Religion, Life Expectancy and Disability-Free Life Expectancy in the United States

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M.B. Ofstedal helped plan the study, prepared the data, conducted descriptive data analysis, and had the lead in writing the paper. C.T. Chiu helped plan the study and conducted the life expectancy analysis. C. Jagger helped plan the study and write/revise the paper. Y. Saito helped plan the study, conduct data analysis and revise the paper. Z. Zimmer helped plan the study and write the paper.

Abstract

OBJECTIVES: Existing literature shows religion is associated with health and survival separately, though the religion indicators that have been used are limited. We extend this literature by considering health and survival together using a multi-state life table approach to estimate total, disability-free and disabled life expectancy by several religion measures.

METHOD: Data come from the Health and Retirement Study (1998-2014 waves). Predictors include religious affiliation, importance of religion and attendance at religious services. Disability is defined by ADLs and IADLs. Models control for sociodemographic and health covariates.

RESULTS: Attendance at religious services shows a strong and consistent association with life and health expectancy. Men and women who attend at least once a week have between 1.5 and 5.2 years longer total life expectancy and between 1.1 and 4.0 years longer disability-free life expectancy than those who attend less frequently or never attend. Importance of religion is related to total and disabled life expectancy, but the differentials are smaller and less consistent. Religious affiliation is not associated with life or health expectancy.

DISCUSSION: By estimating total, disability-free and disabled life expectancy we are able to quantify the advantage of religion for health. Results are consistent with previous studies that have focused on health and mortality separately.

Keywords: Disability, Mortality, Religion/spirituality

Introduction

It is not hyperbole to suggest that religious involvement is one of the longest-standing factors considered a social determinant of health (Dearmer, 1910; Durkheim, 1915; Hiltner, 1943; Koenig, 1989; Suttie, 1932). An enduring interest in the topic is not surprising given the understanding within the social sciences of religion's role in shaping societal values and norms, which subsequently influence health-related behaviors (Strawbridge, Shema, Cohen, & Kaplan, 2001). In the United States, the overwhelming balance of this evidence has suggested that religion is salutary (Koenig, 2012; Krause, 2011; Larson, Swyers, & McCullough, 1998; Lavretsky, 2010; Moreira-Almeida, 2013; Seybold & Hill, 2001; Zimmer et al., 2016). Examination of this literature indicates that much of the evidence is based on studies wherein religious involvement is operationalized by some measure of frequency with which one attends and participates in religious services that take place at a church or temple (Hummer, Ellison, Rogers, Moulton, & Romero, 2004).

One concern with much of this research is the causal nature of the association (Sloan et al., 2000). Finding a positive association between religious involvement and better health could mean that religiosity provides healthful benefits or it may be reflecting a selection bias whereby it is the healthier that are more physically able to attend services and participate in religious activities. The use of cross-sectional data makes it difficult to sort out these

pathways. Because of the longitudinal nature of studies of mortality, investigations that link religiosity to longer life are more convincing than those that use cross-sectional data (Gillum, King, Obisesan, & Koenig, 2008; Hummer, Benjamins, Ellison, & Rogers, 2010; Idler, Blevins, Kiser, & Hogue, 2017). McCullough et al. (2000) examined 42 studies and found a consistent robust connection between religious involvement and longer life. Since that meta-analysis, additional influential studies based on a number of different populations have affirmed the finding (Dupre, Franzese, & Parrado, 2006; Hill, Angel, Ellison, & Angel, 2005; Kim, Smith, & Kang, 2015; Mineau, Smith, & Bean, 2004; Musick, House, & Williams, 2004; VanderWeele et al., 2017). Adjusting models for a large range of lifestyle and risk factors, Li et al. (2016) found a robust connection between religiosity and all-cause mortality, as well as mortality caused by cardiovascular disease and cancer. Luchhetti, Luchhetti and Koenig (2011) found that religious and spiritual involvement had as strong or a stronger impact on mortality in comparison with other common health interventions, including consumption of fruits and vegetables and statin therapy. Idler and colleagues (2017) investigated the extent to which the strong links they observed between religion and mortality could be attributed to reverse causation and they concluded that such bias was minimal or absent. Clearly, as evidence continues to mount, studies are continually showing that a religiosity-longevity nexus is difficult to explain away.

Although longevity is often considered to be a critical and perhaps ultimate measure of health, living longer does not necessarily mean living longer in good states of health (Crimmins, Hayward & Saito, 1994; Jagger, 2006). As such, while religiosity appears to be related to longevity, it is unclear whether this implies that it is associated with both quantity and quality of life. The distinction is particularly important for those at older ages. In general, old-age life expectancy has been rising in the United States and around the world over the last many decades (Kinsella & Phillips, 2005). At the same time, there is debate in the literature regarding whether these extra years of life are the result of health interventions that save lives but do little to improve health (Crimmins & Beltrán-Sánchez, 2011; Nusselder, 2003). One way of focusing attention on this is by considering both total and ”healthy” life expectancy, where health can be defined in different ways.

Our focus in this paper on disability-free life in addition to total life fills a gap in the literature, since how religion is associated with disability-free life is less certain than how it is associated with total life. A number of studies have found a protective quality of religion on physical functioning and disability (Idler & Kasl, 1997a; Roff et al., 2006; Strawbridge, Shema, Cohen, Roberts, & Kaplan, 1998). Many of the early studies were based on cross-sectional data, however. Studies based on longitudinal data have produced mixed findings. Some have found a protective association of religion with disability (Hill, Burdette, Taylor, &

Angel, 2016; Idler & Kasl, 1992, 1997b), while others have found a contemporaneous association, but no association over time (Fitchett, Benjamins, Skarupski, & Mendes de Leon, 2013; Kelley-Moore & Ferraro, 2001). Yet other studies have found no association between religion and disability (Krause, 1998; Son & Wilson, 2011). Using data from two time points, Kelley-Moore and Ferraro (2001) find some support for reverse causation, that is that functional limitations act as a barrier for social activities such as religious service attendance.

There are other issues relating to the religion-disability connection that remain unanswered. Disability as an outcome measure is more vulnerable to reverse causality than is mortality. It is possible that religion affects individuals who are disabled versus not disabled differently. Additionally, religiosity is a complex social phenomenon encompassing different dimensions. One distinction is between participation and belief. Participation is related to behaviors such as attending services, engaging in prayer, acting upon rituals and volunteering for organizations. Belief, in contrast, is more personal, involving notions such as strength or importance of god and faith, ideology, and philosophies. While most studies have concentrated on participation alone, how religion associates with disability may be especially pertinent for religious belief since it may be less prone to endogeneity.

In the current paper, we consider disability and mortality simultaneously and quantify the advantage of religion for later-life disability, by estimating total, disability-free and disabled life expectancy for middle-aged and older adult in the United States. We focus on three different indicators of religion: religious affiliation, attendance at religious services, and self-rated importance of religion. To address some of the gaps in the literature, the analysis uses longitudinal data from the Health and Retirement Study, a nationally representative survey, to estimate how religiosity is associated with both total and disability-free life expectancy. By examining disability-free life we are able to assess the degree to which religion is associated with quantity and quality of life. In order to comment on both participation and belief, we consider multiple measures of religiosity. Further, to assess how religion differentially associates across those more and less healthy, our examination of total and disability-free life expectancy calculates both population and status-based estimates. Both approaches follow individuals prospectively to assess years of life lived with and without disability, but population-based estimates consider the total study population while status-based estimates first divide the population into those who are non-disabled and disabled at baseline. Finally, we control for several key sociodemographic and health variables that may influence the association between religion, disability and mortality.

Methods

Data Source

Data for this study come from the Health and Retirement Study (HRS), an ongoing panel study of men and women over the age of 50 in the United States. The study began in 1992 with a cohort of then preretirement-aged individuals born between 1931 and 1941. New cohorts were added in 1993 and 1998 to round out the sample over age 50, and additional cohorts are enrolled every 6 years (e.g., in 2004, 2010, etc.) to refresh the sample at the younger ages. For the cohorts used in this study, response rates range from 68% to 81% in the baseline wave and from 87% to 89% at each follow-up wave. HRS conducts about 20,000 interviews every 2 years using a combination of telephone and in-person interviews. The questionnaire includes measures of employment and retirement, financial status, health and health care utilization, family composition and exchanges, cognition, expectations, and psychosocial factors. Fact and date of death are verified through linkage to the National Death Index.

Outcome

We define disability-free vs. disabled life by utilizing six questions on Activities of Daily Living (ADLs): dressing, bathing, eating, walking across a room, getting in/out of bed, and using a toilet and five Instrumental Activities of Daily Living (IADLs): preparing meals,

shopping for personal items, using a telephone, taking medications and managing money. Those who have any difficulty performing at least one ADL or IADL are defined as disabled, otherwise as non-disabled.

Measures of Religiosity

HRS includes a question on religious affiliation, which is asked only once for each respondent in the baseline wave. The question asks: "What is your religious preference; is it Protestant, Catholic, Jewish, some other religion, or do you have no preference?" For purposes of this paper we differentiate between any affiliation vs. no affiliation. A question on religious service attendance was asked sporadically between 1992 and 1995, but was not added as a core question until 2004. The question asks: "About how often have you attended religious services during the past year?" This question is asked of all individuals regardless of whether they report any religious affiliation. We used a 3-category indicator of religious attendance: at least once a week; less than once a week; never. Finally, a question on self-rated importance of religion was asked in 1998 and 2004 ("How important would you say religion is in your life; is it very important, somewhat important, or not too important?". We retain all three categories for this indicator.

We considered creating composite indicators of affiliation with attendance and affiliation with importance. However, there are sizable numbers of respondents who are unaffiliated but still view religion as important or attend religious services. Because of this, we opted to investigate each indicator separately.

Control Variables

All models control for age (continuous) and sex. Demographic and socioeconomic control variables include race/ethnicity (Hispanic, Non-Hispanic Black, Non-Hispanic other), a composite measure of coupleness and living arrangements (married or partnered, not married or partnered and living alone, not married/partnered and living with others), and educational attainment (less than high school, high school, more than high school). In addition, we included a control for health, measured as the number of chronic conditions (hypertension, diabetes, lung disease, heart disease, stroke, cancer, psychiatric problems, arthritis), as well as smoking status (current smoker, former smoker, never smoker). All control variables are measured at the initial wave of the time series used in the analysis, as specified in the next section.

Analytic Methods

Disability-free life expectancy estimation begins with the calculation of the probability of transitioning across disability states and mortality. Figure 1 illustrates a basic transition model. Here, the possible transitions among two disability states and the absorbing state of death are shown. As represented by each arrow, there are six transitions including retention in non-disabled or disabled states, movements from non-disabled to disabled or vice versa, and movements from non-disabled and disabled to death. People can deteriorate or improve in disability over time and the model allows us to take into account different mortality rates by initial disability status.

Using data from the 1998-2014 waves of HRS, we estimate total, disability-free and disabled life expectancy for persons age 55 or over, by sex and three indicators of religion, controlling for socio-demographic and health factors. We use the Stochastic Population Analysis for Complex Events (SPACE) software for estimating health expectancy (Cai et al., 2010). SPACE is a SAS-based program that estimates total and healthy life expectancy using a multistate life table (MSLT) approach constructed from transition probabilities estimated by a multinomial logistic regression. Advantages of SPACE are that it calculates standard errors associated with life and health expectancies via a bootstrap method and allows for the inclusion of control variables in the models. All analyses are weighted and estimates of standard errors are adjusted to take into account the complex sample design of the HRS. We

use 300 bootstrap samples for each analysis to calculate standard errors, and all analyses in the study were stratified by sex. SPACE provides both population-based and status-based MSLTs: the former describing the potential life cycle events for the entire population, and the latter demonstrating the potential life cycle for those with different initial disability states at certain ages (Saito, Robine & Crimmins, 2014). (For more detail on the statistical model, see Cai et al., 2010).

For analyses that examine religious affiliation and importance of religion we use 9 waves of survey data (1998-2014) to estimate life expectancy, disability-free life expectancy and disabled life expectancy, and for analyses examining religious attendance, we use 6 waves of data (2004-2014).

Sample

Our study sample comprises 7,705 men and 9,900 women age 55 or over who were residing in the community in 1998 and who had non-missing data on the outcome, religion and control measures. (For analyses of religious attendance, which span the years 2004-2014, the sample is comprised of 6,931 men and 9,516 women who were age 55 or over and residing in the community in 2004.) The level of missing data for all measures used in the analysis is extremely small, less than 0.1% for most variables except smoking status, for which the level

of missing data was 0.8%. In total, 219 respondents were dropped due to missing data on any of the variables.

Validation

We estimated life expectancy by sex to compare with published life table values for 2006, the mid-year for our study period. Our estimated values are slightly lower than the published life expectancies but very close and not statistically different (Table 1). Weir (2016) has conducted an extensive validation of mortality data in HRS and shown it to be effectively complete.

Results

Distributions of Religion Measures

The vast majority of both men and women report some religious affiliation, with most identifying as Protestant (Figure 2). On all three indicators, men are less religious than women. Though small for both sexes, the proportion reporting no affiliation is twice as high for men versus women. With regard to attendance at religious services, 43% of women attended at least once a week during the past year compared to 32% of men. In addition, men were more likely than women to report having never attended (31% vs. 23%). A large majority of both men and women consider religion to be very or somewhat important in their

lives, however women are more likely than men to view religion as very important and less likely to view it as not too important.

Disability Transitions

For the analytic sample that utilizes data from the 1998-2014 waves, we observed a total of 95,173 transitions in disability between two successive waves. A breakdown of the transitions is shown in Table 2. There is a fair amount of stability in the transitions between successive waves, with over half (56,722) starting and ending in a non-disabled state and 16% (15,327) starting and ending in a disabled state. The number of transitions indicative of recovery (disabled to non-disabled) is just over half the number signaling a decline in function (non-disabled to disabled).

Estimates of Disability-Free and Disabled Life Expectancy

We estimated total, disability-free and disabled life expectancies, separately for men and women, by religious affiliation (any versus none), self-rated importance of religion, and religious service attendance. We present population-based estimates from models that include only the religion indicator (unadjusted) and from models that control for sociodemographic and health factors described previously (adjusted). Tables 3 to 5 present these expectancies for each religion indicator, in turn. (Corresponding status-based

estimates are presented in Supplementary Tables 1-3.) The tables present life expectancies for age 65 only; patterns in total, disability-free and disabled life expectancies are similar for other ages. (The full matrix of expectancies by age may be obtained upon request.)

Religious affiliation

In unadjusted models, we find slightly higher total life expectancy as well as both disability-free and disabled life expectancy for those with a religious affiliation compared to those without: 0.34 years more for male total life expectancy and 0.60 years more for female; 0.04 and 0.43 years more for male and female disability-free life expectancy; and 0.30 and 0.31 years more for male and female disabled life expectancy (Table 3). None of the differences are statistically significant, however, and controlling for sociodemographic and health factors has little effect on the estimates, with differences by religious affiliation remaining non-significant. Controlling for initial health state (Supplementary Table 1) yields similar results, with the estimates of total, disability-free and disabled life expectancy being slightly higher for those with any versus no religious affiliation, but no significant differences.

Importance of religion

Those who view religion as very important in their lives tend to have longer life expectancy at age 65 than those who view it as somewhat or not too important, though differences are

only significant in a few cases (Table 4). In unadjusted models, men who view religion as very important have significantly longer total life expectancy at age 65 than those who view religion as somewhat important (17.09 vs. 16.25 years, respectively, $p < .05$). The difference between the very and not too important groups is essentially the same (17.09 vs. 16.24 years), but not statistically significant. Most of the gain in life expectancy for those who view religion as very important is in years of disabled as opposed to disability-free life. Men who consider religion as very important have an estimated 4.70 remaining years of disabled life compared to 4.14 and 3.99 for men who view religion as somewhat and not too important. These differences are statistically significant. In contrast, there is little difference across groups in disability-free life expectancy (12.39 vs. 12.12 and 12.25 years). The unadjusted differences for women in total life expectancy at age 65 are also substantial, but they are not statistically significant. As for men, most of the gain for women appears to be in disabled life expectancy, where there are significant differences between the very important vs. somewhat or not too important groups (6.81 vs. 5.98 for very vs. somewhat and 6.81 vs. 5.87 for very vs. not too important).

The results for those who begin in a non-disabled state mirror those for the overall sample in terms of levels and significance of differences across groups (Supplementary Table 2). Results for those who begin in a disabled state also follow the same general pattern, but the

only significant difference is for total life expectancy at age 65 between women who view religion as very vs. somewhat important (17.86 vs. 16.78 years). Here again, the gain appears to be mainly in disabled as opposed to disability-free life.

Controlling for sociodemographic and health factors has some effect on differences in total, disability-free and disabled life expectancy across religious groups (Table 4). Differences that were statistically significant in the unadjusted models are not significant in the adjusted models, however, some significant differences emerge when controls are added. For example, women who consider religion to be not very important have significantly shorter total and disability-free life expectancies than those who consider religion to be very important (differences of 1.54 years for total LE and 1.08 years for disability-free LE). This pattern is found for women overall and for those who started in a non-disabled state (results not shown). The difference in total life expectancy between the very important and not too important groups is also significant for those who started in an disabled state, and this is true for both men and women (results not shown).

Religious attendance

The aspect of religion for which differentials in life expectancy are largest and highly significant is attendance at religious services (Table 5). For both men and women, more

frequent attendance at religious services is significantly associated with longer life expectancies. Men who attend services at least once per week live 1.53 years longer on average than those who attend services less than once per week and 3.66 years longer than those who do not attend services at all. For women, the differentials are even larger: a 2.31 year advantage for those who attend at least once a week vs. less than once a week and a 5.20 year advantage compared to those who never attend. Differences between those who attend services less than once per week and those who never attend are also statistically significant. In contrast to the findings for importance of religion, most of the gain for those who attend services more frequently is in disability-free as opposed to disabled life expectancy. This is true for both men and women. There are some significant differences in disabled life expectancy in the unadjusted models, but these differences are not significant in the adjusted models.

The differences in total and disability-free life expectancy remain as pronounced in the models that stratify by initial disability state (Supplementary Table 3), providing some evidence that the findings are not driven by reverse causality, that is, that religious attenders are initially more active and healthy than non-attenders.

Controlling for sociodemographic and health factors reduces the differentials across attendance groups, much more so than was the case for religious affiliation and importance. However, for the most part the differences remain statistically significant. An exception is the overall results for men, where the differences in total life expectancy are reduced quite substantially. Whereas men in the highest attendance group had a 1.53 and 3.66 year advantage in total life expectancy over those in the middle and lowest attendance groups in the unadjusted model, the corresponding estimates from the adjusted model are 0.59 and 2.24 years.

Discussion

The links between religion and health and between religion and mortality have been the focus of extensive research over the past few decades. Studies focusing on mortality have by and large found a salutary effect of religion on longevity. In contrast, findings from studies focusing on health outcomes have been more mixed depending on the specific health outcome examined (disability, chronic disease, self-rated health, etc.) and whether the association is estimated concurrently or over time. Most of these studies have examined either health or mortality as an outcome, but have not combined them. In addition, the bulk of studies have focused on a single indicator of religion, most often attendance at religious services. By using multiple indicators of religiosity and a multi-state life table approach to

estimate total, disability-free and disabled life expectancies, we have been able to quantify the association between several different aspects of religion and disability and mortality jointly. This is a unique contribution of the study.

Of the three religion measures that we investigated, we find that attendance at religious services has the strongest and most consistent association with total and disability-free life expectancy. Men and women who attend religious services at least once per week have significantly longer total life expectancy than those who attend less than once per week; in turn, those who attend less than once per week have significantly longer life expectancy than those who never attend. The difference between those who attend regularly and those who never attend are substantial: 5 years for women and just under 4 years for men. Furthermore, most of the gain in life expectancy for those who attend services more frequently is in years of disability-free, as opposed to disabled life.

We also found that the associations between religion and life expectancy that we found for the full sample held up when controlling for baseline disability status. Among those who were disabled at the initial wave, more frequent religious service attendance was associated with higher total and disability-free life expectancy. The pattern is again monotonic--for each increase in the level of attendance frequency, the corresponding increases in total and

disability-free life were substantial and statistically significant. The same pattern and order of magnitude is also evident among those who were non-disabled in the baseline survey. These results lend some confidence that the findings are not due to reverse causality, i.e., that good health leads to more frequent religious attendance.

Our finding of the primary importance of religious service attendance is consistent with other studies and suggests that actual behavior may be more important than affiliation and subjective importance of religion in influencing health and mortality. Although we do find some significant differences in life expectancy by perceived importance of religion, they are much smaller and less consistent than those for religious attendance.

We find some evidence of moderating effects of health and sociodemographic factors in the religion-disability association. For religious attendance, controlling for these factors reduced the differences in total, disability-free and disabled life expectancy across religious groups, although the differences remained statistically significant.

The study has both strengths and limitations. A major strength is the use of 16 years of panel data from a nationally representative and large sample of older adults in the U.S. In addition, the health expectancy approach that we use enables us to quantify the association

between religion and health and mortality jointly, which has not been done in previous studies. We also stratify by sex, which allows us to extend previous work by comparing the associations for men and women. Finally, recent methodological advances in software for health expectancy analysis allow us to control for other key covariates and test for statistical significance of differences.

One limitation of the study is that we focus on a single, broadly defined measure of disability, namely difficulty with any ADL or IADL. It is unclear whether the patterns we find will hold for more refined disability measures or for other health indicators. Another is that our measures of religion pertain to behaviors and beliefs at one point in time. Religious affiliation, beliefs and, particularly, attendance may well change over time. In future work we plan to incorporate measures of religious attendance and affiliation at different points in life.

Despite these limitations, the strength and consistency of the associations we observed between religious attendance and total and disability-free life expectancy give us confidence in concluding that religious attendance is associated with increased quantity and quality of life. Further research is needed to understand the mechanisms underlying this association. Additionally, it would be beneficial to replicate this study in other settings with different

religious traditions and practices to gain a better understanding of the generalizability of our findings.

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Figure 1. Depiction of Possible Transitions among Disability States

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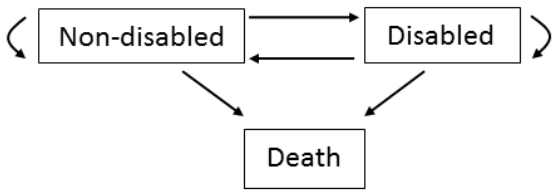

Figure 2. Distributions for Religion Measures, by Sex

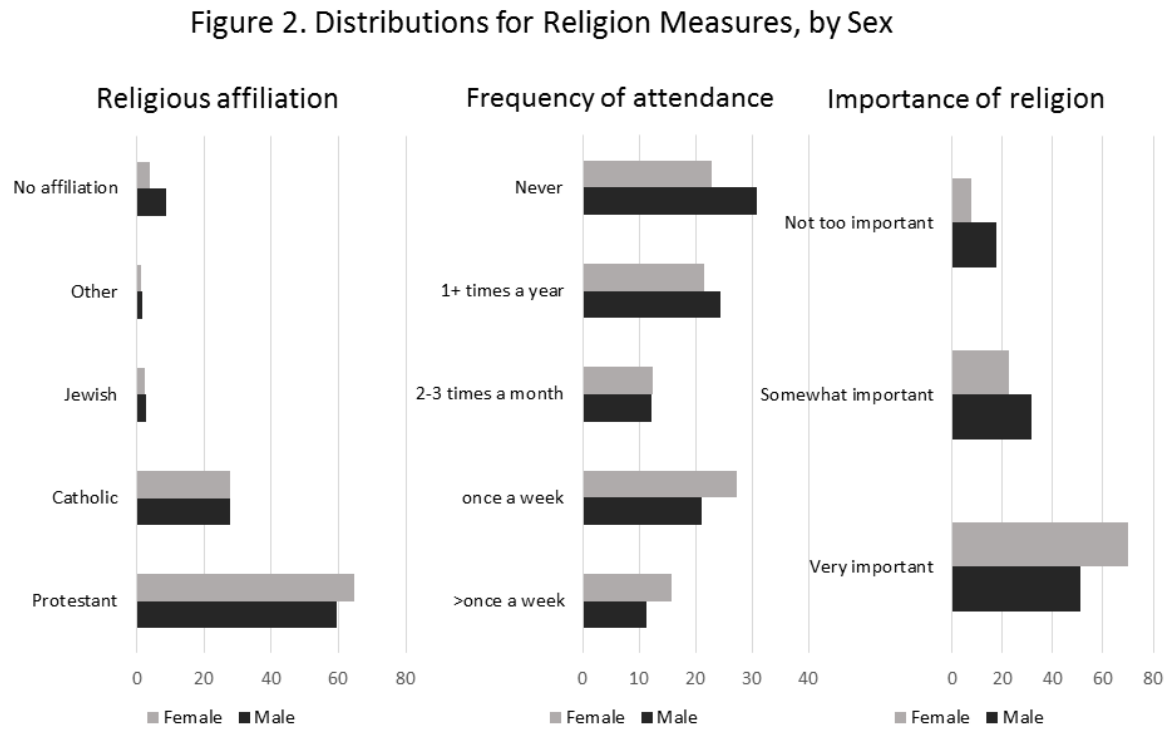

Table 1. Life Expectancy at Age 65 from 2006 Published Life Tables and Estimated from HRS Sample 1998-2014

	2006 Published	Estimated (95% CI)
Females	19.7	19.8 (19.6-20.1)
Males	17.0	16.9 (16.6-17.1)

Table 2. Number of Transitions between Disability States and Death (Unweighted)

	Non-disabled	Disabled	Dead	Total
Non-disabled	56,722	9,437	3,010	69,169
Disabled	5,364	15,327	5,313	26,004
Total	62,086	24,764	8,323	95,173

Table 3. Estimated Total, Disability-Free and Disabled Life Expectancy at Age 65, by Sex and Religious Affiliation (1998-2014)

	Religious affiliation			
	Any affiliation		No affiliation	
	LE estimate	95% CI	LE estimate	95% CI
Female				
Unadjusted				
Total LE	19.64	19.33, 19.95	18.90	17.67, 20.12
Disability-free LE	13.09	12.79, 13.39	12.66	11.32, 13.99
Disabled LE	6.55	6.37, 6.72	6.24	5.32, 7.16
Adjusted[a]				
Total LE	19.55	19.23, 19.86	18.95	17.54, 20.36
Disability-free LE	13.21	12.92, 13.49	12.71	11.35, 14.07
Disabled LE	6.34	6.17, 6.50	6.24	5.16, 7.32
Male				
Unadjusted				
Total LE	16.68	16.38, 16.98	16.34	15.18, 17.51

Disability-free LE	12.32	12.00, 12.64	12.28	11.28, 13.29
Disabled LE	4.36	4.20, 4.52	4.06	3.43, 4.70
Adjusted[a]				
Total LE	16.67	16.40, 16.93	16.33	15.40, 17.26
Disability-free LE	12.30	12.00, 12.61	12.04	11.14, 12.94
Disabled LE	4.36	4.19, 4.53	4.29	3.63, 4.95

[a]Models control for race/ethnicity, coupleness status and household composition, education, number of chronic conditions and smoking status.

Table 4. Estimated Total, Disability-Free and Disabled Life Expectancy at Age 65, by Sex and Importance of Religion (1998-2014)

	Religious importance					
	Very important		Somewhat important		Not very important	
	LE estimate	95% CI	LE estimate	95% CI	LE estimate	95% CI
Female						
Unadjusted						
Total LE	19.87	19.57, 20.17	19.06	18.46, 19.66	18.60	17.45, 19.74
Disability-free LE	13.06	12.70, 13.42	13.08	12.56, 13.59	12.72	11.74, 13.71
Disabled LE	6.81	6.55, 7.07	5.98	5.56, 6.41	5.87	5.22, 6.53
Adjusted[a]						
Total LE	19.81	19.50, 20.11	19.19	18.67, 19.71	18.27	17.23, 19.31
Disability-free LE	13.31	12.99, 13.63	13.05	12.53, 13.57	12.23	11.50, 12.96
Disabled LE	6.50	6.31, 6.69	6.14	5.74, 6.54	6.04	5.24, 6.84
Male						

Unadjusted						
Total LE	17.09	16.76, 17.43	16.25	15.77, 16.74	16.24	15.62, 16.85
Disability-free LE	12.39	12.07, 12.72	12.12	11.67, 12.57	12.25	11.62, 12.87
Disabled LE	4.70	4.48, 4.92	4.14	3.95, 4.32	3.99	3.70, 4.29
Adjusted[a]						
Total LE	17.05	16.65, 17.45	16.29	15.85, 16.72	16.16	15.57, 16.75
Disability-free LE	12.49	12.10, 12.87	12.14	11.73, 12.54	12.06	11.48, 12.63
Disabled LE	4.56	4.34, 4.79	4.15	3.93, 4.36	4.10	3.74, 4.47

[a]Models control for race/ethnicity, coupleness status and household composition, education, number of chronic conditions and smoking status.

Table 5. Estimated Total, Disability-Free and Disabled Life Expectancy at Age 65, by Sex and Religious Service Attendance (2004-2014)

	Frequency of attendance at religious services					
	At least once per week		At least once per week		At least once per week	
	LE estimate	95% CI	LE estimate	95% CI	LE estimate	95% CI
Female						
Unadjusted						
Total LE	21.51	21.01, 22.02	19.20	18.53, 19.86	16.31	15.72, 16.90
Disability-free LE	14.40	14.01, 14.80	12.37	11.86, 12.88	10.36	9.78, 10.93
Disabled LE	7.11	6.61, 7.61	6.82	6.40, 7.25	5.95	5.56, 6.35
Adjusted[a]						
Total LE	20.87	20.34, 21.41	19.45	18.82, 20.07	17.40	16.80, 18.00
Disability-free LE	14.23	13.70, 14.76	12.80	12.23, 13.38	11.20	10.64, 11.75
Disabled LE	6.65	6.19, 7.10	6.64	6.25, 7.03	6.21	5.81, 6.60
Male						

Unadjusted						
Total LE	18.78	18.26, 19.29	17.25	16.76, 17.74	15.12	14.52, 15.71
Disability-free LE	13.78	13.21, 14.34	12.71	12.13, 13.28	10.77	10.23, 11.31
Disabled LE	5.00	4.69, 5.31	4.54	4.17, 4.92	4.35	3.91, 4.79
Adjusted[a]						
Total LE	18.14	17.61, 18.67	17.55	17.04, 18.07	15.90	15.28, 16.52
Disability-free LE	13.28	12.78, 13.77	12.91	12.34, 13.47	11.53	10.94, 12.12
Disabled LE	4.86	4.52, 5.20	4.65	4.31, 4.98	4.37	3.96, 4.79

[a]Models control for race/ethnicity, coupleness status and household composition, education, number of chronic conditions and smoking status.