Illinois Morbidity and Mortality Bulletin

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Message from Director Shah

Welcome to the third issue of the Illinois Morbidity and Mortality Bulletin (IMMB), a Department-wide publication that we created last year to present topics of interest to public health communities in Illinois through scientific analysis and interpretation of data.

In this issue, Jennifer Wood, Terry Dolecek and staff from the Division of Epidemiologic Studies evaluate the projection methods for cancer incidence used by the Illinois State Cancer Registry and the American Cancer Society.

In the second article, Dr. Mohammed Shahidullah from the Center for Health Statistics and Nelson Agbodo from the Illinois Health Facilities and Services Review Board provide estimates of disability-free life expectancies for Illinois and Illinois Counties.

We also encourage contributions from public health professionals at the state and local levels. Please send your manuscripts to the bulletin's editor, Dr. Tiefu Shen at Tiefu.Shen@illinois.gov (217.785.1873)

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Evaluation of Projection Methods for Cancer Incidence in Illinois

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In this issue

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Evaluation of Projection Methods for Cancer Incidence in Illinois

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Abstract

Each year, the Illinois State Cancer Registry (ISCR) projects the number of new cancer cases (cancer incidence) in Illinois and by county. The American Cancer Society (ACS) also projects cancer incidence annually for the total United States and individual states, including Illinois. These projections aid in the planning of cancer prevention and control efforts. In this report, we present an evaluation of the ISCR projection method and the ACS projection method by comparing projected and observed number of new cancer cases in Illinois. Cancer data observed during diagnosis years 2007-2012, and projections from three years before the publication of the observed values were used in the evaluation. The ISCR method produced cancer incidence projections that were closer to the observed values in Illinois than by the ACS method for all cancer sites combined. Further, projections by the ISCR method are easier to implement and require fewer hours to compute as compared to the ACS method. This empirical evidence indicates that Illinois should continue to project cancer incidence for the state and its counties using its own method.

Introduction

There has long been interest in projecting (or forecasting) future cancer incidence and mortality for the purpose of cancer planning and resource management.[1,2] The Illinois State Cancer Registry (ISCR) has been projecting the number of new cancer cases in Illinois and by county since June 1997,[3] and the American Cancer Society (ACS) has been producing projections for the total United States and individual states since 1960.[4-8] The ACS projections were frequently published in the ACS *Cancer Facts & Figures*, and the ISCR projections were regularly posted on the Illinois Department of Public Health's website.

Because the two projection methods are different, determining which method produces results that are closer to the observed incidence in Illinois is of interest. Projections were completed for all sites combined and for the following major cancer control sites: female invasive breast, cervix, colorectal, lung, prostate, and melanomas. For comparability, the evaluation was conducted with projections from three years before the observed values were published.

Methods

ISCR Cancer Incidence

ISCR began collecting data for cancer diagnosis year 1986 and is the only population-based source for cancer incidence information in Illinois. Newly diagnosed cancer cases among Illinois residents are reported by hospitals, ambulatory surgical treatment centers, non-hospital affiliated radiation therapy treatment centers, independent pathology laboratories, and physicians as mandated by state law (Illinois Health and Hazardous Substances Registry ACT 410 ILCS 525). Additionally, ISCR has voluntary exchange of cancer patient data with multiple other states, including all states bordering Illinois. Completeness of reporting from all reporting sources is assessed using the North American Association of Central Cancer Registries (NAACCR) Standard and is considered to be 100% for diagnosis years since 1995.

To benchmark and foster best practices among population-based registries, NAACCR has developed a certification process that reviews registry data for completeness, accuracy, and timeliness of reporting. The criteria for silver and gold certification can be found on the NAACCR website http://www.naaccr.org/Certification/index.html. As of December 2015, ISCR data met the criteria for gold certification for cancer diagnosis years 1995-2012. This report reflects newly diagnosed cancer cases for diagnosis years 2007-2012.[9-17]

ISCR Cancer Incidence Projection

The ISCR cancer projection is based on multiplication of the most recent cancer incidence rates by population projections for future years. The method explicitly assumes that population size and population compositions are the major determinants of cancer incidence.

To obtain population projections, population estimates by age, sex and race, released regularly by the U.S. Census, are introduced to an exponential growth model:

$$Nt = N0 \bullet e^{r \bullet t}$$ where Nt is population at year t.

By logarithm transformation, the model becomes $\log(Nt) = \log(N0) + r \bullet t$, which can be estimated by linear regression. The projection of populations for future years is then made by extrapolating the fitted model. To ensure that the model estimates are stable and capture enough information, the estimated population data used for model construction should include the two most recent census years (e.g., 2000 and 2010), all years in between (e.g., 2001-2009), and all years since the last census year (e.g., 2011-2016).

ISCR cancer incidence projections are calculated for all races combined by multiplying the most recent sex and age specific cancer incidence rates for each of the 18 five-year age groups by the future year's population projections for that sex and age group. The expected new cases are summed for all 18 age and sex subgroups for a total expected cancer incidence estimated for the future years. Projections are typically completed with

data four years, three years, two years, and one year before the observed values are published. For this report, the process was applied for cancers occurring in both sexes for all sites, invasive breast (female), cervix, colorectal, lung, prostate, and melanomas from diagnosis years 2007-2012 using projections from three years before publication of the observed values.[3]

ACS Cancer Incidence Projection

ACS cancer incidence projection data were from the annual *Cancer Facts & Figures* published by the organization from 2007 to 2012. ACS projected cancer cases for the nation and each state based on 1995-2011 incidence rates from population-based cancer registries that meet NAACCR's data standard for incidence.[18-23] The cancer incidence projections are from three years before the observed values were published.

From 1995 to 2007, ACS projected cancer incidence for individual states using the Deaths-Based Method. In this method, projections were based on the estimated cancer cases for the total United States for the projected year and on the estimated cancer deaths for the specific state and total United States for the projected year.[4-5]

Because the Deaths-Based Method did not depend on individual state incidence, starting in 2007, ACS began using a new cancer incidence projection method. The new spatiotemporal model is a three-step process. First, for each state, new cancer cases by county are estimated by applying a hierarchical Poisson model to high-quality data as certified by NAACCR from the Cancer in North America (CINA) Deluxe file over the available time period starting in 1995. Then, the estimated case counts are summed to the state level and adjusted to account for expected case reporting delays. This model also accounts for geographic variations in sociodemographics, health behaviors, and cancer screening availability and usage as predictors of cancer incidence. Finally, the newly adjusted cancer counts are projected for future years using a piecewise linear (joinpoint) regression method.[6-8]

Statistical Comparison

To assess the difference between the two projection methods, two statistics, an arithmetic difference and a sum of squared deviations from the observed number of cancer cases in Illinois over diagnosis years 2007-2012, were calculated.

Arithmetic Difference (AD)= P-O, where P is projected number and O is observed number

Mean Sum of Squared Deviation (MSSD)= $\frac{\sum_i (P_i - O_i)^2}{Y}$, where P is projected number, O is observed number, i=2007, 2008, …2012, and Y is the total number of years for the evaluation.

An arithmetic difference was calculated for the total number of projected cancer cases, and a sum of squared deviations was calculated for all sites combined and the following cancer sites: female invasive breast, cervix, colorectal, lung, prostate, and melanomas. The smaller mean sum of squared deviations for each site would

indicate the more accurate method, as the projected number of cases would be closer to the observed number of cases.[24]

Results

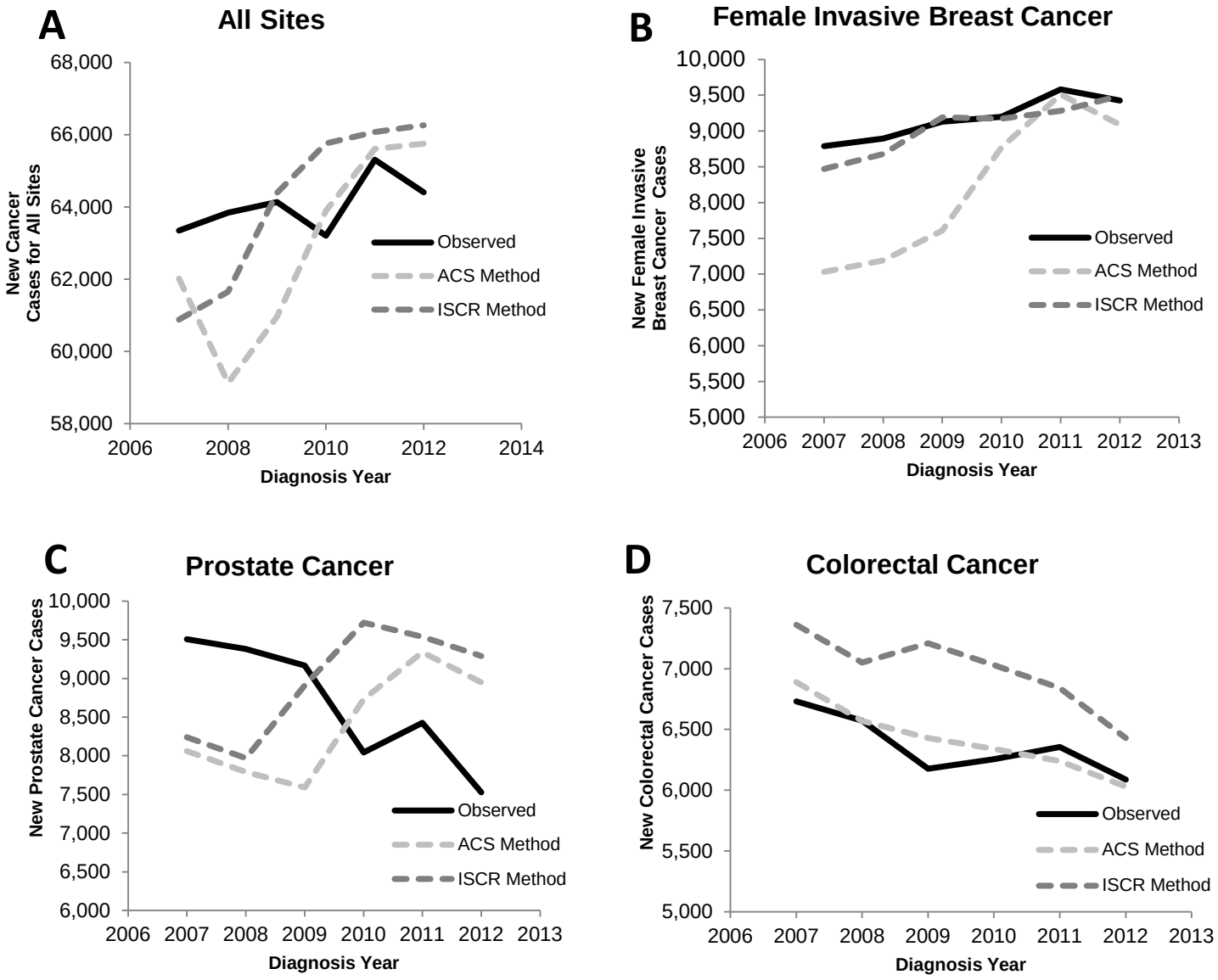
Overall, the projections from the ISCR method seemed to perform better than the projections from the ACS method, irrespective of directions. For all cancer sites combined, there were 384,232 observed cancer cases in Illinois during 2007-2012. The number projected by the ISCR method, 385,010, was closer to the observed value than the ACS method which projected 377,350. Relative to the observed number, the projections from the ISCR method overestimated the observed count by 778, or 0.2%, while the projections from the ACS method underestimated the observed count by 6,882, or 1.79% (Table 1). Mean sums of squared deviations were also much lower for the ISCR method (Table 2 and Figure 1A).

Table 1. Total Observed and Projected Number of New Cancer Cases for Illinois for All Cancer Sites for Diagnosis Years 2007-2012 with Arithmetic Difference (AD)

	Observed Number of New Cancer Cases in Illinois (O)	Projected Number of New Cancer Cases in Illinois (P)	Arithmetic Difference (AD) (P-O)	
			No.	%
ACS Method	384,232	377,350	-6,882	-1.79
ISCR Methods	384,232	385,010	778	0.20

Source: ISCR data- Illinois Department of Public Health, Illinois State Cancer Registry, Projected Cancer Incidence, 2006-2014;[9-17] ACS data-American Cancer Society, Cancer Facts and Figures, 2007-2012.[18-23]

Figure 1. Observed Number of New Cancer Cases in Illinois Compared with Projections from the ISCR Method and ACS Method for Diagnosis Years 2007-2012.



Source: ISCR Data-Illinois Department of Public Health, Illinois State Cancer Registry, Projected Cancer Incidence, 2006-2014,[9-17] ACS Data-American Cancer Society, Cancer Facts and Figures, 2007-2012.[18-23]

Table 2. Observed and Projected Number of New Cancer Cases in Illinois for Selected Cancer Sites for Diagnosis Years 2007-2012 with Mean Sums of Squared Deviations from Observed Number of New Cancer Cases, Averaged over Diagnosis Years 2007-2012

Selected Cancer Site/Diagnosis Year	Observed Number of New Cancer Cases in Illinois	Projected Number of New Cancer Cases in Illinois		Mean Sum of Squared Deviations (MSSD) 2007-2012	
		ACS Method	ISCR Method	ACS Method	ISCR Method
All sites				6,066,841	3,583,114*
2007	63,346	62,010*	60,880		
2008	63,837	59,130	61,650*		
2009	64,135	60,960	64,390*		
2010	63,203	63,890*	65,760		
2011	65,309	65,610*	66,070		
2012	64,402	65,750*	66,260		
Fem. Inv. Breast				1,435,375	41,295*
2007	8,790	7,030	8,470*		
2008	8,895	7,190	8,680*		
2009	9,129	7,610	9,190*		
2010	9,197	8,770	9,170*		
2011	9,581	9,510*	9,280		
2012	9,426	9,090	9,490*		
Cervix				3,991*	5,077
2007	556	530	580*		
2008	628	500	590*		
2009	549	480	600*		
2010	519	490*	580		
2011	549	570*	660		
2012	481	510*	580		
Colorectal				18,734*	439,911
2007	6,732	6,890*	7,360		
2008	6,573	6,570*	7,050		
2009	6.178	6,430*	7,210		
2010	6,255	6,340*	7,030		
2011	6,356	6,240*	6,840		
2012	6,087	6,030*	6,430		
Lung				38,246*	93,876
2007	9,162	9,550	8,850*		
2008	9,197	9,340*	9,010		
2009	9,337	9,180	9,320*		
2010	9,021	9,190*	9,450		
2011	9,143	9,210*	9,440		
2012	9,162	9,190*	9,560		

Selected Cancer Site/Diagnosis Year	Observed Number of New Cancer Cases in Illinois	Projected Number of New Cancer Cases in Illinois		Mean Sum of Squared Deviations (MSSD) 2007-2012	
		ACS Method	ISCR Method	ACS Method	ISCR Method
Prostate				1,741,488*	1,803,615
2007	9,507	8,060	8,240*		
2008	9,382	7,790	7,970*		
2009	9,168	7,590	8,910*		
2010	8,045	8,730*	9,720		
2011	8,427	9,340*	9,540		
2012	7,526	8,950*	9,290		
Melanomas				47,031*	59,628
2007	2,137	2,050*	1,880		
2008	1,936	1,930*	2,080		
2009	2,104	2,010	2,100*		
2010	2,217	2,060	2,240*		
2011	2,410	2,340*	2,020		
2012	2,544	3,030	2,200*		

*Indicates best result: projected number of new cancer cases closest to observed values or lowest mean sum of squared deviations. Source: ISCR data-Illinois Department of Public Health, Illinois State Cancer Registry, Projected Cancer Incidence, 2006-2014;[9-17] ACS data-American Cancer Society, Cancer Facts and Figures, 2007-2012.[18-23]

Across cancer sites and diagnosis years, the performance of either method varied, sometimes substantially (Table 2). Among a few sites examined, for example, projections from the ACS method for colorectal cancer were closest to the observed values for all 6 years (2007-2012) (Table 2 and Figure 1D), and the projections from the ISCR method were closest to the observed values for female invasive breast cancer for 5 of the 6 years (Table 2 and Figure 1B). The projections for cervical, prostate, lung, and melanoma cancers varied about equally from the observed values for both methods (Table 2 and Figure 1C).

Discussion

Cancer projections are useful for policy makers and health agencies to assess future cancer burden and plan resources and interventions for cancer prevention, control, and treatment. Different projection methods, however, produce different results, and must be evaluated against the subsequent and actual cancer incidence.

In this report we evaluated the Illinois State Cancer Registry (ISCR)'s and the American Cancer Society (ACS)'s annual projections of cancer incidence in Illinois. While the projections from the ACS method over the diagnosis years 2007-2012 were able to capture the majority of cancer cases, the simple and straightforward projections from the ISCR method produced the total number of new cancer cases in Illinois that was closer to

the actual number, as demonstrated by both the smaller deviation and smaller mean sum of squared deviations.

For site-specific and single year projections, neither of the two methods has consistently outperformed the other. For example, the projection from the ISCR method performed better for breast cancer, and the projection by the ACS method resulted in a much closer number to the actual count for colorectal cancer. Differences in these projections may be due to intrinsic differences in cancer projection methods, or may be attributable to other factors, some potentially beyond the current projection methodologies. Future studies should examine if the difference in site-specific projection performance between the two methods is consistent and if so why, so that the Illinois Cancer Registry can use each method selectively for particular sites.

The findings in this report are consistent with previous ISCR evaluations. Previous effort by ISCR to assess different diagnosis years have shown that compared with ACS cancer incidence projections, ISCR cancer incidence projections from two years and one year before the observed values were published were closer to the observed values overall and for female invasive breast cancer, cervical cancer, and prostate cancer (data not shown). ISCR projections have been improving each year as less time has occurred in between the projections and published values.

To select a method for cancer projection, one must take into account not only the accuracy of the projections but the amount of time and effort required. The ISCR method is straightforward and can be applied whenever a new projection is needed. In addition to the three-year projection, the ISCR method also projects two years and one year ahead at both the state and the county levels, which always results in more accurate counts because of the shorter timeframes involved. It is suggested therefore that ISCR continue to produce cancer projections in Illinois using its current methodology.

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Estimates of Disability-free Life Expectancies for Illinois and Illinois Counties: 2009-2011

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Abstract

Illinois and most of its counties have experienced a decline in mortality and a significant increase in life expectancy for both males and females from 1990 to 2010. Life expectancy, however, may comprise both time spent being fully functional and time spent with disabilities. Assessing the remaining years of life a person can expect to live without any functional disability is important for measuring quality of life. In this report, we estimated disability-free life expectancy (DFLE) for Illinois and its counties, using the American Community Survey's (ACS) definition of and data on disability, the U.S. Census Bureau's population data, and the Illinois Vital Records System's (IVRS) death data. A demographic-epidemiologic model was used for DFLE's computation, and GIS mapping for assessing spatial contrast.

Results from the 2009-2011 life tables showed significant differences in DFLE between males and females in 96 out of 102 counties and statewide, mostly in favor of females. At the state level, a baby girl might live 70.3 years of her 81.6 expected years of life without disability; whereas a baby boy might live 67.0 years without disability out of 76.6 expected years of life, a difference of 3.3 years ($p<0.001$). At the county level, these differences varied from 8.1 years ($p<0.001$) to 0.8 years (non-significant). Mappings of DFLE as percentage of remaining years of life at birth and at age 65 shows significant contrast between northern and southern parts of the state , with most part of the north with higher levels of DFLE than the south, possibly suggesting a rural-urban disparity. Public policy, health planning, and heath intervention agencies may use these findings to target health programs to relevant population groups and areas.

Introduction

Like the general U.S., the population of the state of Illinois has demonstrated some important improvement in health outcomes. Mortality has been decreasing along with significant increases in life expectancy for both males and females from 1990 to 2010. An increase of life expectancy has been observed in 94 of the 102 counties (Shahidullah and Agbodo, 2014 and 2015). Because of demographic and epidemiologic transitions, more people die of chronic diseases than from acute diseases (Molla et al. 2013), and as a result people live longer and more people belong to the elderly population. As people live longer, they are naturally prone to chronic and degenerative diseases and eventually experience activity limitations. Knowing what portion of their lives remains free of activity limitations has become important to policy makers for planning services for the elderly.

Disability-free life expectancy (DFLE) is the indicator used to assess the portion of the remaining years of life a person can expect to live free of the consequences of activity limitations. Disability is a complex concept because its definition varies by health status, technology advancement, social structure, and cultural beliefs.

The International Classification Functioning, Disability, and Health (ICF) attempted a comprehensive definition by considering disability as an umbrella item for impairments, activity limitations, and participation restrictions (WHO, 2001). To operationalize this definition, the U.S. Census Bureau (Brault 2012) considered disability in the communicative, mental and physical domains. For the sake of this report, we adopt the American Community Survey's (ACS) definition that "disability is functional limitations that include one or a combination of the following six health issues: hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties."

This report provides DFLE at ages (in years) 0, 35, 65, and 75 for the state of Illinois and its 102 counties. In addition, gender differences in active life were also assessed to provide benchmark data for health improvement programs and long-term care planning.

Data and Methods

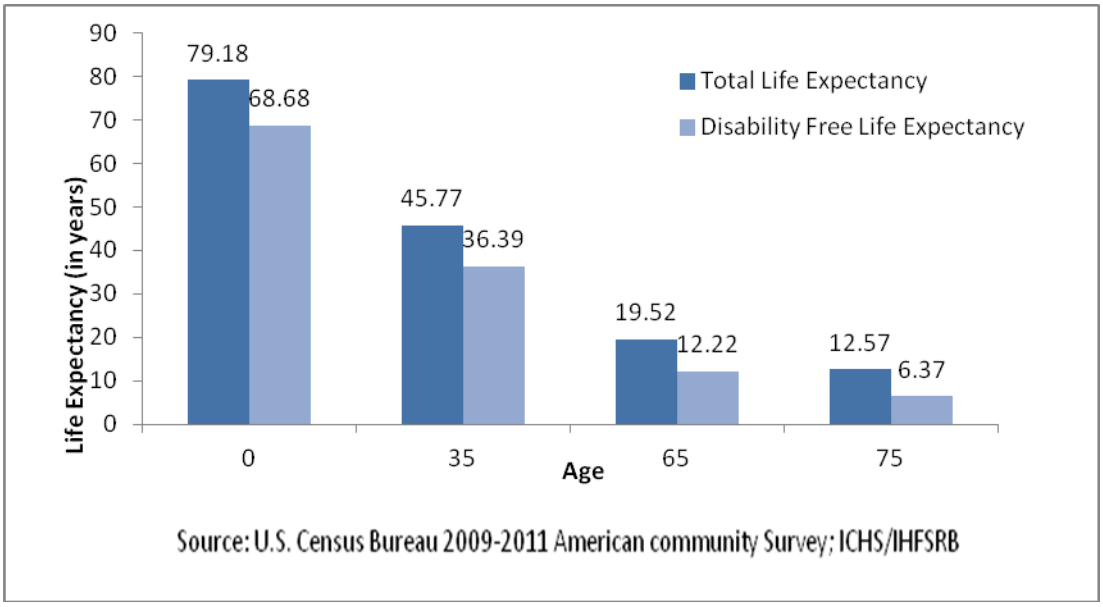
The technique of abridged life table (Shryock and Siegel 1976; Chiang 1984; Wei et al. 2012; Silcocks 2001 and Toson 2003) was used to compute both expected life expectancy (LE) and expected years of DFLE. The data used include the 2010 U.S. census population counts; 2010 Illinois Vital Records System (IVRS) death counts received from the Illinois Center for Health Statistics (ICHS) of the Office of Policy, Planning and Statistics (OPPS); and the 2010 American Community Survey (ACS) disability counts. These data were obtained for Illinois and its counties; population and death data were aggregated into five-year age groups and by sex for abridged life tables' computation, using Chiang's (1984) method. The DFLE was computed for ages 0, 35, 65, and 75, using Sullivan's (1971) and Molla's et al. methods (2001). In the process, years of life with no disability was estimated by applying the proportion of people with no disability at each aforementioned age to the total years of life they contributed. These values were then used in the rest of the life table computation process to obtain DFLE. A Z-test was used to evaluate the significance of differences found between males and females in DFLE. Also, GIS mapping techniques were used to assess spatial contrast within the state.

Results

State Level

In Illinois, a baby born in 2010 could expect to live an average of 79.18 (±0.08) years, of which 68.68 (±0.02) years or 86.74% of his or her life might be free of any functional disability. At age 35, the expectation of life averaged 45.77 (±0.07) years, with 36.39 years (±0.01) or 79.51% free of disability. For older adults aged 65 years, life expectancy neared 19.52 (±0.06) years with DFLE accounting for 12.22 (±0.01) years or 62.63 percent. At age 75 years, life expectancy was 12.57 (±0.05) years, of which DFLE covered 6.37 (0.01) years and represented 50.67 percent (Figure 1 and Appendix E).

Figure 1. Total Life Expectancy and Disability-free Life Expectancy at Ages 0, 35, 65, and 75 for Both Sexes in Illinois: 2009-2011.



Gender Differences

Illinois women lived significantly longer and healthier than men at younger age; the difference decreased in old ages. A baby girl might live 70.30 (±0.02) years of her 81.59 (±0.11) expected years of life with no disability; whereas a baby boy might live 67.02 (±0.01) years with no disability out of 76.64 (±0.12) expected years of life, a difference of 3.28 years ($p<0.001$). At age 65, the gap reduced to only 1.1 years ($p<0.001$); a woman at that age had a life expectancy of 20.75 (0.08) years, of which 12.72 (0.02) years or 61.28 percent are free of disability, and a man at the same age had a life expectancy of 17.99 (0.08) years with 11.62 (0.02) years or 64.56 percent free of disability (Figures 2, 3, and Appendix E).

Across counties, the differences in DFLE between women and men varied from 8.06 years ($p<0.001$) to 0.75 years ($p<0.152$), in favor of women. This observation was made in 96 percent of the counties (Table 1).

Figure 2. Total Life Expectancy and Disability-free Life Expectancy at Ages 0, 35, 65, and 75 for Females in Illinois: 2009-2011.

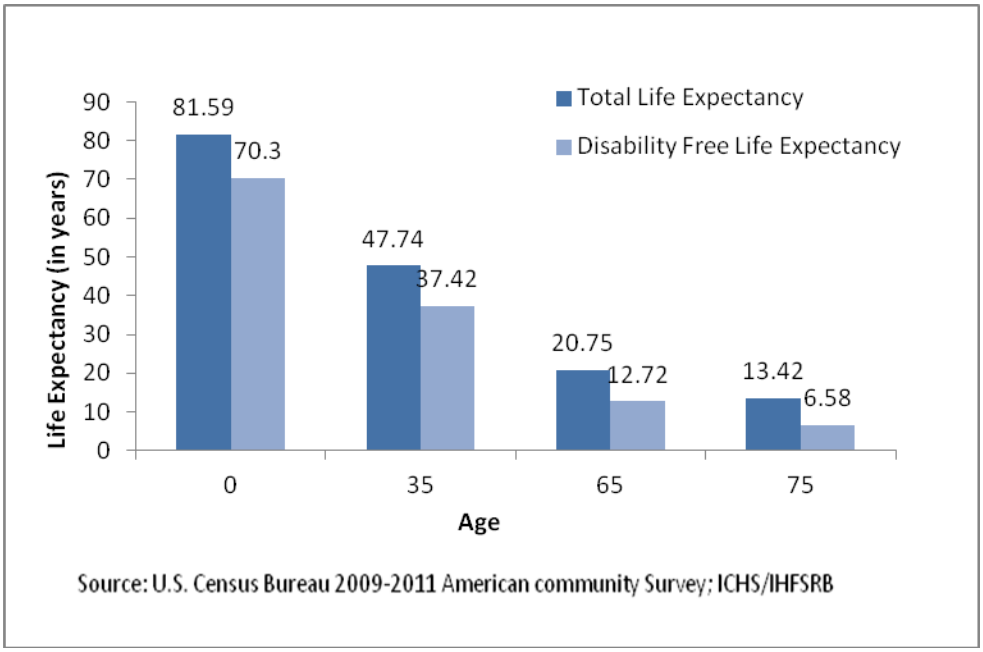
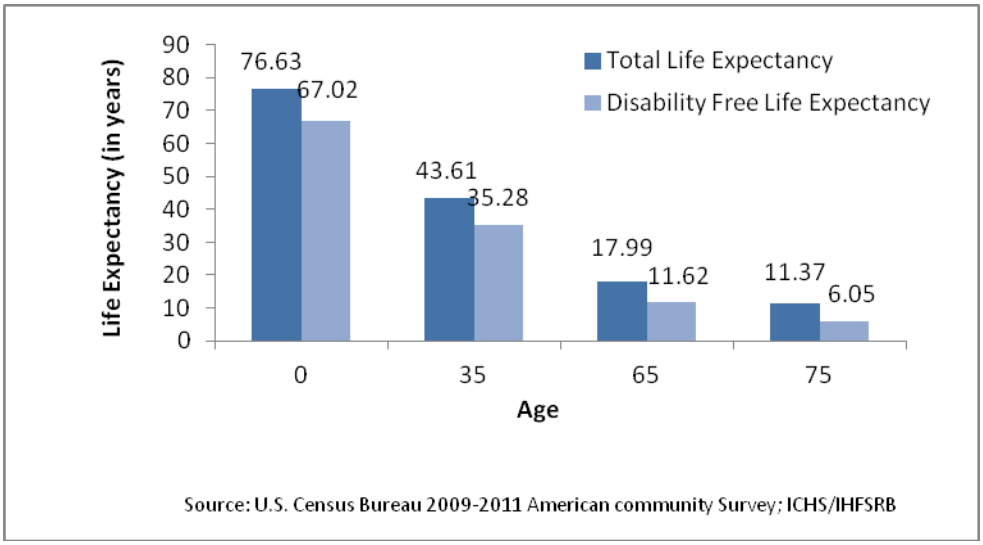


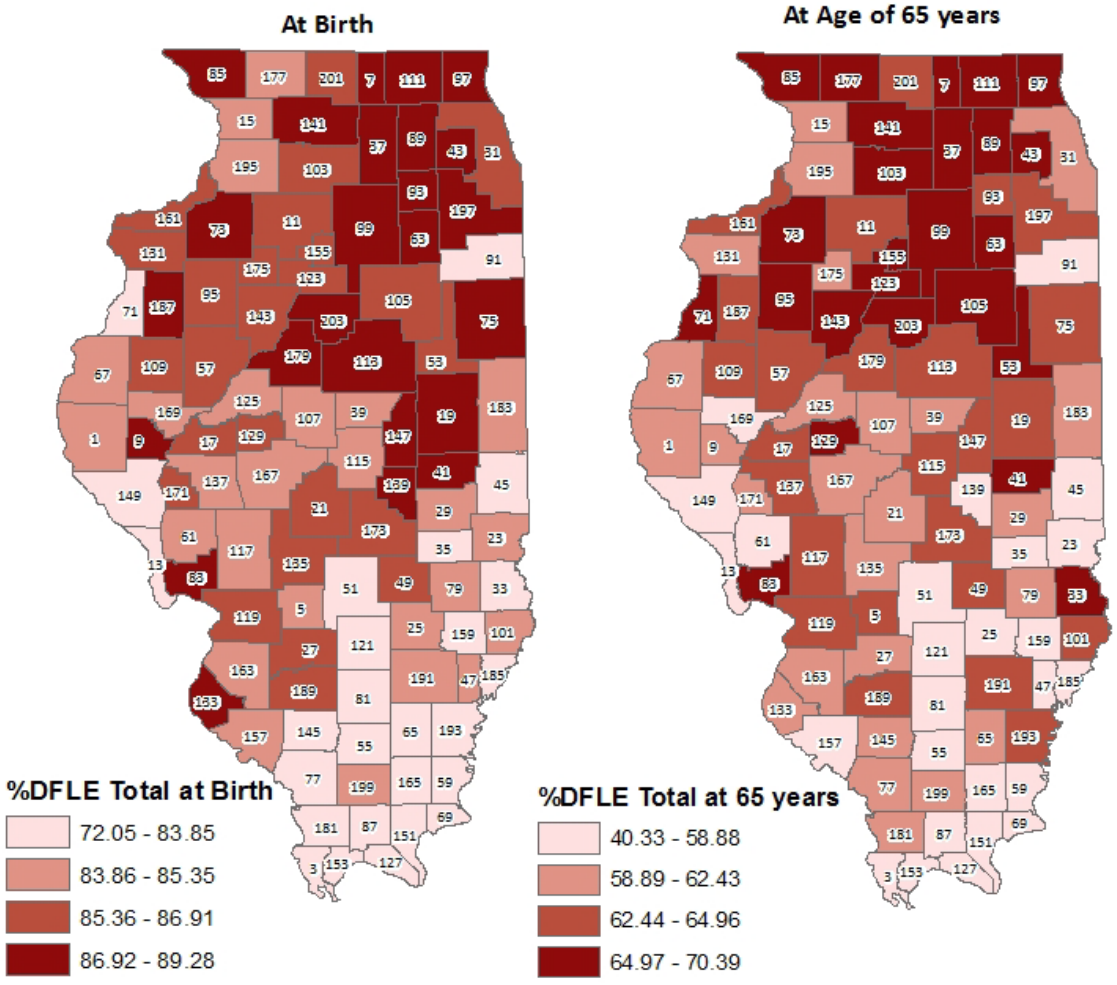
Figure 3. Total Life Expectancy and Disability-free Life Expectancy at ages 0, 35, 65, and 75 for Males in Illinois: 2009-2011.



County Contrast

Mappings of DFLE as the percentage of remaining years of life at birth and at age 65 by county, categorized by quartiles, showed significant contrast between the north and the south within the state with most of the northern counties falling in the first quartile (least disability loss) and the southern counties in the last quartile (most disability loss) (Figure 4 and Appendix E).

Figure 4. Disability-free Life Expectancy (DFLE) as Percentage of Life Expectancy at Birth and at Age 65 Years for Both Sexes in Illinois Counties, 2009-2011.



Illinois Counties' FIPS Codes and Names

1 Adams	23 Clark	45 Edgar	65 Hamilton	85 Jo Daviess	105 Livingston	125 Mason	145 Perry	165 Saline	185 Wabash
3 Alexander	25 Clay	47 Edwards	67 Hancock	87 Johnson	107 Logan	127 Massac	147 Piatt	167 Sangamon	187 Warren
5 Bond	27 Clinton	49 Effingham	69 Hardin	89 Kane	109 McDonough	129 Menard	149 Pike	169 Schuyler	189 Washington
7 Boone	29 Coles	51 Fayette	71 Henderson	91 Kankakee	111 McHenry	131 Mercer	151 Pope	171 Scott	191 Wayne
9 Brown	31 Cook	53 Ford	73 Henry	93 Kendall	113 McLean	133 Monroe	153 Pulaski	173 Shelby	193 White
11 Bureau	33 Crawford	55 Franklin	75 Iroquois	95 Knox	115 Macon	135 Montgomery	155 Putnam	175 Stark	195 Whiteside
13 Calhoun	35 Cumberland	57 Fulton	77 Jackson	97 Lake	117 Macoupin	137 Morgan	157 Randolph	177 Stephenson	197 Will
15 Carroll	37 DeKalb	59 Gallatin	79 Jasper	99 La Salle	119 Madison	139 Moultrie	159 Richland	179 Tazewell	199 Williamson
17 Cass	39 De Witt	61 Greene	81 Jefferson	101 Lawrence	121 Marion	141 Ogle	161 Rock Island	181 Union	201 Winnebago
19 Champaign	41 Douglas	63 Grundy	83 Jersey	103 Lee	123 Marshall	143 Peoria	163 St. Clair	183 Vermilion	203 Woodford
21 Christian	43 DuPage								

Data Source: Illinois Department of Public Health and Illinois Health Facilities and Services Review Board; Certificate of Need Population Projections Project, 2014

Discussion

Proportionally, Illinoisans tend to live more of their years of disability at they are closer to the end of life. Figure 1 shows increasingly higher proportions of years of disability as a percentage of total remaining years of life as age increases, even though the absolute number of years in disability decreases slightly with age. The life expectancy at birth for both sexes in Illinois nears 79.2 years, of which 86.7 percent (68.7 years) are free of functional disability. Nearly 10.5 years will include functional disability from birth to death. At age 35, the life expectancy decreases to 45.8 years, of which 79.5 percent (36.4 years) are free of disability. The number of years of disability to death slightly decreases from 10.5 years to 9.4 years, primarily reflecting the shortened life expectancy. At age 65, the life expectancy reduced to 19.5 years with 12.2 years without disability. Disability accounted for 3.2 years at that age. At age 75, Illinoisans are expected to live 50 percent of their remaining life in functional disability.

This analysis shows that years of disability for both sexes account for 13.3 percent of total life expectancy at birth; this proportion increased to 37.4 percent at age 65 and 49.3 percent at age 75. These statistics hint the hypothesis of *compression of morbidity* (Fries, 1980 and 1989) in Illinois. The compression of morbidity hypothesis purports that various efforts that prolong life and decrease death rate would delay the onset of chronic disease and disability, which will postpone poor health toward the end of a person's life.

The hypothetical compression of morbidity pattern observed in the general population is preserved at gender level; however, women have higher years of disability as they live longer than men. Females may live with disability for 11.3 years from birth to death. As they age, their expectation of living in disability increases. From the age of 75 years, women may experience some type of functional disability for 6.8 years before death. Males follow a similar path. Disability over lifespan for males may cover 9.6 years. At age 35 years, males may experience 1.3 years of disability. This number increases to 3.2 years when reaching the age of 65 years, and 4.3 years at age of 75 years. From 75 years old, males may experience disability for 5.3 years before death.

DFLE is a summary measure (an index) to represent overall health status in a single number (Molla et al. 2001). This index can be used to measure changes over time in the totality of health status (Chang et al. 2013). The summary measure of health can also be used for predicting future health service needs, evaluating health programs and identifying trends and inequalities.

Limitations of the report include the self-reported nature of the American Community Survey data, which might reduce the internal validity of the study. Other limitations include uncertainties in measuring demographic characteristics, small numbers and reliability issues, response rates, and mode of the surveys.

Conclusion

This report combines functional disability prevalence rates and functional DFLE for Illinois and its counties. Illinoisan women live significantly longer and healthier than men at younger ages; the difference decreases

when both sexes reach the age of 65 years. The northern part of the state has a greater concentration of higher life expectancies and healthy life expectancies at birth and at age 65 than the southern part. Overall, the statistics lead to a hypothesis on compression of morbidity in Illinois, probably due to the various disease prevention and health protection programs in place for many years. The hypothetical compression of morbidity pattern is preserved at gender level; however, females have more years of disability as they live longer than men.

The results of this report are relevant for planning for future health service needs, evaluating health programs (as benchmark data), identifying trends and inequalities, and identifying health disparities by gender and geography.

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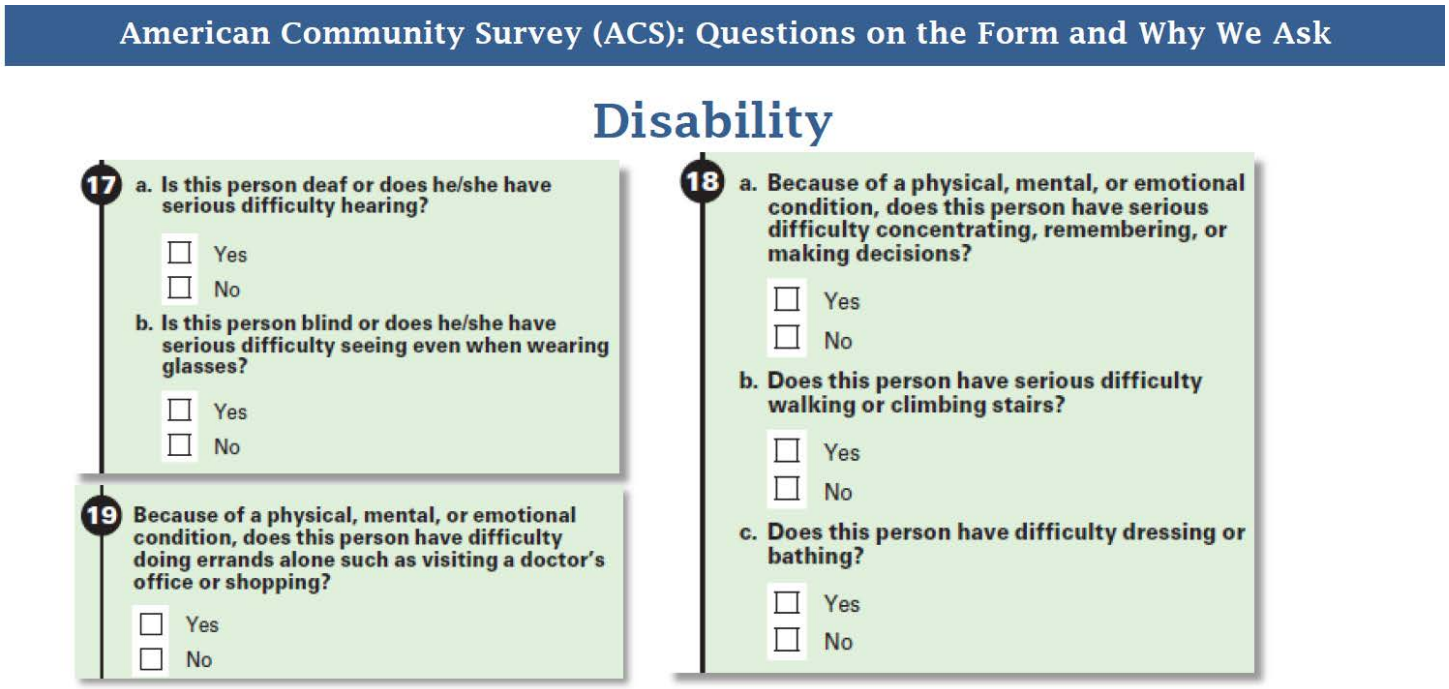
Appendix A

American Community Survey's questions for collecting disability data



Appendix B

Screenshot of the Excel spreadsheet for the computation of disability-free life expectancy

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
Year	Area	Sex	Age	Population	Disability	ex	lx	Tx	Lx	πx	1-πx	(1-πx) * Lx	e'x	πx(1-πx)	S^2= πx(1-πx)/N	L^2	L^2*S^2	Var(e'x)	Var(ex)	Z	Significance
2009	Illinois	Total	0	6,195,345	233,829	79.12	100000	7912184	3456985	0.0377427	0.962257	3,326,508.71	68.76	0.036318	0.00000000586	11,950,742,649,244.80	70,057.32	0.000062596	0.0017598	207.91	207.91***
2009	Illinois	Total	35	5,006,884	508,734	45.67	97550	4455200	2801088	0.1016069	0.898393	2,516,478.09	36.38	0.091283	0.00000001823	7,846,093,886,543.57	143,045.96	0.000058418	0.0012768	214.16	214.16***
2009	Illinois	Total	65	825,666	201,679	19.54	84668	1654112	777412	0.2442622	0.755738	587,519.91	12.20	0.184598	0.00000022357	604,369,986,799.20	135,121.95	0.000057592	0.0008829	196.80	196.80***
2009	Illinois	Total	75+	691,680	340,581	12.64	69383	876699	876699	0.4923968	0.507603	445,015.35	6.41	0.249942	0.00000036136	768,601,495,595.68	277,738.18	0.000057694	0.0005797	196.44	196.44***
2009	Illinois	Male	0	3,140,546	136,426	76.48	100000	7647746	3447395	0.0434402	0.956560	3,297,639.61	67.22	0.041553	0.00000001323	11,884,533,732,670.80	157,246.54	0.000118105	0.0036505	129.92	129.92***
2009	Illinois	Male	35	2,463,496	242,169	43.40	96776	4200350	2749894	0.0983030	0.901697	2,479,571.40	35.38	0.08864	0.00000003598	7,561,918,118,129.12	272,086.77	0.000109315	0.0025746	131.09	131.09***
2009	Illinois	Male	65	375,843	92,292	17.86	81216	1450456	732410	0.2455600	0.754440	552,559.06	11.63	0.18526	0.00000049292	536,423,723,348.34	264,413.62	0.000113964	0.0017982	117.39	117.39***
2009	Illinois	Male	75+	262,301	119,160	11.25	63808	718047	718047	0.4542873	0.545713	391,847.16	6.14	0.24791	0.00000094514	515,590,864,665.85	487,303.93	0.000119689	0.0012397	110.78	110.78***
2009	Illinois	Female	0	3,054,799	97,403	81.60	100000	8159673	3467082	0.0318852	0.968115	3,356,533.21	70.26	0.030869	0.00000001010	12,020,657,265,527.00	121,468.06	0.000129950	0.0031407	168.11	168.11***
2009	Illinois	Female	35	2,543,388	266,565	47.71	98364	4692591	2853949	0.1048071	0.895193	2,554,835.13	37.30	0.093823	0.00000003689	8,145,025,604,547.80	300,460.23	0.000121754	0.0023518	174.75	174.75***
2009	Illinois	Female	65	449,823	109,387	20.86	88155	1838642	822130	0.2431779	0.756822	622,206.32	12.64	0.184042	0.00000040914	675,898,048,115.77	276,539.65	0.000112924	0.0016123	161.76	161.76***
2009	Illinois	Female	75+	429,379	221,421	13.59	74818	1016512	1016512	0.5156773	0.484323	492,319.87	6.58	0.249754	0.00000058166	1,033,296,738,510.60	601,031.31	0.000107370	0.0010132	166.05	166.05***

e_x = life expectancy at age x

l_x = Number of alive at age x

T_x = Total Number of years lived beyond age x

L_x = Number of years in interval

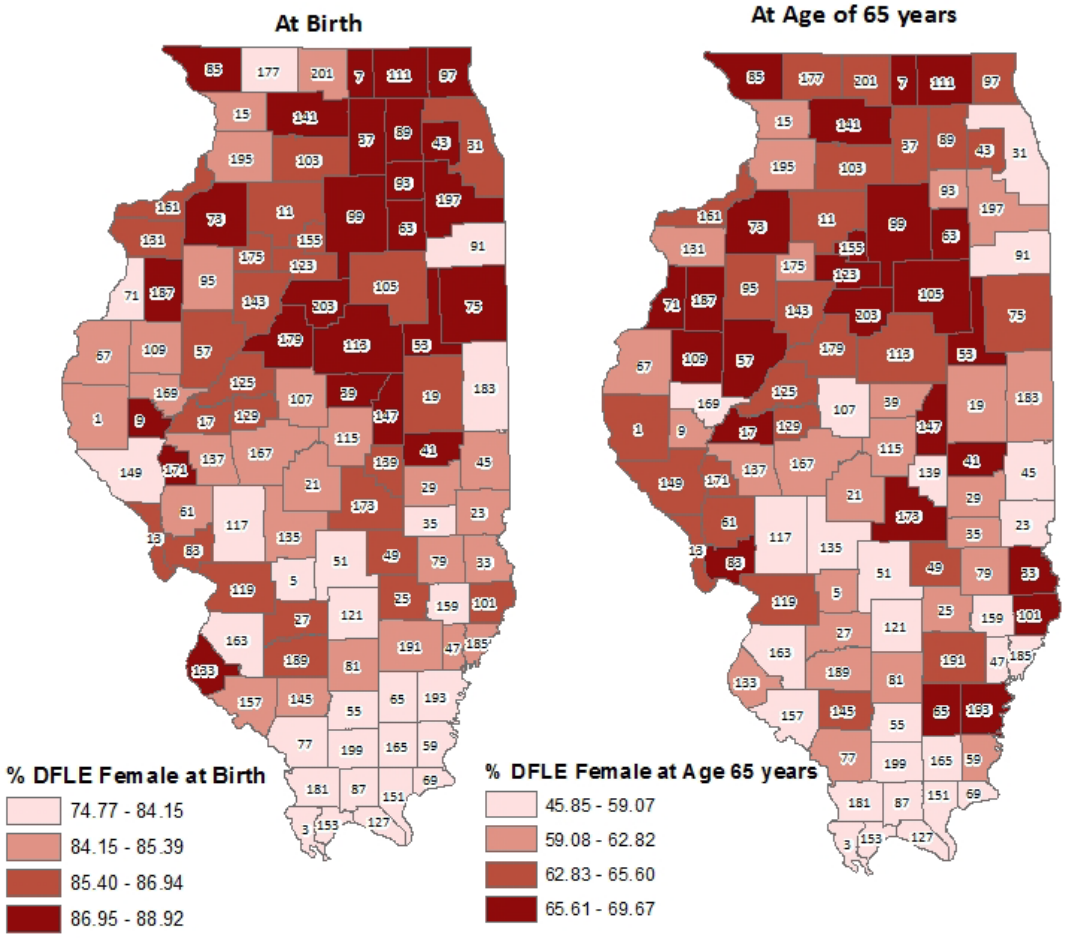
π_x = Disability Proportion at age x

1- π_x = Disability-free proportion at age x

e'_x = disability-free life expectancy

Appendix C

Disability-free Life Expectancy (DFLE) as Percentage of Life Expectancy at Birth and at Age 65 Years for Females in Illinois Counties: 2009-2011



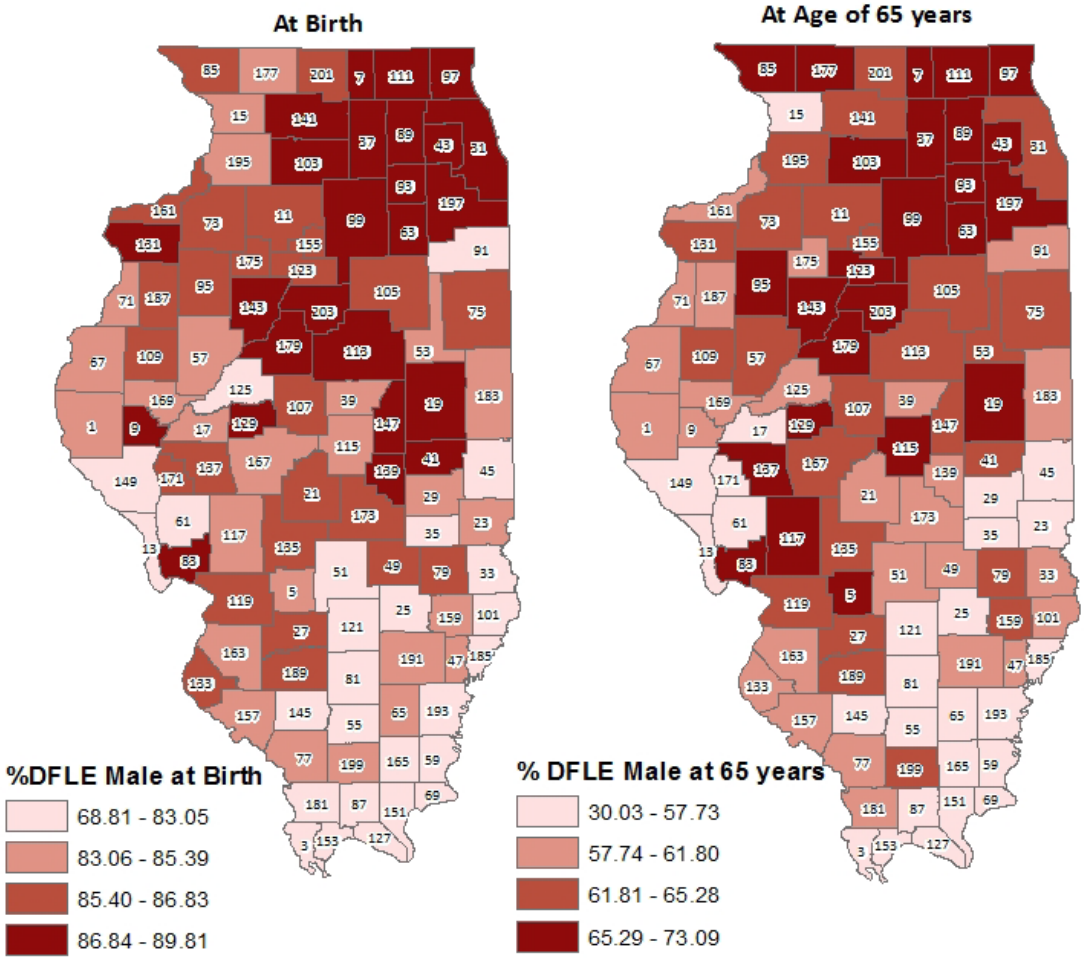
Illinois Counties' FIPS Codes and Names

1 Adams	23 Clark	45 Edgar	65 Hamilton	85 Jo Daviess	105 Livingston	125 Mason	145 Perry	165 Saline	185 Wabash
3 Alexander	25 Clay	47 Edwards	67 Hancock	87 Johnson	107 Logan	127 Massac	147 Piatt	167 Sangamon	187 Warren
5 Bond	27 Clinton	49 Effingham	69 Hardin	89 Kane	109 McDonough	129 Menard	149 Pike	169 Schuyler	189 Washington
7 Boone	29 Coles	51 Fayette	71 Henderson	91 Kankakee	111 McHenry	131 Mercer	151 Pope	171 Scott	191 Wayne
9 Brown	31 Cook	53 Ford	73 Henry	93 Kendall	113 McLean	133 Monroe	153 Pulaski	173 Shelby	193 White
11 Bureau	33 Crawford	55 Franklin	75 Iroquois	95 Knox	115 Macon	135 Montgomery	155 Putnam	175 Stark	195 Whiteside
13 Calhoun	35 Cumberland	57 Fulton	77 Jackson	97 Lake	117 Macoupin	137 Morgan	157 Randolph	177 Stephenson	197 Will
15 Carroll	37 DeKalb	59 Gallatin	79 Jasper	99 La Salle	119 Madison	139 Moultrie	159 Richland	179 Tazewell	199 Williamson
17 Cass	39 De Witt	61 Greene	81 Jefferson	101 Lawrence	121 Marion	141 Ogle	161 Rock Island	181 Union	201 Winnebago
19 Champaign	41 Douglas	63 Grundy	83 Jersey	103 Lee	123 Marshall	143 Peoria	163 St. Clair	183 Vermilion	203 Woodford
21 Christian	43 DuPage								

Data Source: Illinois Department of Public Health and Illinois Health Facilities and Services Review Board; Certificate of Need Population Projections Project, 2014

Appendix D

Disability-free Life Expectancy (DFLE) as Percentage of Life Expectancy at Birth and at Age 65 Years for Males in Illinois Counties: 2009-2011



Illinois Counties' FIPS Codes and Names

1 Adams	23 Clark	45 Edgar	65 Hamilton	85 Jo Daviess	105 Livingston	125 Mason	145 Perry	165 Saline	185 Wabash
3 Alexander	25 Clay	47 Edwards	67 Hancock	87 Johnson	107 Logan	127 Massac	147 Piatt	167 Sangamon	187 Warren
5 Bond	27 Clinton	49 Effingham	69 Hardin	89 Kane	109 McDonough	129 Menard	149 Pike	169 Schuyler	189 Washington
7 Boone	29 Coles	51 Fayette	71 Henderson	91 Kankakee	111 McHenry	131 Mercer	151 Pope	171 Scott	191 Wayne
9 Brown	31 Cook	53 Ford	73 Henry	93 Kendall	113 McLean	133 Monroe	153 Pulaski	173 Shelby	193 White
11 Bureau	33 Crawford	55 Franklin	75 Iroquois	95 Knox	115 Macon	135 Montgomery	155 Putnam	175 Stark	195 Whiteside
13 Calhoun	35 Cumberland	57 Fulton	77 Jackson	97 Lake	117 Macoupin	137 Morgan	157 Randolph	177 Stephenson	197 Will
15 Carroll	37 DeKalb	59 Gallatin	79 Jasper	99 La Salle	119 Madison	139 Moultrie	159 Richland	179 Tazewell	199 Williamson
17 Cass	39 De Witt	61 Greene	81 Jefferson	101 Lawrence	121 Marion	141 Ogle	161 Rock Island	181 Union	201 Winnebago
19 Champaign	41 Douglas	63 Grundy	83 Jersey	103 Lee	123 Marshall	143 Peoria	163 St. Clair	183 Vermillion	203 Woodford
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Data Source: Illinois Department of Public Health and Illinois Health Facilities and Services Review Board; Certificate of Need Population Projections Project, 2014

Appendix E

Total Life Expectancy (LE) and Disability-free Life Expectancy (DFLE) at Ages 0 and 65 Years for Illinois and Illinois Counties: 2009-2011

		Both Sexes (T)			Male (M)			Female (F)			Difference bt M&F
County	Age	LE(T)	DFLE(T)	DFLE(T) as % of LE(T)	LE(M)	DFLE(M)	DFLE(M) as % of LE(M)	LE(F)	DFLE(F)	DFLE(F) as % of LE(F)	DFLE(F) - DFLE(M)
Illinois	0	79.18 (±0.08)	68.68 (±0.02)	86.74	76.63 (±0.12)	67.02 (±0.01)	87.45	81.59 (±0.11)	70.30 (±0.02)	86.16	3.28*****
	65	19.52 (±0.06)	12.22 (±0.01)	62.63	17.99 (±0.08)	11.62 (±0.01)	64.56	20.75 (±0.08)	12.72 (±0.02)	61.28	1.10*****
Adams	0	78.86 (±1.03)	66.71 (±0.21)	84.59	75.61 (±1.48)	63.96 (±0.15)	84.59	82.26 (±1.37)	69.58 (±0.31)	84.59	5.62*****
	65	18.90 (±0.66)	11.78 (±0.17)	62.35	16.85 (±0.91)	10.21 (±0.12)	60.61	20.84 (±0.92)	13.27 (±0.25)	63.67	3.06*****
Alexander	0	74.26 (±3.43)	56.82 (±0.65)	76.51	71.30 (±5.08)	54.40 (±0.46)	76.29	77.88 (±4.44)	59.67 (±0.93)	76.62	5.28*****
	65	17.24 (±1.90)	7.90 (±0.45)	45.82	15.77 (±2.94)	7.27 (±0.31)	46.13	19.02 (±2.44)	8.72 (±0.65)	45.85	1.45*
Bond	0	78.50 (±2.15)	66.01 (±0.42)	84.09	75.83 (±3.07)	64.16 (±0.29)	84.60	81.18 (±2.92)	68.03 (±0.62)	83.80	3.87*****
	65	19.07 (±1.40)	12.02 (±0.35)	63.04	17.04 (±1.95)	11.37 (±0.24)	66.73	20.89 (±1.91)	12.63 (±0.51)	60.50	1.26**
Boone	0	80.26 (±1.28)	71.11 (±0.24)	88.59	78.04 (±1.83)	69.48 (±0.17)	89.03	82.43 (±1.71)	72.67 (±0.35)	88.15	3.19*****
	65	19.74 (±0.90)	13.35 (±0.23)	67.65	18.34 (±1.22)	12.15 (±0.17)	66.23	20.92 (±1.26)	14.36 (±0.33)	68.64	2.21*****
Brown	0	79.24 (±2.86)	69.40 (±0.68)	87.58	76.31 (±3.86)	66.88 (±0.46)	87.64	82.82 (±3.97)	72.49 (±1.03)	87.53	5.62*****
	65	17.91 (±2.38)	10.98 (±0.59)	61.32	15.68 (±3.45)	9.28 (±0.40)	59.21	20.18 (±3.03)	12.68 (±0.89)	62.82	3.39*****
Bureau	0	79.47 (±1.58)	68.54 (±0.27)	86.24	76.72 (±2.33)	66.14 (±0.19)	86.21	82.19 (±2.06)	70.96 (±0.39)	86.33	4.82*****
	65	20.13 (±0.94)	12.64 (±0.24)	62.81	18.96 (±1.33)	11.89 (±0.17)	62.73	21.02 (±1.30)	13.23 (±0.33)	62.94	1.33*****
Calhoun	0	80.60 (±3.50)	67.56 (±0.76)	83.81	78.92 (±5.19)	63.80 (±0.56)	80.85	82.43 (±4.65)	71.53 (±1.03)	86.78	7.73*****
	65	19.75 (±2.20)	11.24 (±0.61)	56.92	18.61 (±3.25)	9.24 (±0.42)	49.64	20.99 (±2.90)	13.26 (±0.88)	63.16	4.02*****
Carroll	0	78.51 (±2.48)	66.11 (±0.42)	84.21	75.51 (±3.76)	63.10 (±0.30)	83.57	81.68 (±2.98)	69.32 (±0.61)	84.87	6.22*****
	65	19.72 (±1.34)	11.73 (±0.33)	59.49	18.28 (±1.86)	10.45 (±0.23)	57.18	21.01 (±1.89)	12.92 (±0.48)	61.48	2.47*****
Cass	0	78.14 (±2.26)	67.06 (±0.46)	85.82	76.34 (±2.87)	64.91 (±0.32)	85.04	79.87 (±3.48)	69.15 (±0.66)	86.58	4.24*****
	65	18.36 (±1.55)	11.73 (±0.39)	63.88	16.30 (±2.15)	9.20 (±0.28)	56.45	20.26 (±2.15)	14.11 (±0.56)	69.64	4.91*****
Champaign	0	80.55 (±0.71)	70.25 (±0.14)	87.22	78.34 (±1.04)	69.26 (±0.10)	88.42	82.59 (±0.96)	71.20 (±0.20)	86.21	1.94*****
	65	20.28 (±0.53)	13.01 (±0.13)	64.14	19.02 (±0.76)	12.84 (±0.10)	67.49	21.26 (±0.72)	13.11 (±0.19)	61.64	0.27^{NS}
Christian	0	77.04 (±1.70)	65.80 (±0.27)	85.41	75.05 (±2.35)	64.21 (±0.19)	85.56	79.08 (±2.43)	67.44 (±0.39)	85.29	3.24*****
	65	18.89 (±0.98)	11.28 (±0.23)	59.72	17.82 (±1.40)	10.59 (±0.17)	59.45	19.78 (±1.34)	11.86 (±0.32)	59.95	1.27*****
Clark	0	76.83 (±2.27)	64.90 (±0.40)	84.47	73.93 (±3.39)	62.22 (±0.29)	84.16	79.54 (±2.91)	67.48 (±0.56)	84.84	5.26*****
	65	17.92 (±1.30)	10.27 (±0.33)	57.29	16.84 (±1.75)	9.50 (±0.24)	56.42	18.61 (±1.87)	10.79 (±0.44)	57.99	1.29***
Clay	0	76.29 (±2.42)	64.08 (±0.44)	84.00	73.62 (±3.50)	60.80 (±0.33)	82.58	78.92 (±3.25)	67.40 (±0.59)	85.39	6.60*****
	65	17.51 (±1.40)	10.18 (±0.33)	58.17	15.59 (±2.05)	8.66 (±0.25)	55.52	19.20 (±1.83)	11.53 (±0.46)	60.09	2.88*****
Clinton	0	79.94 (±1.46)	69.22 (±0.28)	86.59	77.16 (±2.13)	66.91 (±0.20)	86.71	82.85 (±1.82)	71.68 (±0.39)	86.52	4.77*****
	65	19.78 (±0.90)	12.33 (±0.25)	62.31	18.09 (±1.33)	11.55 (±0.18)	63.87	21.21 (±1.18)	12.95 (±0.35)	61.07	1.40*****
Coles	0	78.34 (±1.35)	66.14 (±0.24)	84.42	75.90 (±1.87)	64.08 (±0.17)	84.44	80.67 (±1.90)	68.09 (±0.35)	84.41	4.01*****
	65	19.24 (±0.88)	11.50 (±0.21)	59.75	17.49 (±1.25)	9.91 (±0.15)	56.63	20.71 (±1.18)	12.85 (±0.29)	62.05	2.94*****

County	Age	Both Sexes (T)			Male (M)			Female (F)			Difference bt M&F
		LE(T)	DFLE(T)	DFLE(T) as % of LE(T)	LE(M)	DFLE(M)	DFLE(M) as % of LE(M)	LE(F)	DFLE(F)	DFLE(F) as % of LE(F)	DFLE(F) - DFLE(M)
Cook	0	79.01 (±0.13)	68.33 (±0.02)	86.49	76.08 (±0.20)	66.72 (±0.02)	87.70	81.71 (±0.18)	69.88 (±0.04)	85.52	3.16*****
	65	19.84 (±0.10)	12.09 (±0.02)	60.91	18.13 (±0.14)	11.65 (±0.02)	64.28	21.16 (±0.13)	12.41 (±0.03)	58.64	0.76*****
Crawford	0	77.50 (±2.07)	64.73 (±0.40)	83.52	74.87 (±3.02)	62.05 (±0.28)	82.88	80.09 (±2.69)	67.41 (±0.57)	84.17	5.36*****
	65	18.10 (±1.21)	11.77 (±0.29)	65.01	15.88 (±1.66)	9.81 (±0.20)	61.78	20.11 (±1.64)	13.57 (±0.43)	67.47	3.76*****
Cumberland	0	78.68 (±2.61)	63.59 (±0.56)	80.81	76.21 (±4.02)	60.92 (±0.40)	79.93	81.46 (±2.89)	66.59 (±0.79)	81.75	5.67*****
	65	18.67 (±1.63)	10.56 (±0.43)	56.56	17.55 (±2.43)	9.22 (±0.31)	52.53	19.71 (±2.15)	11.88 (±0.59)	60.29	2.66*****
DeKalb	0	79.75 (±0.91)	70.21 (±0.18)	88.04	78.21 (±1.34)	69.32 (±0.13)	88.63	81.22 (±1.21)	71.13 (±0.26)	87.57	1.81*****
	65	19.08 (±0.68)	12.53 (±0.18)	65.66	18.38 (±1.00)	12.43 (±0.13)	67.63	19.62 (±0.92)	12.61 (±0.24)	64.28	0.18^{NS}
Dewitt	0	78.32 (±2.13)	66.85 (±0.40)	85.35	76.54 (±3.09)	64.01 (±0.30)	83.63	80.00 (±2.87)	69.68 (±0.53)	87.10	5.67*****
	65	17.95 (±1.26)	10.83 (±0.33)	60.35	16.54 (±1.82)	9.61 (±0.24)	58.12	19.18 (±1.70)	11.89 (±0.45)	61.98	2.28*****
Douglas	0	80.19 (±1.95)	70.30 (±0.37)	87.66	77.46 (±2.78)	67.74 (±0.26)	87.45	82.75 (±2.67)	72.77 (±0.53)	87.94	5.04*****
	65	19.51 (±1.33)	12.94 (±0.32)	66.33	17.69 (±1.83)	11.49 (±0.23)	64.94	20.99 (±1.85)	14.17 (±0.46)	67.51	2.69*****
DuPage	0	81.83 (±0.29)	72.62 (±0.06)	88.74	79.70 (±0.43)	71.28 (±0.04)	89.45	83.72 (±0.39)	73.87 (±0.08)	88.24	2.59*****
	65	20.51 (±0.22)	13.60 (±0.06)	66.32	19.05 (±0.32)	13.05 (±0.04)	68.50	21.63 (±0.29)	14.03 (±0.08)	64.84	0.98*****
Edgar	0	77.66 (±2.13)	65.09 (±0.39)	83.82	75.59 (±3.22)	62.78 (±0.29)	83.05	79.65 (±2.75)	67.33 (±0.53)	84.53	4.55*****
	65	18.55 (±1.24)	10.61 (±0.31)	57.21	17.24 (±1.84)	9.49 (±0.23)	55.08	19.68 (±1.66)	11.56 (±0.43)	58.71	2.06*****
Edwards	0	76.19 (±4.18)	64.07 (±0.62)	84.09	74.02 (±4.47)	61.53 (±0.46)	83.12	79.22 (±7.15)	67.04 (±0.88)	84.62	5.51*****
	65	19.16 (±2.20)	11.28 (±0.52)	58.86	15.82 (±2.78)	9.38 (±0.35)	59.28	23.25 (±3.33)	13.48 (±0.83)	58.00	4.11*****
Effingham	0	79.03 (±1.49)	68.40 (±0.28)	86.55	77.39 (±2.10)	66.90 (±0.20)	86.45	80.57 (±2.07)	69.77 (±0.40)	86.60	2.87*****
	65	19.03 (±1.02)	12.02 (±0.25)	63.18	17.69 (±1.54)	10.65 (±0.18)	60.22	20.16 (±1.32)	13.16 (±0.34)	65.28	2.51*****
Fayette	0	79.27 (±2.00)	65.43 (±0.40)	82.55	77.72 (±2.89)	63.65 (±0.29)	81.89	81.05 (±2.74)	67.42 (±0.55)	83.18	3.77*****
	65	19.72 (±1.20)	11.50 (±0.32)	58.30	18.72 (±1.86)	11.23 (±0.23)	60.00	20.79 (±1.57)	11.83 (±0.46)	56.88	0.60^{NS}
Ford	0	77.34 (±2.28)	66.63 (±0.42)	86.15	75.56 (±3.23)	64.17 (±0.32)	84.93	78.87 (±3.16)	69.01 (±0.56)	87.50	4.84*****
	65	18.14 (±1.40)	11.78 (±0.34)	64.97	16.89 (±1.95)	10.84 (±0.26)	64.20	19.03 (±1.93)	12.49 (±0.45)	65.63	1.65*****
Franklin	0	74.56 (±1.60)	60.09 (±0.27)	80.59	71.35 (±2.34)	57.63 (±0.19)	80.77	77.90 (±2.08)	62.70 (±0.39)	80.48	5.07*****
	65	17.76 (±0.81)	9.39 (±0.20)	52.87	16.25 (±1.12)	8.72 (±0.14)	53.66	19.06 (±1.12)	9.98 (±0.29)	52.37	1.27*****
Fulton	0	76.99 (±1.55)	66.04 (±0.27)	85.78	75.38 (±2.12)	64.34 (±0.19)	85.35	78.58 (±2.22)	67.75 (±0.38)	86.22	3.41*****
	65	18.65 (±0.87)	12.02 (±0.21)	64.46	17.30 (±1.24)	10.74 (±0.15)	62.11	19.79 (±1.17)	13.14 (±0.30)	66.38	2.40*****
Gallatin	0	71.30 (±4.55)	58.48 (±0.66)	82.02	69.20 (±6.19)	55.85 (±0.48)	80.72	73.60 (±6.58)	61.31 (±0.91)	83.30	5.46*****
	65	17.26 (±1.97)	9.71 (±0.50)	56.26	16.04 (±2.91)	8.06 (±0.36)	50.28	18.46 (±2.59)	11.33 (±0.69)	61.40	3.27*****
Greene	0	77.77 (±2.40)	65.34 (±0.44)	84.02	75.26 (±3.47)	62.23 (±0.32)	82.69	80.29 (±3.34)	68.50 (±0.63)	85.32	6.27*****
	65	17.86 (±1.48)	10.39 (±0.35)	58.18	15.68 (±1.96)	8.02 (±0.24)	51.13	20.06 (±2.15)	12.78 (±0.51)	63.72	4.76*****
Grundy	0	78.19 (±1.30)	68.51 (±0.24)	87.61	75.45 (±1.87)	66.41 (±0.17)	88.01	80.96 (±1.74)	70.67 (±0.36)	87.29	4.27*****
	65	18.33 (±0.91)	12.21 (±0.23)	66.59	16.96 (±1.29)	11.46 (±0.16)	67.56	19.48 (±1.25)	12.85 (±0.32)	66.00	1.40*****
Hamilton	0	76.21 (±3.43)	63.83 (±0.56)	83.75	73.35 (±5.10)	61.01 (±0.38)	83.19	79.32 (±4.02)	66.73 (±0.83)	84.13	5.72*****
	65	18.69 (±1.73)	11.59 (±0.42)	62.01	17.82 (±2.40)	9.99 (±0.31)	56.08	19.23 (±2.44)	12.70 (±0.56)	66.03	2.70*****

County	Age	Both Sexes (T)			Male (M)			Female (F)			Difference bt M&F
		LE(T)	DFLE(T)	DFLE(T) as % of LE(T)	LE(M)	DFLE(M)	DFLE(M) as % of LE(M)	LE(F)	DFLE(F)	DFLE(F) as % of LE(F)	DFLE(F) - DFLE(M)
Hancock	0	80.78 (±2.11)	68.40 (±0.39)	84.67	78.11 (±2.98)	65.92 (±0.28)	84.40	83.41 (±2.94)	70.82 (±0.55)	84.90	4.89*****
	65	20.92 (±1.16)	12.38 (±0.33)	59.18	18.86 (±1.56)	10.92 (±0.23)	57.91	22.80 (±1.64)	13.67 (±0.47)	59.94	2.75*****
Hardin	0	75.50 (±4.67)	54.40 (±0.94)	72.05	75.96 (±8.23)	52.27 (±0.66)	68.81	76.79 (±5.11)	57.41 (±1.41)	74.77	5.14*****
	65	16.72 (±2.32)	6.74 (±0.53)	40.33	19.41 (±4.98)	5.83 (±0.43)	30.03	16.22 (±2.80)	8.40 (±0.74)	51.79	2.57****
Henderson	0	80.72 (±3.06)	67.69 (±0.67)	83.86	78.65 (±4.04)	65.94 (±0.47)	83.84	82.73 (±4.53)	69.44 (±0.96)	83.94	3.50*****
	65	20.20 (±1.92)	13.21 (±0.49)	65.40	17.82 (±2.55)	10.94 (±0.33)	61.41	22.52 (±2.68)	15.50 (±0.72)	68.84	4.56*****
Henry	0	79.11 (±1.23)	69.44 (±0.22)	87.77	76.56 (±1.83)	66.40 (±0.16)	86.73	81.67 (±1.54)	72.55 (±0.31)	88.83	6.15*****
	65	18.68 (±0.74)	12.45 (±0.19)	66.62	17.20 (±1.05)	10.91 (±0.13)	63.38	19.96 (±1.01)	13.82 (±0.26)	69.25	2.92*****
Iroquois	0	77.66 (±1.64)	67.50 (±0.28)	86.92	75.19 (±2.27)	65.14 (±0.20)	86.64	80.10 (±2.32)	69.87 (±0.40)	87.23	4.73*****
	65	18.57 (±0.97)	12.02 (±0.24)	64.74	16.95 (±1.36)	10.99 (±0.16)	64.81	19.99 (±1.33)	12.94 (±0.34)	64.75	1.95*****
Jackson	0	78.05 (±1.36)	65.01 (±0.23)	83.29	75.87 (±1.92)	64.37 (±0.17)	84.84	80.14 (±1.90)	67.17 (±0.35)	83.82	2.81*****
	65	19.60 (±0.89)	12.17 (±0.19)	62.06	18.05 (±1.30)	11.05 (±0.16)	61.25	20.90 (±1.18)	12.65 (±0.31)	60.49	1.59*****
Jasper	0	80.35 (±2.88)	68.44 (±0.54)	85.17	77.06 (±4.35)	66.17 (±0.37)	85.87	83.82 (±3.52)	70.82 (±0.80)	84.49	4.65*****
	65	19.59 (±1.82)	12.01 (±0.45)	61.29	17.76 (±2.54)	11.23 (±0.31)	63.24	21.32 (±2.51)	12.71 (±0.65)	59.62	1.48*
Jefferson	0	76.56 (±1.52)	63.95 (±0.27)	83.54	74.20 (±2.11)	61.05 (±0.20)	82.27	79.11 (±2.14)	67.08 (±0.37)	84.79	6.04*****
	65	18.28 (±0.90)	10.58 (±0.22)	57.86	16.88 (±1.28)	9.47 (±0.16)	56.07	19.52 (±1.23)	11.58 (±0.31)	59.32	2.11*****
Jersey	0	78.05 (±1.85)	68.44 (±0.33)	87.69	76.20 (±2.63)	67.60 (±0.23)	88.71	79.93 (±2.53)	69.37 (±0.48)	86.78	1.77*****
	65	18.88 (±1.18)	12.51 (±0.30)	66.26	17.91 (±1.73)	12.00 (±0.22)	67.00	19.76 (±1.58)	13.02 (±0.41)	65.88	1.02**
Jo Daviess	0	81.28 (±1.75)	71.22 (±0.33)	87.62	80.66 (±2.46)	70.01 (±0.25)	86.80	81.95 (±2.53)	72.43 (±0.46)	88.39	2.42*****
	65	20.18 (±1.05)	13.81 (±0.27)	68.41	19.60 (±1.54)	13.10 (±0.20)	66.87	20.85 (±1.42)	14.52 (±0.37)	69.67	1.42*****
Johnson	0	77.49 (±2.89)	63.00 (±0.51)	81.30	75.48 (±4.28)	62.59 (±0.35)	82.93	79.50 (±3.96)	63.34 (±0.74)	79.67	0.75^{NS}
	65	19.06 (±1.38)	9.92 (±0.40)	52.03	17.60 (±1.90)	10.05 (±0.26)	57.09	20.51 (±1.92)	9.74 (±0.60)	47.48	-0.31^{NS}
Kane	0	80.96 (±0.42)	71.69 (±0.08)	88.56	79.25 (±0.61)	70.59 (±0.06)	89.08	82.54 (±0.56)	72.77 (±0.12)	88.16	2.18*****
	65	20.11 (±0.32)	13.20 (±0.08)	65.64	19.10 (±0.47)	12.76 (±0.06)	66.85	20.91 (±0.43)	13.56 (±0.11)	64.84	0.80*****
Kankakee	0	77.88 (±0.88)	63.52 (±0.18)	81.55	75.08 (±1.27)	62.13 (±0.12)	82.74	80.68 (±1.17)	64.93 (±0.26)	80.48	2.80*****
	65	18.82 (±0.59)	10.85 (±0.15)	57.65	17.02 (±0.83)	10.27 (±0.11)	60.33	20.43 (±0.80)	11.39 (±0.21)	55.74	1.12*****
Kendall	0	81.01 (±0.95)	71.61 (±0.20)	88.40	78.58 (±1.35)	70.55 (±0.14)	89.79	83.30 (±1.28)	72.60 (±0.31)	87.16	2.05*****
	65	19.91 (±0.78)	12.67 (±0.21)	63.66	18.08 (±1.12)	12.36 (±0.14)	68.37	21.52 (±1.04)	12.93 (±0.31)	60.06	0.56^{NS}
Knox	0	76.94 (±1.37)	65.67 (±0.23)	85.36	74.84 (±1.88)	63.93 (±0.16)	85.43	79.11 (±1.95)	67.50 (±0.32)	85.32	3.56*****
	65	18.61 (±0.73)	12.13 (±0.18)	65.18	17.42 (±1.06)	11.46 (±0.13)	65.79	19.65 (±0.98)	12.73 (±0.25)	64.79	1.27*****
Lake	0	81.34 (±0.35)	72.20 (±0.07)	88.75	79.65 (±0.52)	71.07 (±0.05)	89.23	82.91 (±0.48)	73.31 (±0.10)	88.41	2.23*****
	65	20.40 (±0.27)	13.55 (±0.07)	66.42	19.37 (±0.40)	13.20 (±0.05)	68.14	21.22 (±0.37)	13.84 (±0.10)	65.22	0.64*****
LaSalle	0	77.70 (±0.89)	67.80 (±0.15)	87.26	75.52 (±1.26)	65.91 (±0.11)	87.27	79.86 (±1.21)	69.72 (±0.21)	87.30	3.81*****
	65	18.72 (±0.53)	12.30 (±0.13)	65.74	17.27 (±0.75)	11.37 (±0.09)	65.79	19.95 (±0.72)	13.10 (±0.18)	65.70	1.74*****
Lawrence	0	74.69 (±2.46)	62.94 (±0.46)	84.27	73.53 (±3.57)	60.59 (±0.39)	82.41	75.71 (±3.46)	64.84 (±0.58)	85.64	4.24*****
	65	17.13 (±1.29)	10.74 (±0.32)	62.71	16.15 (±1.93)	9.42 (±0.24)	58.32	17.96 (±1.71)	11.89 (±0.43)	66.23	2.48*****

County	Age	Both Sexes (T)			Male (M)			Female (F)			Difference bt M&F
		LE(T)	DFLE(T)	DFLE(T) as % of LE(T)	LE(M)	DFLE(M)	DFLE(M) as % of LE(M)	LE(F)	DFLE(F)	DFLE(F) as % of LE(F)	DFLE(F) - DFLE(M)
Lee	0	78.51 (±1.53)	67.93 (±0.29)	86.53	76.15 (±2.18)	66.40 (±0.20)	87.20	81.15 (±2.02)	69.79 (±0.42)	86.01	3.40*****
	65	19.30 (±0.97)	12.56 (±0.25)	65.06	18.29 (±1.32)	12.18 (±0.19)	66.61	20.07 (±1.38)	12.89 (±0.35)	64.20	0.71NS
Livingston	0	77.47 (±1.58)	67.01 (±0.27)	86.49	75.71 (±2.25)	65.19 (±0.20)	86.10	79.12 (±2.19)	68.77 (±0.38)	86.92	3.58*****
	65	18.92 (±0.93)	12.69 (±0.23)	67.06	17.62 (±1.36)	11.51 (±0.16)	65.29	19.97 (±1.26)	13.67 (±0.32)	68.46	2.17*****
Logan	0	78.64 (±1.68)	67.04 (±0.33)	85.24	76.17 (±2.35)	65.57 (±0.23)	86.08	81.06 (±2.35)	68.45 (±0.48)	84.44	2.88*****
	65	19.35 (±1.06)	11.70 (±0.28)	60.48	18.04 (±1.51)	11.49 (±0.19)	63.72	20.36 (±1.44)	11.81 (±0.39)	58.01	0.31^{NS}
McDonough	0	79.51 (±1.80)	68.18 (±0.32)	85.75	77.92 (±2.32)	67.46 (±0.22)	86.56	80.74 (±2.78)	68.55 (±0.46)	84.90	1.09**
	65	19.37 (±1.07)	12.51 (±0.27)	64.60	17.85 (±1.49)	11.04 (±0.20)	61.88	20.53 (±1.48)	13.63 (±0.36)	66.39	2.59*****
McHenry	0	80.14 (±0.52)	71.34 (±0.10)	89.02	78.04 (±0.76)	69.89 (±0.07)	89.56	82.18 (±0.67)	72.79 (±0.15)	88.58	2.90*****
	65	19.25 (±0.38)	12.90 (±0.10)	67.02	17.98 (±0.55)	12.36 (±0.07)	68.74	20.33 (±0.52)	13.36 (±0.14)	65.73	1.00*****
McLean	0	79.94 (±0.75)	69.71 (±0.14)	87.20	77.53 (±1.10)	67.75 (±0.10)	87.38	80.75 (±1.21)	70.48 (±0.20)	87.28	2.73*****
	65	19.74 (±0.55)	12.71 (±0.14)	64.37	18.41 (±0.81)	11.70 (±0.10)	63.53	20.50 (±0.75)	13.37 (±0.19)	65.20	1.67*****
Macon	0	78.00 (±0.92)	66.28 (±0.16)	84.98	75.11 (±1.35)	63.95 (±0.11)	85.14	82.20 (±0.99)	69.59 (±0.24)	84.66	5.65*****
	65	19.42 (±0.55)	12.36 (±0.14)	63.64	18.03 (±0.79)	11.84 (±0.10)	65.64	20.82 (±0.74)	12.93 (±0.20)	62.09	1.09*****
Macoupin	0	77.89 (±1.34)	65.75 (±0.25)	84.42	75.92 (±1.95)	64.83 (±0.18)	85.39	79.74 (±1.81)	66.77 (±0.35)	83.73	1.94*****
	65	18.77 (±0.77)	11.73 (±0.20)	62.47	17.58 (±1.08)	12.18 (±0.14)	69.31	19.72 (±1.07)	11.33 (±0.28)	57.43	-0.86^{NS}
Madison	0	77.37 (±0.56)	66.98 (±0.10)	86.57	74.74 (±0.83)	64.89 (±0.07)	86.83	79.92 (±0.74)	69.04 (±0.14)	86.38	4.15*****
	65	18.55 (±0.36)	11.78 (±0.09)	63.51	17.19 (±0.52)	11.02 (±0.06)	64.08	19.67 (±0.48)	12.43 (±0.12)	63.16	1.41*****
Marion	0	75.15 (±1.51)	60.49 (±0.28)	80.49	72.61 (±2.16)	58.30 (±0.20)	80.29	77.71 (±2.07)	62.71 (±0.39)	80.69	4.41*****
	65	17.61 (±0.86)	9.27 (±0.21)	52.66	16.38 (±1.20)	9.05 (±0.15)	55.26	18.67 (±1.20)	9.46 (±0.30)	50.64	0.40^{NS}
Marshall	0	77.31 (±2.72)	66.64 (±0.45)	86.20	74.97 (±4.24)	64.73 (±0.32)	86.35	79.65 (±3.44)	68.54 (±0.65)	86.05	3.81*****
	65	18.95 (±1.45)	12.69 (±0.36)	66.96	18.41 (±2.10)	12.26 (±0.26)	66.59	19.44 (±1.99)	13.08 (±0.49)	67.28	0.82^{NS}
Mason	0	76.00 (±2.70)	64.16 (±0.42)	84.43	74.05 (±3.95)	61.14 (±0.31)	82.57	77.91 (±3.59)	67.26 (±0.56)	86.33	6.12*****
	65	18.26 (±1.36)	11.23 (±0.33)	61.51	17.50 (±1.83)	10.25 (±0.24)	58.54	18.84 (±1.97)	12.09 (±0.44)	64.15	1.84*****
Massac	0	75.79 (±2.38)	61.04 (±0.44)	80.54	73.41 (±3.49)	59.22 (±0.32)	80.67	78.01 (±3.21)	62.79 (±0.61)	80.48	3.57*****
	65	17.43 (±1.38)	9.33 (±0.32)	53.56	16.00 (±1.95)	9.09 (±0.23)	56.80	18.62 (±1.92)	9.54 (±0.44)	51.27	0.46^{NS}
Menard	0	78.63 (±2.56)	68.27 (±0.47)	86.83	76.77 (±3.50)	66.78 (±0.33)	86.99	80.26 (±3.82)	69.61 (±0.66)	86.72	2.82*****
	65	18.98 (±1.59)	12.39 (±0.40)	65.25	17.58 (±2.14)	11.89 (±0.28)	67.64	20.20 (±2.26)	12.80 (±0.58)	63.36	0.91NS
Mercer	0	80.08 (±2.24)	69.21 (±0.40)	86.43	77.13 (±3.46)	67.11 (±0.28)	87.01	82.99 (±2.73)	71.30 (±0.59)	85.92	4.19*****
	65	20.29 (±1.31)	12.54 (±0.36)	61.77	19.05 (±1.79)	11.97 (±0.25)	62.84	21.27 (±1.85)	12.96 (±0.51)	60.96	0.99NS
Monroe	0	80.37 (±1.54)	69.96 (±0.28)	87.05	77.91 (±2.40)	67.59 (±0.21)	86.76	82.82 (±1.83)	72.32 (±0.40)	87.31	4.73*****
	65	19.79 (±1.05)	12.21 (±0.26)	61.71	18.64 (±1.56)	11.43 (±0.19)	61.33	20.72 (±1.39)	12.80 (±0.36)	61.80	1.37*****
Montgomery	0	77.18 (±1.79)	65.97 (±0.31)	85.48	75.16 (±2.45)	64.26 (±0.24)	85.50	79.27 (±2.58)	67.63 (±0.42)	85.31	3.36*****
	65	19.26 (±1.04)	11.85 (±0.25)	61.54	18.14 (±1.47)	11.78 (±0.18)	64.97	20.13 (±1.46)	11.88 (±0.35)	59.05	0.10NS

County	Age	Both Sexes (T)			Male (M)			Female (F)			Difference bt M&F
		LE(T)	DFLE(T)	DFLE(T) as % of LE(T)	LE(M)	DFLE(M)	DFLE(M) as % of LE(M)	LE(F)	DFLE(F)	DFLE(F) as % of LE(F)	DFLE(F) - DFLE(M)
Morgan	0	78.92 (±1.44)	67.09 (±0.29)	85.01	76.15 (±1.96)	65.07 (±0.21)	85.45	81.65 (±2.03)	69.16 (±0.42)	84.70	4.08*****
	65	19.16 (±0.98)	12.09 (±0.24)	63.14	17.15 (±1.31)	11.26 (±0.17)	65.64	20.83 (±1.40)	12.80 (±0.35)	61.45	1.54*****
Moultrie	0	77.86 (±2.33)	67.97 (±0.38)	87.30	74.81 (±3.54)	66.02 (±0.26)	88.25	80.92 (±2.87)	69.97 (±0.56)	86.47	3.95*****
	65	18.04 (±1.42)	10.52 (±0.33)	58.29	16.58 (±1.95)	9.74 (±0.23)	58.77	19.30 (±2.00)	11.20 (±0.47)	58.04	1.46***
Ogle	0	79.53 (±1.28)	69.98 (±0.22)	87.99	78.04 (±1.83)	68.32 (±0.16)	87.54	81.04 (±1.77)	71.65 (±0.32)	88.42	3.34*****
	65	19.73 (±0.78)	12.88 (±0.21)	65.27	18.77 (±1.15)	11.74 (±0.15)	62.53	20.66 (±1.04)	13.98 (±0.30)	67.64	2.24*****
Peoria	0	77.87 (±0.70)	67.68 (±0.12)	86.91	75.18 (±1.01)	65.74 (±0.09)	87.45	80.43 (±0.95)	69.55 (±0.17)	86.47	3.81*****
	65	19.12 (±0.46)	12.43 (±0.11)	65.01	17.57 (±0.65)	11.89 (±0.08)	67.68	20.41 (±0.62)	12.88 (±0.16)	63.08	0.99*****
Perry	0	77.86 (±1.82)	65.19 (±0.38)	83.73	74.65 (±2.43)	61.71 (±0.27)	82.66	81.69 (±2.47)	69.22 (±0.55)	84.74	7.52*****
	65	18.37 (±1.18)	10.94 (±0.30)	59.55	16.18 (±1.63)	8.51 (±0.22)	52.58	20.38 (±1.61)	13.20 (±0.42)	64.76	4.69*****
Piatt	0	79.66 (±2.19)	69.94 (±0.39)	87.80	77.44 (±3.33)	68.02 (±0.28)	87.83	81.99 (±2.59)	72.00 (±0.55)	87.82	3.99*****
	65	19.25 (±1.33)	12.46 (±0.34)	64.72	18.24 (±1.98)	11.60 (±0.25)	63.61	20.10 (±1.79)	13.22 (±0.47)	65.74	1.61****
Pike	0	79.06 (±2.01)	65.87 (±0.43)	83.32	76.79 (±2.68)	63.29 (±0.31)	82.41	81.31 (±2.93)	68.42 (±0.60)	84.15	5.13*****
	65	18.75 (±1.27)	11.02 (±0.32)	58.79	16.57 (±1.69)	8.73 (±0.22)	52.67	20.79 (±1.79)	13.18 (±0.46)	63.38	4.45*****
Pope	0	78.12 (±4.99)	61.30 (±0.88)	78.48	76.19 (±7.31)	59.65 (±0.64)	78.29	80.74 (±5.34)	63.53 (±1.24)	78.68	3.88***
	65	19.15 (±2.34)	9.04 (±0.64)	47.17	18.52 (±3.38)	8.34 (±0.47)	45.01	19.93 (±3.19)	9.83 (±0.89)	49.33	1.49^{NS}
Pulaski	0	75.99 (±3.51)	59.46 (±0.73)	78.26	72.19 (±5.56)	57.86 (±0.50)	80.15	79.78 (±4.01)	61.01 (±1.08)	76.47	3.15***
	65	17.25 (±2.08)	8.63 (±0.50)	50.04	15.85 (±2.90)	8.74 (±0.35)	55.15	18.42 (±2.91)	8.50 (±0.70)	46.13	-0.24^{NS}
Putnam	0	80.99 (±3.65)	70.22 (±0.68)	86.70	77.26 (±5.33)	66.86 (±0.44)	86.54	85.40 (±5.47)	74.25 (±1.08)	86.95	7.40*****
	65	20.55 (±2.46)	13.49 (±0.59)	65.68	17.60 (±2.90)	11.34 (±0.34)	64.42	24.41 (±4.11)	16.50 (±0.99)	67.62	5.16*****
Randolph	0	77.19 (±1.57)	64.98 (±0.30)	84.17	75.10 (±2.07)	62.99 (±0.21)	83.87	79.46 (±2.34)	67.17 (±0.42)	84.53	4.18*****
	65	18.30 (±0.96)	10.78 (±0.24)	58.88	16.55 (±1.37)	9.72 (±0.17)	58.75	19.81 (±1.30)	11.70 (±0.35)	59.07	1.98*****
Richland	0	79.26 (±2.13)	65.60 (±0.43)	82.76	76.05 (±3.29)	64.24 (±0.29)	84.46	82.48 (±2.48)	66.97 (±0.64)	81.19	2.73*****
	65	19.72 (±1.39)	11.60 (±0.34)	58.84	18.08 (±1.94)	11.62 (±0.24)	64.28	21.05 (±1.91)	11.50 (±0.49)	54.63	-0.12^{NS}
Rock Island	0	78.63 (±0.76)	67.40 (±0.14)	85.72	75.87 (±1.09)	65.02 (±0.10)	85.69	81.29 (±1.02)	69.73 (±0.20)	85.78	4.71*****
	65	19.36 (±0.48)	12.21 (±0.12)	63.09	17.69 (±0.67)	10.65 (±0.08)	60.19	20.72 (±0.67)	13.54 (±0.16)	65.33	2.89*****
St. Clair	0	76.88 (±0.58)	64.78 (±0.11)	84.27	73.90 (±0.87)	62.65 (±0.08)	84.78	79.71 (±0.75)	66.86 (±0.15)	83.88	4.21*****
	65	18.42 (±0.39)	10.91 (±0.10)	59.22	16.93 (±0.57)	10.32 (±0.07)	60.92	19.60 (±0.53)	11.38 (±0.13)	58.07	1.07*****
Saline	0	74.75 (±1.84)	59.97 (±0.35)	80.23	72.57 (±2.72)	57.45 (±0.25)	79.17	76.95 (±2.45)	62.47 (±0.48)	81.19	5.02*****
	65	17.14 (±0.99)	9.35 (±0.25)	54.55	16.09 (±1.50)	8.57 (±0.18)	53.27	18.14 (±1.32)	10.03 (±0.35)	55.32	1.46*****
Sangamon	0	78.06 (±0.67)	66.10 (±0.12)	84.68	75.20 (±0.98)	63.47 (±0.09)	84.40	80.72 (±0.88)	68.61 (±0.17)	85.00	5.14*****
	65	18.95 (±0.44)	11.79 (±0.11)	62.23	17.27 (±0.63)	10.75 (±0.08)	62.22	20.26 (±0.59)	12.63 (±0.15)	62.33	1.88*****
Schuyler	0	79.92 (±2.81)	67.39 (±0.62)	84.33	77.92 (±4.04)	65.02 (±0.45)	83.44	82.00 (±3.87)	70.02 (±0.85)	85.39	5.00*****
	65	18.81 (±1.87)	10.63 (±0.50)	56.51	17.45 (±2.50)	10.25 (±0.35)	58.74	20.14 (±2.71)	11.01 (±0.72)	54.65	0.76^{NS}

Scott	0	78.35 (±3.99)	67.92 (±0.67)	86.69	76.94 (±4.60)	66.35 (±0.48)	86.23	79.51 (±6.73)	69.29 (±0.93)	87.14	2.94***
	65	19.13 (±2.30)	11.76 (±0.58)	61.50	16.79 (±3.21)	9.45 (±0.40)	56.30	21.33 (±3.09)	13.98 (±0.83)	65.54	4.52*****
Shelby	0	79.71 (±1.93)	68.38 (±0.35)	85.80	76.73 (±2.68)	65.90 (±0.24)	85.88	82.78 (±2.75)	71.01 (±0.52)	85.79	5.12*****
	65	19.87 (±1.13)	12.57 (±0.29)	63.26	17.83 (±1.50)	10.67 (±0.19)	59.87	21.87 (±1.61)	14.50 (±0.43)	66.28	3.82*****
Stark	0	77.27 (±3.82)	66.41 (±0.62)	85.94	75.63 (±5.43)	64.78 (±0.46)	85.65	78.45 (±5.73)	67.89 (±0.84)	86.54	3.11*****
	65	17.68 (±1.95)	10.50 (±0.49)	59.37	17.34 (±2.64)	10.46 (±0.37)	60.34	17.69 (±2.84)	10.53 (±0.64)	59.51	0.07^{NS}
Stephenson	0	79.53 (±1.32)	67.34 (±0.25)	84.67	77.00 (±1.88)	65.70 (±0.18)	85.33	81.88 (±1.80)	68.87 (±0.36)	84.11	3.16*****
	65	19.99 (±0.79)	13.36 (±0.20)	66.86	18.08 (±1.09)	12.40 (±0.14)	68.61	21.59 (±1.09)	14.16 (±0.28)	65.60	1.76*****
Tazewell	0	78.59 (±0.74)	69.01 (±0.13)	87.80	76.36 (±1.08)	67.56 (±0.09)	88.47	80.76 (±0.99)	70.45 (±0.19)	87.23	2.89*****
	65	18.44 (±0.49)	11.98 (±0.12)	64.96	17.06 (±0.70)	11.55 (±0.08)	67.69	19.62 (±0.67)	12.34 (±0.17)	62.90	0.79*****
Union	0	76.55 (±2.26)	63.31 (±0.40)	82.70	74.06 (±3.21)	60.87 (±0.29)	82.19	79.15 (±3.12)	65.91 (±0.56)	83.28	5.04*****
	65	18.24 (±1.23)	10.90 (±0.31)	59.76	16.72 (±1.71)	10.33 (±0.22)	61.80	19.65 (±1.72)	11.44 (±0.45)	58.20	1.11**
Vermilion	0	76.15 (±1.04)	64.14 (±0.18)	84.23	73.83 (±1.51)	62.76 (±0.13)	85.00	78.52 (±1.39)	65.59 (±0.27)	83.54	2.84*****
	65	17.96 (±0.62)	10.81 (±0.15)	60.22	16.91 (±0.90)	10.38 (±0.11)	61.42	18.85 (±0.85)	11.19 (±0.21)	59.37	0.81*****
Wabash	0	77.09 (±2.69)	64.37 (±0.47)	83.50	74.28 (±3.83)	61.37 (±0.35)	82.62	79.96 (±3.57)	67.58 (±0.63)	84.51	6.21*****
	65	18.46 (±1.60)	9.81 (±0.39)	53.13	17.35 (±2.25)	9.34 (±0.29)	53.82	19.27 (±2.24)	10.24 (±0.52)	53.12	0.90^{NS}
Warren	0	79.02 (±2.05)	68.80 (±0.38)	87.06	74.91 (±3.11)	64.89 (±0.27)	86.62	83.39 (±2.35)	72.94 (±0.55)	87.47	8.06*****
	65	19.36 (±1.28)	12.54 (±0.33)	64.79	16.84 (±1.79)	10.40 (±0.23)	61.72	21.68 (±1.66)	14.51 (±0.48)	66.95	4.12*****
Washington	0	79.83 (±2.54)	68.24 (±0.44)	85.48	77.29 (±3.84)	66.14 (±0.31)	85.58	82.43 (±3.22)	70.44 (±0.64)	85.46	4.29*****
	65	20.11 (±1.41)	12.73 (±0.38)	63.30	18.69 (±1.99)	12.10 (±0.27)	64.74	21.42 (±1.93)	13.31 (±0.54)	62.16	1.21*
Wayne	0	77.22 (±2.35)	65.33 (±0.40)	84.60	73.99 (±3.55)	62.53 (±0.28)	84.51	80.65 (±2.79)	68.32 (±0.58)	84.72	5.79*****
	65	18.77 (±1.25)	11.74 (±0.31)	62.53	17.34 (±1.77)	10.54 (±0.22)	60.79	19.93 (±1.72)	12.75 (±0.43)	63.95	2.20*****
White	0	76.85 (±2.32)	63.90 (±0.44)	83.15	74.92 (±3.36)	61.70 (±0.31)	82.36	78.76 (±3.18)	66.11 (±0.63)	83.93	4.40*****
	65	18.02 (±1.28)	11.28 (±0.31)	62.62	16.79 (±1.88)	9.70 (±0.22)	57.74	19.16 (±1.71)	12.76 (±0.43)	66.62	3.07*****
Whiteside	0	78.97 (±1.17)	67.04 (±0.22)	84.89	76.41 (±1.68)	64.94 (±0.16)	84.98	81.51 (±1.57)	69.17 (±0.32)	84.86	4.23*****
	65	19.25 (±0.72)	12.02 (±0.18)	62.43	17.69 (±1.01)	11.13 (±0.13)	62.88	20.59 (±0.98)	12.79 (±0.26)	62.14	1.67*****
Will	0	79.85 (±0.37)	70.42 (±0.07)	88.20	77.59 (±0.54)	69.40 (±0.05)	89.45	81.97 (±0.50)	71.45 (±0.10)	87.16	2.05*****
	65	19.36 (±0.28)	12.56 (±0.07)	64.87	17.93 (±0.40)	12.42 (±0.05)	69.25	20.53 (±0.39)	12.67 (±0.10)	61.74	0.26**
Williamson	0	76.47 (±1.13)	64.36 (±0.21)	84.15	74.32 (±1.55)	63.17 (±0.15)	85.00	78.58 (±1.63)	65.53 (±0.29)	83.40	2.36*****
	65	18.00 (±0.65)	10.86 (±0.17)	60.31	16.49 (±0.95)	10.34 (±0.12)	62.74	19.31 (±0.87)	11.30 (±0.24)	58.52	0.96*****
Winnebago	0	78.12 (±0.56)	66.83 (±0.10)	85.54	75.14 (±0.81)	64.80 (±0.07)	86.24	81.02 (±0.74)	68.81 (±0.15)	84.94	4.01*****
	65	19.37 (±0.37)	12.26 (±0.09)	63.27	17.66 (±0.51)	11.27 (±0.06)	63.85	20.80 (±0.52)	13.08 (±0.13)	62.89	1.81*****
Woodford	0	80.42 (±1.38)	71.80 (±0.26)	89.29	78.36 (±2.07)	70.38 (±0.18)	89.81	82.36 (±1.78)	73.23 (±0.37)	88.92	2.86*****
	65	19.40 (±0.93)	13.65 (±0.23)	70.39	18.17 (±1.32)	13.28 (±0.17)	73.09	20.41 (±1.28)	13.98 (±0.33)	68.49	0.70*

Notes:

- Margin of errors are shown in parentheses
- Because of rounding, components may not add to totals
- LE = Life expectancy; DFLE = Disability-free Life Expectancy; T = both sexes; M= Male; F=Female
- ***** = significant at 0.0010; **** = significant at 0.0020; *** = significant at 0.010; ** = significant at 0.020; * = significant at 0.050; ^{NS} = Non significant at 0.050 (Two-tailed tests)

Source: Illinois Department of Public Health, Illinois Health Facilities and Services Review Board, Certificate of Need Population Projections Project, 2014