

# Patterns of Mortality and Causes of Deaths Among Rhode Island Jews, 1979–1981

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Although considerable interest exists in Jewish mortality patterns and how they compare to those of other ethnic/religious subgroups in the American population, only a limited number of studies have undertaken such analyses. Research is problematic because information on religion is not collected either in the U.S. census or on vital records. Definitive, large-scale studies are therefore difficult and rare, and our knowledge of ethnic/religious differentials in mortality must perforce be built up from the accumulated evidence of small-scale studies covering diverse subgroups at various points in time. Nonetheless, interest in the possible distinctiveness of Jewish mortality can be expected to grow with the increased aging of both the Jewish and American populations.

Studies for St. Louis (Gorwitz, 1962), New York (Seidman, Garfinkel, and Craig, 1962), and Providence (Goldstein, 1966) identified a number of differences between Jews and non-Jews: Mortality was generally lower at younger ages for Jews than non-Jews; the reverse pattern characterized older ages. The pattern was more typical of Jewish males, however, than of females, whose mortality quite closely resembled that of non-Jewish women. These studies all indicated that the survival of Jews to older ages reflected a substantially lower rate of infant mortality and a relatively lower incidence of the infectious diseases fatal to younger persons. As a result, relatively more Jews survived to those ages plagued by the chronic diseases.

The present study explores mortality patterns of the Jews of Rhode Island during 1979–1981, and compares them to those for the State's entire white population in 1980, and, on a limited basis, to patterns of Jewish mortality identified for 1962–1964. Some attention will also be given to differentials within the Jewish group, especially as they are related to place of birth and socioeconomic status (SES).

The State's approximately 18,000 Jews are largely concentrated in the Providence metropolitan area, with smaller concentrations in a few outlying cities. Although they trace their origins largely to Eastern Europe, the majority of Rhode Island Jews are native-born. The foreign-born are primarily in the older age groups, with a small number being recent, younger Russian immigrants. Like Jews elsewhere in the United States, those in Rhode Island are characterized by very low fertility levels, generally high educational achievement, and white collar occupations. No comprehensive demographic study of the Jewish community of Rhode Island has been undertaken since 1962 (Goldstein, 1964).<sup>1</sup> Indirect evidence, however, indicates that since that time demographic changes have occurred within the Rhode Island Jewish community, including a drop in the birthrate, redistribution within the State, and considerable out-

migration. Unpublished data (Aronson, 1985) indicate, for example, that of Jewish funerals conducted in Rhode Island, the percentage accounted for by persons living outside the State rose from 12% in 1964–1968 to 16% in 1979–1983. This suggests that the elderly were among those likely to have moved out. As a result of these changes and in the absence of a reliable study since 1963 of Rhode Island's Jewish population, no valid basis exists for computing mortality rates. Nonetheless, data on Jewish deaths, when compared to those of the State's total white population, can provide important insights on differential mortality.

### Sources of Data

In the absence of official vital statistics by religion, scholars focusing on Jews have been aided by the fact that in many cities, Jewish decedents are likely to be handled by a limited number of funeral parlors and interred in specific cemeteries. Lists provided by funeral parlors who deal with Jewish burials can thereby identify Jewish deaths in a given locality (Seidman et al, 1962; Gorwitz, 1962; Goldstein, 1966). The current study has taken a slightly different approach. The Jewish community of Rhode Island is serviced by a weekly newspaper which routinely includes obituaries of interest to local Jewry, as provided by funeral directors or families of the deceased. These obituaries were monitored for three years, from January 1979 through December 1981; from them names were culled of all Jewish deaths occurring in Rhode Island or to Rhode Island residents who happened to be out of the state at the time of their death. Excluded from our roster were deaths of former Rhode Island residents whose obituaries were included in the newspaper because they were still of some local interest. Information about the decedent abstracted from the obituaries included name, age, sex, date of death, usual address, place of birth, labor force status, and occupation if employed at time of death or usual occupation. This procedure resulted in a file of 636 names. This roster was augmented by the addition of 99 deaths obtained through checks with those institutions in the State, including synagogues, that handled Jewish deaths. A total of 735 Jewish deaths were thus identified as having occurred to Jewish residents of Rhode Island during 1979–1981. Since almost no Jewish deaths in Rhode Island are handled by anyone other than the institutions contacted, we estimate virtually complete coverage of Jewish deaths during 1979–1981.

Each of the names was then checked in the death records maintained by the Rhode Island Registry of Vital Statistics. The information obtained from the published obituaries and additional listings was cross-checked for accuracy and augmented when necessary. Additional data were abstracted from the death certificates for all decedents to allow analysis of variables not covered in the published reports; these included marital status at time of death and causes of death as coded on the death certificate.

The analysis which follows examines the characteristics of the Jewish decedents, including age, sex, place of birth, and socioeconomic status as defined by occupation. Whenever possible, comparison will be made with the total white population of Rhode Island. Because only 735 deaths, about evenly divided between men and women, were identified for the three-year period, only a limited number of controls can be introduced at any one time; and since most of the Jewish deaths were to men and women over age 45, only very limited analysis of deaths to younger persons was undertaken.

Since rates could not be calculated for the Jewish population in general comparisons with non-Jews had to be restricted to differential distributions by age. Some limited attempt was made, however, to estimate Jewish cause-specific mortality rates and compare them to those for whites.

## Mortality Patterns

### Age at Death

Previous research has indicated more favorable death rates among Jews than among non-Jews at younger ages, and the reverse pattern at older ages. The data available for Rhode Island Jews for 1979-1981 (Table 1) conform to the expected patterns for both men and women. For example, among men, a significantly lower percentage of deaths occurred to Jews under age 65 (20.3%) than to non-Jews (34.6%). The differential was reversed for each of the higher age groups of men; Jewish women had slightly lower mortality at ages 65-74 and 85 and over. For both sexes, median age at death is higher for Jews than total whites, by 3.6 years for men and 3.2 years for women.

TABLE 1. DEATHS, BY AGE AND SEX: JEWS AND TOTAL WHITE POPULATION<sup>a</sup>

Age group	Males		Females	
	Jews	Total	Jews	Total
Total number	379	4,699	356	4,373
Total percent	100.0	100.0	100.0	100.0
Under 20	2.1	3.0	0.6 <sup>b</sup>	2.1
20-44	3.4 <sup>b</sup>	6.2	1.4 <sup>b</sup>	2.8
45-64	14.8 <sup>b</sup>	25.4	12.1	14.7
65-74	31.4 <sup>b</sup>	26.2	19.9	20.2
75-84	29.3	25.6	40.7 <sup>b</sup>	31.1
85 and over	19.0 <sup>b</sup>	13.6	25.3 <sup>b</sup>	29.0
Median age at death	74.7	71.1	81.7	78.5

a. Jewish mortality includes deaths to Jews for 1979-1981 combined; for the total white population, deaths in 1980.

b. The percentage of Jewish decedents in the age group is significantly different from that in the total white age group at the .05 level.

Without information on the Jewish base population, it is not possible to determine how much of the difference in distribution by age at death is due to differences in the age distribution of the respective populations. A number of indicators suggest that the age distribution of the Jewish population is more heavily skewed toward the older ages than is that of the total population (Goldstein, 1964). Nonetheless, the pattern noted above of greater concentration of Jewish deaths among the older population is strong enough and consistent enough with earlier findings to suggest that it would remain even when expressed in terms of rates, although the absolute differences may be somewhat less.

With general improvements in health care and with the greater similarity of life styles among Jews and non-Jews, these differences in age at death are likely to disappear with time (Goldstein, 1981). That this does not appear to have occurred yet may reflect a number of differences that still characterize the two populations: Jews may still differ in their socioeconomic status and life styles, and in their access to and utilization of health services. The proportion foreign-born in the two populations may affect mortality levels (Rhode Island has seen a considerable influx of immigrants from Latin America during the 1970s, and these persons are classified as 'white'); and the genetic make-up of the two groups, as it relates to resistance to certain diseases, may differ. Information on these variables is not available in the published vital statistics. Some limited information on birthplace and occupation is however obtainable directly from the death certificate, and this has been abstracted for the Jews.

### Place of Birth

Like many East Coast cities, Providence received a heavy influx of Jewish immigrants between 1880 and 1920, especially from Eastern Europe. By 1980, however, the Jewish community was constituted largely of native-born persons, and the foreign-born who remained were concentrated in the older ages (Goldstein and Goldscheider, 1968). This situation is clearly reflected in the distribution of deaths by place of birth and age.

Among Jewish male decedents, 65% had been born in the United States, and of these, almost two-thirds were born in Rhode Island (Table 2). Of the foreign-born, the great majority came from Eastern Europe. A somewhat lower percentage of female decedents were native-born (51%), and they were almost equally divided among those born in Rhode Island and elsewhere in the United States. As among males, the foreign-born were overwhelmingly of East European origin.

Reflecting the heavy concentration of the foreign-born among the older Jews of Rhode Island, foreign-born deaths occurred heavily among those over 75 years of age, and the distributions by age were very similar for men and women. Deaths of native-born Jews were more widely distributed by age, with one quarter occurring to persons under age 65. Sex differentials in age at death are also much more pronounced among the native-born than the foreign-born. Among the native-born men, 8% died before age 45, compared to only 3% of the women. At the other end of the age scale, just under half the women's deaths were at ages 75 and over, but only 30% of the male deaths occurred at these late ages. Reflecting these patterns, median age at death for the native-born was much younger than for the foreign-born, and the median for female natives was four years higher than for male natives.

These age-sex differentials by place-of-birth status may in part reflect the differential composition of the native- and foreign-born Jews. Since the native-born are more evenly distributed among the various age groups, one would expect a comparatively broader distribution of deaths as well, and a general reflection of sex differentials in age at death. On the other hand, the foreign-born Jews living in Rhode Island are largely the 'survivors' of a group who arrived in the State in the early decades of the 20th century; therefore, deaths to the foreign-born in 1979-81 are necessarily concentrated in the older ages. Such concentration is likely to lessen sex differential mortality.

TABLE 2. JEWISH DEATHS, BY PLACE OF BIRTH, AGE AND SEX

	Males	Females
Total number	379	356
Total percent	100.0	100.0
Place of birth		
Rhode Island	39.1	27.5
Other U.S.	25.6	23.9
Eastern Europe	32.5	43.8
Western Europe	2.4	2.0
Other foreign	0.5	2.8
Place of birth and age		
Foreign-born		
Total number	134	173
Total percent	100.0	100.0
Under 20	-	-
20-44	0.7	0.6
45-64	1.5	3.5
65-74	17.9	11.6
75-84	41.8	46.2
85 and over	38.1	38.1
Median age	82.1	82.4
Native-born		
Total percent	100.0	100.0
Total number	245	183
Under 20	3.3 <sup>a</sup>	1.1
20-44	4.9 <sup>a</sup>	2.2
45-64	22.0 <sup>a</sup>	20.2 <sup>a</sup>
65-74	38.8 <sup>a</sup>	27.9 <sup>a</sup>
75-84	22.4 <sup>a</sup>	35.5 <sup>a</sup>
85 and over	8.6 <sup>a</sup>	13.1 <sup>a</sup>
Median age	70.1	74.4

a. The percentage of native-born Jews in the age group is significantly different from that of the foreign-born Jews in the same age group at the .05 level.

Moreover, as the foreign-born become an increasingly smaller segment of the total Jewish population, the age distribution of Jewish deaths can be expected to resemble much more closely that of the total white population among whom a relatively smaller proportion are foreign-born.

### Socioeconomic Status

Socioeconomic status has an important bearing on health in general and on access to medical care (Kitagawa and Hauser, 1973), and therefore on patterns of mortality. In the absence of any single comprehensive index of socioeconomic status, education and/or occupation are often used as indicators, although the shortcomings of these measures are recognized (Therriault and Logrillo, 1982). The present study has had to rely on current or usual occupation as the sole indicator of SES, because the Rhode Island death certificate does not contain information on the educational achievement of decedents.

Information recorded on death certificates about occupation, and, to a lesser extent, labor force status may be of variable accuracy for a number of reasons. Problems arise primarily because the information is provided by relatives or acquaintances rather than by the individual concerned, and these informants may not be entirely certain of the usual occupation or labor force status of the decedent. Additionally, the information on occupation may be gathered in terms of either usual occupation or occupation at time of death; the latter may differ from usual occupation among older persons who took a second job after initial retirement. Assessment of this situation was undertaken using data from a sample of the total Rhode Island population (Gute and Fulton, 1982; Fulton and Gute, 1983), which compared the information on the broad census categories of occupation recorded on death certificates with that gathered from a sample survey and that contained in city directories. The results indicated disagreement between the death certificate occupation and that from other sources for about one-third of the men. For women, the discrepancies were much higher when an occupation other than 'housewife' was listed, but the listing of 'housewife' per se appears to be a good indicator of lifetime occupational activity. Assuming these limitations apply equally to the death certificate information for Jews, they preclude any definitive assessment of the effect of occupational differentials, and of SES as indicated by occupation, on mortality levels. Nonetheless, some broad patterns may be identified.

Of the 379 male decedents, only one-fourth were employed at the time of their death (Table 3). Most of the remainder were retired persons. Among the women decedents, two-thirds were identified as homemakers at time of death, one-fourth as being retired, and only 5% as being in the labor force. These patterns are not surprising in view of the age distribution at death. They do, however, mean that information on occupation can be only suggestive, at best.

A number of studies have documented that American Jews since the mid-20th century are overwhelmingly employed in white collar positions (Goldstein, 1981), and that within the broad white collar category, large proportions are professionals or managers/proprietors. These occupational concentrations are reflected in the data on the Jewish decedents. Only 15% of the male decedents were reported to have been employed in blue collar work; an almost equal percentage had been professionals, and almost half were identified as managers or proprietors. Of the women decedents with a listed occupation, a similarly low percentage had been in blue collar jobs (18%), and the largest percentage (44%) had held clerical or sales positions. A much smaller percentage (26.5%) than men had been managers or proprietors, and 12% were identified as professionals. It is quite likely that a number of the 238 women with no occupation listed had at some time in their lives been in the labor force, most probably as lower white collar or as blue collar employees.

In order to obtain some insights into possible differentials in mortality by socioeconomic status, the occupational information has been used to classify decedents as either higher (professionals, managers, proprietors) or lower (all other occupations) SES. Among the males, a slightly larger percentage of higher SES men died at ages 65-74 and at age 85 and over than was true of those in the lower SES category. More noteworthy is the significantly larger percentage of lower SES men dying at ages 75-84; it is this differential which largely accounts for the substantial disparity in median age at death between the two groups. This pattern is the reverse of earlier

TABLE 3. JEWISH DEATHS, BY LABOR FORCE STATUS, OCCUPATION, SOCIOECONOMIC STATUS AND AGE, AND SEX

	Males		Females		
<b>Labor force status at death</b>					
Total number	379		356		
Total percent	100.0		100.0		
Working	26.5		5.2		
Retired	70.4		25.7		
Homemaker	0.3		67.3		
Student/Under 18	2.3		1.5		
Never worked	0.3		0.3		
Institutionalized	0.3		-		
<b>Usual occupation</b>					
Total number	379		356		
Total percent	100.0		100.0		
Professional	14.4		3.9		
Manager/proprietor	47.9		8.7		
Clerical/sales	20.1		14.4		
Blue collar	15.3		6.0		
No occupation listed	2.4		67.0		
<b>Socioeconomic status and age</b>					
	Higher SES	Lower SES	Higher SES	Lower SES	Home-maker
Total number	233	132	45	72	236
Total percent	100.0	100.0	100.0	100.0	100.0
20-44	5.2	4.5	0.8	-	1.3
45-64	15.4	13.3	14.4	20.8	8.9
65-74	33.9	28.9	30.3	27.8	16.1
75-84	27.0*	40.0	32.6	44.5	40.2
85 and over	18.5	13.3	21.9*	6.9	33.5
Median age	73.6	81.1	75.5	75.3	80.8

a. The percentage of higher SES Jews in the age group is significantly different from that of the lower SES Jews in the same age group at the .05 level.

findings that associate higher SES with higher living standards and therefore better health and longer life. Apparently, by the late 1970s, differences in SES no longer affected life styles in the same manner as earlier. It is, in fact, quite likely that the reverse is now true and the stresses associated with higher SES occupations tend to shorten life.

For the women, the small number of cases and weaknesses in reporting occupations precludes analysis by SES status. The distribution by age at death for those women identified as homemakers shows the large majority (three-fourths) dying at age 75 or later, and one-third as surviving at least to age 85.

### Cause of Death

The foregoing discussion has suggested that Jews on the average die at older ages than the total white population of Rhode Island, a pattern which conforms to that

found in other communities, including Greater Providence in the early 1960s (Goldstein, 1966). Like this earlier report of Jewish mortality, the present study can also ascertain major causes of death for the Rhode Island Jewish population. Comparisons between the 1960 findings and those for 1979–1981 indicate that, on the crude level permitted by the available data, the major causes of death – heart disease, cancer, and cerebrovascular disorders – remained the same for Jews and non-Jews in the two age groups presented in Table 4, and continued to account for about three-fourths of all deaths. Some shifts did occur in the relative importance of these and other causes. The changes may, however, be due in part to the aggregation of the data into very broad age categories and lack of distinction by sex; in part, the differences may also reflect changes in reporting cause of death by the attending physicians or in coding practices.

TABLE 4. DEATHS, BY MAJOR CAUSES (SELECTED AGES): 1962–1964 AND 1979–1981 FOR JEWS; 1959–1961 AND 1980 FOR TOTAL WHITE POPULATION

Age group and cause of death	Jews		Total white	
	1962–64 <sup>a</sup>	1979–81	1959–61 <sup>a</sup>	1980
<b>45–64 years</b>				
Total percent	100.0	100.0	100.0	100.0
Heart disease	52.2	36.4	43.6	36.7
Cancer	22.8	31.3	26.4	34.6
Cerebrovascular diseases	2.2	10.1	6.0	3.6
Diabetes	3.3	7.1	2.5	2.5
Respiratory	–	3.0	4.3	3.6
Accidents	1.1	5.0	2.4	2.0
All other	18.4	7.1	14.8	17.0
<b>65 years and over</b>				
Total percent	100.0	100.0	100.0	100.0
Heart disease	47.7	47.7	51.4	48.3
Cancer	17.9	21.4	14.1	20.4
Cerebrovascular diseases	11.9	7.9	12.1	9.6
Diabetes	4.9	2.3	3.0	2.1
Respiratory	4.2	4.6	2.0	6.1
Accidents	2.1	1.5	2.1	1.6
All other	11.6	14.6	15.3	11.9

a. Source: Goldstein, 1966.

### Cause of Death by Sex and Age

The data for 1979–81 allow somewhat more refined analysis of causes of death, controlling for age and sex, and as indicated below, some attempt can be made to estimate cause-specific rates. The Rhode Island death certificate provides listing of multiple causes of death, identified as immediate, intermediate, and underlying. The underlying cause is considered the official cause of death and is the one coded and reported in the published statistics. Since several causes are often contributive to death, use of one cause overly simplifies the situation. Research has indicated, however, that when the broad categories of underlying cause of death are used, causes of mortality

are reasonably represented (Manton and Stallard, 1984). Use of all the information provided on the death certificate would, of course, provide a more complete view of mortality causes, but the underlying cause is the one used in this study, to allow comparisons between the Jewish and total white populations. Because of the very few deaths to Jews under age 45, the analysis will focus on deaths to persons aged 45 and over when distributions are considered and age 65 and over for cause-specific rates.

Among Jewish males aged 45 and over, acute myocardial infarctions (AMI), other heart diseases, and cancer each account for 22 to 24% of all deaths (Table 5). No other single cause accounts for as much as 10% of deaths; 6.1% succumbed to cerebrovascular disorders; diabetes and respiratory disorders each caused 3.9% of the deaths; nephritis and accidents were each responsible for 2.2% of deaths. Considerable variations in these patterns exist for specific age groups. Although AMI was the most prominent cause of death among those aged 45–64 (32.1%), its importance declined continuously with increasing age, accounting for only 9.7% of deaths among men aged 85 and over. Similarly, diabetes declines in importance as age at death increases, from 10.7% to no reported deaths from this cause among decedents aged 85 and over. The reverse pattern characterizes death from other heart diseases, which rises from 14.3% among the 45–64 age group to 29.2% of the oldest decedents. Respiratory diseases and nephritis are also more common causes of death for the older males than the younger ones. Cancer is an important cause of death for each age group, but much more so for men aged 45–74 than for those aged 75 and over. The residual category of all other causes of death accounts for an increasingly larger share of deaths with increasing age over 45 years.

In general, these age specific patterns characterize the total white male decedents as well, although the levels vary. A comparatively smaller percentage of decedents aged 45–64 died of AMI (25.7% compared to 32.1% among Jews in this age group), but more of the total white males aged 85 and over died of other heart diseases (38.1 compared to 29.2%). In no age category among total white males did diabetes account for as much as 3% of deaths, nor was nephritis as common a cause as among Jews, although the levels were low for both groups. Miscellaneous causes of death accounted for 10 to 17% of deaths in the various age categories 45 and over, but unlike among Jews, were slightly more important for younger than older age groups.

To allow overall comparisons between Jews and total white males, controls for age composition have been introduced by age standardization, using the 1980 Rhode Island age distribution of male decedents as the standard population. Again the comparisons are restricted to those aged 45 and over. The standardized data confirm the patterns revealed above, with a slight narrowing of differentials for some causes. The only significant differences in cause of death between the two male groups are the elevated percentage of Jews reported as dying from diabetes and the higher percent of non-Jews dying of respiratory ailments.

These differences are not readily explained by the available data: several factors may be operating. Since diabetes may to some extent be genetically determined, it is not surprising that the Jews, a group characterized by a high degree of in-marriage, should exhibit a relatively high incidence of deaths from this disease. The differentials in deaths from respiratory ailments may be linked to smoking and/or work conditions. A number of studies have found, for example, that the lower incidence of lung cancer among Jews is related to the fact that cigarette smoking is less frequent among them

**TABLE 5. DEATHS, BY PRIMARY CAUSE, BY AGE AND SEX: JEWS AND TOTAL WHITE POPULATION**

Cause of death	Under 20	20-44	45-64	65-74	75-84	85 and over	All ages	45 & over	Standardized for age*
<b>Jewish males</b>									
Total number	8	13	56	119	111	72	379	358	
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Acute myocardial infarction	-	-	32.1	24.4	23.4	9.7	21.1	22.4	24.1
Other heart diseases	-	7.7	14.3	21.8	27.9	29.2	23.0	24.0	22.5
Cerebrovascular disorders	-	-	7.1	3.4	8.1	6.9	5.8	6.1	6.3
Cancer	25.0	7.7	26.8	31.1	16.2	19.4	23.0	23.5	23.9
Diabetes	-	-	10.7	4.2	2.7	-	3.7	3.9	5.0*
Respiratory	-	-	1.8	-	5.4	9.7	3.7	3.9	3.5*
Nephritis	-	-	-	2.5	1.8	4.2	2.1	2.2	1.8
Accidents	-	53.8	3.6	4.2	0.9	-	4.0	2.2	2.5
All other causes	75.0	30.8	3.6	8.4	13.5	20.8	13.7	11.8	10.4
<b>Total white males</b>									
Total number	144	290	1,194	1,234	1,196	641	4,699	4,265	
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Acute myocardial infarction	-	5.2	25.7	24.6	20.9	14.8	20.6	22.4	
Other heart diseases	1.4	8.3	16.9	20.0	25.9	38.1	21.9	23.5	
Cerebrovascular disorders	-	0.7	2.6	6.2	9.1	7.6	5.7	6.2	
Cancer	6.3	15.5	29.5	26.8	22.2	13.7	23.2	24.3	
Diabetes	-	0.7	2.6	2.4	1.7	1.7	2.0	2.1	
Respiratory	0.7	0.7	3.8	6.4	7.4	9.8	5.9	6.5	
Nephritis	0.7	-	0.4	0.6	1.6	1.6	0.9	1.0	
Accidents	33.3	28.6	2.0	1.3	1.7	1.7	4.3	1.7	
All other causes	57.6	40.5	16.5	11.7	9.5	11.0	15.5	12.3	

than among Catholics or Protestants (e.g. Seidman, 1973; Herman and Enterline, 1973). Since the differential is especially pronounced among the younger age groups, this pattern, in particular, deserves closer study. On the other hand, although the proportions of deaths due to cancer and heart diseases appear very similar for the two groups, these rather general categories may mask important differences in types of cancer and heart disease.

In general, the major causes of death account for about the same percentage of Jewish female deaths as of males. However, cerebrovascular deaths are relatively more important among women than men, while the reverse holds for deaths from diabetes. Especially noteworthy is the relatively high percentage (14%) of deaths due to cerebrovascular disorders among Jewish women aged 45-64 and 85 and over. Deaths from respiratory diseases are also somewhat more prevalent among Jewish women than men, especially at younger ages. These differences remain when the data for Jewish women are standardized by the total white female decedent population. The data thus indicate the value of controlling for sex when analyzing cause of death.

If comparisons are made between Jewish and total white women, the patterns are

TABLE 5. (cont'd)

Cause of death	Under 20	20-44	45-64	65-74	75-84	85 and over	All Ages	45 & over	Standardized for age <sup>a</sup>
<b>Jewish females</b>									
Total number	2	5	43	71	145	90	356	349	
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Acute myocardial infarction	-	-	11.6	25.4	23.4	15.6	19.9	20.3	19.6
Other heart diseases	-	-	11.6	25.4	21.1	34.4	25.0	25.5	24.6
Cerebrovascular disorders	-	-	14.0	7.0	8.3	14.4	10.1	10.3	10.8
Cancer	-	20.0	37.2	32.4	20.7	8.9	21.9	22.1	22.2
Diabetes	-	-	2.3	-	3.4	1.1	2.0	2.0	1.8
Respiratory	-	-	4.7	1.4	4.1	8.9	4.8	4.9	5.1
Nephritis	-	-	-	1.4	2.1	1.1	1.4	1.4	1.3
Accidents	-	80.0	7.0	-	1.4	1.1	2.8	1.7	1.9
All other causes	100.0	-	11.6	7.0	12.4	14.4	12.1	11.8	11.7
<b>Total white females</b>									
Total number	90	125	645	885	1,360	1,268	4,373	4,158	
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Acute myocardial infarction	-	2.4	12.8	20.2	21.2	13.9	16.7	17.5	
Other heart diseases	2.2	3.2	12.7	19.7	30.1	39.5	26.8	28.1	
Cerebrovascular disorders	-	4.8	5.6	6.2	11.3	15.1	10.1	10.5	
Cancer	6.7	36.8	44.2	33.2	17.3	10.2	22.8	22.7	
Diabetes	-	0.8	2.5	3.2	2.3	1.4	2.1	2.2	
Respiratory	1.1	0.8	3.2	5.0	3.8	6.1	4.5	4.6	
Nephritis	1.1	0.8	0.6	0.4	1.0	0.9	0.8	0.8	
Accidents	14.4	20.8	1.9	1.4	1.7	1.6	2.4	1.6	
All other causes	74.4	29.4	16.5	10.7	11.3	11.3	13.7	12.0	

- a. In this and succeeding tables, standardization is restricted to those aged 45 and over; the 1980 Rhode Island male and female decedent populations were used as the standard.
- b. The proportion of Jews dying from specified cause is significantly different from that of the total whites dying from the same cause at the .05 level.

remarkably similar, both before and after age standardization. Overall, therefore, these data suggest that there are important differences in cause of death between males and females, and between Jewish males and total white males; but Jewish females closely resemble total white females in distribution by cause of death.

To go beyond simple distributions by cause of death, an attempt was made to estimate cause-specific mortality rates. As indicated earlier, no data were available on the number and age distribution of the Rhode Island Jewish population in 1980. Estimates are possible of the older population, however, given the known number of deaths and making certain assumptions about general mortality levels. Since earlier research (Goldstein, 1966) indicated that mortality rates of older Jews were substantially above those of the total white population in Rhode Island, it did not seem reasonable to apply 1980 Rhode Island rates for whites to the 1979-1981 Jewish deaths.

Nor did it seem reasonable to apply 1963 Jewish rates to the later data, since mortality rates overall have dropped considerably during the two decades. An assumption was therefore made that convergence had occurred between the Jewish and total white rates, so that the difference in the ratios of Jewish to total white mortality rates narrowed by 50%. For example, in 1960 Jewish males aged 65–74 had a mortality rate of 55.8 and total white males 52.5, making a difference of 6%. Assuming a convergence to 3% and given the total white male majority rate of 40.3, the Jewish male mortality rate was estimated as being 41.5. Similar calculations were made for the 75–84 and 85 and over age group, and for females (Appendix, Table A). With the estimated mortality rates and the known number of deaths, the number of persons in each age group could then be estimated. The total number thereby derived for males and females was used as the basis for calculating cause-specific death rates for the population aged 65 and over. Deaths at younger ages were too few in number to allow stable calculations. Even the somewhat larger numbers for the older ages were too small to produce any statistically significant differences between the Jewish and total white rates. The data which follow can, therefore, best be viewed as suggestive of the differential patterns that characterize cause of death.

Overall, the cause-specific rates for those aged 65 and over indicate that for both Jews and total whites, heart diseases, acute myocardial infarctions (AMI), and cancer rates are higher by far than rates for other causes (Table 6). As for the data indicating distributions by cause, the rates show that for males diabetes is somewhat more prevalent among Jews than total whites (though at low levels for both groups), and respiratory disease rates are very much higher among the latter group, 4.9 per 1,000, as compared to 0.7 per 1,000 for Jewish males. Among women, these differentials do not obtain, but Jewish women are characterized by somewhat higher death rates from AMI as well as from cancer, than are total white women. Whether these small differences are due to differential access to medical care or variations in life style cannot be ascertained from these data, although some clues may be available from analyses by socioeconomic status and place-of-birth for the Jews. More striking than the differences between Jewish and total white women are the close parallels in cause of death patterns.

### **Cause of Death and Socioeconomic Status**

Although the above analysis has indicated no sharp differences in distribution of age at death by socioeconomic status for males, or for females when homemakers are included, previous research on the general American population suggested that SES can be an important factor in determining cause of death (Kitagawa and Hauser, 1973). Because of the small number of cases available to this study, analysis of the relation between SES and distribution of deaths by cause will be restricted to males, and even then, the findings can only be viewed as suggestive.

For males, the overall patterns for the higher and lower SES groups are similar, and the differences narrow even more when the data are standardized for age (Table 7). The greatest absolute differences characterize deaths due to AMI and cancer; each cause accounted for a larger percentage of all deaths among high SES than among low SES males (for AMI 25.0 vs. 21.8%, for cancer 25.3 vs. 22.2%). Differences in distribu-

TABLE 6. CAUSE-SPECIFIC MORTALITY RATES (FOR SELECTED CAUSES), BY SEX, JEWISH AND TOTAL WHITE POPULATIONS AGE 65 AND OVER (ESTIMATED RATES PER 1,000)

Cause of death	Males		Females	
	Jewish	Total white	Jewish	Total white
Acute myocardial infarction	14.4	13.7	11.0	8.4
Other heart diseases	18.1	16.9	13.9	14.1
Cerebrovascular disorders	4.2	5.0	5.0	5.2
Cancer	13.7	14.5	10.1	8.6
Diabetes	1.9	1.3	1.0	1.0
Respiratory Diseases	0.7	4.9	2.5	2.2

TABLE 7. DEATHS, BY SOCIOECONOMIC STATUS GROUP AND SELECTED AGES: JEWISH MALES

Cause of death	45-64	65-74	75-84	85 and over	45 & over	Standardized for age
	Higher SES					
Total number	36	79	63	43	221	
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Acute myocardial infarction	30.5	30.4	22.2	9.3	24.0	25.0
Other heart diseases	13.9	20.2	31.7	23.2	23.1	22.1
Cerebrovascular disorders	8.3	1.3	7.9	4.7	5.0	5.6
Cancer	27.8	30.4	17.5	25.6	25.3	25.3
Diabetes	11.1	5.1	1.6	-	4.1	5.0
Respiratory	-	-	4.8	11.6	3.6	3.1
Accidents	5.6	5.1	1.6	-	3.2	3.5
All other causes	2.8	7.6	12.7	25.6	11.7	10.4
Lower SES						
Total number	19	40	43	29	131	
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Acute myocardial infarction	31.5	12.5	27.9	10.3	19.8	21.8
Other heart diseases	15.8	25.0	23.2	38.0	26.0	23.9
Cerebrovascular disorders	5.3	7.5	7.0	10.3	7.6	7.2
Cancer	26.3	32.5	14.0	10.3	20.6	22.2
Diabetes	10.5	2.5	4.6	-	3.8	5.0
Respiratory	5.3	-	7.0	6.9	4.6	4.5
Accidents	-	2.5	-	-	0.8	0.7
All other causes	5.3	17.5	16.3	24.2	16.8	14.7

tion vary considerably more within specific age groups, although the 45-64 age group is notable for very little difference by SES. Among older ages, distributions are quite variable but no consistent pattern appears to help explain the differentials for the two groups by age of death identified earlier (see Table 3). The differences between the

TABLE 8. DEATHS, BY CAUSE, BY PLACE OF BIRTH, SELECTED AGES AND SEX: JEWS

Cause of death	45-64	65-74	75-84	85 and over	45 & over	Standardized for age
<b>Males</b>						
U. S.-born						
Total number	54	95	55	21	225	
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Acute myocardial infarction	33.3	24.2	21.8	9.5	24.4	23.9
Other heart diseases	13.0	22.1	36.4	33.3	24.4	25.2
Cerebrovascular disorders	5.6	4.2	5.4	4.8	4.9	5.0
Cancer	27.8	32.6	16.4	23.8	26.7	25.4
Diabetes	11.1	4.2	-	-	4.5	4.3
Respiratory	1.8	-	7.3	4.8	2.7	3.3
Accidents	3.7	3.2	-	-	2.2	2.0
All other causes	3.7	9.5	12.7	23.8	10.2	10.9*
Foreign-born						
Total number	•	24	56	51	133	
Total percent	•	100.0	100.0	100.0	100.0	100.0
Acute myocardial infarction	•	25.0	25.0	9.8	18.8	21.8
Other heart diseases	•	20.8	19.6	27.5	23.3	21.7
Cerebrovascular disorders	•	-	10.7	7.8	8.3	5.8
Cancer	•	25.0	16.1	17.6	18.1	20.0
Diabetes	•	4.2	5.4	-	3.0	3.8
Respiratory	•	-	3.6	11.8	6.0	3.9
Accidents	•	8.3	1.8	-	2.2	4.0
All other causes	•	16.7	17.8	25.5	20.3	19.0

two groups are especially pronounced among the oldest age category. It is possible that not only occupational (SES) differentials are operating here, but also place-of-birth status. Older, lower SES males are more likely to have been born outside the United States than either higher SES older men or younger men regardless of SES. The health background of the lower SES older men may therefore vary considerably from that of the other males and be an important factor in differentiating them by cause of death.

### Cause of Death and Place of Birth

Since the foreign-born may have been exposed to quite different health and living standards than the native-born, place of birth status may be an important underlying variable in determining specific causes of death. For example, Russian-born (which would include a high percentage of Jews) have been shown to be at especially high risk from cardiovascular diseases and cancer of the gastro-intestinal tract and at low risk from cancer of the reproductive tract (Curtiss and Grahn, 1980). Among Rhode Island Jews, age-specific cause-of-death patterns may also reflect differences in the place-of-birth status of persons in the various age groups.

TABLE 8. (Cont.)

Cause of death	45-64	65-74	75-84	85 and over	45 & over	Standardized for age
Females						
U.S.-born						
Total number	37	51	65	24	177	
Total percent	100.0	100.0	100.0	100.0	100.0	100.0
Acute myocardial infarction	13.5	27.5	21.5	20.8	21.5	21.3
Other heart diseases	10.8	25.5	29.3	25.0	23.7	24.3
Cerebrovascular disorders	16.2	5.9	6.2	20.8	10.2	12.2
Cancer	37.9	33.3	21.5	8.3	26.6	22.6
Diabetes	-	-	4.6	-	1.7	1.5
Respiratory	5.4	-	-	4.2	1.7	2.1 <sup>b</sup>
Accidents	8.1	-	-	4.2	2.2	2.5
All other causes	8.1	7.8	16.9	16.7	12.4	13.5
Total number	*	20	80	66	172	
Total percent	*	100.0	100.0	100.0	100.0	100.0
Foreign-born						
Acute myocardial infarction	*	20.0	25.0	13.6	19.2	21.7
Other heart diseases	*	25.0	20.0	37.9	27.3	26.0
Cerebrovascular disorders	*	10.0	10.0	12.1	10.5	9.1
Cancer	*	30.0	20.0	9.1	17.4	18.3
Diabetes	*	-	2.5	1.5	2.3	1.3
Respiratory	*	5.0	7.5	10.6	8.1	6.7
Accidents	*	-	2.5	-	1.2	0.8
All other causes	*	10.0	12.5	15.2	14.0	16.0

a. Fewer than 10 cases.

b. The percentage of native-born Jews dying from specified cause is significantly different from that of the foreign-born Jews dying from the same cause at the .05 level.

When the data on cause of death are tabulated separately for the native-born and foreign-born (Table 8), the unstandardized data suggest that U.S.-born men are somewhat more likely to die of AMI and cancer than are the foreign-born; conversely, foreign-born males have a higher proportion of deaths caused by cerebrovascular disorders and respiratory diseases. Standardization for age narrows the differences between the two groups in most instances; the exception is 'other heart diseases'. For no specific cause of death are the differences statistically significant. If individual age groups are considered, the older age category among the foreign-born is particularly notable for a much higher percentage dying from respiratory ailments. Among those aged 75-84, the U.S.-born have substantially higher percentages of deaths due to other heart diseases and respiratory diseases than the foreign-born, but the reverse relation characterizes death from cerebrovascular disorders. Somewhat less variation appears among the younger age groups.

For women, the unstandardized and standardized data both indicate a relatively higher percentage of deaths from cancer and a lower percentage from respiratory ailments among the U.S.-born. The significantly higher percentage of foreign-born

women who died of respiratory ailments may be the result of differences in smoking habits or differences in their environment. Many foreign-born spent their early years in small factories or sweat shops, which may have impaired their respiratory systems. As for men, comparisons between specific age groups show somewhat different patterns but no regular relation appears, and, while age standardization narrows the differences for some causes, it widens them for a few others.

### Summary

In assessing factors that influence health and survival, the effect of religion and ethnicity has been of some interest because patterns of living, attitudes toward health and medical care, and genetic factors may all be related to religious/ethnic group membership. Such analysis is difficult, however, because official vital records do not collect information on religion or ethnicity. Using information provided by a newspaper and institutions handling Jewish deaths, this study has been able to identify 735 deaths that occurred to Jewish residents of Rhode Island during 1979–1981. Through matching with official death records, data were obtained on the characteristics of the deceased and on cause of death. Comparisons were therefore possible of Jewish/non-Jewish patterns of mortality and cause of death, controlling for age and sex, as well as analysis of differentials within the group of Jewish decedents, taking account of place of birth and occupation.

These data thus provide a unique opportunity to explore the patterns of death for a single religious group. Unfortunately, lack of information on the exact size and composition of the total Jewish population of Rhode Island generally precluded calculation of rates or of life table values. Comparisons with deaths in the total white population are therefore necessarily crude; differentials between the two groups are influenced by differentials in the age composition of the respective total populations. Standardization by age overcomes this limitation to some extent.

Consistent with previous research, the current study indicates that a lower percentage of Jewish males die at ages below 65 and more at ages 85 and over than is true of the total white population. By contrast, Jewish females exhibit a pattern of age at death similar to that of the general population, but with a higher percentage of Jewish women dying between ages 75–84. These sex differences characterize cause of death patterns as well: differences are more pronounced between Jewish and non-Jewish males than between the female groups. Restricting the analysis to persons aged 45 and over, for Jewish men as for total white males, heart diseases and cancer account for almost three-fourths of all deaths. Among Jews, respiratory diseases and diabetes each account for 4% of all deaths over age 45, and these percentages stand in sharp contrast to those for total white men. Jewish deaths from diabetes are significantly higher and from respiratory disease significantly lower than among total white men. Surprisingly, no such disparities in causes of death are found when Jewish females are compared to total white women. These patterns are confirmed by data on estimates of cause-specific mortality rates for those aged 65 and over in the two groups.

A unique aspect of the data set being used here is the availability of information on the socioeconomic characteristics of a large number of the Jewish decedents. Par-

ticular focus was on place of birth (U.S.-born/ foreign-born) and socioeconomic status (high/low) as indicated by usual occupations, because both types of characteristics are associated with differences in life styles and therefore access to the utilization of health services. Analysis by place of birth suggests that observed differences in cause of death between native-born and foreign-born are largely a function of their very different patterns of age at death. Only among women is there a significant difference for any single cause of death. A much higher proportion of foreign-born women died due to respiratory ailments. Socioeconomic status showed no clear or strong relation to patterns of age at death or cause of death, perhaps in part because the information on occupation is not as accurate as it is desirable, especially for women. The data do suggest, however, that higher SES males are more likely to die of acute myocardial infarction or cancer than lower SES men.

The relatively small number of Jewish deaths available to this study has limited the scope of the analysis as well as affected the variability of the distributions. Nonetheless, the differences identified in age specific patterns of death, in cause of death, and by socioeconomic characteristics point to the desirability of several directions for future research.

(a) Expansion of the time period under investigation would include more Jewish deaths. Such expanded numbers would allow more extensive analysis of selected causes of death, especially respiratory diseases, specific types of cancer, and diabetes. Such expansion would also allow assessment of mortality patterns by birth cohort. At the same time, more in-depth analysis is desirable, perhaps through matching of vital statistics records with hospital and physicians' records to allow determination of the extent to which underlying life-styles and/or genetic factors are responsible for some of the differentials.

(b) Especially valuable would be a sample of non-Jewish death records from which the full array of information on characteristics could be abstracted. More meaningful comparisons, controlling for background characteristics, would then be possible between Jewish and non-Jewish deaths, as would more in-depth research on causes of death. Such comparative research might be especially helpful in isolating the impact of religious identification on mortality.

(c) An expanded sample and in-depth analysis would also allow more exploration of sex differentials. Particularly deserving of further research is the question of why differentials in mortality appear when Jewish male decedents are compared with non-Jewish male decedents, while Jewish and non-Jewish female deaths appear to have very similar patterns.

(d) Long-term monitoring of patterns, extending both retrospectively back in time from 1979 and continuing into the future, would allow assessment of the degree of convergence between Jewish and total white patterns of mortality. Convergence of demographic patterns and characteristics has been posited for a number of groups in a variety of settings as the minority group becomes assimilated into the larger society or as developments in the larger society lead to adoption by the majority population of behavior more generally like that of a minority group. Some of the distinctiveness attributed to Jews in distribution seems to be lessening in recent years (Goldstein, 1981). Whether similar convergence characterizes mortality patterns, as Jews come to resemble non-Jews more closely, remains to be determined.

The present analysis suggests that in many respects, Jewish mortality very closely resembles that of non-Jews, and an assumption of some convergence has been made to estimate cause-specific mortality rates. Whether the similarity in mortality patterns is, in fact, the result of convergence over the last several decades could not, however, be determined with currently available data; and whether future convergence will occur as Jewish and non-Jewish life styles and characteristics become more nearly alike is also open to question. The current study can serve as a useful baseline for such extended research.

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### Note

1. After this article was written, a study of the Rhode Island Jewish population was carried out (Goldscheider and Goldstein, 1988).

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TABLE A. CALCULATION OF MORTALITY RATES FOR THE JEWISH POPULATION AGE 65 AND OVER

Age	1960 mortality rates <sup>a</sup>			1980 mortality rates		
	Jewish	Total white	Ratio	Total white <sup>b</sup>	Ratio assuming convergence	Estimated Jewish
Males						
65-74	55.8	52.5	1.06	40.3	1.03	41.5
75-84	124.4	108.2	1.15	88.3	1.08	95.4
85 and over	380.9	232.8	1.64	211.2	1.32	278.8
Females						
65-74	43.6	31.3	1.39	20.2	1.20	24.2
75-84	91.1	85.0	1.07	53.4	1.03	55.0
85 and over	328.1	202.9	1.62	160.3	1.31	210.8

a. Source: Goldstein, 1966.

b. Based on data in the 1980 U.S. Census for Rhode Island's total white population and in the State's 1980 Vital Statistics report.