

Worklife Expectancies for Individuals with Disability: A Comparison Between the United States and Canada

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I. Introduction

Data emanating from major government surveys in both the United States and Canada show that, on average, individuals with a disability experience lower levels of employment than their non-disabled counterparts. Employment levels when combined with probabilities of life form the building blocks for the calculation of a worklife expectancy value. The Annual Social and Economic Supplement (ASEC) to the Current Population Survey (CPS) as well as the American Community Survey (ACS) provide the best available government data in the U.S. by which to calculate worklife expectancy values that consider disability status. The Participation and Activity Limitation Survey (PALS) provides the best publicly available government data in Canada by which to calculate worklife expectancy values that consider disability status; however, the Canadian Survey on Disability (CSD) is useful in measuring trends as it is more current but not yet available for microdata computations. The purpose of this article is to describe and make comparisons between the worklife expectancy values emanating from the ASEC and ACS in the United States and the PALS in Canada.

II. The Annual Social and Economic Supplement (ASEC) to the Current Population Survey

Labor force characteristics such as the monthly employment rates for the U.S. population are measured from the Current Population Survey. The Annual Social and Economic Supplement (ASEC) has been conducted in March of every year since 1981 in order to obtain information on earnings and employment in the United States. Importantly, the ASEC asks questions that specifically address work disability. These questions do not consider the specific types of disabling impairments, but rather examine whether an individual has work-related limitations because of a physical or mental impairment that limits the individual in terms of performing work.

The U.S. Census Bureau defines work disability as existing when a person meets one or more of conditions

in Table 1. Respondents who answer “Yes” to any of the Not Severe questions, but “No” to all of the Severe questions are classified as being not severely work disabled. Those who say yes to any of the Severe questions are classified as being severely work disabled.

Employment levels can be cross-tabulated for groupings based upon age, gender, level of educational attainment, and disability status. For instance, one could utilize the 2005-2014 ASEC public microdata files to calculate the average employment level of males between the ages of 35-44 that have a baccalaureate degree and a non-severe work disability. This employment level is found to be 0.816 as compared to 0.941 for a group of males between the ages of 35-44 that have a baccalaureate degree and no disability (U.S. Census Bureau, 2014).

Worklife expectancy values can be calculated by combining the employment data from the ASEC for a particular cohort group with probabilities of life found in the *United States Life Tables, 2009* put forth by the National Center for Health Statistics (Arias, 2014). These worklife expectancy values will be specific to an individual's age, gender, level of educational attainment, and disability status.

DataFerrett, a data analysis and extraction tool provided by the U.S. Census Bureau, allows a user to compute employment levels for a particular cohort based upon the ASEC data. Alternatively, one can compute employment levels using the ASEC public microdata files, however, this approach is more time-consuming and requires a greater deal of sophistication with managing, recoding, and analyzing data.

III. The American Community Survey (ACS)

The largest annual survey conducted in the United States is the American Community Survey (ACS) administered by the U.S. Census Bureau. This survey asks a wide variety of questions in order to gather a wide range of data from respondents. Namely, the ACS asks a series of disability-related questions. The sample size has been 1% of the U.S. population annually since 2005, providing a robust source of data on

Table 1
ASEC Work Disability Criteria

Not Severe	Identified by the March supplement question "Does anyone in this household have a health problem or disability which prevents them from working or which limits the kind or amount of work they can do?"
	Identified by the March supplement question "Is there anyone in this household who ever retired or left a job for health reasons?"
	Received VA disability income in previous year
Severe	Identified by the core questionnaire as currently not in the labor force because of a disability that is expected to last for at least six months
Severe	Identified by the March supplement as a person who did not work at all in the previous year because of illness or disability
	Under 65 years old and covered by Medicare in previous year
	Under 65 years old and received Supplemental Security Income (SSI) in previous year

disability. The ACS specifically addresses functional limitations such as having difficulty hearing, seeing, remembering, making decisions, concentrating, walking, or climbing stairs.

Table 2 presents the ACS disability questions that have been asked since 2008 in the annual survey. These questions allow us to classify respondents as having hearing, vision, cognitive, and/or mobility disabilities. Furthermore, if an individual has problems with either self-care or going outside the home, we consider the disability to be severe. Thus, there are 8 classifications of disability generated from the current set of ACS disability questions: non-severe hearing, severe hearing, non-severe vision, severe vision, non-severe cognitive, severe cognitive, non-severe mobility, and severe mobility.

In addition, the ACS asks respondents about their participation in the labor force and whether they are employed. It is important to note that these questions are entirely separate from the disability questions

(i.e., they are not compound questions). The ASEC disability question specifically asks if the disability prevents or limits the amount or kind of work that an individual engages in—the ACS disability questions do not. Furthermore, the ACS disability questions are also specific to considering the functional limitation classification.

The ACS, like the ASEC, allows for cross-tabulation of employment levels for groupings based upon age, gender, level of educational attainment, and disability type. For instance, one could utilize the 2008-2012 ASEC public microdata files to calculate the average employment level of males between the ages of 35-39 that have a baccalaureate degree and a non-severe mobility disability. This employment level is found to be 0.706 as compared to 0.937 for a group of males between the ages of 35-39 that have a baccalaureate degree and no disability (U.S. Census Bureau, 2014).

Worklife expectancy values can be calculated by combining the employment data from the ACS for a par-

Table 2
ACS Disability Criteria (Beginning 2008)

Question	Classification
Is this person deaf or does he/she have serious difficulty hearing?	Hearing
Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?	Vision
Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?	Cognitive
Does this person have serious difficulty walking or climbing stairs?	Mobility
Does this person have difficulty dressing or bathing?	Self-Care
Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?	Go Outside Home

ticular cohort group with probabilities of life found in the *United States Life Tables, 2009* put forth by the National Center for Health Statistics (Arias, 2014). These values will be specific to an individual's age, gender, level of educational attainment, and disability type.

DataFerrett, a data analysis and extraction tool provided by the U.S. Census Bureau, allows a user to compute employment levels for particular cohort based upon the ACS data. Alternatively, one can compute employment levels using the ACS public microdata files, however, this approach is more time-consuming and requires a greater deal of sophistication with managing, recoding, and analyzing data. Since the ACS public microdata files have such large sample sizes (3 million observations per year), their utilization may require special programs or hardware. Furthermore, worklife expectancy tables can be consulted that utilize government data to produce worklife estimates (Gamboa & Gibson, 2010).

IV. The Participation and Activity Limitation Survey (PALS)

Statistics Canada conducted the Participation and Activity Limitation Survey (PALS) in 1986, 1991, 2001, and 2006 in order to develop a national database on disability that includes information on both earnings and employment for persons with and without a disability. In 2012, Statistics Canada conducted the Canadian Survey on Disability (CSD), however, worklife expectancy values cannot be computed from this survey since the public microdata files are not yet available. In order to calculate the impact of disability on worklife expectancy using Canadian data, one must rely on the 2006 PALS.

PALS defines disability as "an activity limitation or participation restriction associated with a physical or mental condition or health problem". The basis for Statistics Canada's definition of disability comes from the World Health Organization's (WHO) framework of disability provided by the *International Classification of Functioning, Disability and Health* (ICF). Using the ICF as its framework, PALS views disability as the interrelationship between body and functions, activities and social participation, while recognizing the role of the environment as providing barriers or facilitators. (Statistics Canada, 2006)

This is operationalized in PALS through a series of questions asking about difficulties a person may have with functional limitations, with learning and remembering, and with limitations at home, school, work, or leisure because of a physical or psychological condition.

Respondents are asked a series of questions in the survey regarding their ability to perform certain tasks. For instance, if a respondent answers "yes" to

an initial filter question, they are asked if they have difficulty walking a kilometer or up and down a flight of stairs or carrying a 10 pound object for 30 feet (mobility disability). PALS distinguishes ten types of disabilities among respondents and the level of severity increases with the number of disabilities affecting each individual. Depending on their answers, respondents are assigned a point value for each of the ten types of disability and the points are combined into an indexed value, which determines the severity of disability: mild, moderate, severe, or very severe (Faucher, 2002). The point value utilized for each of the ten types of disability depends on the frequency and intensity of the limitations associated with the disability. The severity of a disability can have a profound effect on the types of limitations experienced by a person with a disability. Statistics Canada reports that mild disabilities were the most common in Canada for 2006 with slightly more than one third (35.4%) of adults with disabilities experiencing mild limitations.

Similar to the ACS and ASEC, the PALS in Canada asks disability questions separate from questions about the employment status of individuals. We are able to compute worklife expectancy values by combining the employment rates from PALS with the probabilities of life from *Life Tables: Canada, Provinces and Territories 2009-2011* (Statistics Canada, 2014). Worklife expectancy values generated from PALS are specific to age, gender, level of educational attainment, and disability status. Because of sample size restrictions, we cannot consider disability type and level of educational attainment together, but we can consider disability status and level of educational attainment jointly.

Public use microdata files for PALS data are available by request from Statistics Canada. Worklife expectancy values can be generated through utilizing a statistical program such as STATA or SPSS to recode and analyze the variables in PALS. Crouse & Gamboa (2015) provide worklife expectancy tables for Canadians that can be consulted as an alternative to calculating values through use of microdata files.

V. Comparing the ASEC, ACS, and PALS

Prior to comparing worklife expectancy values across three government surveys conducted in the United States (ASEC and ACS) and Canada (PALS), it is important to visualize the differences in the non-disabled employment levels generated from the major government surveys in each country. The likelihood of employment is strongly dependent upon one's age. Using PALS statistics for non-disabled individuals in Canada, Figure 1 depicts this relationship. Note that the curve shifts steeply downward starting at the age of fifty for both genders. Using ACS statistics for non-disabled individuals, Figure 2 depicts this rela-



Figure 1. Employment Rates by Age (PALS)

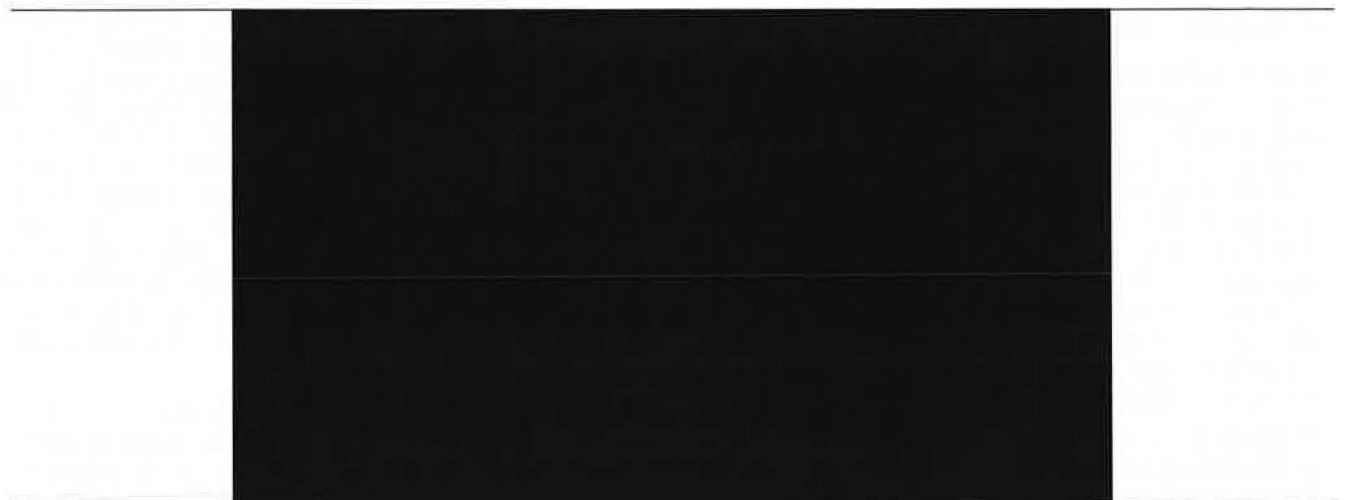


Figure 2. Employment Rates by Age (ACS)

tionship. The curves shift steeply downward starting at the age of 55 for both genders.

Worklife expectancy values for non-disabled individuals are presented in Tables 3 and 4. These values are for all levels of education and are age and gender specific. We select ages 25, 35, 45, and 55 to compute worklife expectancy values for, but a worklife expectancy value can be computed for any age. Similarly, we could present values that are specific to the level of educational attainment. As is demonstrated in Table 3, the worklife expectancy values for males are consistent across all 3 major government surveys. The ACS produces the lowest worklife expectancy values at ages 25 and 35 and the PALS produces the lowest worklife expectancy values at ages 45 and 55. This is

likely due to the fact that Canadians tend to retire sooner as demonstrated in Figure 1. Likewise, Table 4 shows the consistency between the ASEC, ACS, and PALS worklife expectancy values for non-disabled females. Female worklife expectancy values are lower than those of males, on average, since women tend to spend time raising a family and retire sooner. Some women have a work pattern more consistent with that of an average male, and it may be justified in this case to utilize a male worklife expectancy.

Disability status is considered in Tables 5 and 6 which compare the PALS and ASEC data for both males (Table 5) and females (Table 6) at all levels of educational attainment. The PALS data are presented for both mild and moderate disability and the ASEC data are

Table 3

Non-Disabled Statistics Across Surveys: Males, All Levels of Education

	ASEC	ACS	PALS
25	36.0	34.4	35.2
35	27.9	26.3	26.6
45	19.4	18.0	17.8
55	11.1	10.1	9.2

Table 4

Non-Disabled Statistics Across Surveys: Females, All Levels of Education

	ASEC	ACS	PALS
25	31.2	29.9	29.0
35	24.2	22.9	21.6
45	16.9	15.7	13.8
55	9.3	8.4	5.9

Table 5

PALS vs. ASEC: Males, All Levels of Education

	PALS (Mild/Moderate)	ASEC (Not Severe)
25	29.2 / 23.4	26.4
35	21.2 / 17.0	19.8
45	13.6 / 10.6	12.8
55	5.8 / 4.0	6.1

Table 6

PALS vs. ASEC: Females, All Levels of Education

	PALS (Mild/Moderate)	ASEC (Not Severe)
25	25.0 / 20.9	21.9
35	17.9 / 15.5	16.7
45	11.1 / 9.4	10.9
55	4.7 / 3.6	5.1

Table 7

PALS vs. ASEC: Males, Less than High School Education

	PALS (Mild/Moderate)	ASEC (Not Severe)
25	23.7 / 17.0	20.7
35	16.9 / 11.2	15.7
45	11.0 / 6.4	10.2
55	4.7 / 2.9	5.1

Table 8

PALS vs. ASEC: Males, High School Education

	PALS (Mild/Moderate)	ASEC (Not Severe)
25	28.8 / 21.4	25.1
35	21.5 / 15.8	18.3
45	14.6 / 11.0	11.8
55	6.7 / 3.3	5.4

Table 9

PALS vs. ASEC: Males, College/University Education

	PALS (Mild/Moderate)	ASEC (Not Severe)
25	31.4 / 27.4	29.6
35	23.2 / 20.3	21.9
45	14.7 / 12.3	14.1
55	5.9 / 5.1	7.0

Table 10

PALS vs. ACS: Males, Mobility Disability, All Levels of Education

	PALS (Less Severe/ More Severe)	ACS (Non-Severe/ Severe)
25	19.8 / 10.9	17.9 / 7.1
35	14.2 / 7.7	13.1 / 5.0
45	8.6 / 4.1	8.7 / 3.1
55	9.2 / 3.8	4.8 / 1.7

Table 11

PALS vs. ACS: Females, Mobility Disability, All Levels of Education

	PALS (Less Severe/ More Severe)	ACS (Non-Severe/ Severe)
25	18.2 / 9.9	18.1 / 6.6
35	12.9 / 5.7	13.8 / 4.6
45	8.2 / 3.5	9.4 / 2.9
55	3.3 / 1.3	5.1 / 1.5

presented for non-severe work disability. Non-severe work disability can be viewed, on average, as somewhere in between the PALS constructs of mild and moderate disability. Both the PALS and ASEC demonstrate that disability reduces worklife expectancy and they provide consistent and similar values.

Level of educational attainment is considered in Tables 7-9 which compare PALS and ASEC worklife expectancy values for disabled males. Both surveys demonstrate that individuals with higher levels of educational attainment have longer worklife expectancies. Furthermore, both surveys produce consistent and similar worklife expectancy values.

Mobility disability is explicitly considered in Tables 10 and 11 which compare worklife expectancy values computed from both PALS and ACS for males (Table 10) and females (Table 11). Level of severity is also considered in the mobility disability construct available from both government surveys allowing a worklife expectancy computation based on severity. The less severe (PALS) and non-severe (ACS) results are very similar and consistent. There are larger differences between the PALS and ACS in the more severe and severe categorizations giving rise to the differing values.

VI. Usefulness of Worklife Expectancy Values in Litigation

One will never know with certainty how long any particular individual will work. Statistical information helps inform decision makers (e.g., an expert, a jury, government officials, lawmakers, etc.) of what is likely to occur for an individual based upon the cohort group to which the individual belongs. For instance, if an individual has a professional degree, we would expect that this individual will work longer than his counterpart that has less than a high school education. Furthermore, an individual with a mobility disability would be expected to have a shorter worklife expectancy than her counterpart without a disabling condition.

While it is true that the data on mobility disability emanating from surveys such as the ACS and PALS is aggregated data and includes a range of mobility disabilities, the data still serves as a useful guide for a decision maker as it represents a reasonable approximation that can be adjusted. Worklife expectancy data serves as an aid to the trier of fact who can then adjust the worklife expectancy values as they see fit based on the totality of the information received at trial. After listening to medical testimony and reviewing all of the information presented at trial, a jury may decide that an injured individual is better off, worse off, or the same as the statistically average individual with a particular disability. The expert's role with regards to worklife expectancy in a personal in-

jury case should be to: (i) select the appropriate data source that considers the individual's characteristics (age, gender, level of educational attainment, disability status and severity), (ii) calculate the employment levels for the cohort group to which the individual belongs and translate the employment levels into a worklife expectancy value by combining them with the probabilities of life, and (iii) clearly present to the jury the construct of disability being used in calculating a worklife expectancy value and how the estimate provided represents a statistical average.

VII. Conclusion

Government data available from both the U.S. and Canada in three distinct major surveys confirm that disabled individuals, on average, suffer reduced employment levels when compared to their non-disabled counterparts. These reduced employment levels when combined with probabilities of life lead to a probable reduction in worklife expectancy for an individual with a disability. It is compelling that this fact holds true, on average, across genders, levels of educational attainment, disability type, disability severity, construct of disability, and in both the United States and Canada. Thus, Canadian data on disability generates very similar results to the U.S. data and serves as further support that disability leads to a probable reduction in worklife expectancy.

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Author Notes

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When referring to employment levels in this article, the author is referring to PE rates which combine participation rates and employment rates. This PE rate, referred by the author as the employment level in this article, is defined as the number of individuals employed divided by the summation of individuals employed, unemployed, and not participating.