Religious Involvement and Adult Mortality in the United States: Review and Perspective

Robert A. Hummer, PHD, Christopher G. Ellison, PHD, Richard G. Rogers, PHD, Benjamin E. Moulton, MA, and Ron R. Romero, BA

Objectives: The scientific community has recently taken a serious interest in the relation between religious involvement and adult mortality risk in the United States. We review this literature, highlighting key findings, limitations, and future challenges.

Methods: Literature from medicine, epidemiology, and the social sciences is included.

Results: Taken together, the existing research indicates that religious involvement is related to US adult mortality risks. The evidence is strongest for public religious attendance and across specific religious denominations. The evidence is weakest for private religious activity. The mechanisms by which religious involvement appear to influence mortality include aspects of social integration, social regulation, and psychological resources.

Conclusions: The religion-mortality literature has developed in both size and quality over the past decade. Fruitful avenues for continued research include the analysis of (1) more dimensions of religious involvement, including religious life histories; (2) population subgroups, including specific race/ethnic and socioeconomic populations; and (3) a richer set of social, psychologic, and behavioral mechanisms by which religion may be related to mortality.

Key Words: adult mortality, religious activity and involvement, religious denominations

There is a long tradition of research that addresses the association between religion and mortality, especially suicide. Only recently, however, has the scientific community taken a serious interest in how religious factors may impact the mortality risk of individuals in the US population more generally. In addition to examining the magnitude of the religion-mortality relation, this line of research has begun examining the mechanisms by which religion influences mortality outcomes. Much of this work suggests that religious involvement offers a protective advantage in regard to mortality.[1] This body of research has also generated both considerable publicity and debate. Despite some criticism, recent empiric results appear to be quite strong and are based on higher quality data sets and more sophisticated methodologies than ever before.

This report reviews the medical, public health, and social science literature that has empirically addressed the religion-mortality linkage in the United States. Our objectives are to (1) examine key findings in the area of religion and mortality, describing the limitations as well as consistencies and inconsistencies of the work to date; (2) describe which indicators of religious involvement have been used, which study populations have been used, and for which subgroups of the population religious factors seem to be most strongly associated with mortality outcomes; (3) review the mechanisms by which religious involvement might be associated with adult mortality; and (4) highlight the key critiques of, and forthcoming challenges for, this literature.

Key Points

- A number of high-quality, population-based studies have shown an association between higher levels of public religious attendance and lower mortality risks among US adults.
- Key confounders, such as baseline health, have accounted for a relatively small portion of this association.
- Key hypothesized mechanisms for such a relation include increased levels of social support and integration, social regulation, and psychologic resources among more religiously active persons.
- Evidence is mixed at this point for an empiric relation between private religious activity and mortality.

From the Population Research Center and Department of Sociology, University of Texas at Austin, Austin, TX, and the Department of Sociology, University of Colorado at Boulder, Boulder, CO.

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Reprint requests to Dr. Robert Hummer, Department of Sociology, University of Texas at Austin, 1800 Main Building, Austin, TX 78712. Email: rhummer@prc.utexas.edu

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Research on Religion and Mortality Outcomes

Religious denominational differences in mortality

Denominational differences in mortality were given substantial attention throughout the 1970s and 1980s and continue to surface in this literature. The greatest focus has been on Mormons, Seventh Day Adventists, and members of other religious groups with distinctive lifestyle guidelines. Members of these denominations—especially those who are active—enjoy reduced mortality risk compared with the general population.[2–8] In fact, Manton et al[9] reported that two of the select US population subgroups with extremely high life expectancies are Mormons and Seventh Day Adventists. Jewish individuals, particularly males, have also been shown to have lower mortality rates than the non-Jewish white population.[10] Because of the lack of specific denominational affiliation information in most large data sets, almost no attention has been given to whether or not there are mortality differences between Catholics and Protestants and between different Protestant groupings, such as liberal and conservative denominations.

In addition to individual-level studies, there is a rich parallel tradition of aggregate-level studies linking the religious denominational composition of geographic units with mortality rates.[11] Recent studies indicate that counties with high concentrations of Mormons and evangelical Protestants tend to have lower suicide and/or cancer mortality rates, and those with Catholic concentrations also have lower suicide rates. In contrast, counties with concentrations of Jews, liberal Protestants (eg, Episcopalians, Presbyterians), and nonreligious persons tend to have elevated suicide and cancer mortality rates, statistically controlling for numerous covariates.[12,13]

Among metropolitan areas, those with high congregational membership rates and those with high levels of religious homogeneity tend to exhibit lower suicide and homicide rates than others.[14–16] At the same time, metropolitan areas with higher percentages of conservative Protestants have been found to have higher homicide rates in the South but not elsewhere in the country, suggesting regional variations in the meaning of religious denominational concentrations for mortality outcomes.[17]

Public religious attendance and mortality

The largest and most consistent body of research has focused on public religious attendance, where a number of studies have found a relation between more frequent attendance and lower adult mortality. A recent meta-analysis[18] found that less frequent attendance at religious services was associated with 1.29 times the odds of mortality in follow-up studies compared with individuals who attend more frequently.

Two recent nationally representative studies have demonstrated this linkage. Hummer et al[19] used data from the 1987 National Health Interview Survey linked to the National Death Index (NHIS-NDI) and showed that religious attendance at baseline was associated with adult mortality risk in a graded fashion over the ensuing 8 years. Although demographic factors, health selectivity, social ties, and health behavior were responsible for a portion of the differences, religious attendance maintained a moderately strong and graded relation with mortality risk, even in the most complete regression model. The association was of greater magnitude for some causes (eg, respiratory diseases, external causes) in comparison to others (eg, circulatory diseases) but worked in the same direction across causes and was statistically significant for most causes despite relatively small cell sizes by cause.

Musick et al[20] later included a wider range of religion variables than is typically the case in predicting adult mortality risks. Using nationally representative data from the Americans' Changing Lives survey, they found that individuals who reported attending at least once a month at baseline experienced a 31% to 35% decreased risk of death in the 6-year follow-up period than those who never attended, after controlling for other religion variables and a range of demographic, socioeconomic, health, and behavioral characteristics. Unlike the Hummer et al[19] results, the Musick et al[20] findings did not exhibit a graded pattern of mortality by attendance: Mortality risks were uniformly lower for those attending at least once a month compared with those who reported never attending.

> Taken together, the existing research indicates that religious involvement is related to adult mortality in the United States.

A number of prominent studies of religion and mortality risk, conducted in specific communities, have also shown protective effects of attendance. For example, Strawbridge et al[21] found that frequent religious attendance was associated with lower all-cause mortality in a 28-year follow-up of respondents in the Alameda County (California) Study data. In a later study using the same data, Oman et al[22] found lower mortality due to circulatory diseases, digestive diseases, respiratory diseases, and all causes combined for those attending services more frequently at baseline, even after adjusting for several individual chronic diseases and other health status indicators at baseline. An earlier study by Oman and Reed[23] that used data from Marin County, California, produced similar findings: individuals 55 years of age and over who attended religious services at least weekly at baseline were 28% less likely to die over the follow-up period compared with individuals who reported never attending. This figure was similar in magnitude to the Strawbridge et al[21] findings from a different part of California. A study by Koenig et al[24] an-

alyzing a sample of community-dwelling elderly individuals in North Carolina also found a protective effect of religious attendance on mortality risk. That study reported a 46% lower risk of death among those who attended once a week or more compared with those who attended less frequently.

Public religious attendance and mortality risk: Subgroup differences

Although the above studies have consistently shown that religious attendance is associated with lower mortality risk using both nationally representative and community-based data sets, some (but not all) evidence is beginning to point toward stronger relative differences in the attendance-mortality relation for younger adults, women, and blacks. Rogers et al,[25] using the NHIS-NDI, showed that whereas adults 18 to 64 years of age who never attended services had more than twice the mortality risk compared with their frequently attending counterparts, adults older than 65 who never attended had just 24% higher mortality. The larger relative difference among younger adults was further supported by Hummer et al,[26] who used a national sample of preretirement adults 51 to 61 years of age from the Health and Retirement Study and found that those who reported never attending services at baseline had over twice the risk of mortality over the 6-year follow-up in comparison to those who attended once a week or more. The Musick et al[20] study also showed that the attendance-mortality relation was stronger among younger than among older individuals.

> Some evidence suggests stronger relative differences in the attendance-mortality relation for younger adults, women, and blacks.

To best address religious involvement and mortality among elders, the latest national-level study of public religious involvement and mortality risk analyzed individuals 70 years of age and older, using data from the Second Longitudinal Survey of Aging.[27] These findings demonstrated that attendance at religious services in the two weeks before the survey was associated with a 30% lower mortality risk in the 6-year follow-up period compared with individuals not attending, net of a large range of confounding factors. This was found among the entire sample of elderly persons, as well as among women, men, unmarried persons, and married persons, and among unmarried men, unmarried women, married men, and married women. And although no national-level studies have found sex differences in the attendance-mortality relation, both Strawbridge et al[21] and Koenig et al[24] have reported stronger effects for women using community-based samples. Given higher religious attendance rates for women in the United States, this pattern is in need of further study and clarification.

Few studies have examined race/ethnic differences in the religion-mortality relation. In one of the few studies to examine a minority population, Ellison et al[28] used the NHIS-NDI data to examine blacks and found very wide differences in mortality by religious attendance. Compared with black adults who reported attending services more than once a week, those who reported never attending services were more than twice as likely to die during the 8-year follow-up period, even after controlling for a range of variables. The strong effect of nonattendance was robust and pervasive across all subgroups of this population, although the strength of the relation was found to be weaker among older (55+) individuals. These results were consistent with an earlier, but smaller, study of religion and mortality among black elders.[29]

Private religious activity and mortality

A third, recently emerging, body of research considers the association between private religiosity and mortality. The overall conclusion from these studies is somewhat unclear. On the one hand, some evidence points to lower mortality among persons who are privately religious. The largest study of its kind, to date, was conducted by Helm et al,[30] who analyzed community-level data from elders in North Carolina. The study found that the effect of private religiosity depended on baseline levels of health. Among those who were healthy at baseline, individuals who reported not engaging in private religious activity were 47% more likely to die over the course of 6 years than healthy elderly individuals who engaged in private religious activity, net of a range of other risk factors that included public religious attendance. Private religiosity did not appear to affect mortality among those individuals who were not healthy at baseline. Earlier, results from a national-level study found that religious coping offset the negative influences of stressors on mortality among low-educated individuals.[31]

On the other hand, data from clinical studies have yielded mixed results. In a study of heart patients, Oxman et al[32] found that an absence of strength and comfort in religion was independently related to a higher risk of death during the first 6 months after cardiac surgery. However, Koenig et al[33] found no relation between religious coping and the risk of follow-up mortality among hospitalized patients. A later study by Pargament et al[34] found that elderly patients who exhibited religious struggle had a higher subsequent mortality risk than patients who were not struggling with their religious beliefs. Thus, this group of studies provides some support for a protective relationship between private religious involvement and mortality risk among healthy individuals in community-based and nationally based samples, but less so among clinically based samples of individuals who are already unhealthy.

The higher degree of ambiguity in this area of study is understandable, most notably, because of (1) the many different types of private religious activity that exist, (2) the lack of measures available in most large data sets to thoroughly examine private religious activities and mortality, and (3) the nearly complete lack of national level data that have been examined. The need for further research using more in-depth measures of private religious activity among population-based samples is clearly warranted. Data availability, to this point, has hampered such investigation. Importantly, a NIA/Fetzer-sponsored panel of experts has created and tested a set of measures that could be included in health surveys to better tap the multidimensional components of religion that may be important for health.[35]

Summary

Taken together, the existing research indicates that religious involvement is related to adult mortality in the United States. The evidence is strongest for public religious attendance: A large number of recent high-quality studies—using data from specific communities, from nationally representative samples, and from different demographic subpopulations—have shown that attendance is related to lower mortality risks above and beyond controls for demographic, socioeconomic, and health-related risk factors. Mortality differences by religious denomination have also proven to be robust, with Mormons, Seventh Day Adventists, and individuals from a few other denominations exhibiting lower mortality than the general population.

At the same time, there is still much need for further research and clarity, particularly in three areas. First, there is a critical need to explore more dimensions of religious involvement, including but not limited to more inclusive measurement on private religious behavior and on the religious life history of individuals.[35] Second, the analysis of religion-mortality linkages among specific subpopulations (eg, Hispanics, Asian Americans, and Native Americans; individuals of low education and low income; adolescents and young adults) is clearly needed. Inattention to the diverse demographic and socioeconomic landscape of the contemporary United States can lead to empirical findings that, while potentially true among the whole population, mask substantial heterogeneity within the population. For example, preliminary work in our research group[36] found that the relation between religious involvement and mortality risk among very well-educated (16+ years of education) adult individuals was substantively and statistically nonsignificant. This may be because the protective functions of religious involvement among the very well educated are substituted with other well-defined behavioral norms and social support mechanisms that are learned and reinforced by participation in higher education. Third, understanding of the pathways by which religious involvement and mortality are associated, while improving, remains under-developed. Just why religious involvement is related to mortality has not been fully answered, even in the most sophisticated studies to date.

Religious Involvement and Mortality: Possible Mechanisms

Ellison and Levin[37] and Koenig et al[1] have provided excellent discussions on the various mechanisms linking religious involvement and mortality. Waite and Lehrer[38] have also drawn a strong parallel between the religion-mortality and marriage-mortality literature in thinking through the mechanisms by which these relations may work.

A first concept to consider is social integration, which refers to the social ties and support that are garnered from involvement in a religious community. Individuals who are religiously involved have more friendship networks and are more socially integrated within their community compared with those who are less religiously involved.[39] Formally, doctrinal emphases on certain forms of social organization, such as on the institution of marriage, is important. Indeed, public religious involvement has been strongly linked to higher propensities of marriage and to lower likelihoods of divorce.[21] Further, congregations often formally sponsor social events and educational and health programs, as well as encourage social interaction and friendship. Informally, congregational members provide support for one another through assistance with household chores, transportation, basic health care, and even finances.[40] Ellison and George[41] reported that frequent religious participation was not only related to an increased number of social ties and interactions but also to more positive evaluations of these ties. Thus, public religious involvement may cultivate friendships and socially integrative networks that can develop further in secular settings.[37,42] Outside the family, few forms of social organization have such a potentially important impact on social life. In turn, social ties and support have been shown to be strongly associated with lower adult mortality risks.[43]

Social regulation is a second important concept. One of the key functions of religious communities is to shape the norms of individual members through behavioral regulations

Religious communities shape the norms of individual members through behavioral regulations that are:

- Specified in sacred teachings
- Reinforced through authoritative messages from congregational leaders
- Solidified through social interactions in the religious community

that are specified in sacred teachings, reinforced through authoritative messages from congregational leaders, and solidified through social interactions in the religious community. Individuals who attend religious services more often and/or who belong to specific denominations are less likely to initiate, or to continue, smoking or be heavy users of alcohol and drugs compared with people who attend less regularly or who belong to less conservative denominations or none at all.[44,45] Religious involvement also has been linked with distinctive views about the importance of physical activity for maintaining one's health,[46] and with preventive health care utilization.[47] Regulatory aspects of religious involvement may also influence a number of other lifestyle factors that are associated with mortality: A review of the religion-health literature suggests that religiously involved individuals are less likely to carry or use weapons, fight, exhibit violent behavior, and partake in risky sexual behavior compared with their less religious counterparts.[1] Furthermore, persons who are religiously involved may encounter fewer day-to-day stressors, such as marital and family problems, legal hassles, and on-the-job troubles, which may result in health benefits and lower mortality risks over the life course.[37]

Unique to the religion/mortality literature, religious involvement may be related to spiritual benefits that work to influence the risk of mortality.[38] Religious involvement may help individuals to generate an overall more coherent world view and may ease the impact of stressful life events such as unemployment, illness, and grief.[48,49] Older adults who derive a sense of meaning in life from religion also tend to have higher levels of life satisfaction, self-esteem, and optimism.[50] Coping resources acquired through religious involvement, particularly in times of stress, may also be important for mortality outcomes.[21,51] These resources may include increased satisfaction with social support, and the perceived availability and reliability of support from congregation members. Other literature notes the importance of religious rituals, such as the observance of religious holidays, as reminders of a shared past, a connection to preceding generations, and a hopeful future. Recent studies have shown that mortality dips occur both on particular religious holidays[52] as well as in the general time periods before important holidays of various religious traditions for individuals belonging to those traditions.[53]

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The Role of Selectivity (Confounding)

Clearly, the question of selectivity, or confounding, is also of critical importance in best assessing whether the overall association between religious involvement and mortality is actually working through the above mechanisms or is simply spurious. Although observational research may never fully address this question, careful data analyses and advanced regression methodology can go a long way. The basic idea is that people who are more religiously involved may differ in key ways from others who are less involved, and such differences may be the real reasons behind an observed relation between religious involvement and mortality risks.

At the most basic level, controlling for demographic and socioeconomic variables in models of religion and mortality is imperative, but recent studies have shown that such confounders account for no more than 15% to 20% of the overall association.[19] Physical health may influence an individual's ability to attend religious services and also affect her/his mortality risks, although one recent study found that the onset of disability is not followed by reductions in religious attendance.[54] However, physical health was found to be an important confounder in an early set of studies on religious involvement and mortality, with statistical controls for baseline health eliminating an apparent religion-mortality linkage.[55,56] Thus, the best recent studies of religious involvement and mortality have statistically accounted for physical health differences between individuals at the baseline point of observation. The weight of recent evidence suggests that health selectivity accounts for only a small (10–15%) portion of the overall religion-mortality association.[19–22,24,26]

Finally, and most elusive to this point, individuals who are risk averse may not only be more likely to attend religious services but also be less likely to die in mortality follow-up studies. That is, it may be primarily those individuals who are already inclined toward conformism and so-called clean living who engage in regular religious activities and join religious congregations, and who are also less likely to die during any given follow-up period.[57,58] Other persons involved with religious communities may be comfortable with social control or be immersed in nuclear families, which have been shown to promote positive health behaviors and outcomes.[37] Although some of these factors may be observable in typical data sets (eg, nonsmoking, refraining from alcohol and drug use, and being married can be used as crude indicators of risk aversion), others are clearly unobservable. In the latter case, econometric methods to deal with unobserved heterogeneity will be most useful in helping to understand the impact of these forms of selectivity.

Critiques and Challenges

Despite the growing empiric evidence for a religion/mortality association and the mechanisms by which the relation

may work, there are a number of limitations of the research that beget continued challenges.

First, this research has relied heavily on public attendance as a measure of religious involvement. Denominational variation may not be adequately measured by a single question on frequency of religious attendance, especially as the country diversifies by race/ethnicity and religion.[35,59] Although a reasonable criticism and an important critique on which to improve future research, the average effects yielded by studies of religious attendance and mortality, without taking denomination into account, is surely a solid initial step in this literature. This is particularly the case when the attendance findings are beginning to consistently mount from study to study and from data set to data set. Nevertheless, it will be very important to be more inclusive, and diverse, with measures of religious involvement in future data collection efforts; the inclusion of much more in-depth measurement of private religious activity, as well as information on the life history dimensions of religious involvement, is clearly warranted.[35]

Second, some have criticized the quality of empiric work in the religion-health and religion-mortality areas, focusing on (a) the lack of appropriate controls for confounders; (b) the lack of multiple comparisons across predictor and outcome variables; and (c) the perception of inconsistent findings.[59–61] At the same time, others have strongly defended the findings from this research area and provided substantial evidence supporting the religion-health and religion-mortality connections.[1,62,63] One of the key issues of criticism has been the inappropriate control of confounding variables, discussed in the section above. Recent studies in the religion-mortality area have been very careful to take demographic, socioeconomic, and health confounding into account in statistical models.[19,20,22,24] Future studies must also consider whether there are other, perhaps unmeasured, factors that possibly confound the religion-mortality relation. At the same time, "overcontrolling" for confounders is also an important issue to consider. Indeed, if religious factors influence health across the life course, as much evidence points to,[1] then controlling for baseline health indicators in studies of religion-mortality will yield conservative estimates of the religion variables included in the models.

A second issue of criticism is the failure of studies to make multiple comparisons across both predictor and outcome variables. This is less of an issue in studies of mortality than of health because, most often, the outcome is simply death or survival. Studies of cause-specific mortality and age-specific, sex-specific, and race-specific mortality are exceptions, and authors should be very careful to fully and accurately report results from such multiple comparisons when they are made. At the same time, critics and authors alike must realize that making multiple comparisons, such as by cause of death, can sometimes result in quite small cell sizes for analysis (eg, an underlying cause of death such as diabetes), even when using very large data sets. Thus, statistical nonsignificance must also be evaluated in light of the number of cases available for analysis.

Third, the issue of inconsistent findings, at least to a degree, must be expected, especially as this literature develops, and data sets are simply not as rich as they need to be. As the religion-health and religion-mortality literature continue to develop and data sets begin to include more sophisticated measures of religious involvement,[35] nuances and contingencies will be fleshed out, weak and inconsistent results will be discarded, and strong results will be uncovered and upheld. This is the role of empiric research. However, given the multidimensional nature of religion, the large number of outcomes to be assessed, the multiple mechanisms to be tested, and the methodologic challenges that abound, it should come as no surprise that the findings are not crystal clear to this point. Perhaps the bigger surprise is that the results to date are as lucid as they are.

A final challenge refers to the implications of the findings in this area for the provision of health care. Sloan et al[59] argue that the current empiric findings are not strong or consistent enough to warrant implications for care. Sloan et al draw a parallel to the marriage-mortality literature, arguing that even though there are very strong studies linking marriage and mortality, health care providers should not in any way influence the marital decisions of their patients. We absolutely agree. At the same time, the literature that we have reviewed demonstrates that at least some aspects of religious involvement are clearly associated with adult mortality risks, a relation that health professionals should not overlook. Although there is still much to be learned, the findings thus far indicate that religious involvement—which has social, psychologic, and community dimensions—seems to work through aspects of social regulation, social integration, and spirituality mechanisms to contribute to a lower mortality risk for US adults. Thus, there may be important religious-based resources that individuals rely on for health and health care that providers might benefit from knowing about—in a parallel manner that spouses, other family members, and neighbors are often counted on to assist with specific dimensions of health and health care if providers know about such individuals. Thus, taking stock of any religious resources, without judgment, would seem to be a fruitful avenue by which health providers could both respect the beliefs of, and potentially tap into the resources of, individuals under their care.

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When ideas fail, words come in very handy.

—Goethe