

Religious Affiliation, Religiosity, and Mortality

Jibum Kim, Tom W. Smith, and Jeong-han Kang

GSS Topical Report 44, June 25, 2012

Studies on the relationship between religion and health have been growing, and the discussions of this issue naturally include a nexus of religion and mortality, an ultimate health indicator. In general, various aspects of religion can have a positive impact on health conditions (Levin 2001; Koenig, King, & Carson 2012) and mortality is not an exception (Chida, Steptoe, & Powell 2009; Koenig, King, & Carson 2012 pp. 468-491; McCullough et al. 2000; Oman et al., 2002; Powell, Shahabi, & Thoresen 2003). Despite that the protective effects of religion on mortality seem to be well-known, very few studies have examined the effects of both religious affiliation and religiosity on mortality at the same time (Idler 2011; Sullivan 2010), while studies employing multiple dimensions of religious measures other than religious attendance are rare (Hill, Burdette, & Idler 2011; Koenig, King, & Carson 2012 pp. 487-88).

Distinctive doctrines related to health among religious groups are recognized (Jarvis & Northcott 1987). According to Koenig, McClullough, & Larson (2001 P. 318-330), certain religious groups, such as Jews, Latter-Day Saints (LDS), and Seventh-Day Adventists, are more likely to live longer than the general population. For example, Seventh-day Adventists refrain from consuming alcohol and tobacco, and comply with a vegetarian diet (Jarvis & Northcott 1987). Compared to Catholics, Jews were less likely to consume alcohol (Idler and Kasl 1997). While previous studies on the relationship between religious affiliation and mortality have mainly focused on Christian religions, especially Amish, Seventh-Day Adventists, Mormons, and Judaism (see Idler 2011 Table 17.1 for reviews of specific religious groups on mortality), it seems to be clear that the level of three functions of religion on health - regulative function (e.g., life style), integrative function (e.g., belonging and support), and consistent meaning offering function (Idler and Kasl 1997), are rooted in specific religious principles of each religious group.

Yet, it goes without saying that religiosity should be another dimension because members can be different in terms of faithfulness to the doctrine of a specific religious group.

Research to date has largely focused on the association between attending religious services and mortality (Chida, Steptoe, and Powell, 2009; Gillum et al., 2008; Moulton & Sherkat 2012; Oman et al. 2002). Based on a review comparing meta-analysis studies of religiosity/spirituality and those of health intervention, Lucchetti, Lucchetti, and Koenig (2011) found that the mortality-reduction effect of religiosity/spirituality (18 – 25% reduction) is similar to that of eating fruit and vegetables (26% reduction). While only some researchers have concluded that attending religious services is the only religious/spiritual dimension that matters (Musick, House, and Williams, 2004), the role of other religious and spiritual variables have not been adequately examined. For example, in the Americans' Changing Lives Study, Musick, House, and Williams (2004) found a positive association between attending religious services and longevity, but concluded that “a variety of direct measures of other religious behaviors and beliefs fails to mediate or explain the predictive association of religious attendance with mortality (p. 208).” But their analysis was severely limited by the fact that they had no measures of personal praying or basic religious beliefs such as belief in God or an afterlife. (Their study was also limited because it failed to find several well-established associations between such variables as age, marital status, and being overweight and mortality.) Unlike the rather consistent positive effect of public religious attendance on mortality, Hummer et al. (2004) noted the inconsistent findings of private religiosity due to various measures of private religiosity and largely the lack of national data sets. But, although not directly examining mortality, using the 2007 National Health Interview Survey (NHIS), Harrigan (2011) found that praying for health is

positively associated with complimentary and alternative medicine use, seeing medical doctors, and physical activity, all of which could reduce the mortality risk.

Recently, using the Health and Retirement Study, Sullivan (2010) has contributed to this field by bringing religious affiliation back in the study of the relationship between religious factors and mortality. They found that, compared to mainline Protestants, Catholics and Black Protestants have higher hazards of mortality but Jewish, religious nones, and Evangelical Protestants are not different net of religious attendance, health behaviors, and socio-economic variables. Clearly, Sullivan's study (2010) helps immensely to understand the religious affiliation and mortality connection. However, it was a rare study that include various religious affiliation based on Steensland et al. (2000)'s classification and the sample is limited to older adults, and as they noted, they could only examine the public practice of religion. Basically, the focus on religious attendance has usually come from the fact that it was often the only religious variable available in the utilized datasets (Gillum et al., 2008). As Hummer et al. (2004, p. 1226) has noted, there has been a "lack of measures available in most large data sets to thoroughly examine private religious activities and mortality" and "the nearly complete lack of national level data that have been examined."

Thus, using the newly created General Social Survey-National Death Index (GSS-NDI) data (Muennig et al. 2011), our report aims to contribute to the religion and mortality literature by incorporating religious beliefs and religious affiliations as well as private and public practice of religion. Especially, the GSS has multiple measures on religiousness and spirituality including regularly-included items on attending religious services, religious affiliation, strength of religious identification, frequency of praying, belief in God, and belief in an afterlife. The variety of GSS measures allows us to test the role of religious and spiritual variables beyond attending religious

services. The wide range of both religious/spiritual and non-religious variables on the GSS, its large sample size, the high-quality of the data, and its national representativeness allow us to notably extend what is known about the association of religion and spirituality with mortality.

<Table 1 about here>

METHODS

Data:

We are using the 2008 GSS-NDI (General Social Survey - National Death Index) dataset. The records from the 1978 to 2002 waves of the General Social Survey were linked to death records through 2008 from the National Death Index. The 2008 GSS-NDI dataset contains 32,830 total records, of which 9,271 have been classified as deceased (for detailed information, see Muenning et al. 2011). Table 1 shows the percentage of death by GSS year. As expected, overall, the percentage of death has declined as the survey year becomes more recent. For example, about 46% of 1978 respondents had died, while about 11% of 2002 respondents had died in 2008. Only 1% of the sample died at age 28 and the average age at death is 71. Due to the GSS split-ballot design (Smith et al. 2011), respondents were not asked all questions, which limit the number of cases for analysis compared to the original GSS-NDI data set. Given the importance of health for mortality and the limited items of health-related questions in the GSS-NDI, we limit our analysis only to those who were asked about self-rated health throughout the years.

<Table 2 about here>

VARIABLES

DEPENDENT VARIABLES: Our dependent variable is duration for survival in years. Duration was calculated by subtracting age at the time of survey from age at death. Then, for those cases who survived in 2008, we calculated duration by subtracting survey year from 2008. Finally, to prevent duration equal to 0 (N=276), we added 1 to duration for all cases. So, of 32,830 cases, we could assign duration for 32,830 cases. The mean duration is 15.8 years. Our definition of duration is clearly not equivalent to biological survival time. To correct for this problem, we will control age at the time of survey for the estimation of the duration.

INDEPENDENT VARIABLES:

Religious affiliation: Our coding is based on the categories available in Steensland et al. (2000), which includes Black Protestant (BP), Evangelical Protestant (EP), Other affiliation, Catholic, Jewish, and religious none with Mainline Protestant (MP) as a reference group. Since some of the denominations appeared after Steensland et al. (2000)'s paper, we added 6 other denominations to his classifications: New song (137) and Assyrian Evangelist church (143) as EP, Zwinglian (150), Course in Miracles (OA-LN), and Unity of the Brethren (153) as MLP, and World Overcomer Outreach ministry (151) as BP. However, we cannot assign "Spirit of Christ" to any of the available categories. One exception to Steensland et al. (2000)'s classification scheme is that of Other affiliation; we found 874 cases were Protestants, so we assigned these cases as MLP (6,765 cases in Steensland et al.'s classification vs. 7,639 cases in our coding system). Due to either missing in religion or denomination information, we cannot assign 274 cases, and thus the distribution of classification shows that there are 29% EP, 26% Catholic, 21% MP, 9% religious none, 8% BP, 6% other affiliation, and 2% Jewish. Detailed descriptive statistics by religious classification are shown in Table 2.

ATTEND: Church attendance question was asked by “How often do you attend religious services?” with nine response categories from “Never” (0) to “Several Times a Week” (8). About 28% of people said that they attend religious services “every week” or “several times a week,” and about 15% said “Never.”

Strength of Religious Affiliation: Strength of religious association was asked of those with religious preference by “Would you call yourself a strong (PREFERENCE NAMED IN RELIG) or a not very strong (PREFERENCE NAMED IN RELIG)?” Response categories were “strong”, “not very strong”, “somewhat strong”, and “no religion”. Since the number of cases who answered DK or no answer was about 4%, we included it in our analysis. So we have four dummy variables (not very strong, somewhat strong, no religion, DK) with those who have a strong strength of association as a reference group.

PRAY: Pray was asked by “About how often do you pray?” It was captured by a 6-point scale, “never,” “less than once a week,” “once a week,” “several times a week,” “once a day,” and “several times a day.” We reverse the code so that a higher score indicates a greater frequency of prayer.

POSTLIFE: Belief in life after death was asked by “Do you believe there is a life after death?” with response categories of “yes”, “no”, and “undecided”. We created two dummy variables (no and undecided) with those who believe in life after death as a reference category.

GOD: The question is “Please look at this card and tell me which statement comes closest to expressing what you believe about God.” The response categories include “I don't believe in God,” “I don't know whether there is a God and I don't believe there is any way to find out,”

“I don't believe in a personal God, but I do believe in a Higher Power of some kind,” “I find myself believing in God some of the time, but not at others,” “While I have doubts, I feel that I do believe in God,” and “I know God really exists and I have no doubts about it.” We created five dummy variables with those who have no doubt about God as a reference category.

Controls:

The control variables include two domains: socio-demographic and geographic variables. For socio-demographic and geographic variables, age and education is a continuous variable, and education measures highest years of school completed. We have created several dummy variables for gender (1=female), race (dummy variables for black, other race, and Hispanic with white as a reference group), marital status (dummy variables for widowed, divorced, separated, and single with married as a reference group), work status (dummy variables for part-time job, temporary job, unemployed, retired, and other job with full-time job as a reference group), constant household income (dummy variables for 2nd quartile, 3rd quartile, 4th quartile, and missing income with the first quartile as a reference group). Self-rated health was asked by “Would you say your own health, in general, is excellent, good, fair, or poor?” We reversed the code so a higher score indicates excellent self-rated health, and treated it as a continuous variable (1 to 4). The number of persons in household ranged from 1 to 14, and we assigned more than 6 (3.9%) into those with 5 and treated it as a continuous variable. Whether respondents were born in this country was asked by “Were you born in this country?” and we have created a dummy variable (US born=1). For geographic areas, we include region (dummy variables for Midwest, South, and West with Northeast as a reference group) and residential geographic information based on the GSS variable, SRCBELT (dummy variables for 13 to 100 ranked among Standard

Metropolitan Statistical Area (SMSA), 1 to 12 ranked SMSA suburb, 13 to 100 ranked SMSA suburb, other urban, and other rural with 1 to 12 ranked SMSA as a reference group).

ANALYSIS:

We use cox proportional hazard models (Cleves, Gould, Gutierrez, and Marchenko 2010) to estimate mortality differentials by several religious measures. All the predictors represent the status at the time of survey, without varying over time. Due to the different number of cases related to religion items, we will do several different analyses: First, we examine how different religion measures are associated with mortality differentials (Table 3) and select an appropriate measure for the second analysis. Second, guided by the first analysis, we examine how religious affiliation and attendance, is associated with mortality differentials (Table 4).

RESULT:

<Table 3 about here>

Table 3 presents hazard ratios for the multiple religious measures controlling for the same socio-demographic and geographical variables. Model 1 is the effects of the strength of religious affiliation, Model 2 for attendance, Model 3 for praying, and Model 4 for postlife, and model 5 for belief in God. Except attendance, we found no evidence that strength of religious affiliation, praying, belief in life after death, and belief in God have an influence on mortality. Therefore, we will include attendance in the next analysis, as is summarized in Table 4.

Of control variables, given similar patterns and statistical significance, we interpret the mortality risk of control variables based on Model 1. Model 1 shows that, other things being

equal, one-year older respondents at the time of survey are 5% more likely to die in terms of the hazard of death ($p < .001$). The risk of death for females is 0.69 times the risk for men. Both Blacks (1.34 times) and Hispanics (1.41 times) have a higher risk of death than non-Hispanic whites. The risk of death for widowed is about 1.10 times the risk of married. In terms of employment status, compared to employed, unemployed, retired, and other (e.g. housewife) increases the mortality risk. A one-point better self-rated health reduces mortality risk by 15% ($(1 - 0.85) * 100$). As income increases, the general pattern shows the decrease in mortality risk. For example, the hazard of mortality of the highest household income quartile group is only about 85% of the hazard for the lowest income quartile group ($p < .01$). We do not find regional differences, but we found that, compared to those who live in the top 1 to 12 ranked SMSA, those who live in the 13 to 100 ranked SMSA, other urban, and other rural have a reduced risk of mortality. Finally, while the number of household members was not associated with mortality risk, the risk of death for those who were born in the United States was 1.23 times the risk of those who were not born in the United States.

<Table 4 about here>

Model 1 to Model 3 in Table 4 presents the hazard ratios of religious affiliation and church attendance. Model 1 shows the mortality estimate of each religious affiliation compared to Mainline Protestants and Model 2 is similar to Model 2 in Table 3. The slight differences resulted from selecting the same number of cases for three models. Model 3 incorporates both religious affiliation and church attendance. In Model 1, compared to our baseline category, Mainline Protestants, Other religious group, Catholics, and Jews are associated with lower risk of death. For example the risk of death for Jews is about 0.80 times the risk of Mainline Protestants.

There is a remarkably similar hazard ratio among control variables among Model 1, Model 2, and Model 3. When we include religious affiliation and attendance simultaneously in Model 3, there are little changes in hazard ratios, compared to either Model 1 or Model 3, and suggest independent influences of religious affiliations and attendance on mortality.

Discussion

We find that both religious affiliation and religious attendance matter for mortality. Compared to Mainline Protestants, Catholics, Jews, and other religious groups have lower risk of death, but Black Protestant (BP), Evangelical Protestant (EP), and even religious nones are not different from Mainline Protestant. While our study is consistent with previous findings that religious attendance led to reduction of mortality, we did not find other religious measures, such as strength of religious affiliation, frequency of praying, belief in an afterlife, and belief in God to be associated with mortality.

Our findings on religious affiliation and mortality are different from that of Sullivan's study, which found that "Mainline Protestants still have a sizeable, significant advantage, relative to Catholics and black Protestants (2010, p. 749)." Although we have similar control variables, such as gender, race/ethnicity, nativity, education, and income, the major difference is that while his study incorporated time-varying marital status and health behaviors focused on older adults, our study includes baseline self-rated health and employment status focusing on all adults. In addition, while in general both studies agree that female, foreign born, and those in the highest income group have low hazards of death, our study shows the higher hazard of black and Hispanic group, but his study shows blacks are not different and Hispanics have a low hazard of

mortality. This contrast definitely requires further research that includes both religious group and religiosity.

We have several limitations: First, due to the GSS design, the sample size for different religiosity/spirituality measures is different. Second, we also could not incorporate previously known mediating factors associated with mortality, such as health behaviors, personality, or mental health variables (Hill, Burdette, & Idler 2011). Third, due to the cross-sectional nature of the GSS, we have not examined if changes in religiosity or spirituality are associated with changes in health outcome, (Lucchetti, Lucchetti, and Koenig, 2011). Given that the GSS collects three follow-up studies of respondents from 2006, it is feasible to study this topic in the future. Fourth, this paper has focused on all-cause mortality, not cause-specific mortality. Fifth, we have not examined if religiosity is related with mortality in specific religious groups (Jarvis & Northcott 1987), which can be examined in the future. Finally, we also could not incorporate religious context effects which has an impact on mortality (Blanchard et al., 2008; Dwyer et al., 1990; Jaffe et al. 2005).

Research on religion and health has mainly focused on religious affiliation without religiosity or religiosity without religious affiliation. As Jarvis and Northcott (1987) noted more than 25 years ago, and Sullivan (2010) examined, our study indicates the need to consider both religious group and religiosity to fully understand the prescribing or proscribing religious factors associated with health.

REFERENCES

- Blanchard, T. C., Bartkowski, J. P., Matthews, T. L., & Kerley, K. R. (2008). Faith, Morality and Mortality: The Ecological Impact of Religion on Population Health. *Social Forces*, 86(4), 1591-1620.
- Chida, Y., Steptoe, A., & Powell, L. H. (2009). Religiosity/Spirituality and Mortality A Systematic Quantitative Review. *Psychotherapy and Psychosomatics*, 78(2), 81-90.
- Cleves, M., Gutierrez, R. G., Gould, W., & Marchenko, Y. V. (2010). *An Introduction to Survival Analysis Using Stata*. College Station, Texas: Stata
- Dwyer, J. W., Clarke, L. L., & Miller, M. K. (1990). The Effects of Religious Concentration and Affiliation on County Cancer Mortality Rates. *Journal of Health and Social Behavior*, 31, 185-202.
- Gillum, R. F., King, D. E., Obisesan, T. O., & Koenig, H. G. (2008). Frequency of Attendance at Religious Services and Mortality in a U.S. National Cohort. *Annals of Epidemiology*, 18, 124-129.
- Harrigan, J. T. (2011). Health Promoting Habits of People Who Pray for Their Health. *Journal of Religion and Health*, 50, 602-607.
- Hill, T. D., Burdette, A. M., & Idler, E. L. (2011). Religious Involvement, Health Status, and Mortality Risk. In R. A. Settersten & J. L. Angel (Eds.), *Handbook of Sociology of Aging* (pp. 533-546). New York: Springer.
- Hummer, R. A., Ellison, C. G., Rogers, R. G., Moulton, B. E., & Romero, R. R. (2004). Religious Involvement and Adult Mortality in the United States: Review and Perspective. *Southern Medical Journal*, 97, 1223-1230.
- Idler, E. L. (2011). Religion and Adult Mortality: Group- and Individual-Level Perspectives. *International Handbook of Adult Mortality* (pp. 345-377). New York: Springer.

- Idler, E. L., & Kasl, S. V. (1997). Religion among disabled and nondisabled persons .1. Cross-sectional patterns in health practices, social activities, and well-being. *Journals of Gerontology Series B-Psychological Sciences and Social Sciences*, 52(6), S294-S305.
- Jaffe, D. H., Eisenbach, Z., Neumark, Y. D., & Manor, O. (2005). Does living in a religiously affiliated neighborhood lower mortality? *Annals of Epidemiology*, 15(10), 804-810.
- Jarvis, G. K., & Northcott, H. C. (1987). Religion and Differences in Morbidity and Mortality. *Social Science & Medicine*, 25, 813-824.
- Koenig, H., McCullough, M. E., & Larson, D. B. (2001). *Handbook of Religion and Health* (pp. 318-330). Oxford: Oxford University Press.
- Koenig, H., King, D., & Carson, V. B. (2012). *Handbook of Religion and Health* (2nd ed.). Oxford: Oxford University Press.
- Koenig, H., King, D., & Carson, V. B. (2012). Mortality. *Handbook of Religion and Health* (2nd ed., pp. 468-491). Oxford: Oxford University Press.
- Muennig, P, Johnson G., Kim, J., Smith, T. W. & Rosen, Z. The General Social Survey-National Death Index: an Innovative New Dataset for the Social Sciences. *BMC Research Notes* 2011, 4, 385
- Levin, J. (2001). *God, Faith, and Health*. New York: John Wiley & Sons.
- Lucchetti, G., Lucchetti, A. L. G., & Koenig, H. G. (2011). Impact of Spirituality/Religiosity on Mortality: Comparison with Other Health Interventions. *Explore-the Journal of Science and Healing*, 7(4), 234-238.
- McCullough, M. E., Hoyt, W. T., Larson, D. B., Koenig, H. G., & Thoresen, C. (2000). Religious Involvement and Mortality: A meta-analytic review. *Health Psychology*, 19(3), 211-222.

- Moulton, B. E., & Sherkat, D. E. (2012). Specifying the Effects of Religious Participation and Educational Attainment on Mortality Risk for US Adults. *Sociological Spectrum*, 32(1), 1-19.
- Musick, M. A., House, J. S., & Williams, D. R. (2004). Attendance at Religious Services and Mortality in a National Sample. *Journal of Health and Social Behavior*, 45(2), 198-213.
- Oman, D., Kurata, J. H., Strawbridge, W. J., & Cohen, R. D. (2002). Religious Attendance and Cause of Death over 31 Years. *International Journal of Psychiatry in Medicine*. 32(1), 69-89
- Powell, L. H., Shahabi, L., & Thoresen, C. E. (2003). Religion and Spirituality: Linkages to Physical Health. *The American Psychologist*, 58, 36-52.
- Smith, T. W., Marsden, P., Hout, M., & Kim, J. (2011). *General Social Surveys, 1972-2010: cumulative codebook*. Chicago: NORC.
- Steensland, B., Park, J. Z., Regnerus, M. D., Robinson, L. D., Wilcox, W. B., & Woodberry, R. D. (2000). The Measure of American Religion: Toward improving the State of the Art. *Social Forces*, 79(1), 291-318.
- Sullivan, A. R. (2010). Mortality Differentials and Religion in the United States: Religious Affiliation and Attendance. *Journal for the Scientific Study of Religion*, 49(4), 740-753.

Table 1. % of Death by Year

Year	% Death	Total N
1978	45.7	1,509
1980	45.8	1,274
1982	43.5	1,715
1983	40.8	1,349
1984	39.1	1,411
1985	43.9	1,439
1986	40.9	1,363
1987	36.3	1,725
1988	35.4	1,451
1989	33.5	1,486
1990	31.7	1,346
1991	30.6	1,486
1993	21.9	1,547
1994	19.9	2,949
1996	16.9	2,835
1998	14.9	2,712
2000	13.5	2,650
2002	10.8	2,583
Total	28.2	32,830

Table 2. Weighted Descriptive Statistics (% or proportion) by Religious Classification (N=unweighted N)

	BP	EP	MP	OA	CA	Jew	None	Total
Unweighted N for	N=3,144	N=9,135	N=6,765	N=1,747	N=8,025	N=646	N=3,094	N=32,556
Death	34	27	33	21	24	26	17	27
Strength of affiliation								
Very strong	50	45	33	53	38	37	-	37
Not strong	33	40	51	32	47	43	-	39
Somewhat strong	12	10	11	10	13	14	-	10
No affiliation	-	-	-	-	-	-	-	9.4
No Answer/Don't Know	5	5	4	5	2	6	-	4
Attend (0-8)	4.7(2.3)	4.4(2.8)	3.8(2.4)	4.3(2.8)	4.3(2.5)	2.8(2.0)	.8(1.4)	3.9(2.7)
Pray (6=several times a day)	4.9(1.2)	4.6(1.4)	4.3(1.5)	4.4(1.5)	4.3(1.4)	3.2(1.4)	2.7(1.4)	4.2(1.5)
Life after death								
Yes	72	83	76	72	73	36	46	73
No	19	11	16	16	18	49	36	18
Don't Know	10	6	9	12	9	16	18	9
God								
I don't believe in God	1	1	2	6	1	2	13	3
I don't know whether there is a God	1	1	3	7	2	23	19	4
I do believe in a Higher Power of some kind	4	4	9	21	7	17	24	8
I find myself believing in God some of the time	2	3	4	5	5	12	7	4
While I have doubts, I feel that I do believe in God	9	12	22	12	21	20	15	17
I know God really exists and I have no doubts about it	82	79	61	49	65	27	22	64
Age (mean)	44.1(16.9)	44.8(17)	48.3(17.6)	41(15.6)	42.7(16.6)	48.2(17.2)	37.1(14.6)	44(17)
Female	62	55	58	54	55	52	41	55
Race/ethnicity								
White	5	91	95	73	80	97	82	80
Black	94	5	3	11	3	1	8	12
Other	1	2	1	12	3	0	5	3
Hispanic	1	3	1	4	14	2	5	5
Education	11.5(3.2)	12.2(2.9)	13.3(2.9)	13.6(3.1)	12.9(2.9)	15.2(3.1)	13.3(3.0)	12.8(3.0)
Self-rated health	2.8 (0.8)	3.0(0.8)	3.1(0.8)	3.2(0.8)	3.1(0.8)	3.2(0.8)	3.1(0.8)	3.1(.8)
Marital Status								
Married	43	66	66	60	60	66	45	60
Widowed	11	7	9	5	6	7	3	7
Divorced	11	10	9	10	9	6	12	10
Separated	8	2	1	3	2	2	3	3
Never married	28	15	15	22	23	20	37	21
Work status								
Full-time job	46	51	50	51	52	56	58	52
Part-time job	10	11	10	14	12	13	13	11
Temporary job	2	2	2	2	2	2	2	2
Unemployed	4	3	2	3	3	1	5	3
Retired	12	11	16	8	10	11	6	11
Other job (student/housewife)	26	22	20	22	20	16	17	21
Family Income								
1st quartile	34	19	15	20	16	9	20	18
2nd quartile	23	24	20	20	20	10	23	21
3rd quartile	17	25	24	23	25	17	22	24
4th quartile	13	22	32	27	29	48	26	26
Income "don't know"	13	9	10	11	10	15	9	10
Size of place								
1-12 SMSA	19	3	3	10	10	27	10	8
13-100 SMSA	26	13	10	15	12	15	17	14
1-12 SMSA suburb	8	7	10	13	16	24	11	11
13-100 SMSA suburb	9	13	15	18	19	20	16	15
Other urban	26	45	44	40	36	13	35	39
Other rural	12	19	17	5	8	1	10	13
Region								
Northeast	14	8	20	17	35	47	21	20
Midwest	21	24	33	15	27	10	23	26
South	56	51	32	24	19	20	24	35
West	6	17	15	43	18	22	32	19
# of home population								
1	14	12	14	12	11	17	15	13
2	27	35	39	29	29	38	33	33
3	21	21	19	19	21	17	22	21
4	18	19	17	18	21	21	17	19
5+	21	14	11	21	18	6	12	15
Born in the U.S.	97	97	95	80	87	86	91	92

Note: BP, Black Protestants; EP, Evangelical Protestants; MP, Mainline Protestants; OA: Other religious affiliation

Within a specific religious group, the number of cases for other variables are different.

Table 3. Hazard Ratios of Adult Mortality, RELITEN, ATTEND, PRAY, POSTLIFE, GOD

	HR	P	95% CI	HR	P	95% CI	HR	P	95% CI	HR	P	95% CI	HR	P	95% CI
	RELITEN (N=23,179)			Attend (N=22,909)			PRAY(N=11,834)			POSTLIFE (N=14,429)			GOD (N=5,908)		
Not very strong	1.01	0.8	0.94	1.09											
Somewhat strong	1.07	0.2	0.96	1.18											
No religion	1.01	0.8	0.89	1.15											
No answer/DK	1.03	0.7	0.89	1.19											
Attend (0-8)				0.98 **	0.97	0.99									
Pray (1-6)							0.99	0.6	0.96	1.02					
No: a life after death										0.99	0.8	0.90	1.09		
Undecided: a life after death										1.02	0.8	0.88	1.18		
God: don't believe													1.05	0.69	1.59
God: don't know													1.06	0.76	1.50
God: higher power													0.98	0.76	1.27
God: sometimes													0.82	0.58	1.16
God: with doubts													1.06	0.88	1.26
Age	1.05 ***	1.04	1.05	1.05 ***	1.04	1.05	1.05 ***	1.04	1.05	1.05 ***	1.04	1.05	1.05 ***	1.04	1.05
Female	0.69 ***	0.64	0.74	0.70 ***	0.65	0.75	0.68 ***	0.62	0.74	0.67 ***	0.62	0.73	0.63 ***	0.54	0.73
Black	1.34 ***	1.20	1.49	1.36 ***	1.23	1.52	1.39 ***	1.21	1.59	1.36 ***	1.18	1.56	1.26 *	1.02	1.55
Other race	0.78	0.61	1.01	0.78	0.60	1.01	0.77	0.57	1.04	0.84	0.60	1.19	0.41 **	0.22	0.78
Hispanic	1.41 ***	1.17	1.68	1.43 ***	1.20	1.70	1.25	0.96	1.62	1.43 **	1.13	1.81	1.85 **	1.20	2.86
Education	1.00	0.99	1.01	1.00	0.99	1.01	1.00	0.99	1.01	1.01	0.99	1.02	1.00	0.98	1.02
Widowed	1.10 *	1.00	1.20	1.09	0.99	1.19	1.20 **	1.06	1.36	1.20 **	1.07	1.36	1.14	0.94	1.38
Divorced	0.99	0.90	1.09	0.98	0.89	1.07	0.96	0.84	1.11	0.96	0.85	1.10	1.07	0.87	1.33
Separated	1.06	0.88	1.28	1.04	0.86	1.26	0.96	0.74	1.26	1.06	0.83	1.37	1.05	0.64	1.73
Single	1.07	0.96	1.20	1.05	0.94	1.18	1.08	0.92	1.26	1.14	0.99	1.32	0.93	0.75	1.15
Part-time	0.98	0.86	1.11	0.98	0.87	1.11	1.08	0.93	1.25	0.96	0.82	1.12	0.98	0.79	1.23
Temporary job	1.19	0.97	1.46	1.19	0.97	1.47	1.33 *	1.03	1.71	1.30 *	1.01	1.67	1.35	0.81	2.22
Unemployed	1.27 *	1.04	1.55	1.23 *	1.00	1.50	1.21	0.91	1.61	1.20	0.91	1.59	1.26	0.83	1.93
Retired	1.21 ***	1.10	1.34	1.21 ***	1.09	1.34	1.27 **	1.10	1.46	1.23 **	1.09	1.39	1.27 *	1.05	1.54
Other job (student)	1.15 **	1.04	1.26	1.15 **	1.04	1.26	1.21 **	1.06	1.39	1.18 **	1.05	1.32	1.16	0.94	1.43
Self-rated health	0.85 ***	0.81	0.88	0.85 ***	0.82	0.89	0.87 ***	0.83	0.92	0.83 ***	0.79	0.87	0.80 ***	0.74	0.86
2nd quartile income	0.96	0.87	1.06	0.96	0.87	1.06	1.02	0.90	1.16	1.01	0.90	1.14	0.83	0.67	1.04
3rd quartile income	0.91	0.82	1.01	0.91	0.83	1.01	0.92	0.80	1.06	0.98	0.86	1.10	0.88	0.71	1.10
4th quartile income	0.85 **	0.75	0.96	0.85 **	0.75	0.96	0.80 **	0.68	0.94	0.86 *	0.74	1.00	0.72 *	0.56	0.94
NA/DK income	1.00	0.89	1.12	0.98	0.87	1.10	0.97	0.84	1.10	1.05	0.93	1.19	1.03	0.83	1.28
Midwest	1.06	0.98	1.15	1.06	0.98	1.16	1.03	0.92	1.15	1.01	0.90	1.12	0.90	0.75	1.09
South	1.09	1.00	1.20	1.09	0.99	1.19	1.11	0.98	1.26	1.09	0.96	1.23	1.02	0.85	1.22
West	1.04	0.94	1.16	1.02	0.92	1.14	1.01	0.88	1.16	1.00	0.88	1.14	0.90	0.71	1.13
13-100 SMSA	0.82 *	0.71	0.96	0.84 *	0.72	0.98	0.74 **	0.62	0.89	0.77 *	0.63	0.95	0.68 **	0.51	0.91
1-12 SMSA suburb	0.93	0.79	1.11	0.95	0.80	1.13	0.93	0.74	1.16	0.92	0.73	1.17	0.90	0.67	1.22
13-100 SMSA suburb	0.89	0.76	1.03	0.91	0.78	1.05	0.84	0.70	1.00	0.85	0.71	1.02	0.77	0.57	1.03
Other urban	0.84 *	0.73	0.98	0.87	0.75	1.00	0.80 **	0.67	0.94	0.81 *	0.68	0.98	0.71 *	0.54	0.94
Other rural	0.81 **	0.69	0.95	0.83 *	0.71	0.97	0.72 **	0.60	0.86	0.81 *	0.66	0.99	0.67 **	0.50	0.90
# of household members	1.00	0.97	1.03	1.00	0.97	1.03	1.02	0.97	1.06	1.00	0.96	1.04	0.96	0.89	1.03
Born in the USA	1.23 **	1.07	1.42	1.23 **	1.07	1.41	1.19 *	1.01	1.40	1.17	0.97	1.41	1.38	0.97	1.96

Note: RELITEN, strength of religious affiliation, reference category = strong; Attend, religious service attendance (0: never to 8: several times a week);

PRAY, Pray (0: never to 6: several times a week); Postlife, believe a life after death, reference category = Yes;

God, believe in God, reference category = no doubts; Omitted category for gender is male; race is white; married for marital status;

full-time job for work status; 1st quartile income for family income; Northeast for region; 1-12 SMSA for size of place.

* < .05; ** < .01; *** < .001

Table 4. Hazard Ratios of Adult Mortality by Religious Affiliation and Attendance (N=22,757)

	Model 1			Model 2			Model 3		
	HR	P	(95% CI)	HR	P	(95% CI)	HR	P	(95% CI)
Black Protestant	0.96		0.81 1.14				0.97		0.82 1.15
Evangelical Protestant	0.94		0.87 1.03				0.96		0.88 1.04
Other Affiliation	0.84 *		0.73 0.97				0.86 *		0.74 0.99
Catholic	0.87 **		0.79 0.95				0.89 *		0.81 0.97
Jew	0.80 *		0.65 0.99				0.79 *		0.64 0.97
Religious nones	0.93		0.81 1.05				0.88		0.77 1.01
Attend				0.98 **		0.97 0.99	0.98 **		0.97 0.99
Age	1.05 ***		1.04 1.05	1.05 ***		1.04 1.05	1.05 ***		1.04 1.05
Female	0.69 ***		0.64 0.74	0.70 ***		0.65 0.75	0.69 ***		0.65 0.74
Black	1.31 **		1.12 1.52	1.37 ***		1.23 1.52	1.33 ***		1.15 1.56
Other race	0.79		0.61 1.01	0.79		0.61 1.02	0.79		0.61 1.02
Hispanic	1.45 ***		1.21 1.75	1.43 ***		1.20 1.72	1.47 ***		1.23 1.76
Education	1.00		0.99 1.01	1.00		0.99 1.01	1.00		0.99 1.01
Widowed	1.09		1.00 1.19	1.08		0.99 1.19	1.09		0.99 1.19
Divorced	0.99		0.90 1.09	0.97		0.89 1.07	0.98		0.89 1.08
Separated	1.05		0.87 1.28	1.04		0.86 1.26	1.04		0.86 1.26
Single	1.07		0.96 1.20	1.05		0.94 1.18	1.06		0.95 1.19
Part-time	0.98		0.87 1.11	0.99		0.87 1.12	0.99		0.88 1.12
Temporary job	1.19		0.97 1.46	1.19		0.97 1.46	1.20		0.97 1.47
Unemployed	1.24 *		1.02 1.52	1.23 *		1.01 1.51	1.24 *		1.01 1.51
Retired	1.21 *		1.09 1.34	1.21 ***		1.09 1.34	1.21 ***		1.09 1.33
Other job (student, housewife)	1.15 **		1.04 1.27	1.15 **		1.05 1.27	1.15 **		1.05 1.27
Self-rated health	0.85 ***		0.82 0.88	0.86 ***		0.82 0.89	0.85 ***		0.82 0.89
2nd quartile income	0.96		0.87 1.06	0.96		0.87 1.06	0.96		0.87 1.06
3rd quartile income	0.91		0.82 1.01	0.91		0.83 1.01	0.91		0.82 1.01
4th quartile income	0.85 **		0.75 0.96	0.85 *		0.75 0.96	0.85 **		0.75 0.96
NA/DK income	0.98		0.87 1.10	0.98		0.87 1.10	0.98		0.87 1.11
Midwest	1.04		0.95 1.12	1.06		0.98 1.15	1.04		0.96 1.13
South	1.05		0.96 1.16	1.09		0.99 1.20	1.06		0.96 1.17
West	1.01		0.91 1.13	1.02		0.91 1.13	1.01		0.90 1.12
13-100 SMSA	0.82 *		0.71 0.96	0.84 *		0.72 0.98	0.83 *		0.71 0.97
1-12 SMSA suburb	0.94		0.79 1.12	0.95		0.80 1.13	0.94		0.79 1.12
13-100 SMSA suburb	0.89		0.77 1.04	0.91		0.78 1.06	0.89		0.77 1.04
Other urban	0.84 *		0.72 0.97	0.87		0.75 1.00	0.85 *		0.73 0.98
Other rural	0.79 **		0.68 0.94	0.83 *		0.71 0.97	0.80 *		0.68 0.95
# of household members	1.00		0.97 1.03	1.00		0.97 1.03	1.00		0.97 1.03
Born in the USA	1.21 **		1.05 1.40	1.23 **		1.07 1.42	1.21 **		1.05 1.40

Note: Attend, religious service attendance (0: never to 8: several times a week);

Omitted category for is Mainline Protestants for religious affiliation; male for gender; white for race;

married for marital status; full-time job for work status; 1st quartile income for family income;

Northeast for region; 1-12 SMSA for size of place. * $<.05$; ** $<.01$; *** $<.001$