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ORGINAL PAPER

Dying Devotion: Discerning the Association Between Differential Mortality from Scarlet Fever and Religious Affiliation Among Early Edmontonians (1893–1894)

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Abstract Regarding the relationship between religious affiliation and patterns of differential mortality, many hold that any proxy for religion is hopelessly confounded, but that religiosity nevertheless certainly functions to benefit the health of the devout. Edmonton's scarlet fever epidemic (1893–1894) provides a counterexample to prevailing notions, in that religious affiliation is revealed as a risk-factor for this specific threat to health. Roman Catholic children were found to be at a significantly greater risk of dying from scarlet fever than were their counterparts from all other denominations combined, which is demonstrated as a direct corollary of religious affiliation.

Keywords Scarlet fever · Epidemic · Differential mortality · Religious affiliation · Institutionalized religiosity

Introduction

Nearly two centuries have passed since Travers' (1837) early observation of an association between religious affiliation and patterns of morbidity and morality among the faithful. Since that time, hundreds of articles have employed a variety of indicators to examine the differential experience of a plethora of ailments (such as cardiovascular disease, hypertension, stroke, colitis, enteritis, and cancer) among numerous religious groups, most notable of which include; Mormons, Hutterites, Seventh Day Adventists, Jews, and members of the religious elite (Levin and Schiller 1987). These studies have seasoned the literature with observations grounded in diverse populations (both past and present) from around world, and have considered the disparate experiences of both men and women of all age groups from a diverse array of socioeconomic strata and ethnic heritages.

Spanning centuries worth of academic inquiry, the scope of this research is certainly vast, yet it has nevertheless been noted that, "these hundreds of studies do not truly

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represent a 'literature,' in the usual sense of the term" (Levin 1994: 1475). That is, although an extensive body of work collectively, most of these studies have not set out to directly examine the nature of the relationship between religion and health (Levin 1994). Rather, the trend has been towards brief references of such effects amid other potentially confounding variables without explanation as to why such associations have, and continue to exist in the first place (Levin 1994). John Billings Shaw and Emile Durkheim, for example, attributed both social behaviors prescribed by various religious sects and differences in socioeconomic status that are reflected in religious affiliation as the actual differences being measured when religious affiliation is factored into analyses of morbidity or mortality. Some have additionally attributed placebo-esque psychosocial effects which impact health vis-à-vis religion, including the effect of prayer on health outcomes (Byrd 1988). Others have cited the frequency of church attendance and the resulting social support networks as buffering against some of the harmful effects of disease, thereby providing an advantage in coping with illness, resulting in more positive outcomes including reduced incidence of disease-specific mortality (Comstock and Partridge 1972; Jarvis and Northcott 1987; Levin 1994). Still others have suggested the potential influence of hereditary, particularly among socially closed religious groups that may share certain genetic traits (Levin 1994).

In all of these ways, however, religion has been treated as "just another variable to crunch" instead of a primary avenue of investigation in its own right (Levin and Schiller 1987: 22). Thus, while scores of studies stand testament to the existence of a relationship between religion, "religiosity" or "religiousness" and health, there remains little consensus regarding the precise nature of this relationship, nor a firm understanding of the significance that such an association holds. Yet, in the majority of studies, it is nevertheless typically implied that religion works in some way to benefit the health of the devout (Levin 1994).

Despite the apparent diversity of approaches taken in regard to the question of religion and health, the majority of studies can nevertheless be categorized into two broad groupings based on their general approach to the subject. The first concerns the reduced risk of disease observed among groups whose behavior is morally restricted by religious dogma; as in the case of Mormons, Seventh Day Adventists and Orthodox Jews, who have lower incidence of a range of chronic and debilitating ailments relative to their fellows of other religious backgrounds. The second category takes more of a biomedical approach, and focuses on scrutinizing the epidemiology when lower rates of disease-specific morbidity and mortality are found to be inversely correlated with increasing degrees of religiosity (Levin 1994). Criticism has been lodged against both of these approaches; however, in that researchers have tended to focus their analyses on extreme cases—considering instances of either "exaggerated 'religiosity' or [alternatively] the consequences of a lack of religious commitment or orientation" to the exclusion of individuals of average religiousness (Levin and Schiller 1987: 10). Findings may not, therefore, generalize to the greater population, specifically in regard to those with a more moderate commitment to their faith.

In examining the effect of religion on health, Allport (1957) has pointed to the utility of distinguishing between institutionalized and interiorized aspects of religiosity. Institutionalized religiosity, in this sense, refers to the objectively observable and collectively experienced aspects of religious identity, such as the frequency with which people attend church and participate in their parish community, or other behaviors that devout individuals actually engage in due to religious beliefs or proscriptions (Allport 1957). Interiorized religiosity on the other hand, refers to subjective and privately experienced aspects of

religion, such as personal spirituality, an individual's conviction in their faith, or the degree to which one adheres to the ideals of their religion (Allport 1957).

The relationship between religion and health likely encompasses some combination of the aforementioned factors, which exist in diverse compilations and vary by degree depending upon the unique characteristics of the population in which one seeks an explanation for such associations. Thus, in order to realize the nature of this relationship, each occurrence must be approached from a case-study perspective grounded in the local biosocial context of a particular population, especially since religion is ultimately a social construct and thus, part of the particular culture of the community being studied.

In response to these critiques, a third alternative to the study of religion and health—religious affiliation as the primary factor constituting a community of susceptibles at risk of infection by a contagious disease—will be explored here. This approach diverges from the categories of studies that have sought explanations either as a result of moral proscriptions impacting specific behaviors or epidemiological measures of religiosity. Instead, this analysis will focus specifically on the nature of the relationship between religious affiliation as a social factor and its interaction with a specific biological threat to health within the local population. Such an approach will facilitate a reconsideration of many commonly held assumptions regarding the nature of the relationship between religion and health disparities since it permits a more acute perspective on the nature of this particular relationship, as opposed to seeking generalizations that hold true across time and place. Along this line, Kaplan, for instance, has noted that rather than affording a health advantage, "religious behavior can also be a risk factor" for the experience of differential mortality (1976: 11), and although he was writing in reference to heart disease and hypertension, it is likely that this unconventional premise may also hold true for other physiological disorders. The present study will thus approach the disparate experience of mortality observed from scarlet fever among Roman Catholic children relative to their counterparts of all other religious denominations in Edmonton during the 1883–1884 epidemic from an anthropological perspective. This case-study will be informed by a biosocial theoretical stance which seeks to explore the interaction of physiological and cultural aspects (namely religion) in regard to disease ecology, which it will be argued, was the primary factor impacting the disproportionate experience of scarlet fever mortality among religious groups residing in Edmonton during the 1893–1894 outbreak.

As has been conveyed above, when examining religion as a factor influencing the differential experience of mortality within a given population, it is essential to clearly identify what aspect of religion is being conceptualized and invoked as a factor impacting health in order to both make valid measurements and appreciate the meaning of differences observed (Levin and Schiller 1987). This in turn requires a fundamental understanding of the disease in question, as well as familiarity with the sociohistorical context in which such observations are to be situated.

Scarlet Fever in the Nineteenth Century

Caused by streptococci bacteria, scarlet fever is an acute infectious disease that occurs primarily among young children (Hardy 1993). Characteristic features of the disease include sore throat, fever, and headache, with vomiting and nausea in children, as well as a rash that appears 2 days after the onset of symptoms (spreading from the chest and back to the rest of the body), followed by desquamation, or the shedding of the upper layers of the skin, in addition to the tell-tale "raspberry tongue" sign (Hardy 1993). During the late

nineteenth century, most physicians and caregivers were highly proficient in accurately diagnosing scarlet fever, and could differentiate it from other diseases of childhood based on the timing and appearance of the key signs and symptoms (Swedlund and Donta 2003). Prior to the advent of antibiotics, once a child became infected there was little that could be done to intervene in the natural course of the disease, and so while epidemics historically varied in severity depending upon the strain in question, it was not uncommon for mortality rates to reach as high as thirty percent (Hardy 1993; Swedlund and Donta 2003).

Scarlet fever is transmitted through interpersonal contact, which is facilitated by crowded spaces and prolonged or repeated contact between infected and susceptible individuals (Hardy 1993). Survival typically affords the individual lifelong immunity, while the passage of antibodies from mother to child through breastfeeding explains the observation that more than half of infants are initially immune to the disease but loose that resistance around 2 years of age when only twenty percent continue to enjoy immunity (Hardy 1993; Swedlund and Donta 2003). If an individual survives their encounter with the disease in childhood, immunity begins to rise, "reaching 77 percent at 10–15 years and 86 percent in adults" (Hardy 1993: 991).

A Brief History of Nineteenth Century Edmonton

The present-day city of Edmonton owes its existence to the Hudson Bay Company, as it was the fur trade that first brought European settlers to Alberta. After shifting several times along the North Saskatchewan River as the fur trade depleted resources in previous locations, Fort Edmonton was finally relocated in 1819 to the site that is now parliament grounds (Gilpon 1984). The development of Edmonton as a community beyond the walls of the fort can be traced back to the efforts of Revered George McDougall, the Methodist missionary who arrived at Fort Edmonton in June of 1871, and shortly thereafter laid claim to the land one mile east of the Hudson Bay post; building a Methodist church and manse on that site in 1873 (Gilpon 1984). Aside from the importance this had for the future prospects of the Methodist church in the region, it also represented a significant development for the future of Edmonton, in that these structures were the first buildings to be erected outside of the fort that were not ancillary to its function (Gilpon 1984).

Whereas there had been little progress in the Edmonton area since the arrival of the Hudson Bay Company, within a few short years following the establishment of the Methodist church, a community began to rise out of the wilderness. In the early 1870s, former fort employees and pioneer settlers began staking claims to the land surrounding the Hudson Bay Company's reserve. Although initial growth was slow, by the time that the first city lot was sold to Frank Oliver in 1878, the population of Edmonton had increased from non-existent to 148 residents (Gilpon 1984; MacGregor 1967). Only 2 years later, the little hamlet boasted *The Bulletin* (the first daily newspaper in Alberta), Dominion telegraph service, a brickyard, a sawmill, two flour mills, as well as growing coal mining and commercial farming industries (Gilpon 1984).

Edmonton experienced its first land boom in 1881 when the Hudson Bay Company released 100 lots for public purchase, while the population enjoyed modest growth, reaching 263 inhabitants (Gilpon 1984; MacGregor 1967). Edmonton also experienced its first major setback that year when the Dominion government changed the planned route of the Canadian Pacific Railway. Whereas original plans envisioned the line passing through Edmonton on its way to the west coast, a more southerly route that would take the track through Calgary—Edmonton's burgeoning southern rival—was instead opted for (MacGregor 1967). Yet

progress continued, and by 1882 Edmonton had gained a livery stable as well as the first regular public school in operation west of Manitoba (Gilpon 1984). Edmonton's first butcher shop was established in 1883, by 1887 the population had increased to approximately 350, and in 1889 the first retail store operating independently from the fort opened its doors for business (Gilpon 1984; MacGregor 1967).

A second blow to the community came in 1890 when the new railway connecting Calgary with Edmonton prematurely ended its tracks on the south bank of the North Saskatchewan River due to the anticipated cost of extending the tracks across the waterway to where Edmonton was located (MacGregor 1967). The establishment of the railway-owned town of South Edmonton (later known as Strathcona) across the river proved to be the bane of Edmontonians who stubbornly refused to simply pick up and move across the river to join with their new rival settlements (MacGregor 1967). With the arrival of settlers via this new railway, the population of South Edmonton grew more rapidly than had that of Edmonton; however, it was soon evident "that in spite of the new settlement across the river, Edmonton was going to hold its own" and in 1891, eighty percent of the combined population, and ninety percent of local trade was indeed based on the northern side of the North Saskatchewan river in Edmonton proper (MacGregor 1967: 107).

The hamlet of Edmonton was incorporated as a town in 1892, by which time the population had reached 700 (MacGregor 1967). Matthew McCauley was unanimously elected as the first Mayor, and due to the continued problem of limited venues large enough to accommodate public gatherings, the town council met in a crowded room over the butcher shop, which space it shared with the equipment of the volunteer fire brigade (MacGregor 1967). The population of Edmonton continued its modest growth throughout the period of study, with population estimates fluctuating from 1,000 to 1,500 between 1893 and 1896 (MacGregor 1967). Yet Edmonton remained primarily a "man's world…[as f]ew white women were willing to face its hardships, its loneliness and its lack of female companionship" (MacGregor 1967: 90). During the early years of the settlement, there had in fact been only seven Caucasian women known to be residing in the Edmonton area—three of whom lived within the confines of the fort and were the wives of the ranking officers there (MacGregor 1967). Thus, while no data is available to account for precisely how many children resided in Edmonton at this time, their numbers were undoubtedly few. As individual settlers and families began arriving in the area, "homes in isolated spots or in little groups cleared out of the enveloping bush" sprang up here and there (MacGregor 1967: 90), but the ruggedness of the community meant that such structures remained quite isolated from each other, being connected only by trails cut out of the bush (MacGregor 1967).

Edmonton's Religious and Cultural Communities

Edmonton was quite literally built-up around its churches. Yet, as much as religion was central to the community's development, Edmontonians also remained socially segregated as a result of their religious affiliations, with Anglophone Christians at one end of the spectrum and Francophone Roman Catholics at the other, as the fact that there was far more commingling within these groups than between them has been well documented (Hart 1980). This should not imply, however, that there was animosity or prejudice among the groups, but simply that shared language, cultural heritage, and religious affiliation drew people together into tight-knit groups that offered a sense of belonging, social support, and the familiarity of home in an otherwise uncertain frontier community.

The separation between the French and English speaking communities in late nineteenth-century Edmonton harkened back to the rivalry between the Hudson Bay Company and the Montreal-based North West Company in previous centuries; each of which made a policy of hiring employees from their respective cultural backgrounds while competing furiously with each other for fur pelts in the Canadian West (Hart 1980). It was, in fact, the amalgamation of these two companies in 1821 that first caught the attention of the Roman Catholic Church who "fear[ed] the loss of the district to Protestantism", and thus served as the motivating factor for the decision to send Reverend Father Jean-Baptiste Thibault to Fort Edmonton in 1842 in hopes of solidifying the influence of the Roman Catholic Church in this frontier (Hart 1980: 9).

Although Edmonton boasted four churches by 1887, it was the Methodist church that served as the nucleus for the burgeoning community of Edmonton. Not only was it the original cornerstone upon which the hamlet was built, but in Edmonton's early days, the Presbyterian, Anglican, Baptist and Salvation Army services in Edmonton were all hosted by this church, as were most social functions, since it was the only building large enough to accommodate even moderately well-attended gatherings in the community (McDougall Church 1971). This fostered close relations among the various Christian denominations in Edmonton, and Sunday soon became the day that local residents and settlers in the area came together to socialize, "to relive the loneliness of their lives, to hear the news and to do a little shopping" after assembling for morning church services (Munro 2004).

In 1852, the Reverend Father Albert Lacombe was sent to replace Thibault, and it was he who established the Roman Catholic mission of Saint Joachim, conducting church services out of a small building provided to him within the confines of the fort until January 14th of 1877 when Saint Joachim's church, built on land donated by Malcolm Groat, was ceremonially blessed (Hart 1980). In acting early to establish its presence outside of the fort in the fledgling hamlet of Edmonton, the Roman Catholic church had responded to ever-increasing concerns that it "continue to act as a vital focal point for the French speaking community's religious and social activities" (Gilpon 1984: 34). As the Roman Catholic population residing in Edmonton was primarily of French heritage, the priests worked vigorously to reinforce these ties, thereby binding together Francophone Roman Catholics who shared a common language, cultural heritage and religious affiliation. The clergy accomplished this goal by positioning the Roman Catholic Church as the focal point of the French community thereby creating a "nucleus around which new French-speaking arrivals in Edmonton could establish themselves" (Hart 1980: 15).

The social lives of early Edmontonians thus revolved largely around their respective parishes, which provided not only the necessary venue, but also a network for early Edmontonians' socialization. While no statistics are available to precisely measure the degree to which Edmonton's early population was comprised of either French- or English-speaking settlers, it can be extrapolated that by the time this study concerns, the ratio of French to English within the Edmonton population had declined.[1] This was largely the result of aggressive immigration campaigns of the Laurier government in the late 1890s which saw a tremendous influx of ethnically diverse settlers into Edmonton and the surrounding area, which "drastically reduced the proportion of French-speaking peoples" in the greater community (Hart 1980: 29). Despite a diminishing ratio, rather than obscuring

[1] The 1985 census made by the North West Mounted Police reported a combined population of 1,670 for Edmonton and South Edmonton, while the 1901 Dominion Census reported the population to have grown to 2,626, however the 1899 St. Joachim's Parish Census reported only 379 individuals of French-language heritage (Hart 1980).

the dichotomy between French and English groups, the newly found ethnic diversity instead strengthened group solidarity within the French community whose "conception of itself as being a separate group with an identity different from the rest of the population" was only further consolidated (Hart 1980: 29). Thus, when the first organized Catholic school opened in 1889, it was thus celebrated "as a great victory among French-speaking Catholics" (Hart 1980: 22), since it directly furthered the clergy's agenda of preserving French culture by promoting a cultural identity defined by conjoined religious affiliation and oral heritage.

While Edmonton's churches were open to anyone who wished to attend, and indeed, there were English speaking Catholics present in the community, there nevertheless remained an inherent division between the primarily Francophone Roman Catholics and Anglophones of all other religious denominations in both their religious activities and social lives. This separation was celebrated by the clergy, who preached "the traditions of religion and language" to parishioners, insisting that "[t]he person who says he is French-Canadian says he is Catholic…One cannot be one without the other".[2] In this way, and from the earliest days of the community, Edmontonians had deep ties to those with whom they shared religious affiliation, and these social networks were especially tight-knit as French-Roman Catholic group solidarity was further reinforced by the other equally significant ties of shared language and cultural heritage.

The local churches thus served as the pillars upon which sub-cultures within the community were nurtured and it was precisely these deep-rooted social ties stemming from religious affiliation among Edmontonians that can explain the excess of scarlet fever deaths that almost exclusively ravaged Edmonton's Roman Catholic families during the outbreak of this disease between July 1893 and March 1894.

Methods and Analysis

A case-study approach is employed here to interpret the trend observed for scarlet fever mortality between 1893 and 1894, which differentially claimed the lives of Roman Catholic children residing in Edmonton, Alberta. To this end, all deaths ($N = 490$) that occurred in the electoral district of Edmonton between 1890 and 1897 were transcribed from the death records of what was then considered the North-West Territories.[3] In addition to the date and cause of individuals' death, religious affiliation, and whether or not a doctor had been attended was also noted from this source. Names were excluded from the data collection process, and while this precludes the detection of any multiple incidence of scarlet fever that may have occurred within a single family, this was nevertheless deemed a necessary precaution in order to protect the legacy of individual privacy as well as that of any surviving descendants.

Although in some contexts 490 deaths might be considered a small number of cases, this number nevertheless proved sufficient for meaningful statistical analysis using the Pearson chi-square method, with the confidence interval established at .05. It should be further noted that these deaths include those that occurred in the community of South Edmonton, as differences in place of death or residence were not drawn between this community and that of Edmonton proper in the death register. The inclusion of individuals from both of

[2] L'Ouest canadien, 28 September 1899.

[3] Death Register for Canada North–West Territories, Provisional District of Alberta, Electoral District of Edmonton, Vital Statistics, Edmonton, Alberta.

these communities should not, however, compromise the validity of the findings, as the parish of Saint Joachim's was the only Roman Catholic Church in either community at this time, and therefore, drew its parishioners from both sides of the North Saskatchewan River.

It should also be noted that the 490 deaths observed over the eight-year period encompassed by this study actually represent a considerable number of such events given the appreciably small populations which resided in Edmonton proper and South Edmonton; neither of which can be credited with having risen above 1,500 residents throughout this period (MacGregor 1967). A reasonable degree of confidence can thus be had that the death records are representative of the mortality experience of all Edmontonians, as there is no indication in the literature of the excessive mortality level that would have been necessary for a large number of deaths to have gone unreported in addition to those recorded in the Death Register. Confidence can also be had that those deaths attributed to scarlet fever were accurately diagnosed given the familiarity of nineteenth-century doctors and caregivers with the signs and symptoms of this disease (Swedlund and Donta 2003), and the fact that a doctor attended more than eighty percent of these cases.

Scarlet Fever Mortality During the Epidemic

Between July 1893 and March 1894, twenty-four children succumbed to the effects of scarlet fever in the electoral district of Edmonton. While superficially, this may appear as a small number of deaths to be considered an epidemic in the proper sense of the term, it must be noted that the population of Edmonton at this time was modest and largely comprised of single men. Thus, when one considers the number of children who likely contributed to the population figures reported for this period, the impact of the mortality experienced due to this outbreak of scarlet fever most certainly had a devastating effect upon the youngest cohort of the community.

This outbreak of scarlet fever conforms to the historical epidemiology of the disease in that it exclusively claimed the lives of children, with ninety-six percent of the deaths having occurred among individuals eight years of age or younger. Following the trend reported by Hardy (1993)—that at least fifty percent of infants enjoy immunity to scarlet fever due to maternal antigens transferred in breast milk—only seven such deaths were found to have occurred among infants under the age of two (accounting for twenty-eight percent of the total mortality from this disease). The expected increased burden of scarlet fever mortality among weaned children under the age of ten (Hardy 1993), is also reflected in the Edmonton mortality data, as sixty-eight percent of scarlet fever deaths occurred among this age group, while only one death beyond this age range—that of a 12-year-old girl—resulted from this cause, which accords to the expectation that after the age of ten, immunity then begins to rise with increasing age towards adulthood.

Of all the scarlet fever deaths, seventy-six percent ($N = 19$) occurred among individuals of Roman Catholic religious affiliation. Twenty percent ($N = 5$) occurred among the other various denominations, and a single death accounting for the final four percent of mortality from this cause had no religious affiliation noted in the death register. This finding is telling, in that not only did more Roman Catholic children die from scarlet fever during the epidemic than children from all other religious affiliations combined, but Roman Catholics as a whole, were, in fact, significantly more likely to have died from scarlet fever than from all other causes of death combined throughout the entire period of study relative to their fellow Edmontonians of all other religious affiliations combined ($\chi^2 = 14.918$, $df = 2$ $P = .001$).

While there is unfortunately no morbidity data preserved to offer insight into the number of individuals who suffered, but recovered from their illness during the epidemic, the full impact of this outbreak of infectious disease must be assumed to have been exponentially greater, as the mortality rate from scarlet fever in the pre-antibiotic era is known to have ranged only as maximally high as thirty percent. Thus, morbidity rates can be inferred to have been greater than twice that of the incidence of deaths reported from this cause.

Discussion

That the scarlet fever epidemic struck the primarily Francophone Roman Catholic community at a rate statistically significantly greater than that of their Anglophone counterparts of all other religious affiliations combined, speaks to the deep social ties within these communities in early Edmonton, particularly since the French-Roman Catholic community accounted for a minority of the population in Edmonton at the time of the study. Further, even if it could be argued that the Roman Catholic population had a greater number of children on average per family (although there is no evidence to suggest this was the case), that number would surely still have been less than the number of children of parents of all other denominations given the fact that based on the best information available, Roman Catholics accounted for only 14.4–22.7% of the total population (see Footnote 1).

Since scarlet fever is transmitted through interpersonal contact and all else being equal, will infect all susceptibles that come into contact with the contagion, it is likely that the Roman Catholic children who died from this cause were differentially exposed during gatherings determined by their religious affiliation; such as attending the French Roman Catholic school, religious services, or social functions hosted by the church as a result of the clergy's promotion of socialization along these lines.

The population of early Edmonton therefore, provides a unique opportunity to scrutinize the impact of religious affiliation upon health, as the confounding variables that often obscure studies of the impact of religion upon health can be dismissed in this particular context. That is, while cultural heritage or ethnicity often complicate analyses of religion and differential mortality, the fact that religious affiliation was paralleled by shared language and cultural background, thereby forming a triumvirate of forces binding together the social affiliations of early Edmontonians, means that these variables can be considered as interchangeable proxies for the same measure in this instance. Socioeconomic status can likewise be ruled out as a potentially confounding variable. It been noted that French settlers in early Edmonton were just as prosperous in business ventures and real estate holdings as their English-speaking counterparts (Hart 1980), thereby precluding the likelihood of this group having suffered an increased mortality rate due to inferior quality of life. Further, the lifestyle differences that are generally understood to impact levels of morbidity and mortality in historic populations are not necessarily applicable to frontier communities. It can be argued, for example that when such settlements are in their infancy, there are few institutions in place which could realistically afford an individual an elevated status over that of his peers, and perhaps still fewer opportunities for such differences to impact health given the rustic conditions in which they resided. Finally, residential segregation as a factor contributing to the differential experience of mortality can be disqualified since although there were several separate French settlements within the vicinity of Edmonton (Hart 1980), only those deaths that occurred among Edmonton and South Edmonton residents are represented in the data. In this regard, it has been noted that the

entire residential community of Edmonton was characterized by some degree of dispersion, as it has been noted that houses were scattered and connected by trails cut into the bush rather than being densely situated at this time. This then lends support to the argument that the primary opportunity for transmission of infection would have occurred when people came together for socialization, such as attending religious sermons, school service, or simple gatherings whether organized or casual, which in the case of the Francophone Roman Catholic community, tended to be orchestrated and encouraged by the church.

Thus, with the primary points of this study having been established as valid in that they are not skewed by the confounding variables typically identified in studies of this nature, it remains to be determined whether the relationship between religious affiliation and differential risk of scarlet fever mortality was a causal one in this particular time and place.

It is well known that infectious diseases will spread evenly throughout a community provided there is adequate opportunity for contact among infectious and susceptible individuals; therefore, the "likelihood of a child contracting such a disease is, among other things, a function of the number and frequency of the child's contacts" (Van Poppel et al. 2002: 277). This however, takes for granted a "homogenous mixing of individuals …assumed to be equally as likely to interact and become infected by co-religionists as by others…while this is unlikely to have been the case in the past" (Van Poppel et al. 2002: 279). And so, while the social isolation engendered by religious affiliation may have worked to actually save lives in some instances, as Van Poppel et al. (2002) in fact argue, it is apparent that this is not always the way in which religious affiliation impacts the health of relatively closed groups. While Van Poppel and colleagues note that "[i]nteraction was probably less frequent and intensive *between* religious groups than *within* them" (2002: 279, emphasis in original text), and that social isolation engendered by religious affiliation may therefore, have worked to benefit health by protecting the communal wellbeing of a close-knit community defined by their shared religious affiliation, the inverse of this may also hold true in certain contexts. In the case of the scarlet fever epidemic in Edmonton, the solidarity of the Roman Catholic community evidentially functioned to spare the rest of the population from the lion's share of the mortality burden from this disease, which was, for the most part, confined to members of this community. Thus, in this particular context, rather than limiting exposure to contagion by precluding inter-group contact, religious affiliation instead predisposed children with shared religious affiliation to contract scarlet fever when it erupted in their midst by restricting their opportunities for other interpersonal contacts, resulting in the excess deaths of Roman Catholic children relative to all other Christian denominations. In this context, religious affiliation can therefore, be said to have been at the very least, a directly contributing factor if not the single most important cause of this differential pattern of mortality.

This data also stands as a counterexample to two prevailing assumptions in the literature regarding the nature of the relationship between one's religious affiliation and their health status. In the first instance, this case diverges from Comstock and Partridge's (1972) argument that infrequent church attendance is correlated with an increased risk for cause-specific mortality. In the case of infectious diseases (such as scarlet fever), the greater one's participation in social gatherings—namely attending regular church services—then the greater the risk is that one will transmit or contract a contagion and thus facilitate the spread of infection among those with whom one shares religious affiliation.

The second disparity concerns the touted preference for analyses pertaining to interiorized religiosity since it is argued that this indicator may provide a more accurate measure of the differences among individuals in regard to their adherence to their religion and its ideals (Allport 1957). The example here, however, highlights how data regarding

institutionalized forms of religiosity; such as church attendance and active participation in social life centered around the parish community (which physically brings people together) is in some cases of greater value to understanding differential mortality trends, especially in regard to the transmission of infectious diseases. This is particularly relevant for studies that focus upon the effect of religious affiliation on health disparities among children—a group whom it can be argued, are far more influenced by factors inherent in institutional than interiorized religiosity, particularly in considering the health impact of religion upon infants and very young children who probably do not yet fully appreciate the meanings and values inherent in their ascribed religious status.

Conclusion

The population residing in Edmonton was ethically diverse from its very beginning, yet it was also characterized by a high degree of segregation, as groups of settlers chose to align themselves with those with whom they shared a common language, cultural heritage, and most importantly, a religious affiliation. Edmonton's churches were in fact the cornerstones upon which the community was built; providing not only physical nuclei, but also serving as the social hubs around which early Edmontonians congregated. Thus, while confounding variables often pose a difficulty in population studies concerning the relationship between religion and health, this does not present a particular problem in the case of early Edmontonians as these variables (language, cultural heritage, and religious affiliation) can practically be used as interchangeable units for the same measure, while socioeconomic status and residential segregation have also been demonstrated as moot points.

Beyond simply providing a window into life in this historic community, deaths from scarlet fever also provide a counterexample to many of the prevailing assumptions regarding the effect of religious affiliation upon the differential experience of cause-specific mortality. First and foremost of these follows in accordance with Kaplan (1976), who noted that rather than affording an individual a health advantage, religion, "religiousness" or "religiosity" can sometimes also pose a risk factor, especially (as has been demonstrated) in the case of infectious diseases such as scarlet fever.

Secondly, while the precise nature of the relationship between religion and health often remains elusive, differential mortality from scarlet fever has, in this case, been revealed as a direct corollary of religious affiliation, predisposing French-Roman Catholic children to succumb to this disease at a rate that significantly exceeded that of children of all other religious affiliations combined during the 1893–1894 epidemic.

Thirdly, the hypothesis that contact among children with shared religious affiliation is probably greater than contact between children from different religious groups (Van Poppel et al. 2002), is confirmed as this relationship parallels what is known about the interpersonal contact of adults in early Edmonton, which was largely determined by the efforts of the Roman Catholic clergy who worked tirelessly to promote intra-group socialization. This inherent division among adult Edmontonians along the lines of religious affiliation evidentially filtered down to their children, as the data implies that contagion spread unevenly through the general population, thereby providing further insight into the contact between children of different religious affiliations in the past; a topic about which very little is currently known (Van Poppel et al. 2002: 279).

Fourthly, while it as been pointed out that many studies concerning the effect of religion upon health have tended to concern populations characterized by extreme religiousness (Levin and Schiller 1987), the population of Edmonton, however, provides an opportunity

to study the effect of religion upon the health of individuals who were of average religiosity.

Fifthly, and contrary to the common view that interiorized religiosity is a more precise proxy for religion in analyses of the effect of this variable upon health among adults, it has been demonstrated that institutionalized religiosity can sometimes provide a more accurate measure, particularly in the case of infectious diseases, but also especially in the case of young children who have yet to internalize significant aspects of the religion of their parents.

Finally, it has been shown that in regard to studies of historic populations, including those focusing upon the impact of religion upon health, the study population must always be situated within the unique context of its biosocial and historical milieu. This is particularly pertinent to the goal of determining the precise nature of this relationship since humans have a complex relationship with the diseases from which we suffer, that is by no means limited to biological aspects of the pathogens and physiological conditions within the bodies of the patients. Thus, in cases where religion, "religiousness" or "religiosity" is found to be correlated with differential health trends, such cases must be approached on a case-study basis in order to ultimately arrive at an understanding of the significance of the relationship in a particular time and place.

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