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RESEARCH ARTICLE

Health Disparities in Nonreligious and Religious Older Adults in the United States: A Descriptive Epidemiology of 16 Common Chronic Conditions

Alexandra C. H. Nowakowski* and J. E. Sumerau†

In this paper, we compute prevalence estimates for nonreligious and religious people in relation to 16 common chronic conditions in contemporary American society. Using survey data from the National Social Life, Health, and Aging Project, we speak to current debates concerning potential relationships between religion, nonreligion and health in older adult populations with two key findings. First, we show no consistent relationships between religion or nonreligion and chronic condition prevalence. Second, we demonstrate race, sex, and class variations within nonreligious people's health outcomes consistent with patterns noted in previous analyses of religious populations. In conclusion, we draw out implications for future research concerning the importance of (1) using caution when interpreting correlations between religion (i.e., a privileged social location) and health; (2) developing intersectional approaches to religion, nonreligion, and health; and (3) building a diverse base of scholarship concerning nonreligion and health.

As studies of nonreligious populations and experiences have expanded in recent years, an intriguing debate has emerged concerning health. Many studies published in the last few decades found negative correlations between lower levels of religiosity and specific health-related outcomes, and used these correlations to argue that religion had positive benefits for overall health and well-being (see, e.g., Brennan 2004; Koenig et al. 2001; Vance et al. 2008). At the same time, other scholars have pointed out that these studies often have significant methodological flaws (i.e., asserting causal possibilities from correlations that could be explained in many ways), sampling limitations (i.e., many of these studies rely on entirely religious-identified samples of people and thus cannot compare to nonreligion or establish any concrete benefit from religion itself), and pro-religious bias (i.e., definitions of health that assume religion as a positive force from the outset) embedded within them (see, e.g., Hwang et al. 2009; Levin 1994; Sloan & Bagiella 2002). These review articles suggest any relationship between religion and health is likely tenuous at most, and that identification of consistent positive relationships between the two may stem partly from confirmation bias related to attitudes about religion itself.

In fact, recent studies beginning to actually compare religious and nonreligious respondents support these articles (see, e.g., Cragun et al. 2015; Cragun et al. 2016). Reviewing existing literature claiming associations between religion and health, for example, Cragun and associates (2015) note that most studies only compare respondents who are more or less religious, and generally ascribe religious explanatory power to outcomes that could be accomplished via secular organizations, relationships, and resources just as easily (see also Hwang et al. 2009). Further, comparing religious and nonreligious respondents on multiple mental, social, and physical health measures in two samples, Cragun and associates (2016) found that religion had little to no effect on health. Rather than demonstrating relationships between religion and health, such studies suggest that existing studies are granting religion explanatory power it does not empirically deserve by conflating it with social activities and resources – like social support – that may be gained from secular and religious experiences, organizations, and networks (see also Galen & Kloet 2011).

As Hwang and associates (2009) suggest, one reason previous researchers have granted religion false explanatory powers may result from the use of correlations to assert broader and causal relationships (see also Cragun et al. 2016). While this issue is generally only mentioned in passing or left unsaid in studies claiming relationships between religion and health (likely due to the amount of faith placed in correlation-based research in the social sciences at present), a casual glance at established epidemiological practice reveals the importance of first establishing the prevalence of a given health issue before turning to correlational methods to tease out nuances within such phenomena (Gordis 2004). The prevalence of a health condition is the proportion of a population currently living with that condition (Gordis 2004). Without knowing

*Florida State University, US
†The University of Tampa, US
Corresponding author: Alexandra C. H. Nowakowski (xnowakowski@fsu.edu)

the prevalence of a given health outcome within and between specific populations, researchers sometimes extrapolate the meaning of a given correlation based on their own assumptions and experiences (Link & Phelan 2010). Because literature on religion and health does not yet offer prevalence estimates for diverse conditions among religious and nonreligious populations simultaneously, asserting that religion does or does not influence health may be premature.

For readers less familiar with epidemiological methods and standards, an example of the pitfalls of correlational interpretation devoid of prevalence estimates may be useful. A classic example concerns correlations between lower educational attainment and poorer health outcomes (Link & Phelan 2010). For years, scholars relied on this correlation to promote health education programs for populations with less education, but these efforts rarely resulted in any concrete benefits. In fact, practitioners learned that many people with lower education already knew how to live healthy lifestyles. When researchers and practitioners turned to prevalence estimates of varied health conditions among those with less education, however, they realized quickly that such groups typically had less access to social resources (i.e., stoves, parks, transportation, grocery stores, disposable income, and health care access to name a few) that rendered their knowledge or ignorance about how to sustain good health irrelevant. In fact, prevalence estimates revealed that even those with more education who lacked such social resources had poorer health outcomes. Taken out of context, the correlation between education and health lost meaning, instead masking the more likely mechanisms producing lower health status among less educated people.

Findings from recent studies comparing religious and nonreligious respondents suggest a similar misunderstanding of correlational relationships may have been at work in past years (Cragun et al. 2016). When studies demonstrated correlations between religious service attendance (the most common measure used in such studies, see Musick et al. 2004 for review) and health outcomes, they missed the context that would suggest what these relationships actually meant (i.e., prevalence estimates) and without comparisons to nonreligious people that could have shown whether or not religion itself actually mattered (Cragun et al. 2015). At the same time, religious service attendance could – as many studies have argued (Koenig 2012) and more recent studies contradict (Cragun et al. 2016) – facilitate better health outcomes. However, it is equally likely – given the structure of healthcare in the United States (Sloan 2006) – that religious attendance might simply be one of the scant few health-promoting social resources in a given community. In that case, a secular community center could provide the exact same results (Cragun et al. 2016). Similarly, it could be that since people with more social resources – who are also already more likely to be healthier (Link & Phelan 2010) – are more able to attend services (religious and/or secular) as a result of these resources. Put simply, the correlations between attendance and health do not suggest religion itself is either beneficial or harmful to health overall, but rather that there may be *some* relationship between attending community events (religious or secular) and health outcomes. The potential benefits may or may not stem from actually being religious or from anything related explicitly to religion (Cragun et al. 2016).

Considering debates within the field about whether or not religion matters to health, simultaneously generating prevalence estimates for a wide variety of health outcomes among religious and nonreligious people represents a key step forwards (see also Cragun et al. 2016). For example, if such estimates reveal that the prevalence of negative health outcomes are higher or lower for religious or nonreligious people, we can describe a relationship in detail using raw data. We can then use inferential mathematical models with multiple covariates accounting for a variety of social and contextual factors to refine and elaborate our understanding of identified relationships. By the same token, if prevalence estimates from raw data reveal no apparent relationships between religion and health, we should instead investigate the possible influence of other social factors on health outcomes of interest in religious and nonreligious populations. For example, well-documented social determinants of health (see Phelan, Link & Tehranifar 2010) such as race, sex, class, marginalization, resources, and healthcare access may be creating the correlations we find when we examine religious and nonreligious variables.

In short, descriptive epidemiological analysis can help to mitigate potential pitfalls in secondary data and correlational research on religion and health by exploring nuances of identity and well-being in depth. Two specific advantages emerge: (1) a means of meaningfully using what may be very small group-specific samples for populations that are glossed over or explicitly marginalized in research, and (2) comparing and contrasting results with findings from pooled inferential analysis. A direct corollary to both of these benefits is that detailed descriptive epidemiological investigation can indicate specific gaps in data collection and management that can subsequently be addressed through more sophisticated and thorough primary data gathering and coding in the future.

By establishing initial prevalence estimates and using them to contextualize complementary inferential analyses given mathematically adequate sample sizes, we can thus begin to, as suggested by recent studies (Cragun et al. 2015; Cragun et al. 2016; Hwang et al. 2009), illuminate unique contributions to health status from religion and nonreligion versus other social factors with demonstrated influences on health. Such efforts follow the insights of intersectional scholars by critically examining the concrete experiences of people in varied social locations instead of expecting specific relationships a priori or simply repeating dominant cultural discourses (i.e., religion is good, see Barton 2012) that say more about societal power relations than actual health experience (see Grollman 2012; Schultz & Mullins 2006 for examples). This process should begin with assessment of baseline variation in health status between and within populations, and proceed to exploration of the ways in which health may be influenced by intersecting social locations.

In this research report, we begin this process of exploring and mapping the prevalence of common health outcomes among religious and nonreligious populations. Rather than assuming a relationship a priori, we examine a series of chronic health conditions among both religious and nonreligious respondents from a large survey dataset to gain a picture of variation (or lack there of) in such conditions between these populations. Following intersectional recognitions that health outcomes often vary along lines of social privilege and oppression (see Nowakowski & Sumerau 2015; Grollman 2012), we then compute the prevalence of such conditions among nonreligious respondents occupying different race, class, and sex locations in contemporary American society. In so doing, we seek to (1) provide health outcome prevalence estimates for religious and nonreligious people to aid in evaluating and contextualizing prior research and (2) offer a framework for comparative analyses and further exploration using a wide variety of data sources.

Data and methods

Research Questions

Rather than assuming any relationship between religion, nonreligion, and health outcomes, we began our study with a foundational epidemiological question (Gordis 2004): how are common chronic conditions distributed among nonreligious people and religious people? To further map the prevalence of chronic conditions within and between such populations, we then asked a core question in intersectional studies of health (Grollman 2012): how do chronic physical condition frequencies vary in relation to intersecting social locations among nonreligious people? We defined "chronic conditions" as any diagnosed health condition capable of producing consistent and recurrent symptoms. We focus on these conditions because they generally influence large portions of the life course, and thus allow health researchers and practitioners to gauge potential influences that go beyond specific or discrete events or outcomes (see Elder & Giele 2009). We defined "nonreligious people" as individuals expressing no religious identity or behavior, and "religious people" as those who did express religious identity or behavior. Although this is a simplistic way of separating these populations for analysis, data limitations do not allow us to further disaggregate these groups. Further, following Cragun & associates (2015), we utilize this limited measurement option to effectively compare respondents who identify as religious to those who do not in order to avoid patterns in existing literature wherein studies often only compare more religious respondents to less religious respondents (see also Hwang et al. 2009). As such, studies that build on our endeavors here should seek ways to unpack the nuances of nonreligious and religious distinction over the course of people's lives.

Data and Subject Selection

We explored these questions using data from Wave I of the National Social Life, Health, and Aging Project (NSHAP). Developed between 2005 and 2006, this biosocial dataset provides information on physical, mental, and social health among cisgender United States residents aged 57 to 85. Data for the NSHAP are collected via a combination of questionnaires (administered during home visits), in-home interviews, and basic clinical techniques such as using cotton swabs to collect small amounts of saliva (performed during home visits).

NSHAP data documentation describes the study sample as "a nationally representative probability sample of community-dwelling individuals" (Waite et al. 2007). Certain groups within the study population (African Americans, Latinos, men, and persons 75 to 85 years of age) are oversampled to boost statistical power (Waite et al. 2007). Several key demographic groups are also not captured explicitly; we comment on this in our discussion of study limitations (for limitations of cisgender samples also see Westbrook & Saperstein 2015).

We used NSHAP data capturing religious preference and attendance; diagnosed chronic conditions; and sex identity, ethnoracial background, and educational attainment. While gender is often significantly related to chronic and other health experience (see Nowakowski & Sumerau 2015), the NSHAP – like most other "representative" surveys – currently has no measure of gender, but rather only collects cissex (i.e., female/male) responses from subjects (see also Nowakowski et al. 2016; Westbrook & Saperstein 2015). The NSHAP dataset includes 3,005 individual cases in total. After dropping any cases with missing values on our variables of interest, we retained an analytic sample of 2,966 people, accounting for 98.7% of the total NSHAP population at Wave I. Of these individuals, 189 reported no religious preference and 573 reported no religious attendance. Our study sample is described fully in **Table 1**. Among these individuals, we were able to assess the distribution of 16 different chronic conditions, as well as the frequency of not having any of those conditions. We were also able to assess the overall relationship between burden of chronic disease and each of our predictor constructs by computing basic count regression models for inferential analysis.

We sought to achieve a high level of detail in our description of chronic condition prevalence estimates across religious and demographic groupings of older adults. We did this both because such estimates appear absent from current religious and nonreligious studies, and because very few explicitly health science surveys contain measures on religiosity at present. Seeking to capture an epidemiological map of (non)religion *and* health as these aspects intersect with other social locations, we thus chose to represent the full range of characteristics assessed by the NSHAP on our measures of interest, instead of collapsing any of the categories for variables with wide ranges of response options. In the case of ethnoracial background, we actually used data from two different NSHAP variables to create our own diversified measure of heritage including information about Hispanic ethnicity in the dataset's large White population. In all other cases, we simply recoded real and missing values of single NSHAP variables to facilitate analysis.

Strategies for Analysis

We used descriptive epidemiology techniques to analyze our data (see Hajat 2011 for epidemiological methodological instructions and techniques). To create our "prevalence"

Attribute	Response	Number Reporting	Proportion Reporting
Religious preference	None	189	6.3%
	Protestant	1,359	45.8%
	Catholic	849	28.6%
	Jewish	50	1.69%
	Other	519	17.5%
Religious attendance	Never	573	19.3%
	Less than once a year	146	4.9%
	About once or twice a year	276	9.3%
	Several times a year	320	10.8%
	About once a month	285	9.6%
	Every week	1,007	34.0%
	Several times a week	359	12.1%
Chronic conditions	Arthritis	1,566	52.8%
	Ulcers	400	13.5%
	Emphysema or COPD	318	10.7%
	Asthma	304	10.2%
	Stroke	265	8.9%
	Hypertension	1,699	57.3%
	Diabetes	636	21.4%
	Alzheimer's or dementia	25	0.8%
	Cirrhosis	33	1.1%
	Leukemia	12	0.4%
	Lymphoma	24	0.8%
	Skin cancer	428	14.4%
	Any other cancer	340	11.5%
	Poor kidney function	124	4.2%
	Thyroid problems	433	14.6%
	Enlarged prostate	381	12.8%
	None of the above	321	10.8%
Sex identity	Male	1,440	48.6%
	Female	1,526	51.4%
Racial background	Non-Hispanic White	2,091	70.5%
	Hispanic White	178	6.0%
	Black	505	17.0%
	Native American or Alaskan	22	0.7%
	Asian or Pacific Islander	36	1.2%
	Other	134	4.5%
Education level	No degree	764	25.8%
	High school diploma or GED	1,090	36.7%
	Associate's degree	463	15.6%
	Bachelor's degree	368	12.4%
	Master's degree	206	6.9%
	Doctoral degree	75	2.5%

Table 1: Characteristics of Study Population at NSHAP Wave I (n = 2,966).

tables, we computed frequencies of each chronic condition in each religious category and sociodemographic group of interest. We used Stata 12 Special Edition to create and describe our analytic variables as outlined above, and to drop any cases from the full NSHAP sample that lacked real data on one or more measures of interest. These cases were dropped after recoding all included variables using a unified operator for missing values to ensure that no cases with missing data were erroneously included in the study sample.

We then continued working in Stata to compute counts of people with each included chronic condition across any categories we were interested in for each of our two research questions. Using Stata's "summarize" and "bysort" commands with "if" statements, we obtained counts of prevalent cases of each chronic condition within each religious category and sociodemographic group. We also used "summarize" and "bysort" commands to compute the group-specific sample sizes (e.g., number of people with no religious preference identifying as Black) that we would need for the next phase of analysis.

To compute chronic condition frequencies in each group of interest, we next transferred our counts of prevalent cases to Microsoft Excel, along with our overall counts of people with specific (non)religious and

sociodemographic characteristics from the full analytic sample. Using "product" functions in Excel, we proceeded to compute the percentage of people in each social location of interest diagnosed with a given chronic condition. These functions multiplied number of prevalent cases by one over the number of people in the relevant risk pool (e.g., people with Bachelor's degrees who never attend religious services).

These computations in Excel yielded contingency values for **Tables 2, 3, 4a–c,** and **5a–c**. Overall sample sizes for these tables were total numbers of people with no religious preference (**Tables 2** and **4a–c**, n = 189) or no service attendance (**Tables 3** and **5a–c**, n = 573). We used a similar process to describe our overall study population, using the full sample size (**Table 1**, n = 2,966) as the denominator for product functions. Outputs from each product function were expressed as percentages for ease of interpretation across disciplines. We thus refer to these values as "frequency" rather than "prevalence" estimates, as the latter are usually expressed in cases per 100,000 population (Gordis 2004).

After conducting our descriptive analyses and submitting our manuscript for review, we received feedback from reviewers affirming our concerns about doing inferential analysis with relatively small samples for some of our predictor categories, but also encouraging us to provide a couple of basic count regression models for purposes of comparison. We thus went back and computed negative binomial regression models for relationships between chronicity and religiosity.

For our outcome variable in these models, we generated a measure of total chronic disease burden by adding together indicator variable values for each of the 16 conditions we assessed independently. We also created a binary variable for religious preference to use as a predictor in the first set of inferential models, given that our original preference variable was nominal rather than ordinal. The religious attendance variable remained unaltered for inferential analysis. Finally, we recoded the nominal variable for race into a binary indicator of whether or not a person identified as a racial minority. Variables for sex (already binary due to lack of attention to intersex physiology in the NSHAP) and education (ordinal) were left unaltered for inferential analyses.

In constructing our regression models for each predictor construct, we first computed raw models using a negative binomial framework to assess apparent net effects from religiosity on chronic disease burden. After computing these models we checked significance test results to see if negative binomial regression was required for these data due to violation of data dispersion assumptions for standard Poisson models. Having verified that negative binomial regression was indeed the appropriate modeling framework, we proceeded to compute two models per predictor construct: one illustrating apparent net effects from religiosity; and one expanded to include covariates for sex, race, and education.

Results

We first examined the prevalence of the 16 common chronic conditions captured in the NSHAP in relation to religious identification. Results from these descriptive analyses are shown in **Table 2**. Prevalence estimates presented in **Table 2** suggest at most a minor (or tenuous, see Hwang et al. 2009) relationship between (non)religious identification and health. Specifically, these frequency statistics indicate that nonreligious and religious NSHAP participants typically have roughly the same prevalence of chronic conditions overall. In some cases (arthritis and emphysema), nonreligious older adults have lower frequencies; in others, (enlarged prostate, asthma, and forms of cancer not noted explicitly), religious older adults have lower frequencies. These relationships also have complex nuances in some instances. For example, in some cases nonreligious and Jewish respondents show lower chronic condition frequencies (ulcers, stroke, hypertension,

Condition	None		Protestant		Catholic		Jewish		Other	
Arthritis	81	42.9%	731	53.8%	427	50.3%	25	50.0%	302	58.2%
Ulcers	23	12.2%	179	13.2%	108	12.7%	3	6.0%	87	16.8%
Emphysema or COPD	15	7.9%	147	10.8%	85	10.0%	7	14.0%	64	12.3%
Asthma	25	13.2%	141	10.4%	88	10.4%	5	10.0%	45	8.7%
Stroke	11	5.8%	137	10.1%	60	7.1%	1	2.0%	56	10.8%
Hypertension	98	51.9%	796	58.6%	456	53.7%	25	50.0%	324	62.4%
Diabetes	30	15.9%	280	20.6%	181	21.3%	6	12.0%	139	26.8%
Alzheimer's or dementia	1	0.5%	10	0.7%	7	0.8%	0	0.0%	7	1.3%
Cirrhosis	2	1.1%	13	1.0%	7	0.8%	1	2.0%	10	1.9%
Leukemia	1	0.5%	5	0.4%	4	0.5%	1	2.0%	1	0.2%
Lymphoma	3	1.6%	10	0.7%	8	0.9%	2	4.0%	1	0.2%
Skin cancer	27	14.3%	220	16.2%	108	12.7%	11	22.0%	62	11.9%
Any other cancer	27	14.3%	165	12.1%	98	11.5%	4	8.0%	46	8.9%
Poor kidney function	6	3.2%	66	4.9%	29	3.4%	1	2.0%	22	4.2%
Thyroid problems	25	13.2%	206	15.2%	112	13.2%	5	10.0%	85	16.4%
Enlarged prostate	31	16.4%	171	12.6%	116	13.7%	8	16.0%	55	10.6%
None of the above	25	13.2%	133	9.8%	104	12.2%	4	8.0%	54	10.4%

Table 2: Chronic Condition Frequency by Religious Preference (n = 2,966).

Condition	Never		Less than Once a Year		About Once or Twice a Year		Several Times a Year		About Once a Month		Every Week		Several Times a Week	
Arthritis	276	48.2%	75	51.4%	131	47.5%	174	54.4%	141	49.5%	554	55.0%	215	59.9%
Ulcers	83	14.5%	20	13.7%	38	13.8%	39	12.2%	36	12.6%	127	12.6%	57	15.9%
Emphysema or COPD	75	13.1%	19	13.0%	31	11.2%	43	13.4%	16	5.6%	98	9.7%	36	10.0%
Asthma	74	12.9%	18	12.3%	28	10.1%	34	10.6%	25	8.8%	89	8.8%	36	10.0%
Stroke	60	10.5%	15	10.3%	28	10.1%	38	11.9%	22	7.7%	72	7.1%	30	8.4%
Hypertension	323	56.4%	84	57.5%	144	52.2%	193	60.3%	148	51.9%	593	58.9%	214	59.6%
Diabetes	111	19.4%	42	28.8%	49	17.8%	68	21.3%	54	18.9%	220	21.8%	92	25.6%
Alzheimer's or dementia	3	0.5%	3	2.1%	3	1.1%	2	0.6%	2	0.7%	9	0.9%	3	0.8%
Cirrhosis	10	1.7%	2	1.4%	5	1.8%	2	0.6%	2	0.7%	8	0.8%	4	1.1%
Leukemia	2	0.3%	0	0.0%	0	0.0%	1	0.3%	1	0.4%	5	0.5%	3	0.8%
Lymphoma	7	1.2%	0	0.0%	1	0.4%	4	1.3%	2	0.7%	10	1.0%	0	0.0%
Skin cancer	89	15.5%	16	11.0%	41	14.9%	43	13.4%	29	10.2%	170	16.9%	40	11.1%
Any other cancer	80	14.0%	10	6.8%	32	11.6%	29	9.1%	24	8.4%	123	12.2%	42	11.7%
Poor kidney function	26	4.54%	11	7.5%	10	3.6%	15	4.7%	9	3.2%	38	3.8%	15	4.2%
Thyroid problems	77	13.4%	14	9.6%	43	15.6%	40	12.5%	42	14.7%	167	16.6%	50	13.9%
Enlarged prostate	93	16.2%	14	9.6%	31	11.2%	45	14.1%	38	13.3%	115	11.4%	45	12.5%
None of the above	65	11.3%	14	9.6%	36	13.0%	40	12.5%	39	13.7%	94	9.3%	33	9.2%

Table 3: Chronic Condition Frequency by Religious Attendance (n = 2,966).

diabetes, Alzheimer's or dementia, and poor kidney function) than Christian people; in others, (cirrhosis, leukemia, skin cancer) there is no clear relationship. Finally, participants identifying as nonreligious appear most likely to have none of the 16 common chronic conditions assessed by the NSHAP (i.e., "none of the above").

These findings suggest that whatever relationships exist between (non)religion and health among older adults are likely nuanced and intersectional in nature rather than direct, concrete, or significant. Using religious service attendance as our measure of religiosity helps to elucidate these nuances. Results from these analyses are shown in **Table 3**. Chronic condition frequency estimates in **Table 3** suggest that no uniformly positive relationships exist between religious attendance and health. Rather, it appears that the NSHAP participants who are least likely to have chronic conditions by the time they reach later life are those who attend religious services no more than once a month. In fact, the only column where the highest religious attendance matches the lowest condition frequency (i.e., lymphoma) suggests people may achieve the exact same frequency if they attend services

Condition	Male		Female	
Arthritis	53	43.4%	28	41.8%
Ulcers	18	14.8%	5	7.5%
Emphysema or COPD	8	6.6%	7	10.4%
Asthma	9	7.4%	16	23.9%
Stroke	8	6.6%	3	4.5%
Hypertension	60	49.2%	38	56.7%
Diabetes	21	17.2%	9	13.4%
Alzheimer's or dementia	0	0.0%	1	1.5%
Cirrhosis	2	1.6%	0	0.0%
Leukemia	1	0.8%	1	1.5%
Lymphoma	2	1.6%	1	1.5%
Skin cancer	16	13.1%	11	16.4%
Any other cancer	16	13.1%	11	16.4%
Poor kidney function	5	4.1%	1	1.5%
Thyroid problems	6	4.9%	19	28.4%
Enlarged prostate	31	25.4%	0	0.0%
None of the above	20	16.4%	5	7.5%

Table 4a: Chronic Condition Frequency by Sex Among People with No Religious Preference (n = 189).

Condition	Non-Hispanic White		Hispanic White		Black		Native American or Alaskan		Asian or Pacific Islander		Other	
Arthritis	72	44.4%	1	11.1%	8	61.5%	0	0.0%	0	0.0%	0	0.0%
Ulcers	19	11.7%	1	11.1%	3	23.1%	0	0.0%	0	0.0%	0	0.0%
Emphysema or COPD	13	8.0%	0	0.0%	2	15.4%	0	0.0%	0	0.0%	0	0.0%
Asthma	21	13.0%	1	11.1%	2	15.4%	0	0.0%	0	0.0%	1	75.0%
Stroke	10	6.2%	0	0.0%	1	7.7%	0	0.0%	0	0.0%	0	0.0%
Hypertension	81	50.0%	5	55.6%	10	76.9%	1	100.0%	0	0.0%	1	25.0%
Diabetes	19	11.7%	0	0.0%	8	61.5%	0	0.0%	0	0.0%	3	75.0%
Alzheimer's or dementia	1	0.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cirrhosis	2	1.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Leukemia	1	0.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Lymphoma	3	1.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Skin cancer	26	16.0%	1	11.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Any other cancer	25	15.4%	0	0.0%	2	15.4%	0	0.0%	0	0.0%	0	0.0%
Poor kidney function	5	3.1%	0	0.0%	1	7.7%	0	0.0%	0	0.0%	0	0.0%
Thyroid problems	24	14.8%	1	11.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Enlarged prostate	29	17.9%	1	11.1%	1	7.7%	0	0.0%	0	0.0%	0	0.0%
None of the above	23	14.2%	2	22.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

Table 4b: Chronic Condition Frequency by Race Among People with No Religious Preference (n = 189).

Condition	No Degree		HS Diploma or GED		Associate's Degree		Bachelor's Degree		Master's Degree		Doctoral Degree	
Arthritis	17	41.5%	28	48.3%	13	39.4%	13	39.4%	7	46.7%	3	33.3%
Ulcers	10	24.4%	7	12.1%	3	9.1%	1	3.0%	1	6.7%	1	11.1%
Emphysema or COPD	3	7.3%	4	6.9%	3	9.1%	2	6.1%	2	13.3%	1	11.1%
Asthma	6	14.6%	6	10.3%	4	12.1%	8	24.2%	1	6.7%	0	0.0%
Stroke	3	7.3%	2	3.4%	3	9.1%	3	9.1%	0	0.0%	0	0.0%
Hypertension	22	53.7%	31	53.4%	21	63.6%	16	48.5%	7	46.7%	1	11.1%
Diabetes	11	26.8%	10	17.2%	6	18.2%	3	9.1%	0	0.0%	0	0.0%
Alzheimer's or dementia	0	0.0%	1	1.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Cirrhosis	2	4.9%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Leukemia	0	0.0%	0	0.0%	1	3.0%	0	0.0%	0	0.0%	0	0.0%
Lymphoma	1	2.4%	0	0.0%	0	0.0%	2	6.1%	0	0.0%	0	0.0%
Skin cancer	6	14.6%	7	12.1%	3	9.1%	5	15.2%	5	33.3%	1	11.1%
Any other cancer	6	14.6%	7	12.1%	7	21.2%	4	12.1%	2	13.3%	1	11.1%
Poor kidney function	1	2.4%	2	3.4%	2	6.1%	0	0.0%	1	6.7%	0	0.0%
Thyroid problems	3	7.3%	9	15.5%	7	21.2%	3	9.1%	1	6.7%	2	22.2%
Enlarged prostate	3	7.3%	10	17.2%	5	15.2%	9	27.3%	1	6.7%	3	33.3%
None of the above	4	9.8%	10	17.2%	4	12.1%	3	9.1%	2	13.3%	2	22.2%

Table 4c: Chronic Condition Frequency by Education Among People with No Religious Preference (n = 189).

less than once a year. Further, the most common chronic health condition in America at present (i.e., arthritis) appears least frequently among those older adults who never attend religious services or only attend about once or twice a year. Echoing reviews of religious studies of health (Hwang et al. 2009), our findings in **Table 3** suggest that asserting a clear, uniform relationship between service attendance and health outcomes oversimplifies what is actually an inconsistent and nuanced association. As intersectional scholars of health have noted (Grollman 2012), such oversimplifications potentially mask important social resources and processes that directly influence health.

Because comparisons between religious and nonreligious respondents do not reveal clear relationships in terms of health outcomes, we next sought to ascertain whether examining health outcomes among nonreligious older adults – as noted among religious people in other health research capturing such populations (see Koenig et al. 2001 or studies reviewed in Sloan & Bagiella 2002) – would reveal nuanced variations or uniform trends in chronic condition prevalence. Results from these analyses are shown in **Tables 4a** through **c**. Following intersectional scholarship on health to date (Schultz & Mullins 2006), we expected that if religious and nonreligious NSHAP respondents accomplished similar outcomes (i.e., religion is not driving health disparities), then nonreligious people would echo their religious counterparts by experiencing varied health outcomes in relation to sex, race, and educational status in society.

Table 4a presents chronic condition frequency estimates among nonreligious identified older adults of different binary sex categories (i.e., female and male). Since many studies have noted sex differences – in cissex (see Nowakowski et al. 2015 for reviews of this literature), intersex (see Davis 2015 for review) and transitioning between sexes (see Miller & Grollman 2015 for reviews of this literature) populations – we sought to see how nonreligion intersects with sex to gauge whether or not nonreligious females and males would show similar variation. As demonstrated in **Table 4a**, nonreligious NSHAP respondents appear to experience variations in health related outcomes by sex that are very similar to those observed in their religious counterparts (see, e.g., Calasanti & Slevin 2001 for reference). Specifically, nonreligious male identified people exhibit lower prevalence estimates for most chronic conditions than their female peers do as their cohorts age.

Similar patterns appear for race in **Table 4b**, and for education in **Table 4c**. Consistent with health research focused on mixed (see Link & Phelan 2010 for reviews) and religious (see Sloan & Bagiella 2002 for reviews) populations, nonreligious respondents vary in their frequency of chronic conditions based on race and educational factors. In fact, nonreligious NSHAP participants once again look much more like the broader population (see, e.g., Burgard * Kalousova 2015; Phelan & Link 2015; Williams & Collins 1995) than prior correlational studies suggesting uniform positive associations between religion and health would suggest. Our own chronic condition frequency estimates suggest that a diverse array of other social factors, rather than religion and nonreligion in and of themselves, may play stronger roles in producing and sustaining health disparities among older adult populations.

Condition	Male		Female	
Arthritis	138	42.2%	138	56.1%
Ulcers	41	12.5%	42	17.1%
Emphysema or COPD	39	11.9%	36	14.6%
Asthma	34	10.4%	40	16.3%
Stroke	35	10.7%	25	10.2%
Hypertension	184	56.3%	139	56.5%
Diabetes	70	21.4%	41	16.7%
Alzheimer's or dementia	1	0.3%	2	0.8%
Cirrhosis	7	2.1%	3	1.2%
Leukemia	1	0.3%	1	0.4%
Lymphoma	5	1.5%	2	0.8%
Skin cancer	56	17.1%	33	13.4%
Any other cancer	45	13.8%	35	14.2%
Poor kidney function	15	4.6%	11	4.5%
Thyroid problems	20	6.1%	57	23.2%
Enlarged prostate	93	28.4%	0	0.0%
None of the above	40	12.2%	25	10.2%

Table 5a: Chronic Condition Frequency by Sex Among People with No Religious Attendance (n = 573).

Condition	Non-Hispanic White		Hispanic White		Black		Native American or Alaskan		Asian or Pacific Islander		Other	
Arthritis	237	49.2%	4	21.1%	24	53.3%	4	57.1%	1	33.3%	6	35.3%
Ulcers	73	15.1%	1	5.3%	6	13.3%	1	14.3%	0	0.0%	2	11.8%
Emphysema or COPD	68	14.1%	2	10.5%	4	8.9%	0	0.0%	0	0.0%	1	5.9%
Asthma	62	12.9%	4	21.1%	6	13.3%	0	0.0%	0	0.0%	2	11.8%
Stroke	46	9.5%	0	0.0%	10	22.2%	1	14.3%	0	0.0%	3	17.6%
Hypertension	266	55.2%	9	47.4%	34	75.6%	5	71.4%	1	33.3%	8	47.1%
Diabetes	81	16.8%	1	5.3%	19	42.2%	3	42.9%	1	33.3%	6	35.3%
Alzheimer's or dementia	2	0.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	5.9%
Cirrhosis	8	1.7%	0	0.0%	2	4.4%	0	0.0%	0	0.0%	0	0.0%
Leukemia	2	0.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Lymphoma	7	1.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Skin cancer	85	17.6%	2	10.5%	0	0.0%	1	14.3%	0	0.0%	1	5.9%
Any other cancer	76	15.8%	1	5.3%	3	6.7%	0	0.0%	0	0.0%	0	0.0%
Poor kidney function	22	4.6%	0	0.0%	4	8.9%	0	0.0%	0	0.0%	0	0.0%
Thyroid problems	72	14.9%	2	10.5%	2	4.4%	0	0.0%	0	0.0%	1	5.9%
Enlarged prostate	88	18.3%	2	10.5%	2	4.4%	0	0.0%	0	0.0%	1	5.9%
None of the above	51	10.6%	5	26.3%	4	8.9%	1	14.3%	1	33.3%	3	17.6%

Table 5b: Chronic Condition Frequency by Race Among People with No Religious Attendance (n = 573).

The lack of a uniform positive association between religion and health becomes even clearer when examining relationships between service attendance and chronic condition frequency among varied sex, race, and education related social locations in our older adult study population. Results from these analyses are shown in **Tables 5a** through **c**. All three tables once again demonstrate substantial variation in the frequency of specific chronic conditions across diverse social locations adults may occupy in late life. These findings mirror our results from **Tables 4a** through **c**, which used religious preference rather than attendance as a marker of religiosity. Rather than any consistent overall relationship between religion and health, we again wind up with a nonreligious population that appears similar to both religious populations and US society as a whole. While prior correlational studies suggest consistently higher negative health outcomes among those who never attend religious services, our analyses of such respondents in the NSHAP instead reveal tremendous variation by sex, education, and race.

The inferential models we computed are shown in **Tables 6a** and **6b**. These are negative binomial regression

Condition	No Degree		HS Diploma or GED		Associate's Degree		Bachelor's Degree		Master's Degree		Doctoral Degree	
Arthritis	83	55.3%	102	49.3%	43	48.3%	26	36.1%	16	45.7%	6	30.0%
Ulcers	31	20.7%	25	12.1%	13	14.6%	10	13.9%	2	5.7%	2	10.0%
Emphysema or COPD	21	14.0%	23	11.1%	17	19.1%	11	15.3%	2	5.7%	1	5.0%
Asthma	26	17.3%	20	9.7%	12	13.5%	11	15.3%	3	8.6%	2	10.0%
Stroke	25	16.7%	21	10.1%	5	5.6%	8	11.1%	1	2.9%	0	0.0%
Hypertension	94	62.7%	112	54.1%	54	60.7%	35	48.6%	22	62.9%	6	30.0%
Diabetes	43	28.7%	43	20.8%	15	16.9%	5	6.9%	4	11.4%	1	5.0%
Alzheimer's or dementia	1	0.7%	1	0.5%	1	1.1%	0	0.0%	0	0.0%	0	0.0%
Cirrhosis	6	4.0%	3	1.4%	0	0.0%	1	1.4%	0	0.0%	0	0.0%
Leukemia	0	0.0%	1	0.5%	1	1.1%	0	0.0%	0	0.0%	0	0.0%
Lymphoma	2	1.3%	2	1.0%	0	0.0%	3	4.2%	0	0.0%	0	0.0%
Skin cancer	22	14.7%	35	16.9%	8	9.0%	15	20.8%	7	20.0%	2	10.0%
Any other cancer	19	12.7%	28	13.5%	16	18.0%	11	15.3%	4	11.4%	2	10.0%
Poor kidney function	9	6.0%	11	5.3%	4	4.5%	0	0.0%	2	5.7%	0	0.0%
Thyroid problems	17	11.3%	25	12.1%	18	20.2%	11	15.3%	4	11.4%	2	10.0%
Enlarged prostate	13	8.7%	33	15.9%	12	13.5%	27	37.5%	2	5.7%	6	30.0%
None of the above	12	8.0%	27	13.0%	10	11.2%	6	8.3%	3	8.6%	7	35.0%

Table 5c: Chronic Condition Frequency by Education Among People with No Religious Attendance (n = 573).

Predictor	Model 1	Model 2
States a religious preference	–0.0000233†	–0.0970391†
Female	–	0.0205313
Racial minority background	–	–0.1045975***
Education level	–	–0.0488698***
Prob > χ^2	0.0570	0.0000

Table 6a: Negative Binomial Regression Models of Chronic Disease Burden by Religious Preference (n = 2,966).
† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Predictor	Model 1	Model 2
Level of service attendance	–0.0000233	0.0030472
Female	–	0.0225048
Racial minority background	–	–0.1031267***
Education level	–	–0.0496964***
Prob > χ^2	0.9968	0.0000

Table 6b: Negative Binomial Regression Models of Chronic Disease Burden by Religious Attendance (n = 2,966).
† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

models representing total number of diagnosed chronic conditions as the outcome, and each of our two religiosity measures as a predictor. Each table presents Model 1 (raw model of the relationship between chronic disease burden and religiosity) and Model 2 (expanded model of the above relationship with covariates for sex, racial minority status, and education level).

Overall, our inferential models revealed little evidence to suggest that having a religious preference or attending religious services substantially impacts burden of chronic disease one way or another. This is generally consistent with our findings from descriptive analysis. Our inferential models did identify a marginally significant association between having a religious preference and burden of chronic disease. However, contrary to findings from much of the literature discussed in the front matter, our own models actually show that people who express a religious preference have a slightly *higher* burden of disease in both a raw model incorporating only religious preference as a predictor and an expanded one incorporating covariates for sex, racial minority status, and education level.

Discussion

Despite the proliferation of both studies examining religion and health *and* studies of the nonreligious, many gaps and controversies persist between these lines of scholarship. Researchers have often based their arguments for whether or not religion and/or nonreligion benefits health on correlations removed from any concrete social context, and devoid of comparisons to the prevalence of health outcomes among religious or nonreligious populations. As Hwang and colleagues (2009) note, little is known about what these correlations might actually mean beyond theoretical assertions and mathematical postulations, and even less is known about the overall health of nonreligious people in society, either in general or among older adults specifically.

Our study contributes to these conversations by outlining the prevalence of chronic conditions among religious

and nonreligious respondents. In addition, it draws on intersectional insights to provide variations in prevalence rates among nonreligious people occupying disparate sex, race, and educational positions within society. The combination of these endeavors reveals an absence of any clear religious influence upon 16 common chronic health conditions within a diverse sample of older adults who, given their advanced ages, would be *most likely* to have experienced the benefits and/or pitfalls of religious or nonreligious beliefs and practices over the course of their lives. Most strikingly, religious NSHAP participants appear to be those least likely to have none of the 16 included conditions later in life. This finding offers a counterpoint to extant scholarship suggesting clear and consistent positive ties between religion and health. Building on this observation, our study offers three key insights researchers may extend to better understand potential dynamics concerning religion, nonreligion and health.

First, our descriptive and inferential analyses both call into question ongoing assertions concerning religious benefits for health. Additionally, our elaboration of prevalence estimates suggests that in many cases nonreligious people may have better long term health outcomes or lower likelihood of major health issues. In addition, our exploration of the most common measure used to argue for religious health benefits revealed that service attendance could actually be negative if people attended more than once a month, and that this measure overall did not suggest any direct or consistent relationship to health outcomes. As much of social scientific scholarship on religion, nonreligion, and the relation of these phenomena to health and other social experiences currently depends heavily on the interpretation of correlations, these observations reveal the need for developing baseline prevalence estimates that will allow us to judge such interpretations against concrete, data-based outcomes in the concrete world. In so doing, we may catch instances – like the current religion and health literature – where apparent correlations in aggregated data may lead us in unproductive directions. More detailed assessment of relationships between religion and health can enable us to direct our efforts toward understanding social resources and processes that explain these associations.

Second, results reveal the importance of attending to power and intersectionality in studies of religion and nonreligion. Although it may seem counterintuitive at first that decades of studies have focused on a relationship that does not appear in prevalence estimates of religion/nonreligion and health, this makes a lot more sense when we think about the power and privilege granted to religion in contemporary American society (see, e.g., Cragun & Sumerau 2015; Edgell et al. 2006; Hammer et al. 2012). Rather than neutral categories of existence, intersectional scholars have long noted that people are trained to see the world in relation to dominant assumptions, patterns, and power structures (Collins 2000). We currently live and work in a society where religion is typically defined as good, moral, beneficial, and useful for all people (see Barton 2012). Within such a context, it is not surprising that researchers would see or seek correlations suggesting a potential positive effect, and then uncritically interpret such correlations as "evidence" that religion is in fact good (see also Cheng & Powell 2015). It may thus be the case that social training protocols or dominant discourses (Collins 2000) promoting the "benefits" of religion have overshadowed or outright contradicted the data themselves in many prior studies of religion and health.

Researchers can build a better foundation for nuanced understanding of relationships between religion and health by beginning with the assumption that no relationship necessarily exists between religion and health in one direction or the other, and instead examine their data first from an exploratory perspective. This may lead to different conclusions that more accurately capture the diversity of possible associations between religion and health, as well as any uniform trends therein (see also Hwang et al. 2009).

Our descriptive analyses support theoretical evidence (see Magyar-Russell & Pargament 2006) that religion can be good, bad, or ineffectual in relation to many health outcomes over the life course. Likewise, our findings suggest that nonreligion can be interpreted as equally good, bad, or ineffectual in relation to health outcomes. This possibility appears to be especially strong when having no common chronic conditions in late life is included as a key outcome.

The ability or inability of particular indicators of religiosity (rather than a general "umbrella" measure that likely captures a broad range of experiences related to spiritual life) may offer some clues as to why we did not find positive associations between religion and health (i.e., negative associations between religiosity and chronic disease burden) in either our descriptive analyses or our inferential ones. Specifically, one of our measures (religious belief) says little on its own about what types of practices a person might engage in as a result of their beliefs that would in turn yield opportunities for social support. Indeed, many people with extremely devout beliefs focus their energies on cultivating strong personal relationships with deity, rather than participating in organized worship activities. Our other religiosity measure (religious attendance) may yield better insight into opportunities for social support, but remains limited in its predictive value for this potential mediator because it cannot independently capture the nature or tenor of specific activities in which people engage when attending services. Magyar-Russell & Pargament (2006) explain that organized worship that encourages anxiety about punishment in the afterlife can actually foment social anomie and harm health, whereas worship services that encourage personal empowerment and secure attachment to deity are likely to do the opposite.

Rather than a clear relationship that would support dominant discourses within a society where religion is privileged above other ideological and interpretive forms (see Cragun & Sumerau 2015), our research reveals a nuanced, intersectional set of relationships and variations that suggest religion (and even nonreligion) may not matter at all for health except in cases where it diverts our scholarly attention away from social forces that catalyze

health outcomes more directly. Scholars of religion and nonreligion alike may do well to pay close attention to the ways religion – as a privileged system of power in contemporary America (see Barton 2012; Edgell et al. 2006) – intersects with other systems of power and inequality in the course of people's lives and the reporting of scientific results.

Third and finally, our research also reveals the importance of establishing studies of nonreligious health and well being (see also Hwang et al. 2009). While religious aspects of these phenomena have received thorough attention in the last few decades, studies concerning nonreligious people's health are fairly rare at present (see also Brewster et al. 2014). Yet in our own analyses, we found considerable variation among nonreligious people in relation to sex, race, and education status. Our findings echo intersectional studies in health specifically (Grollman 2012) and social life generally (Collins 2000) in suggesting that we can learn at least as much about how intersecting social forces influence nonreligious people's health as we can from similar analyses of religious people. As is common in epidemiological practice (see Gordis 2004), our prevalence estimates of nonreligious health variation can provide a foundation for systematic analyses of the prevalence of various mental and physical health conditions among nonreligious populations, correlational studies seeking to tease out nuances and influences in nonreligious health outcomes or experiences of chronic conditions, and qualitative and quantitative analyses of the ways intersectional statuses play out in the health experiences and behaviors of nonreligious people.

While these insights may dramatically expand research on religion, nonreligion and health in the years to come, our study does have some important limitations, and thus opportunities for further examination of these dynamics. First, as with any current data set called "nationally representative," several key demographic groups (especially in relation to health) are not captured explicitly (Nowakowski et al. 2016; Westbrook & Saperstein 2015). For example, people transitioning between sexes, intersex, transgender of any type, gender nonbinary, same sex attracted, bisexual, asexual, and nonsexual people are often not represented in such surveys and they are not in the data set used for this report (see, for example, Ivankovich et al. 2013; Wentling et al. 2008; Westbrook & Saperestein 2015). Although people with these characteristics may be included in the total participant pool (Westbrook & Saperstein 2015), we cannot comment meaningfully on their experiences at present using this dataset. As calls continue for more truly representative data, it may thus be useful to re-estimate prevalence rates including these and other often unrepresented populations to gain a better picture of overall population health (Ivankovich et al. 2013).

Speaking in detail to the above limitations of NSHAP as a whole, in this specific study we also cannot offer insight into the human immunodeficiency virus (HIV) status of marginalized sex, gender, and sexuality groups. HIV status was also assessed in the original data collection effort for Wave I, but later pulled from the restricted use dataset due to confidentiality concerns. These data were never released for use by other researchers, and thus represent a lost opportunity for assessing the nuances of well-documented inequalities in HIV prevalence (Gorman et al. 2015) in older adult populations. It would thus be wise for researchers to examine what (if any) relationship exists between HIV prevalence and experience among religious and nonreligious populations.

We also cannot comment substantively on prevalence patterns for chronic mental and behavioral health conditions. Our analytic sample did include data on one cognitive condition group (Alzheimer's or dementia) included in the NSHAP's assessment of commonly diagnosed chronic conditions in older adults. The other 16 common conditions with reported outcomes only offered information about physical health. The NSHAP does collect data on mental and behavioral health *experiences* (e.g., depression) and *practices* (e.g., smoking). However, it does not capture diagnosis status, and thus does not offer a meaningful opportunity to compare findings across different condition categories in a single study. We intend to follow up with separate studies engaging the available NSHAP data for experiences and practices indicative of chronic mental and behavioral health conditions among nonreligious and religious respondents. Finally and perhaps most importantly, our study deals solely with older adults. Literature on the etiology and dynamics of health in late life has long acknowledged that volunteer work and other forms of organized civic activity in both the secular *and* religious spheres appears to exert a substantial positive impact on both physical and mental health. Social support is one of several hypothesized mediation mechanisms in this research. Indeed, a recent study (Cragun et al. 2016) suggests that social support may play a key role in any potential positive associations between religion and health. Although we have no means of directly comparing our population in the NSHAP to themselves at younger ages, extant literature certainly suggests that these individuals may have increased their civic engagement across the board as they grew older. So among older adults, it may be more difficult to distinguish unique influences on health from social support stemming from secular versus religious activities.

Our emphasis on older adult populations also introduces some notable strengths, such as the fact that chronic conditions remaining latent in earlier portions of the life course are more likely to manifest and progress to clinical diagnosis in later years. Likewise, in the United States most adults over the age of 65 – a substantial portion of the total NSHAP study sample – are eligible for health insurance coverage via Medicare. Adults in this age bracket may thus be more likely to obtain clinical diagnoses for their chronic conditions due to expanded access to health care if they did not previously have consistent ability to pay for office visits.

Indeed, our report also offers significant other strengths (especially in relation to epidemiological methods and prevalence estimates, see Gordis 2004). First, we began our study with substantial samples of people with no religious preference (n = 189) and no service attendance

(n = 573). Although these sample sizes are often regarded as adequate even for basic inferential analysis, good epidemiological practice requires thorough description of a study population prior to attempting inference (Gordis 2004). We present both perspectives here for comparison and contrast. We were able to achieve a high level of detail in our analysis by breaking each sample of nonreligious people into smaller contingency groups by sociodemographic characteristics. This allowed us to illuminate potential variations with implications for academic and applied health practice alike.

By contextualizing these observations with a basic inferential analysis for both predictors, our findings from the descriptive epidemiology open doors for many possibilities in scholarship. As noted regarding small sample sizes, it is very possible that these inferential analyses (especially the one for religious preference, where the sample of people in the "none" category contained only 189 cases) would miss a significant "true" effect because not enough people responded that they had no religious preference to provide adequate power in that sample. They also offer opportunities to explore the inconsistency in statistical associations and reliability we found here as further evidence that the impact of religiosity on health may be much more nuanced than previously believed.

Because we only used data from Wave I of the NSHAP to assess condition frequencies, we avoided potential issues with cohort inversion – the phenomenon in which certain groups in an analytic sample appear to become gradually healthier over time relative to their peers because members with profound health challenges die prior to subsequent waves of data collection (Noymer, Beckett & Elliott 2001). That said, we caution against over-interpretation of our findings for the "none of the above conditions" measure. People in this category did not necessarily have no chronic conditions at all, only none of those captured by the 16 commonly diagnosed condition variables in NSHAP.

We also feel confident that we captured religiosity meaningfully in our study population (especially considering the tendency for health data sets to have little or no measures of religiosity). Although the NSHAP includes additional response options for the services question that indicate attending rarely or occasionally, we focused our analysis only on the 573 people who said that they never attended. Using the NSHAP also gave us access to what extant literature suggests are two of the three most common measures of religiosity (see also Hwang et al. 2009). We did not have access to the last of these three measures – belief in a higher power – because the NSHAP (like many health surveys) does not ask this question. Despite limitations on religious variables in health data, we were thus able to utilize both commonly accepted religious measurements *and* diverse collections of health information in this report.

Conclusion

Our study sheds light on some ways in which descriptive epidemiological approaches may help scholars make sense of evolving controversies and debates concerning religion, nonreligion and health. Considering that health outcomes are facilitated by multiple, interlocking systems of social power and privilege (Schultz & Mullins 2006), fully understanding such controversies requires establishing baseline portraits of diverse health outcomes in people who identify as religious and nonreligious, as well as those who do or do not attend religious services regularly. Further, such understanding requires attention to how nonreligious people's health – like that of their religious counterparts – is shaped by intersections of sex, race, and class inequalities in the broader social world.

To this end, we first explored the frequency of common chronic health conditions among religious and nonreligious populations simultaneously then stratified our frequency estimates by sex, race, and education characteristics within nonreligious populations. Our findings offer little reason to believe religion or nonreligion plays a major positive or negative net role in health outcomes across the life course. We thus echo Hwang and colleagues (2009) in suggesting that prior studies indicating otherwise based on simple aggregate correlations may thus oversimplify what is actually a complex and nuanced causal landscape. Our analyses also revealed considerable variation in the health outcomes of nonreligious respondents. This suggests that developing an intersectional field of nonreligious health scholarship may be an important step for scholars seeking to illuminate intersections between religion, nonreligion, and health embedded within the broader social world and influenced by other systems of power and privilege.

Competing Interests

The authors have no competing interests to declare.

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