuczmarski et al. 2001; Spencer et al. 2002). Using the relationship between objective

measures of weight and height and self-reported values from the National Health and Nutrition Examination Survey (NHANES), the weight and height values in the BRFSS sample was adjusted.³ Because NHANES gathers information on both self-reported and actual weight and height, height is adjusted in the BRFSS using this information. The adjustment is done separately by age, gender, and race, and has previously been used (see, for example, Kelly and Tennant 2012; Chou et al. 2004; Cawley 1999).

EMPIRICAL IMPLEMENTATION

Our empirical model is based on a static labor supply model in which the decision to work includes the indirect costs of a lack of accommodations provided at a potential workplace. Note that while the ADA may have caused a shift in the labor supply curve to the right, it may simultaneously have shifted demand to the left, as employers may react to such laws by lowering employment to sub-optimal levels. The dependent variables of interest are outcomes related to employment. To investigate the effect that various measures of disability may have on employment, the following general equation is estimated:

$$Employment = \alpha_0 + \alpha_1 Dis + \bar{\alpha}_2 X + \alpha_3 (unemp) + u \quad (1)$$

where *Employment* is a dichotomous indicator equal to 1 if the respondent is employed; *Dis* is a dichotomous indicator that is equal to 1 if the respondent reports having a disability and 0 otherwise⁴; *X* includes personal, parental, and demographic characteristics, including year of survey and state or region of residence; *unemp* represents the state unemployment rate in a given year; and *u* is an error term. Our coefficient of interest is α_1 , which shows the effect that being disabled has on employment. The measures of disability that we use, particularly the question regarding poor health, may not be an ideal measure for disability. Our measure for equipment use is more appropriate yet is only available in the BRFSS starting 2001 (and is a modular question, asked of only a subset of respondents, in 2002).

Since the potential endogeneity of disability may be of concern, we also run the following two DD models:

$$Employment = \beta_0 + \beta_1 Ob + \beta_2 Dis + \beta_3 (Ob * Dis) + \bar{\beta}_4 X + \beta_5 (unemp) + \varepsilon_1 \quad (2)$$

where *Ob* is a dichotomous indicator that is equal to 1 if the respondent has a body mass index (BMI) greater than or equal to 30 kg/m², and 0 otherwise; and ε_1 is an error term, and

$$Employment = \gamma_0 + \gamma_1 Pre99 + \gamma_2 Dis + \gamma_3 (Pre99 * Dis) + \bar{\gamma}_4 X + \gamma_5 (unemp) + \varepsilon_2 \quad (3)$$

where *Pre99* is a dichotomous indicator that is equal to 1 if the year is prior to 1999 and 0 otherwise; and ε_2 is an error term. Our coefficients of interest here are β_3 and γ_3 for equations (2) and (3), respectively, which show the effects that being disabled has on employment, assuming that the comparison groups are comparable.

RESULTS**Table 1: Effect of Disability on Employment Using Various Disability Indicators, BRFSS 1993-2008**

Variables	Poor Health	Poor Health– Alt	Use Equip	Limited Work	Limited Activity
Disability measure	-0.2695*** (0.005)	-0.3515*** (0.006)	-0.3570*** (0.006)	-0.0094* (0.005)	-0.2802*** (0.006)
Age	0.0542*** (0.001)	0.0537*** (0.001)	0.0517*** (0.001)	0.0123*** (0.001)	0.0553*** (0.001)
Age squared	-0.0007*** (0.000)	-0.0007*** (0.000)	-0.0007*** (0.000)	-0.0002*** (0.000)	-0.0007*** (0.000)
Black non-Hispanic	-0.0198*** (0.006)	-0.0334*** (0.007)	-0.0319*** (0.007)	-0.0251*** (0.006)	-0.0502*** (0.006)
Hispanic	-0.0066 (0.005)	-0.0286*** (0.006)	-0.0271*** (0.006)	-0.0257*** (0.008)	-0.0429*** (0.006)
Other	-0.0600*** (0.010)	-0.0699*** (0.009)	-0.0646*** (0.009)	-0.0188 (0.012)	-0.0704*** (0.008)
Male	0.1617*** (0.004)	0.1603*** (0.004)	0.1525*** (0.004)	0.0111*** (0.003)	0.1525*** (0.004)
Some high school	-0.0017 (0.008)	0.0205** (0.008)	0.0194** (0.008)	-0.0075 (0.009)	0.0265*** (0.008)
High school	0.1144*** (0.009)	0.1544*** (0.009)	0.1588*** (0.010)	0.0067 (0.006)	0.1562*** (0.009)
Some college	0.1339*** (0.009)	0.1816*** (0.010)	0.1966*** (0.011)	0.0133** (0.006)	0.1932*** (0.009)
College	0.2033*** (0.010)	0.2559*** (0.010)	0.2740*** (0.012)	0.0274*** (0.006)	0.2620*** (0.010)
Married	0.0042 (0.004)	0.0104*** (0.004)	0.0123*** (0.004)	0.0045 (0.003)	-0.0029 (0.004)
Divorced	0.0579*** (0.002)	0.0605*** (0.002)	0.0502*** (0.002)	0.0028 (0.004)	0.0545*** (0.002)
Widowed	0.0240*** (0.004)	0.0268*** (0.004)	0.0296*** (0.004)	0.0083 (0.007)	0.0163*** (0.004)
Unemployment Rate (State)	-0.0083*** (0.002)	-0.0124*** (0.002)	-0.0042** (0.002)	0.0171* (0.009)	-0.0058*** (0.002)
Observations	3,336,996	3,514,757	2,292,442	21,554	2,444,924

Note: Marginal effects from probit models are shown. Standard errors are reported in parentheses and are clustered on the state level. Controls for year of survey and state of residence are included in all regressions. *** p<0.01, ** p<0.05, * p<0.10.

Disability prevalence in this time period, using various measures of disability, ranges from 5.3 percent to 17.7 percent.⁵ Means for demographic characteristics are remarkably similar between the two data sets, and the prevalence of obesity of approximately 31 percent for both data sets is expected. However, disability means exhibit more variation, partly due to differences in the wording of the questions. Self-reported poor health has a prevalence of 12.5 percent in the NHIS and 15.9 percent in the BRFSS. Approximately two percent of the NHIS sample has trouble with activities of daily living, usually problematic among older individuals and not a major concern for this sample. The prevalence of using

equipment, which has the same wording in both data sets, is very similar: 7.7 percent of the NHIS and 7.4 percent in the BRFSS, which is comforting.

Employment regressions using the full BRFSS sample are shown in Table 1. Regardless of the measure of disability used, disability consistently has a negative and statistically significant effect on employment. This is true even for *limited work*, which is only available as a modular question from 1993 to 1995. We initially regressed employment on only measures of disability, without any other covariates. (Results available upon request.) Another intriguing finding is that the coefficients of interest do not decline substantially in magnitude and maintain their levels of significance even after controlling for a rich set of covariates. Provided that observed and unobserved factors have similar effects on employment, this suggests that unobserved heterogeneity, or statistical endogeneity, may not be too problematic in this context. On the other hand, reverse causality, or structural endogeneity, would be a concern to the extent that employment affects disability. Since we would expect employment to have a positive effect on disability, our probit results are likely biased downward and thus conservative.

The effects of the remaining controls are as expected. Males and those with a college education are consistently more likely to be employed, confirming findings from the labor economics literature. The higher the state unemployment rate, the lower the probability of working.

Since endogeneity may still be a concern, we present DD results in Table 2. In columns (1)-(5), DD results suggest that disabled individuals are 0.76-7.11 percentage points less likely to work. Comparing pre- and post-1999, around which two significant court cases narrowly interpreted the ADA, we see that disabled individuals were significantly (2.75-5.58 percentage points) more likely to work prior to 1999.⁶

Table 2: Effect of Disability on Employment, Difference-in-Difference Estimates, BRFSS 1993-2008

VARIABLES	Poor Health	Poor Health– Alt	Use Equip	Limited Work	Limited Activity	Poor Health	Poor Health – Alt
Disability measure	-0.2633*** (0.005)	-0.3313*** (0.006)	- 0.3547*** (0.006)	-0.0077 (0.006)	- 0.2649*** (0.006)	- 0.2755*** (0.004)	-0.4161*** (0.004)
Obese	0.0031** (0.001)	-0.0062*** (0.001)	- 0.0055*** (0.002)	-0.0022 (0.005)	0.0177*** (0.001)		
Disability*Obese	-0.0238*** (0.002)	-0.0711*** (0.005)	-0.0064 (0.004)	-0.0076 (0.012)	- 0.0476*** (0.003)		
Pre99						0.0094** (0.004)	0.0074* (0.004)
Disability*Pre99						0.0275*** (0.003)	0.0558*** (0.006)
Observations	3,206,594	3,374,567	2,198,049	21,010	2,345,044	2,714,492	2,747,644

Note: Marginal effects from probit models are shown. Standard errors are reported in parentheses and are clustered on the state level. All controls included in Table 1 are included in all regressions. *** p<0.01, ** p<0.05, * p<0.10.

Results for the 2008 NHIS and BRFSS are presented in Tables 3a and 3b, respectively. Similarly to what we see in Table 1, all disability measures are associated with reduced employment probabilities. DD estimates presented in the even-numbered columns, however, are mixed. The significant results – limited work for the NHIS, poor health days and limited activity for the BRFSS – carry the expected negative signs.⁷ However, *use equip*obese* is positive (albeit insignificant) in all 2008 models. This may not be implausible, since those who have taken the initiative to use equipment may have expanded opportunities for themselves.

Table 3a: Effect of Disability on Employment, NHIS 2008

Variables	Poor Health	ADL	Use Equip for Walking	Ltd Work	Use Equip
Disability measure	-0.3426*** (0.015)	-0.5334*** (0.023)	-0.4726*** (0.020)	-0.4643*** (0.013)	-0.4168*** (0.022)
Obese	-0.0169* (0.010)	-0.0382*** (0.009)	-0.0300*** (0.009)	-0.0113 (0.010)	-0.0306*** (0.009)
Disability*Obese	0.0069 (0.025)	-0.1486 (0.120)	0.0528 (0.044)	-0.0564** (0.028)	0.0476 (0.041)
Age	0.0541*** (0.002)	0.0500*** (0.002)	0.0510*** (0.002)	0.0576*** (0.002)	0.0504*** (0.002)
Age Squared	-0.0007*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0007*** (0.000)	-0.0006*** (0.000)
Black non-Hispanic	-0.0163 (0.012)	-0.0186 (0.012)	-0.0178 (0.012)	-0.0312** (0.013)	-0.0207* (0.012)
Hispanic	0.0051 (0.012)	0.0073 (0.012)	0.0010 (0.012)	-0.0254** (0.013)	0.0020 (0.012)
Other race	-0.0755*** (0.017)	-0.0765*** (0.017)	-0.0791*** (0.017)	-0.0888*** (0.018)	-0.0785*** (0.017)
Male	0.1350*** (0.008)	0.1353*** (0.008)	0.1386*** (0.008)	0.1462*** (0.008)	0.1405*** (0.008)
Some high school	0.0000 (0.021)	0.0170 (0.020)	0.0093 (0.021)	0.0246 (0.021)	0.0177 (0.020)
High school	0.1270*** (0.019)	0.1674*** (0.018)	0.1585*** (0.018)	0.1429*** (0.019)	0.1614*** (0.018)
Some college	0.1680*** (0.018)	0.2123*** (0.017)	0.2049*** (0.018)	0.1881*** (0.018)	0.2112*** (0.018)
College	0.2277*** (0.018)	0.2868*** (0.016)	0.2728*** (0.017)	0.2390*** (0.018)	0.2811*** (0.016)
Married	-0.0297*** (0.011)	-0.0127 (0.011)	-0.0217* (0.011)	-0.0516*** (0.011)	-0.0156 (0.011)
Divorced	0.0380*** (0.014)	0.0345** (0.014)	0.0419*** (0.014)	0.0493*** (0.014)	0.0349** (0.014)
Widowed	-0.0292 (0.022)	-0.0261 (0.022)	-0.0125 (0.022)	-0.0209 (0.022)	-0.0207 (0.022)
Observations	19,407	19,415	19,416	19,409	19,413

Note: Marginal effects from probit models are shown. Standard errors are reported in parentheses. Controls for region of residence are included in all regressions. *** p<0.01, ** p<0.05, * p<0.10.

Table 3b: Effect of Disability on Employment, BRFSS 2008

Variables	Poor Health	Poor Health – Alt	Use Equip	Limited Activity
Disability measure	-0.2718*** (0.005)	-0.3859*** (0.005)	-0.3344*** (0.006)	-0.2502*** (0.006)
Obese	0.0016 (0.003)	-0.0077*** (0.002)	-0.0026 (0.002)	0.0184*** (0.003)
Disability*Obese	-0.0069 (0.006)	-0.0363*** (0.009)	0.0019 (0.009)	-0.0368*** (0.005)
Age	0.0537*** (0.001)	0.0539*** (0.001)	0.0514*** (0.001)	0.0545*** (0.001)
Age squared	-0.0007*** (0.000)	-0.0007*** (0.000)	-0.0006*** (0.000)	-0.0007*** (0.000)
Black non-Hispanic	-0.0379*** (0.008)	-0.0544*** (0.009)	-0.0437*** (0.008)	-0.0680*** (0.008)
Hispanic	-0.0062 (0.007)	-0.0327*** (0.008)	-0.0329*** (0.008)	-0.0473*** (0.007)
Other	-0.0555*** (0.011)	-0.0617*** (0.010)	-0.0640*** (0.010)	-0.0701*** (0.010)
Male	0.1388*** (0.005)	0.1361*** (0.005)	0.1401*** (0.005)	0.1346*** (0.005)
Some high school	-0.0280** (0.013)	0.0010 (0.012)	0.0009 (0.012)	0.0104 (0.011)
High school	0.0885*** (0.013)	0.1301*** (0.013)	0.1439*** (0.013)	0.1469*** (0.012)
Some college	0.1226*** (0.015)	0.1730*** (0.014)	0.1928*** (0.014)	0.1973*** (0.013)
College	0.1923*** (0.016)	0.2462*** (0.015)	0.2735*** (0.015)	0.2703*** (0.015)
Married	0.0254*** (0.006)	0.0273*** (0.006)	0.0337*** (0.006)	0.0182*** (0.006)
Divorced	0.0507*** (0.004)	0.0543*** (0.004)	0.0476*** (0.005)	0.0490*** (0.005)
Widowed	0.0358*** (0.006)	0.0362*** (0.006)	0.0438*** (0.006)	0.0267*** (0.006)
Unemployment Rate (State)	-0.0252*** (0.000)	-0.0246*** (0.000)	-0.0249*** (0.000)	-0.0240*** (0.000)
Observations	375,993	381,047	380,841	379,533

Note: Marginal effects from probit models are shown. Standard errors are reported in parentheses. Controls for state of residence are included in all regressions. *** p<0.01, ** p<0.05, * p<0.10.

DISCUSSION

Our study confirms the need for consistency in measuring disability across data sets and further highlights the need for a national disability survey if we are to better understand this group of individuals.

Using the BRFSS and NHIS, we find that, when disability is measured similarly, prevalence estimates are similar. However, differences can be stark when disability is measured differently. This is less problematic with regression results, which, regardless of the measure of disability, consistently show

negative and significant effects of disability on employment.⁸ The definition of a disability needs to be further clarified, in addition to its relationship to obesity. The recent ADA is a step in the right direction.

ENDNOTES

1. Note that: MEPS = Medical Expenditure Panel Survey, NHANES = National Health and Nutrition Examination Survey, PSID = Panel Study of Income Dynamics, and SIPP = Survey of Income and Program Participation.
2. See Thompson (2010) and Kelly and Tennant (2012) for more detail on ADA court cases, particularly those related to obesity.
3. Coefficients used in the correction utilize NHANES III (conducted between 1988 and 1994), NHANES 99 (conducted between 1999 and 2000), NHANES 01 (conducted between 2001 and 2002), and NHANES 03 (conducted between 2003 and 2004), reported in Rashad (2008). The NHANES surveys are publicly available from the National Center for Health Statistics at <http://www.cdc.gov/nchs/nhanes.htm>.
4. Several measures of disability are used: Whether the respondent reports (1) being in fair or poor health (*Poor Health*), (2) being in poor health for at least one of the 30 days prior to being surveyed (*Poor Health – Alt.*), (3) having used equipment for his or her disability (*Use Equip*), (4) being limited in work due to health problems (*Limited Work*), or (5) being limited in activities due to health problems (*Limited Activity*).
5. Weighted summary statistics for the two data sets and additional statistical results are available upon request.
6. It is important to note that there were fewer disabled individuals prior to 1999 (Kelly and Tennant 2012).
7. Note that *limited work* is not available in 2008 in the BRFSS.
8. This is similar to findings that analyze the ADA, including DeLeire (2000), Acemoglu and Angrist (2000) and Kelly and Tennant (2012). Tennant (2006) finds positive effects of the ADA on home-based employment for disabled workers, while Kelly and Tennant (2012) and Jolls (2004) find that the ADA increased educational attainment for disabled individuals.

REFERENCES

- Acemoglu, D., Angrist, J.D., 2000. Consequences of Employment Protection? The Case of the Americans with Disabilities Act, *Journal of Political Economy* 109(5): 915-957.
- Americans with Disabilities Act of 1990. 42 U.S.C. § 12102(2).
- Cawley, J., 1999. Rational Addiction, the Consumption of Calories, and Body Weight. Ph.D. Dissertation, University of Chicago, Chicago, IL.
- Chou, S., Grossman, M., Saffer, H., 2004. An Economic Analysis of Adult Obesity: Results from the Behavioral Risk Factor Surveillance System. *Journal of Health Economics*, 23: 565-587.

- DeLeire, T. 1997. Wage and Employment Effects of the Americans with Disabilities Act, *Journal of Human Resources*, 35(4): 693-715.
- Himes, J.H., Roche, A.F., 1982. Reported Versus Measured Adult Statures. *American Journal of Physical Anthropology*, 58: 335-341.
- Jolls, C., 2004. Identifying the Effects of the Americans with Disabilities Act Using State-Law Variation: Preliminary Evidence on Educational Participation Effects. *American Economic Review*, 94(2): 447-453, Papers and Proceedings of the One Hundred Sixteenth Annual Meeting of the American Economic Association San Diego, CA, January 3-5, 2004.
- Kelly, I.R., Tennant, J. 2012. Spillover Effects of the ADA: The Case of Obesity. *Journal of Disability Policy Studies*, 22(4): 228-234.
- Kuczmarski, M.F., Kuczmarski, R.J., Najjar, M., 2001. Effects of Age on Validity of Self-Reported Height, Weight, and Body Mass Index: Findings from the Third National Health and Nutrition Examination Survey, 1988-1994. *Journal of the American Dietetic Association*, 101: 28-34.
- Livermore, G., Stapleton, D., O'Toole, M. 2011a. Health Care Costs Are a Key Driver of Growth in Federal and State Assistance to Working-Age People with Disabilities. *Health Affairs*, 30(9): 1664-1672.
- Livermore, G, Whalen, D, Prenovitz, S., Aggarwal, R., Bardos, M. 2011b. Disability Data in National Surveys. U.S. Department of Health and Human Services. Available at: <http://aspe.hhs.gov/daltcp/reports/2011/DDNatISur.shtml>.
- Livermore, G, Whalen, D, Stapleton, D.C. 2011c. Assessing the Need for a National Disability Survey: Final Report. U.S. Department of Health and Human Services. Available at: <http://aspe.hhs.gov/daltcp/reports/2011/NatIDS.shtml>.
- Rashad, I., 2008. Height, Health, and Income in the US, 1984-2005. *Economics and Human Biology*, 6(1): 108-126.
- Spencer, E.A., Appleby, P.N., Davey, G.K., Key, T.J., 2002. Validity of Self-Reported Height and Weight in 4808 EPIC-Oxford participants. *Public Health Nutrition*, 54: 561-565.
- Tennant, J. 2006. Labor Force Participation and Disability: Did Home-Based Work Facilitate Labor Force Participation in the Dawn of the Americans with Disabilities Act? Ph.D. Dissertation, CUNY Graduate Center, New York NY.
- Thompson, A.A. 2010. Obesity as A Disability Under the Americans with Disabilities Act Amendments Act and the Amendments' Affect On Obesity Claims Under the Pennsylvania Human Relations Act: Should Employers Anticipate A Big Change? *Duquesne Business Law Journal*, 12: 259-272.