

Does Religious Observance Promote Health? Mortality in Secular vs Religious Kibbutzim in Israel

ABSTRACT

Objectives. This study assessed the association of Jewish religious observance with mortality by comparing religious and secular kibbutzim. These collectives are highly similar in social structure and economic function and are cohesive and supportive communities.

Methods. In a 16-year (1970 through 1985) historical prospective study of mortality in 11 religious and 11 matched secular kibbutzim in Israel, 268 deaths occurred among 3900 men and women 35 years of age and older during 41 347 person-years of observation.

Results. Mortality was considerably higher in secular kibbutzim. Cox proportional hazards analysis was used to adjust for age and the matched design; rate ratios were 1.67 (95% confidence interval [CI] = 1.17, 2.39) for men, 2.67 (95% CI = 1.55, 4.60) for women, and 1.93 (95% CI = 1.44, 2.59) overall. Kaplan-Meier survival analysis of birth cohorts confirmed the association. The lower mortality in religious kibbutzim was consistent for all major causes of death.

Conclusions. Belonging to a religious collective was associated with a strong protective effect not attributable to confounding by sociodemographic factors. Elucidation of mechanisms mediating this effect may provide etiologic insights and leads for intervention. (*Am J Public Health.* 1996;86:341-346)

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Introduction

Awareness of psychosocial and cultural determinants of health is necessary as a renewed balance and integration is sought between organic biomedical and biopsychosocial models of causation.¹ The possible association of religion and religious observance with health status has long intrigued scholars of diverse disciplines (e.g., Galton²). The focal role of religion and its importance in the social and cultural context (as reflected by the persistence and resurgence of religion in human populations) suggest that study of this attribute may provide valuable insights into determinants of health and disease. The question of whether religious belief and practice promote health is unresolved, and the effect may vary according to religion.^{3,4} Different denominations have been compared, but few studies have considered the effect of religiousness within a single religious denomination.^{3,5} Except for studies of Mormons⁶ and Seventh-Day Adventists⁷ and a recent investigation of Chinese,⁸ most within-denomination studies have focused on church attendance as the variable expressing the degree of religiousness.^{3,5} However, attendance can be influenced by health status and may not be a determinant thereof.⁹ Investigation of other dimensions or expressions of religion is worthwhile.³⁻⁵

Several studies in the Jewish population of Israel have pointed to a protective association between religious orthodoxy and coronary heart disease.^{10,11} However, comparison across different degrees of observance among Jews in Israel may be confounded by other factors that have been related to morbidity and mortality, such as ethnic group,¹² social class,^{13,14} or the availability of social supports.¹⁵ Our

objective was to determine the association between Jewish religious observance and mortality among study populations with maximal similarity in social structure, social support mechanisms, and lifestyle. These similarities, despite religious differences, are found in Israeli kibbutzim.

Most of the kibbutzim (egalitarian collectives) were initially established by and affiliated with political movements that were secular in nature. A small number, representing about 6% of the total adult kibbutz population, were established by religiously observant Jews who maintained a homogeneous religious lifestyle in their settlements. Other than this central difference, secular and religious kibbutzim have been highly similar in their social and economic structure and function. Both are cohesive, supportive communities.^{16,17} The kibbutz population as a whole, relative to the general Israeli Jewish population, is characterized by low mortality.¹⁸ The question posed in our study was whether belonging to a religious community provides additional protection.

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TABLE 1—Person-Years of Exposure (PY) and Number of Deaths in Israeli Religious and Secular Kibbutz Members Aged 35 and Older, by Age Group, 1970 through 1985

	Type of Kibbutz	Age Group, y										Total	
		35–44		45–54		55–64		65–74		75+		PY	No. Deaths
		PY	No. Deaths	PY	No. Deaths	PY	No. Deaths	PY	No. Deaths	PY	No. Deaths		
Men	Religious	3628	1	3085	10	2588	20	910	18	73	2	10 284	51
	Secular	3730	9	2634	10	2568	37	1520	46	262	20	10 713	122
Women	Religious	3379	1	3143	4	2291	6	713	6	69	1	9 595	18
	Secular	3716	6	2615	7	2644	24	1528	27	252	13	10 755	77
Both	Religious	7006	2	6228	14	4878	26	1623	24	143	3	19 879	69
	Secular	7446	15	5249	17	5212	61	3048	73	514	33	21 468	199

Note. There were 924 men and 853 women on religious kibbutzim and 1072 men and 1051 women on secular kibbutzim (a total of 1996 men with 20 997 PY and 1904 women with 20 350 PY follow-up and a grand total of 3900 members with 41 347 PY follow-up). PY accrued within age groups at any time during follow-up, and number of deaths refers to those that occurred in the person-time in each age group. Small differences between the sum of the age-specific PY of exposure and the totals shown are due to rounding errors.

Methods

Study Design and Population

We undertook a historical prospective study of mortality in secular and religious kibbutzim over a 16-year period (January 1, 1970, through December 31, 1985). Eleven religious kibbutzim established before 1965 were pair matched with 11 secular kibbutzim from the labor movement according to the following criteria: same geographic locale, use of the same regional hospital, similar numbers of members 40 years of age and older, and dates of establishment as close as possible.

Included in the study were male and female members who were 35 years old or older at any time during the follow-up. Residents who were not members were excluded. Based on the population registry of each kibbutz, the population was reconstructed for January 1, 1970. Calculation of duration of exposure in these dynamic cohorts took account of in- and out-migration, achieving the age of 35 years, and deaths. The data available for this study included sex, date of birth, entrance into or departure from the kibbutz, and death.

Over the 16-year period, the 3900 individuals included in the follow-up contributed 41 347 person-years of observation, and 268 deaths occurred (Table 1). There were 16% fewer subjects in religious kibbutzim (1777) than in secular kibbutzim (2123); this difference was 7% in aggregated years of exposure (19 879 person-years in religious kibbutzim and

21 468 person-years in secular kibbutzim). The members of religious kibbutzim were younger; 8.9% of time (in person-years) accrued in those 65 years of age and over, in comparison with 16.6% in the secular kibbutzim (Table 1).

Stability of the population above the age of 35 years was marked in both types of kibbutz. There was less out-migration in the religious kibbutzim than in the secular kibbutzim, with losses of 63 and 162 individuals, respectively, over the 16-year follow-up. Of those who left religious kibbutzim, 75% did so before they were 50 years old; the corresponding figure for secular kibbutzim was 80%. Only 20 new members 50 years old or older joined the kibbutzim during the study period.

Information on Deaths

Data sources to ascertain deaths were (1) individual kibbutz population registers, which were verified and supplemented by records of primary care providers; (2) central population files of the religious and labor kibbutz movements; and (3) kibbutz burial and remembrance committees. Two hundred sixty-eight deaths were recorded, 69 in religious kibbutzim and 199 in secular kibbutzim. Members who left the kibbutz movement were not followed up for subsequent mortality.

Information on underlying cause of each death, as routinely coded between 1970 and 1985, was obtained from the Israel Central Bureau of Statistics. In addition, copies of death certificates were

retrieved and recoded according to the *International Classification of Diseases* (9th edition) (ICD-9) by a trained nosologist unaware of the study hypothesis or religious affiliations. Obvious discrepancies between the two sources were checked, and Central Bureau of Statistics codes were preferred unless unavailable (seven deaths) or clearly in error. In seven cases in which cause of death was coded as unknown (all out-of-hospital deaths), and in five cases with missing information for both sources, kibbutz clinic data were used to determine cause of death.

Statistical Analysis

Sex-specific mortality rates were calculated by the person-time method, based on months of exposure. Time was counted from entry into the study until death, out-migration, or conclusion of the study. Direct age adjustment (using 5-year age groups) was performed to account for differences in the age structure of the kibbutzim. Kaplan-Meier survival analysis was applied to birth cohorts,¹⁹ and mortality in religious vs secular populations was compared by the log rank test. Cox proportional hazards analysis, with age introduced as a continuous variable, was used to incorporate the matched design of the study by summarization across the 11 paired strata.^{20,21} The effect of the method of sampling (by cluster) was evaluated. This effect was shown to be negligible and was disregarded in the analyses presented (a description of the statistical assessment of the cluster sampling is available from the authors).

Results

For each sex, there was a substantial excess rate of death for members of secular kibbutzim relative to members of religious kibbutzim (Table 2). The age-adjusted rate ratios were 1.76 (95% confidence interval [CI] = 1.26, 2.46) in men, 2.72 (95% CI = 1.60, 4.62) in women, and 1.98 (95% CI = 1.50, 2.62) in the sex-pooled data. The association was generally consistent across 10-year age groups. The age-adjusted mortality rates for religious kibbutzim were 5.67 (SE = 0.82) per 1000 person-years for men and 2.33 (SE = 0.57) per 1000 person-years for women. For secular kibbutzim, the rates were 9.96 (SE = 0.91) per 1000 person-years for men and 6.34 (SE = 0.72) per 1000 person-years for women.

Cox proportional hazards analyses confirmed these findings: the rate ratios were 1.67 (95% CI = 1.17, 2.39; $P < .01$) for men, 2.67 (95% CI = 1.55, 4.60; $P < .001$) for women, and 1.93 (95% CI = 1.44, 2.59; $P < .0001$) for the total population (controlling for sex). The apparently stronger protective effect of religiousness in women than in men, tested by introduction of a term for interaction into the Cox model, was associated with a P value of .088.

In light of a secular (time) trend toward reduced mortality in Israel during the study period,¹² the follow-up was subdivided into three periods: 1970 through 1975 (62 deaths, 12 822 person-years), 1976 through 1980 (80 deaths, 12 901 person-years), and 1981 through 1985 (126 deaths, 15 624 person-years). Excess mortality in the secular kibbutzim was apparent in each period in both sexes (Table 2).

The time trend in mortality, the younger age of the religious kibbutz population, and the person-time method of analysis used could have produced an apparent excess in secular kibbutz mortality as a result of a possible cohort effect. This possibility was further explored by Kaplan-Meier survival analysis of the mortality experience of 10-year birth cohorts during our study period (1970 through 1985). Excess mortality at the end of follow-up was apparent in secular kibbutzim in all cohorts except the youngest (those born between 1940 and 1950; there were only seven deaths in this cohort) (Table 3). Even in this age group, a comparison of the observed and the expected mortality over the entire follow-up (as assessed by the log rank test)

TABLE 2—Age-Adjusted Rate Ratios and 95% Confidence Intervals of Mortality from All Causes: Secular vs Religious Kibbutzim, 1970 through 1985

Period	Rate Ratio (95% Confidence Interval)		
	Men	Women	Total
1970–1975	1.85 (1.33, 2.58)	3.84 (2.24, 6.58)	2.16 (1.33, 3.50)
1976–1980	1.56 (1.07, 2.27)	5.80 (3.22, 10.45)	2.18 (1.59, 2.99)
1981–1985	1.74 (1.06, 2.86)	1.99 (1.01, 3.90)	1.80 (1.21, 2.68)
1970–1985	1.76 (1.26, 2.46)	2.72 (1.60, 4.62)	1.98 (1.50, 2.62)

TABLE 3—Survival Probabilities and Relative Risk of Death in Secular vs Religious Kibbutzim between 1970 and 1985 for 10-Year Birth Cohorts Born between 1900 and 1950: Kaplan-Meier Analysis

Birth Cohort	Secular Kibbutzim			Religious Kibbutzim			Relative Risk	P^a
	No. Sub-jects	No. Deaths	Probability of Survival (SE)	No. Sub-jects	No. Deaths	Probability of Survival (SE)		
1900–1909	130	61	.518 (.044)	35	12	.657 (.080)	1.4	.21
1910–1919	381	77	.793 (.021)	252	29	.883 (.020)	1.77	.003
1920–1929	344	35	.891 (.017)	427	21	.950 (.011)	2.18	.002
1930–1939	434	15	.960 (.010)	410	4	.987 (.007)	3.08	.007
1940–1950	822	4	.991 (.005)	653	3	.952 (.042)	0.19	.88
1900–1950	2111	192 ^b		1777	69 ^b		1.89	<.0001

Note. Twelve members of secular kibbutzim born before 1900 were excluded.

^aFrom log rank test.

^bExpected numbers of deaths were 155.3 in secular kibbutzim and 105.7 in religious kibbutzim ($\chi^2 = 23.01$; $P < .0001$). Division into 5-year birth cohorts provided similar results, with expected numbers of deaths of 156.3 in secular kibbutzim and 104.7 in religious kibbutzim ($\chi^2 = 22.01$; $P < .00001$; relative risk = 1.86).

showed a slight excess in secular kibbutzim (mortality ratio = 1.1).

The underlying cause of death was categorized into the following groups: all circulatory conditions (ICD-9 codes 390 through 459), of which 73% were coronary heart disease (ICD-9 codes 410 through 414); all neoplasms (ICD-9 codes 140 through 239); all external causes (comprising road accidents, all other accidents, and suicide); and all other causes taken together (Table 4). These four categories, respectively, accounted for 117 (44%), 83 (31%), 22 (8%), and 46 (17%) of the 268 deaths. The main contribution of this cause-specific analysis is in demonstrating the overall consistency of the association across major diagnostic categories. For each cause of death, when men and women were grouped together, those in secular kibbutzim exhibited significantly higher overall rates than those in religious kibbutzim. The rate ratios ranged from 1.7 to more than 4 across the different diagnostic groups, an excess

evident in each sex in most diagnostic groups (Table 4).

Discussion

Summary of Findings

There was a distinctly lower mortality rate in religious kibbutzim than in secular kibbutzim that was evident in both sexes, evident at all ages, and consistent throughout the 16-year period of observation. The lower mortality persisted, with remarkable overall consistency, across the major categories of underlying cause of death. The magnitude of the protective effect associated with membership in a religious kibbutz is exemplified by ablation of the usual female mortality advantage: secular women did not live longer than religious men.

Possible Biases

The possibility that confounding by sociodemographic variables could explain

TABLE 4—Age-Adjusted Cause-Specific Mortality Rates (per 1000 Person-Years) and Rate Ratios, 1970 through 1985

Cause of Death (ICD-9 Codes)	Gender	Secular Kibbutzim		Religious Kibbutzim		Rate Ratio	95% Confidence Interval
		No. Deaths	Rate	No. Deaths	Rate		
Coronary heart disease (410–414)	Men	45	3.8	14	1.6	2.40	1.30, 4.42
	Women	19	1.4	7	1.1	1.31	0.54, 3.18
	Both	64	2.6	21	1.3	1.93	1.16, 3.20
All circulatory conditions (390–459)	Men	60	4.8	22	2.6	1.88	1.14, 3.10
	Women	27	2.0	8	1.2	1.73	0.77, 3.89
	Both	87	3.4	30	1.9	1.78	1.16, 2.73
Neoplasms (140–239)	Men	27	2.4	18	2.0	1.16	0.63, 2.14
	Women	30	2.6	8	0.9	3.05	1.37, 6.78
	Both	57	2.5	26	1.5	1.67	1.04, 2.69
External causes ^a	Men	13	1.25	4	0.36	3.47	1.13, 10.64
	Women	5	0.47	0	0.00
	Both	18	0.86	4	0.18	4.78	1.62, 14.13
All other causes	Men	22	1.63	7	0.76	2.14	0.90, 5.06
	Women	15	1.18	2	0.32	3.69	0.84, 16.19
	Both	37	1.4	9	0.55	2.54	1.21, 5.33

^aRoad accidents, work accidents, other accidents, suicide.

TABLE 5—Sociodemographic Characteristics of Members of Five Secular and Five Religious Kibbutzim, 1991

	Secular Kibbutzim		Religious Kibbutzim	
	Women	Men	Women	Men
No.	120	99	120	116
Country of origin of father, %				
Europe	79	78	88	92
Israel	9	11	3	4
Asia/Africa	12	11	9	4
No. of children	3.3	3.3	4.4	4.6
Schooling, y	11.4	11.2	11.2	11.2
Higher education, %	57	55	55	55
Marital status, %				
Married	79	88	91	98
Divorced	13	1	3	0
Religiousness, %				
Orthodox	1	0	90	94
Nonobservant	90	98	1	0

Note. Members were 35–64 years of age when studied. Equal numbers of men and women were invited to participate. Five members with missing data were excluded.

the findings seems remote. Selected socio-demographic data are available from a subsequent separate cross-sectional study we conducted in 1991 on an age-stratified sample of men and women 35 to 64 years of age in five of the religious and five of the matched secular kibbutzim initially studied. A total of 460 people participated (a response rate of 79%) (unpublished data) (Table 5).

Ethnic origin is associated in Israel with differential mortality.¹² However,

members of the kibbutzim studied were overwhelmingly of European origin (Table 5). Educational level was almost identical between the kibbutz types (Table 5). Occupation and standard of living were very similar in religious and secular kibbutzim, although personal consumption of goods in the religious kibbutzim tended to be lower.²² The economic structure and advanced technology of the kibbutzim were almost identical. Hence, social class differences, an important

determinant of health,^{13,14} cannot explain the findings. Duration of membership in the kibbutz, another potential confounding variable, did not affect the strength of the association when included in the multivariable Cox survival models.

Absence of social supports has been repeatedly shown to be associated with elevated mortality.^{15,23} One of the possible explanations for a protective effect of being religious is the benefit derived from support by the group.^{3–5} However, kibbutz society in general is characterized by strongly structured support mechanisms consisting of both formal and informal networks.^{16–18,24} Indeed, perceived and instrumental social supports assessed in the cross-sectional study we conducted in 1991 in 10 of the kibbutzim were similar in the religious and secular individuals (unpublished data). Provision, quality, and accessibility of primary care services, also possible determinants of mortality, were equally high in each kibbutz, and the geographic proximity and use of the same secondary and tertiary care facilities ensured equality of access.

The possibility of bias in completeness of ascertaining all deaths is small. Considerable effort was expended in obtaining complete mortality data and in cross checking alternative sources of information. As for underlying cause of death, differences in the quality of certification—in hospitals, in other medical institutions, or in deaths occurring in the community—are unlikely. Similar proportions of religious and secular deaths occurred in hospitals, and the same regional hospital served each matched pair of kibbutzim. Also, it is most unlikely that bias occurred in coding underlying causes of death because reclassification by a nosologist unaware of the study hypothesis produced nearly identical results.

Selection bias requires consideration. Might there have been differences in the health characteristics of those who established, joined, or left religious vs secular kibbutzim that could have led to such substantial differences in subsequent mortality? Such a “healthy worker effect”²⁵ or “healthy migrant effect”²⁶ probably operated within both types of kibbutz. However, it is difficult to conceive of a reasonable mechanism whereby this could differentially affect religious and secular kibbutzim. There is no evidence that religious kibbutzim were more stringent in the health criteria used in selecting founding members and new members, and neither type of kibbutz had a policy of dismissing unhealthy members. Indeed, in

both types of kibbutz hardiness was required for similarly strenuous physical labor and the difficult living conditions, particularly in the early years. Furthermore, the small number of members who left either type of kibbutz during the 16-year study period (3.5% of religious and 7.6% of secular members) reflects the stability of the population. The low overall mortality of kibbutzim¹⁸ suggests that differential out-migration of healthy members since establishment of the kibbutzim, leaving a more disease-prone residue, is an improbable explanation. While the selection argument cannot be totally discounted, it is unlikely that differential forces of selection at various ages and time periods were operative between the two kibbutz movements or, if present, could have been of a sufficient magnitude to produce the effects we documented.

Mortality Differences and Characteristics of Religious vs Secular Kibbutzim

We compared two societies living in almost identical cohesive communal settlements with the same kibbutz ideology of equality and sharing in production and in fulfilling needs. Those residing in secular kibbutzim are almost all agnostic or nonreligious, whereas almost all of those residing in religious kibbutzim are religiously orthodox and observant (Table 5).

Conventional Risk Factors

Differences in the more traditional risk factors such as diet, smoking, obesity, alcohol intake, exercise, and exposure to accidents might play a role. Information on these factors, some of which may be viewed as potential intervening variables in a causal pathway rather than as confounders (i.e., they are determined by religious practices), was not available at the onset of this historical prospective study. For example, travel is forbidden on the Sabbath and on certain holidays. Furthermore, other studies have shown intakes of saturated fatty acid and total fat to be moderately lower among religiously orthodox urban dwellers^{10,27} and intake of fish greater (Kark JD et al., unpublished data, 1987–89 and 1989–91). Much of the difference in fat intake was attributed to the kashrut ritual of milk products and meat not being consumed at the same meal. However, there are no proscriptions against use of alcohol, coffee, tea, and tobacco (except the latter, which is not permitted on the Sabbath and some holidays) and no encouragement of exer-

cise, in contrast with Mormons and Seventh-Day Adventists.^{6,28}

In urban populations in Israel, blood cholesterol concentrations and the prevalence of cigarette smoking have been shown to be lower in those who are religiously orthodox.^{10,27} However, levels of blood pressure, exercise, and adiposity have been shown to be similar in the two groups.^{10,27}

Conventional risk factors for mortality were compared in the cross-sectional study of 1991. Blood pressure and body mass index were similar between the kibbutz groups. Plasma cholesterol was higher in the secular kibbutzim (by 16 mg/dl in women and 6 mg/dl in men), and high-density lipoprotein cholesterol and triglyceride were higher in secular women (by 3 mg/dl and 14 mg/dl, respectively). Religious men and women reported a diagnosis of diabetes (9% and 6%, respectively) more frequently than secular men and women (3% and 2%, respectively). Smoking was more frequent in secular kibbutzim, in which 19% of men and 18% of women smoked regularly (vs 12% and 6%, respectively, in religious kibbutzim). Differences were greater in terms of individuals ever having smoked regularly (56% vs 42% for men and 48% vs 14% for women).

As a means of assessing the potential effect of risk factor differences, logistic regression coefficients for these variables were derived from three separate mortality studies of the Israeli population, two involving men and one involving both men and women (the Israel Ischemic Heart Disease Study²⁹; the Kiryat Hayovel Community Health Study Mortality follow-up [Kark JD, Yofin J, Epstein L, Abramson JH, unpublished data, 1969–71 through 1993]; and the Jerusalem Lipid Research Clinic Study mortality follow-up [Kark JD, Friedlander Y, Stein Y, unpublished data 1976–79 through 1988]). These coefficients were applied to the 35- to 64-year-old kibbutz members studied in 1991. Estimates of the relative risk of mortality in secular vs religious kibbutzim reflecting the risk factor differences were on the order of 1.0 to 1.2. Assuming that these risk factor differences measured in 1991 reflected those that prevailed during the incidence study between 1970 and 1985, other explanations for the protective effect associated with living on a religious kibbutz should be sought.

Amelioration of Stress

A cogent explanation for the salutary effect of living on a religious kibbutz

would need to relate to a pervasive protectivity evident for all main causes of death (see Table 4). A major possibility is that such a social environment induces less stress, enhances host resistance, and promotes overall well-being and a positive health status, consistent with the hypotheses proposed by Cassel³⁰ and Antonovsky.³¹ In line with this concept is a previous finding that although orthodox Jewish men reported more “problems,” they were less worried by them.¹⁰

Possible components of stress reduction include the following:

1. An overall coherent world view⁵ and sense of belonging (over and above that peculiar to the kibbutz) that could promote emotional well-being.

2. A relaxation response³² induced by frequent prayer. However, this pertains almost exclusively to orthodox men, who pray together up to three times daily, but not to orthodox women. They usually attend prayers only on the Sabbath (if at all) as well as holidays, but are apparently protected from premature morbidity as much as the men, if not more so. The communal aspects of prayer may be important (see component 6).

3. Belief in the Almighty and religious heteronomy. The authority setting normative behavior in the orthodox religious is derived from an external divine source, whereas secular autonomy determines that the source is within people.²²

4. Repetitive ritualistic behaviors based on the religious law that governs many aspects of a carefully regulated life, resulting in less ambivalence and exposure to stress (orthodox certainty and determinism vs secular ambiguity and doubt). Strict observance of the Sabbath and festivals dedicated to rest and prayer may also contribute to stress reduction.

5. Highly stable marital bonding in the religious kibbutzim. The kibbutz is a close-knit, family-oriented society, but the divorce rate was 11-fold higher in secular than in religious kibbutzim.³³ Between 1974 and 1984, there were only 10 divorces in all 17 religious kibbutzim in Israel (0.7% of the 1381 married couples). Our cross-sectional study of 1991 confirmed these differences (Table 5). There is very strong social pressure in religious kibbutzim against dissolution of marriage, with preservation of the family a top priority. Marital expectations appear to be lower with regard to satisfaction of individual needs, with fewer prior illusions and consequently less disillusionment.³³ The birth rate is higher (as seen also in Table 5), which may in itself be

protective for certain cancers in women. The traditional attitudes toward marriage and the family are similar to those prevailing among Mormons,³⁴ another population characterized by low mortality. However, differences in mortality between single, divorced, and married individuals evident in the general population¹² cannot explain more than a small fraction of our study findings.

6. A sense of well-being deriving from living in a cohesive religious community. Although social supports are substantial in secular kibbutzim, participating in a religious collective may reinforce the shared attributes of the secular socialistic collective and provide additional support. In this regard, daily and Sabbath communal prayer enhances the feeling of collective solidarity.²² In a cross-sectional study of a religious kibbutz and a secular kibbutz, recent stressful life events were associated with adverse health status among members of the nonreligious, but not the religious, kibbutz.²⁴ Anson and coworkers²⁴ invoked Durkheim^{35,36} in their investigation of the possible protection and enhanced ability to cope with stress afforded by collective attributes of religion rather than by individual religiosity. Durkheim showed that religions with better social integration provided greater protection against suicide. This was confirmed by Pescosolido and Georgianna, who inferred that religious networks provide additional social support and guidance at times of personal crisis, reducing the risk of suicide.³⁷ Our findings for suicide are consistent in this regard; five members of secular kibbutzim committed suicide vs one in a religious kibbutz.

Conclusions

The breadth of the protective effect, encompassing all major causes of death, and its strength, reflected in the elimination of the sex difference in mortality between religious men and secular women, are remarkable.

Our study suggests that even when the increasingly recognized and powerful effects of socioeconomic differences on the health of populations^{13,14,38} are removed and a high level of health is attained (as in an egalitarian utopian society such as the kibbutz), profound influences of the social environment on health may remain. Understanding how this embracing protective effect of religious observance is actually mediated

could provide valuable etiologic insights. □

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