Hadassah, The Women's Zionist Organization of America

The Israel Women's Network

Israel Center for Disease Control (ICDC) Ministry of Health

Hadassah-Israel

Women's Health in Israel 1999

A Data Book

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Introduction

We are pleased to present this data book, which came in being as a result of intensive advocacy efforts by the Israel Women's Network (IWN) and Hadassah-Israel to have women's health recognized as a separate area of concern in the Ministry of Health. The urgent need for current data became evident to those who were working to promote awareness of the unique health issues of women among policy and decision-makers and to assure equitable allocation of limited resources.

At a meeting in October, 1995, Dr Boaz Lev, deputy director of the Ministry of Health, agreed to convene a professional steering committee on women's health in the Ministry, and it was agreed that, if the necessary resources could be obtained, the Israel Center for Disease Control would collaborate in producing a women's health data book. Subsequently, the IWN, with the support of Hadassah-Israel, enlisted Hadassah, the Women's Zionist Organization of America (HWZOA), to provide the major funding for the book. The American Physicians Fellowship for Medicine in Israel (APF) agreed to sponsor the chapter on heart disease.

This cooperative project of the IWN, HWZOA and the ICDC of the Ministry of Health is an excellent example of how non-governmental organizations (NGO's) can influence the public sector to direct attention and resources towards neglected areas.

The specific goals for the Data Book were:

- to identify and collate existing data on women's health in Israel;
- to identify areas in which data are lacking;
- to generate preliminary recommendations for initiatives in research, policy, education and services, based on the findings.

The book includes chapters on demographic characteristics, life expectancy, mortality and leading causes of death of women in Israel, reproductive health, cancer, heart disease, stroke, selected other chronic diseases and disability, mental health, health behavior and use of services, and injuries and violence. It is intended to use the data to monitor changes over time, and to evaluate interventions.

Other important areas of women's health were not included because of a lack of sound data and limitations of time and resources. Among these are occupational health, environmental influences on health and certain infectious diseases. The diversity of the Israeli population was not always fully addressed, and health concerns of special groups, such as women in the army, women with disabilities, ultra-orthodox women, Beduin women and lesbians need to be studied. In addition, gender differences in health expenditure need to be examined. These and other issues will be addressed in future, updated editions of this book.

We hope that this book will be of interest and use to health care professionals and decision makers as well as to concerned lay persons. It has been a major challenge to address such a wide variety of audiences; we hope we have succeeded in some measure.

One immediate and gratifying result of the data book project has been the initiation of the ICDC National Women's Health Survey. We believe that this book will provide the basis for ongoing projects on women's health in the ICDC.

Suzanne Brown

Dr Diana Flescher

Prof Manfred S. Green

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- The Women's Health Data Book Project was funded by an educational grant from Hadassah, The Women's Zionist Organization of America (HWZOA).
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Miri Ziv	Director, Israel Cancer Association

Finally, I wish to thank Sharona Segal for her friendly support in addition to her professional skill, and Jenny Kertes, for her generous assistance in the completion of this book.

Anneke Ifrah

Editor

A message from the Minister of Health

The publication of the data book on women's health in Israel deserves a warm welcome. I wish to offer special congratulations to the Israel Women's Network, to Hadassah, the Women's Zionist Organization of America, to Hadassah-Israel and to the Israel Center for Disease Control of the Ministry of Health, for this significant initiative.

As Minister of Health, the delivery of health care and services for women was always a priority topic on my agenda. When I assumed my position, I instructed the Ministry's various departments and divisions to regard the issue as top priority. In today's perspective, I believe that we have passed the stage of recognition of the difference between the health needs of women and men and the need for special attention to the subject of women's health.

The Data Book project is a very important undertaking. This is the first time that data on women's health in Israel have been published in a single volume, with the purpose of presenting existing information and indicating in which areas data are lacking. I am certain that the book will be of great assistance to all those dealing with women's health, and will serve to promote the development of this important area.

I would like to congratulate all those involved, and to promise any assistance that may be required in the future.

Joshua Matza
Minister of Health.
June, 1999.

A Message from the National President of Hadassah, The Women's Zionist Organization of America

Hadassah, HWZOA, Inc. has continued its pioneering efforts toward improving health standards in Israel by supporting the development and realization of the Data Book on Women's Health in Israel. Working with Hadassah-Israel, the Israel Women's Network and the Israel Center for Disease Control (ICDC), Hadassah is proud to have had a part in the publishing of this well-researched book on women's health in Israel that will serve as a definitive reference for decision-makers, health care providers and the scientific community. It will also serve as a vital tool for advocacy, legislation and education, in the continuing efforts to provide appropriate care in the area of women's health, as well as highlighting the need to establish a permanent unit for women's health in the ICDC.

Marlene Edith Post

Made possible by Hadassah,
The Women's Zionist Organization of America, Inc.

Produced by the Israel Women's Network in cooperation with the Israel Center for Disease Control

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Highlights

Morbidity

- In the 1993 National Health Survey, 20% of women over age 65 (as compared with 27% of men) were reported as suffering from heart disease.
- In a recent national survey of women's health, 11% of women aged 45-75 reported that they had been diagnosed with heart disease, and 6% were being treated with medication.
- In 1995, the age-adjusted incidence of acute myocardial infarction among residents aged 25-74 in the Jerusalem area was 3 times higher in men; however, case fatality rates one year after the event were 50% higher in women.

Mortality

- Heart disease is the leading cause of death in Israeli women, as it is in men.
- In 1995, heart disease was responsible for almost one third of all deaths among women.
- Age adjusted mortality rates for heart disease are approximately 40% higher among Arab women than among Jewish women.
- Among Jewish women, the highest age-adjusted mortality rates are for those born in North Africa and the lowest are for Israeli-born women.
- In studies of patients hospitalized for acute myocardial infarction, in-hospital mortality, one-year mortality and 12 year mortality rates are higher for women than for men.
- In one large study, women undergoing coronary artery bypass grafting were found to have a threefold mortality risk, compared to men.
- Mortality due to ischemic heart disease in 1995 was third highest in Israeli women, compared to women in the 15 European Community countries. Men were ranked in 9th place for heart disease mortality. The female-male mortality advantage (a mortality rate ratio of 1.6) was smaller for Israeli women than for women in all these countries.

Trends

- Over the past 20 years, age adjusted heart disease mortality has decreased by approximately 30% in women, and 27% in men.
- Between 1975-1995, age adjusted mortality from ischemic heart disease declined by 46% in women and by 43% in men, with the greatest decrease occurring in mortality from acute myocardial infarction.
- The decrease in heart disease mortality is more evident in Jewish women than in Arab women.

higher rates of ischemic heart disease mortality than Israeli women. Moreover, the male/female mortality ratio in Israel (1.6) is considerably lower than that of all the other countries listed, where the ratios range between 1.9 and 2.4 (Figure 13). In other words, the mortality advantage of Israeli women vis-a-vis Israeli men is significantly smaller than in western European countries. Similar trends were reported as early as 1976 by the late Sidney Kark (25), who hypothesized at the time that the social disequilibrium resulting from mass migration, especially family disorganization with selective stressful effects on women could possibly explain the low male:female ratios in mortality as well as the relatively high rates for Israeli women. The persistence of these trends into the 1990's is an issue that merits further careful investigation of various hypotheses, including those related to possible sex-related differences in diagnosis and treatment.

Women and men with CHD

In this section we take a closer look at sex differences in mortality after MI and in the management of heart disease.

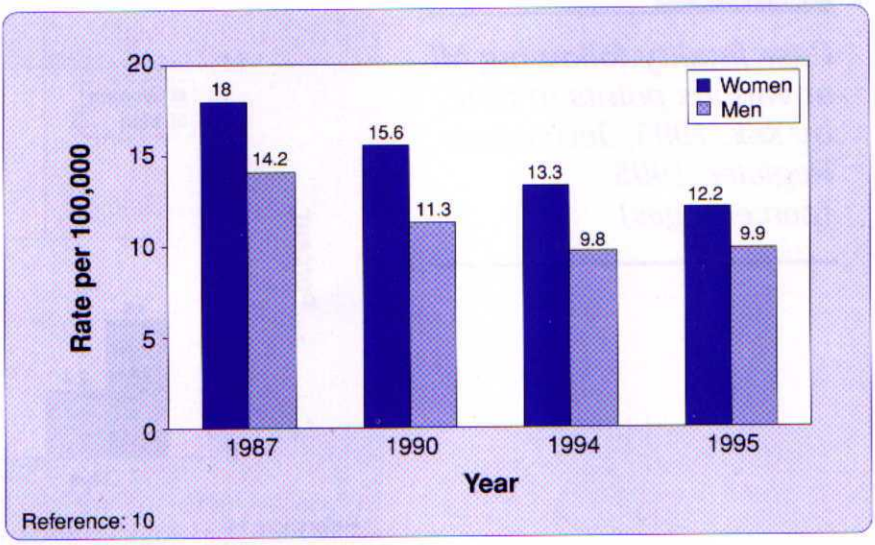
Mortality following MI

National hospitalization data

Data based on the centralized hospitalization data base of the Ministry of Health for the years 1987-1995 indicate that age adjusted, in-hospital case fatality after acute myocardial infarction (MI) was consistently higher among women than men (Figure 14) (10). The sex differential was evident both in patients admitted to Internal Medicine wards and to an even greater extent among those admitted to Coronary Care Units.

The Acute MI Register, Jerusalem: case fatality

As previously reported, incidence rates of MI based on the Acute MI



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Heart disease is the leading cause of death for both Jewish and Arab women in Israel, as it is for men (1). In spite of the widespread view that heart disease is predominantly a man's disease, almost as many Israeli women as men die of heart disease each year. In 1995, heart disease accounted for just under one third of all deaths in women, and among women over the age of 65, close to 40% of all deaths were attributed to heart disease. Over 60% of these deaths were caused by ischemic heart disease (1). It is estimated that close to 30,000 women are hospitalized each year for heart disease (2).

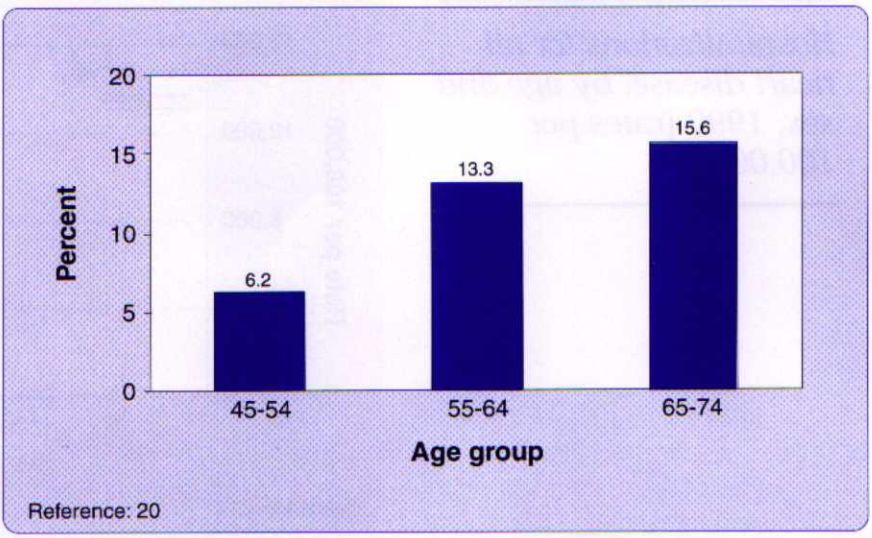
Women develop ischemic heart disease on the average about 10 years later than men; their symptoms are often different from those of men, and they are more likely than men to be suffering from co-existing illnesses (3,4). As in other countries (5-8), mortality rates after acute myocardial infarction and following coronary bypass surgery in Israel are higher among women than men (9-14). Among the factors cited to explain this excess mortality are the older age of women patients, their smaller body size and consequently, narrower arteries, and more frequent and more severe coexisting illnesses (15).

Another possible explanation for the poorer prognosis of women with heart disease is that the care women patients receive may be delayed, resulting in less favourable outcomes (3,7). Although little information on this subject exists in Israel, evidence from studies conducted in a number of other countries suggests that there may be a gender bias in the diagnosis, referral and treatment of coronary heart disease in women (7,16-18). It has been reported that women undergo invasive and non-invasive evaluations and treatments for heart disease less frequently than men; particularly with regard to the evaluation of chest pain (15). It is not yet clear whether the worse prognosis of women with heart disease may reflect a different type of pathology with unique aspects for women; or whether to some extent this can be attributed to the level of awareness and help-seeking behavior of women themselves; and/or to what extent the attitude of the physician and the health care establishment in general towards women and their symptoms can be held accountable.

Morbidity

All heart disease

Included in this chapter under the general heading "heart disease" are: acute myocardial infarction, other ischemic heart disease, angina pectoris, congestive heart failure, hypertensive heart disease, pericarditis, myocarditis, cardiac dysrhythmias and other diseases of the heart. In the absence of a recent long-term, community based study of the incidence and determinants of heart disease in women and men, data available on the prevalence of heart disease have been collated from a variety of sources, including national health surveys and hospitalization reports.



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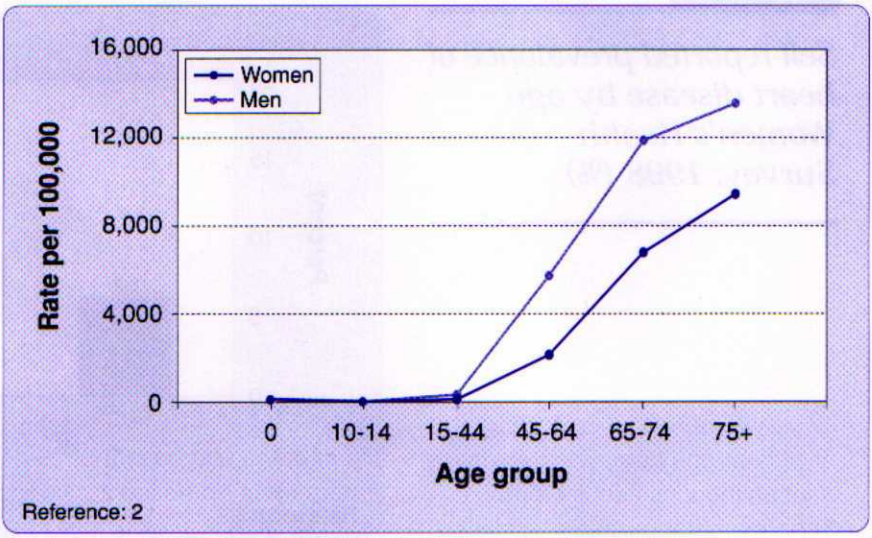
1. National health surveys

- The national Use of Health Services Survey of 1993 (19) reported that 19.9% of women aged 65 and over were suffering from heart disease, as compared to 26.9% of men. The reported prevalence of heart disease among women aged 45-64 was 7%. These data are based on self reports or proxy reporting by one adult individual in each household in a representative, national sample of 5,738 households.
- In a recent national survey of women's health (20) 11% of women aged 45-75 reported that they had been diagnosed with heart disease, and 6% were being treated with medication. The reported prevalence of heart disease was 6.2% for women aged 45-54, 13.3% for women aged 55-64, and 15.6% for women aged 65-74 (Figure 1).

2. Hospitalizations

In the absence of more recent official hospitalization data, the figures presented here are for 1990. During 1990, 27,763 women were hospitalized for heart disease (2). The overall annual hospitalization rate for heart disease was 118.7 per 10,000 for women, as compared to 202.2 per 10,000 for men. Extrapolating to 1997 population figures, the number of women hospitalized each year for heart disease can be estimated very approximately at 33,000; however, since hospitalizations, as based on official figures, include not only discharges from the hospital but also internal transfers from ward to ward, this figure is probably an overestimate.

The sharp increase in hospitalization rates among women occur at a later age (above age 65) than among men, whose hospitalization rate increases sharply after age 45



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(Figure 2). Hospitalization rates for women were considerably lower than for men at all ages (Figure 2); even at ages 75 and over, when heart disease mortality rates are only 10% higher for men than for women (1), hospitalization rates were 50% higher for men than for women.

These disproportionate gender differences in hospitalization rates among older women and men may be indicative of a tendency for heart disease in women to be diagnosed and treated at a relatively late stage of the disease; or they may reflect a greater tendency for men to be more aggressively treated and thus transferred from ward to ward in the same hospital.

Myocardial Infarction

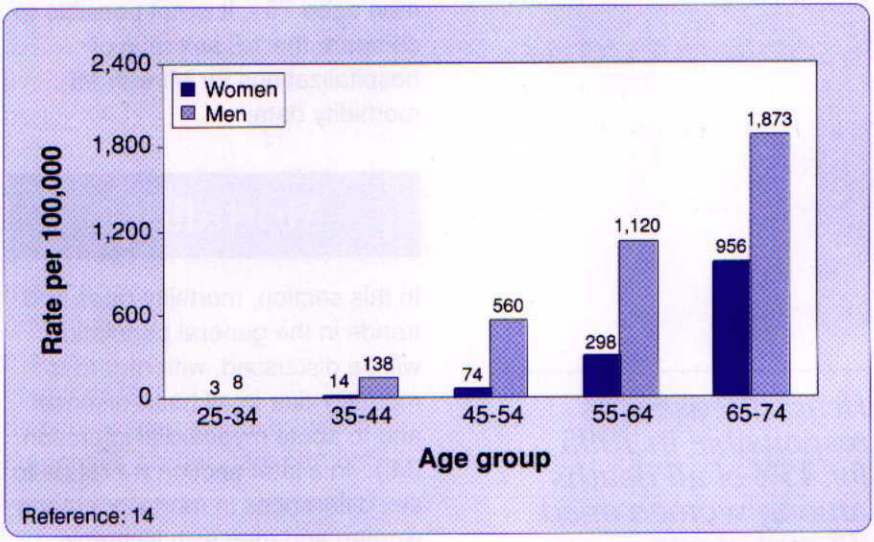
Data on myocardial infarction (MI) are presented from three sources: the 1996 National Health Survey (21), which provides self reported prevalence data; incidence data for 1995 from the Jerusalem MI Registry (14); and hospitalization statistics for 1990 (2).

1. Self reported survey data

The National Health Survey of 1996/7 (21) found that among women aged 65-74, 8% were reported as having been diagnosed with MI at some time, as compared to 19% of men. At ages 75+, 20% of women reported having a diagnosis of MI, as compared with 24% of men.

2. The Acute MI Register: Jerusalem

Data on the incidence of acute myocardial infarction (MI) in residents aged 25-74 have been collected in the Jerusalem area by a regional register of acute myocardial infarction and sudden death. Cases of MI were classified according to criteria used by the MONICA program of the WHO (14,22), on the basis of personal interviews and medical records. In 1995, 738 cases of MI and sudden coronary death were diagnosed. 532 (72% of all cases) were men. The crude incidence rates were 479 per



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100,000 for men and 179 per 100,000 for women (14). In all age groups, incidence rates were considerably higher for men than for women; the male/female ratio was particularly high at younger ages (approximately 10:1 at ages 35-44) and decreased with increasing age, to a ratio of approximately 2:1 at ages 65-74 (Figure 3). Age-adjusted incidence rates were 3.1 times higher for men than for women. However, since women over 75 are those with the greatest risk of myocardial infarction (4,21,23), and since the above study was limited to the population under the age of 75, the data presented here give only a partial impression of sex differences in the incidence of acute MI in Israel.

3. Hospitalizations

Hospitalization rates for acute MI are higher for men than for women at all ages (Table 1) (2). The relative differences in rates between men and women decrease with age, however even at ages 75 and above, hospitalization rates are still 80% higher for men than for women.

The official hospitalization rates cited above reflect, to a large extent, the differential rates of MI morbidity in men and women, up to age 74 (14). Since no direct data are available on the inci-

Table 1: *Hospitalizations for acute myocardial infarction by age and sex, 1990. Rates per 10,000.*

Age	Men	Women	M/F Ratio
15-44	8.1	0.5	16.2
45-64	118.8	31.4	3.8
65-74	213.5	107.8	2
75+	271.9	148.9	1.8

Reference: 2

dence of MI among women and men aged 75+, it is not possible to compare the 1.8 sex ratio of hospitalizations for MI with MI morbidity data.

Mortality

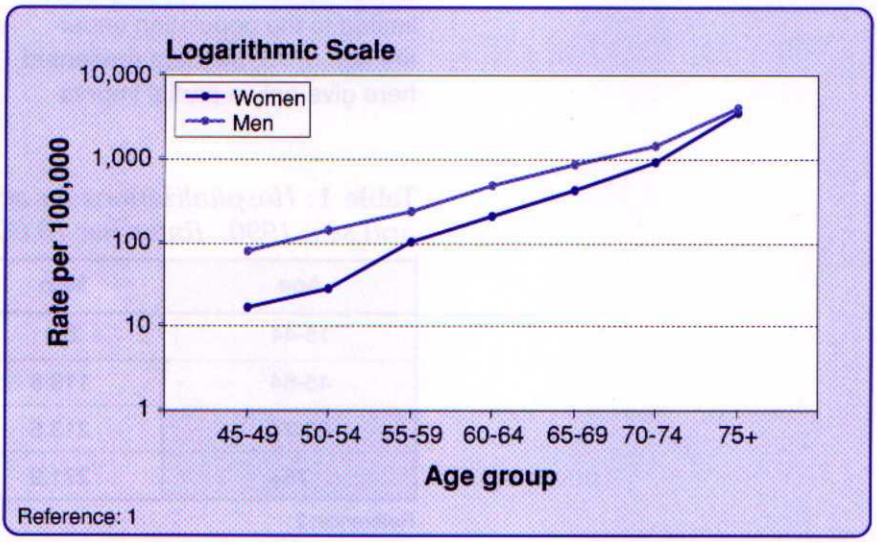
In this section, mortality rates and trends in the general population will be discussed, with regard to mortality due to all heart disease and to acute myocardial infarction (MI). In a later section we relate to sex differences in mortality among women and men with ischemic heart disease.

All heart disease mortality

In 1995, 5,654 women (5,226 Jewish women and 428 Arab women) died of heart disease of all kinds (1). The majority of these deaths (62%) were attributed to ischemic heart disease. Deaths from heart disease comprised 43% of total mortality among women aged 75 and above, and 30% of mortality among women between the ages of 60 and 75.

Mortality by age and sex

In Israel as in other countries, rates of mortality from heart disease increase steeply with age, and are lower among women than men at all age groups. The mortality advantage of women is particularly evident at younger ages (45-55) but decreases with age. This trend can clearly be seen in Figure 4, which utilizes a logarithmic scale to demonstrate the relative changes in the mortality rates of men and women with increasing age. The rate of increase in heart disease mortality is steeper for women than for men, particularly between the ages of 50 and 60, when there is an increase of 180% among women as compared to a 80% increase among men, and after age 70, when the increase in mortality is fourfold among women, as compared to threefold among men. By ages 75 and above, there is very little difference between the mortality rates of men and women.



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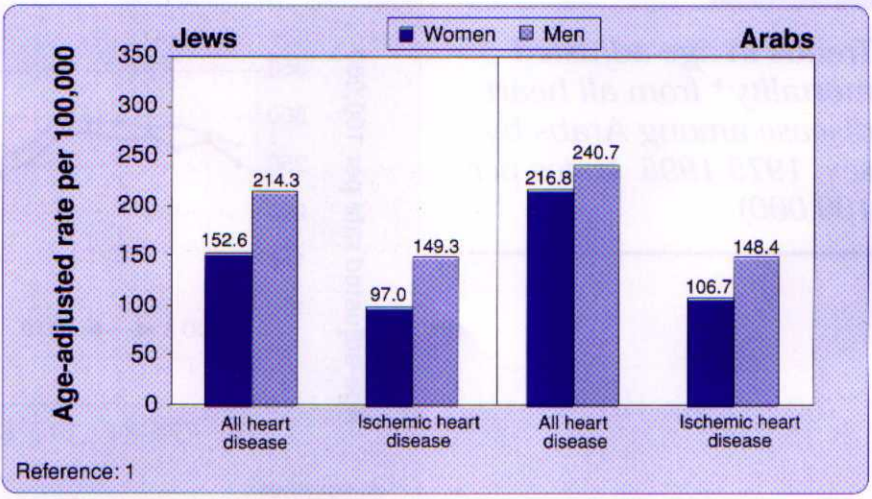

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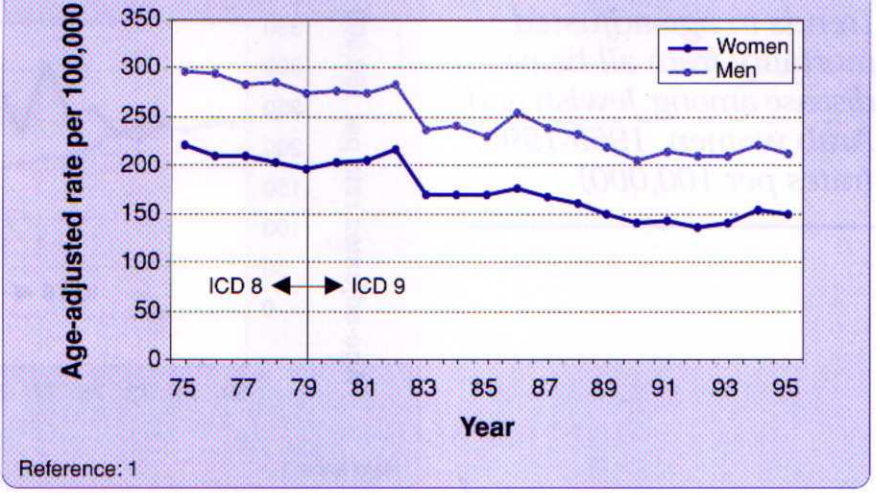
Mortality by sex and population group

Among both Jews and Arabs, heart disease mortality rates are lower in women than in men (Figure 5). In 1995, age-adjusted mortality among Jewish women was 29% lower than among Jewish men for all heart disease, and 35% lower for ischemic heart disease. In the Arab population, mortality was 10% lower among women for all heart disease, and 28% lower for ischemic heart disease. Among both men and women, age-adjusted heart disease mortality is higher in Arabs than in Jews: the age-adjusted mortality rate from total heart disease among Arab men in 1995 was 12% higher than among Jewish men, and 42% higher among Arab women than among Jewish women. For ischemic heart disease, age-adjusted mortality was almost identical in Jewish and Arab men, and 9% higher in Arab women than in Jewish women (Figure 5).



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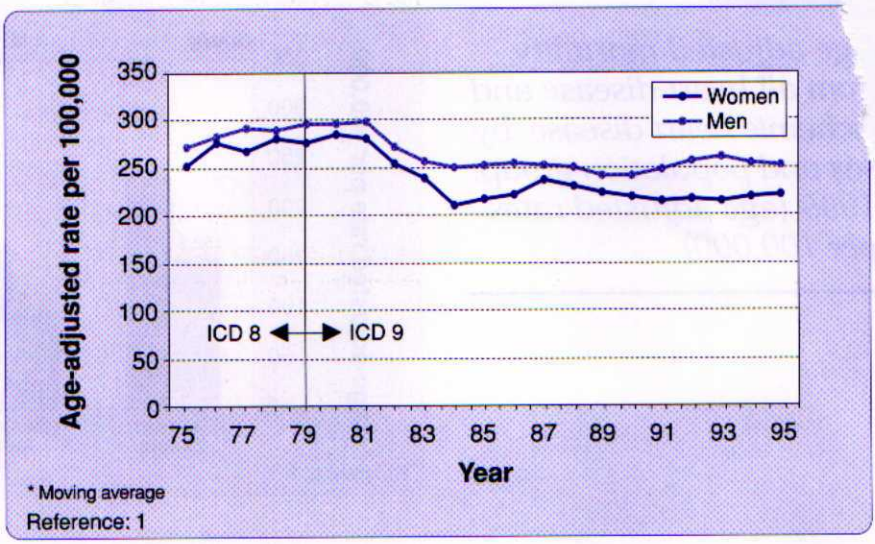
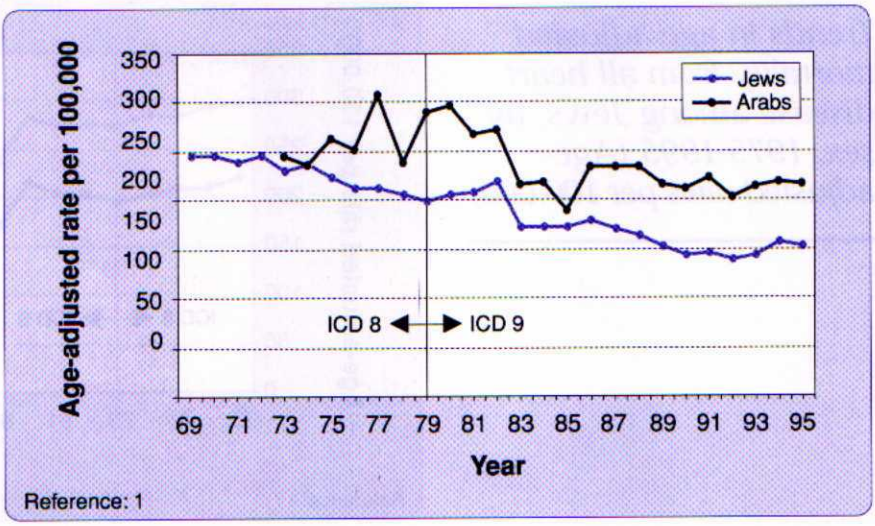


* Moving average
Reference: 1

Mortality trends

In the Jewish population, age-adjusted mortality from all heart disease has been decreasing steadily since the early 1970's, among both men and women (Figure 6). The trends are similar among women and men: the overall decrease between 1975 and 1995 was slightly steeper among women (32%) than among men (29%), and the male/female mortality ratio has stayed constant (between 1.3-1.5).

In the Arab population, a considerable increase in ischemic heart disease mortality among both men and women was reported between 1965 and 1975, a period during which this population experienced rapid and turbulent social change, but also included a rise in standards of living (24). The male/female mortality ratio remained very low, specifically among Moslems and Druze (between 1.1 and 1.2). While mortality from heart disease has gradually



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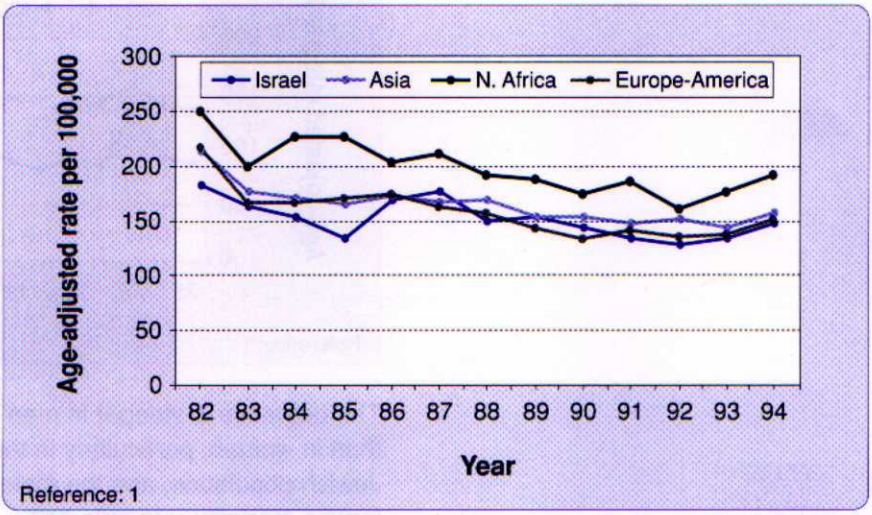
decreased among Arabs during the past 20 years (Figure 7), the decrease (7.7% among women and 7.1% among men) is much smaller than in the Jewish population (32% in women and 29% in men) and the female mortality advantage has remained persistently small, with male/female mortality rate ratios varying between 1.1 and 1.2, until the present. Two decades later, in 1995, age standardized mortality rates among Arabs were only 10% lower among women than men, compared with a corresponding 29% sex differential in Jews (1), a finding that merits closer inquiry.

women whose mortality decreased by 17% during those years.

Heart disease mortality in Jewish women by origin

Among Jewish women, the highest mortality rates for heart disease are among those of North African origin, while rates for women of Asian and European origin, and for Israeli-born women are markedly lower (Figure 9). The high mortality rates among women of North African origin have been evident since the late 1960's (25), and have been linked to the persistently high prevalence of hypertension in this group,



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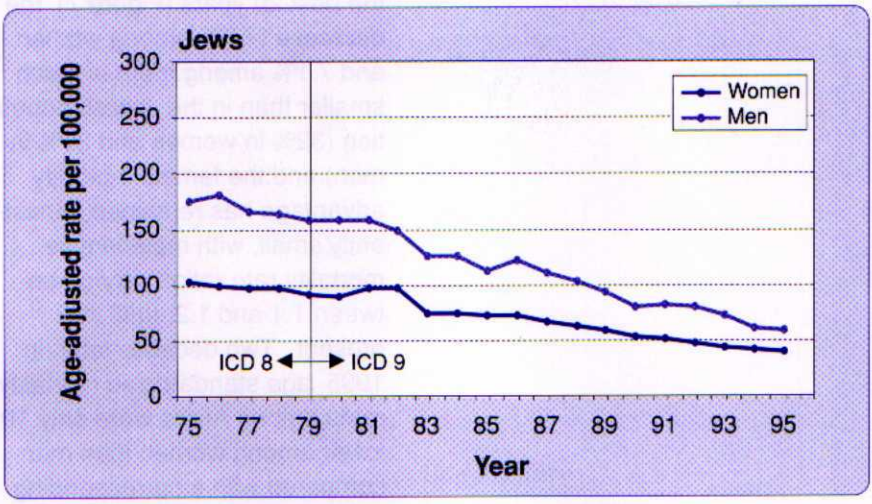
Heart disease mortality in Jewish and Arab women

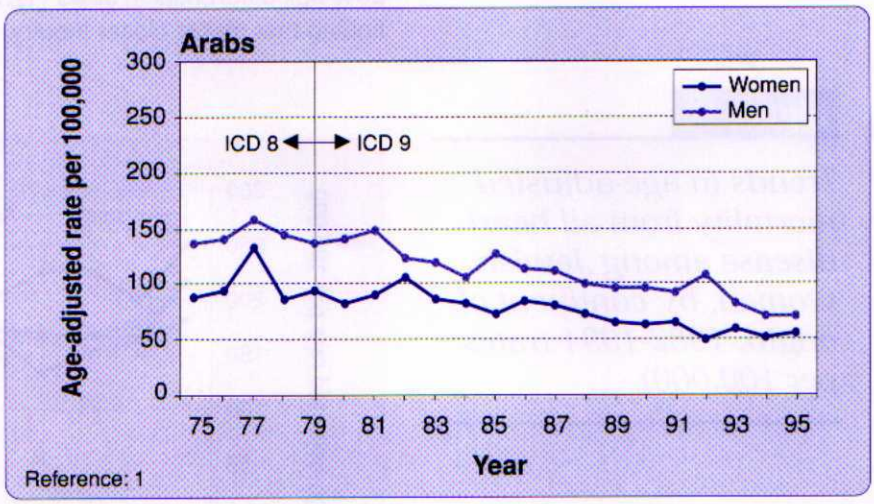
Higher age-adjusted mortality rates among Arab women, compared to Jewish women, have been evident since the mid 1970's (Figure 8). The downward trend in heart disease mortality over the past two decades is considerably more apparent among Jewish women, who experienced a mortality drop of 40% between 1973 and 1992 than among Arab

possibly combined with other risk factors (24). Compared with other origin groups in Israel, the male: female heart disease mortality ratio in those of North African origin is exceptionally low: 1.1:1.

Mortality from acute myocardial infarction

Over the past two decades, a clear decrease in mortality rates from acute MI is evident in both men and women (Figure 10) .





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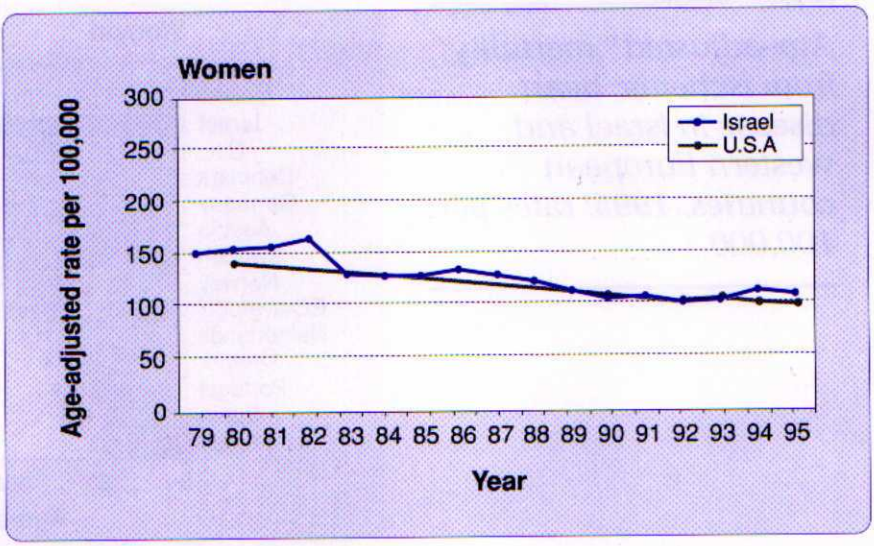
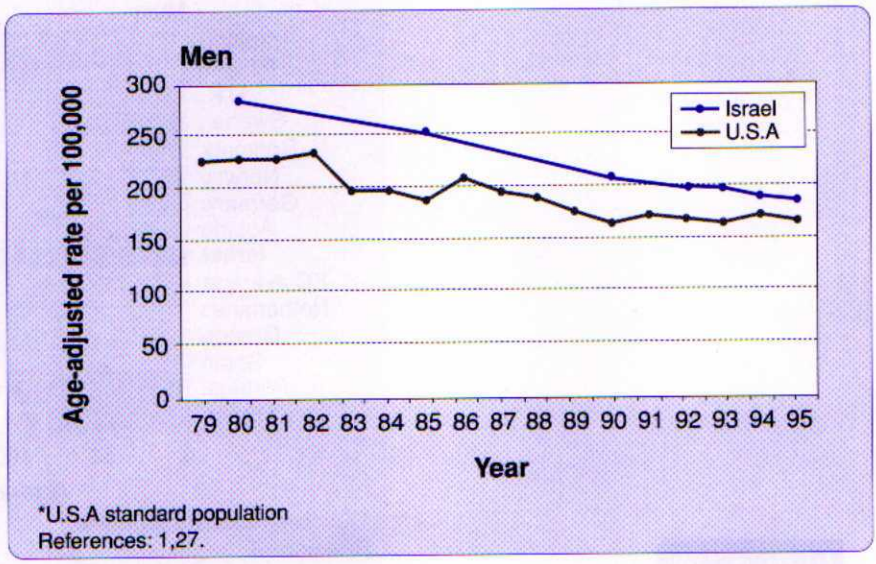
The decrease is steeper in men than in women, particularly in the Jewish population, and the male/female mortality rate ratio has become progressively smaller. Women's mortality advantage vis-a-vis men has decreased from a ratio of 1.8 in 1980 to 1.5 in 1995 among Jews, and from 1.7 in 1980 to 1.3 in 1995 among Arabs. The overall downward trend in mortality from acute MI, in Israel as in other countries, has been attributed to major advances in diagnosis and treatment, including the development of procedures such as angioplasty, thrombolytic treatment and coronary revascularization (17,26). In the light of the diminishing male/female mortality rate ratios, the question arises as to whether women and men are benefiting equally from these life-saving procedures.

International comparisons

All heart disease mortality in Israel and in the U.S.A.

The downward trend in mortality seen in Israeli women during the years between 1979 and 1995 is similar to the trend seen among



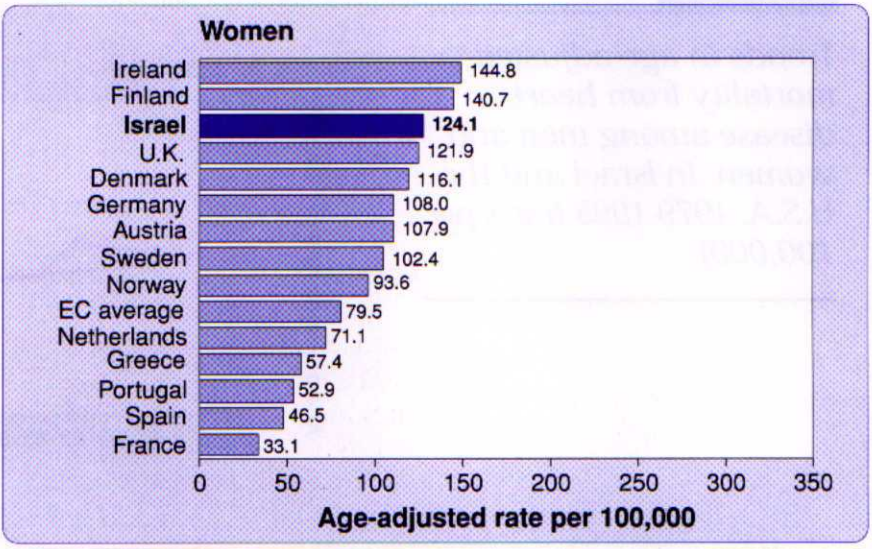


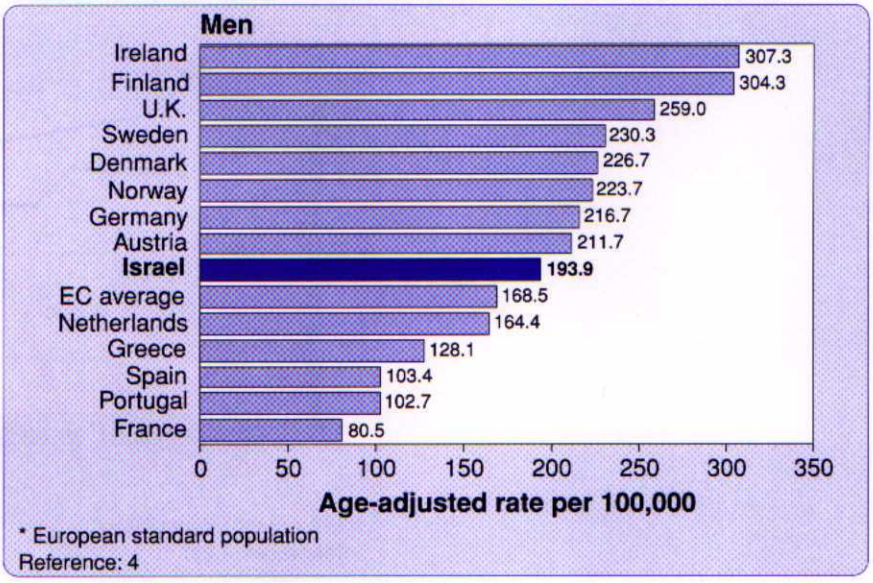
*U.S.A standard population
References: 1,27.

women in the U.S.A. (Figure 11) (27). It is interesting to note that among men, mortality rates from heart disease have been consistently lower in Israel than in the U.S.A during the past 15 years, while among Israeli women, mortality rates have been very close to those in the U.S.A. (Figure 11).

Ischemic heart disease mortality in Israel and Europe

When one compares ischemic heart disease mortality in Israel with that of western European countries, it is evident that the position of Israeli women is a disadvantageous one, both in comparison with women in other countries and in comparison with Israeli men (Fig 12). While Israeli men have an intermediate rank with respect to rates of mortality from ischemic heart disease in 1995 (9th out of the 14 European Community countries included in the analysis) (28), women rank third. In only two countries (Ireland and Finland) do women have





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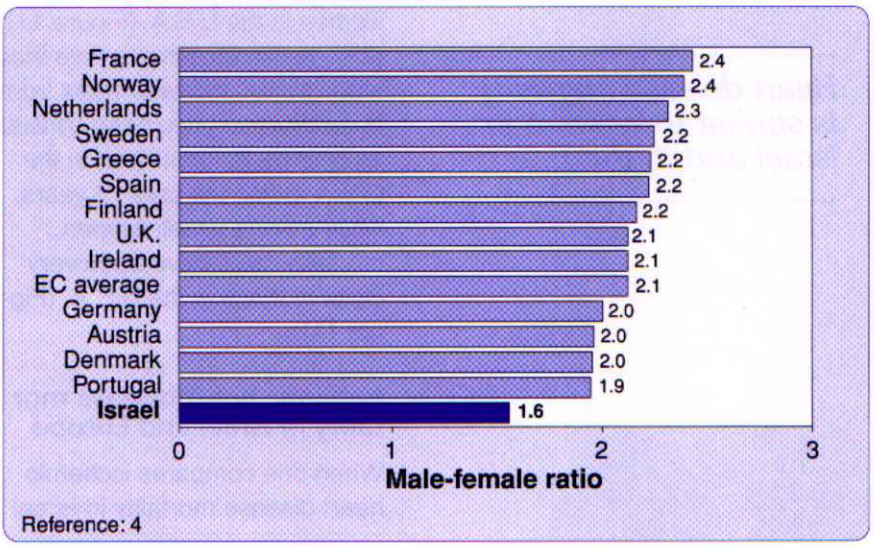

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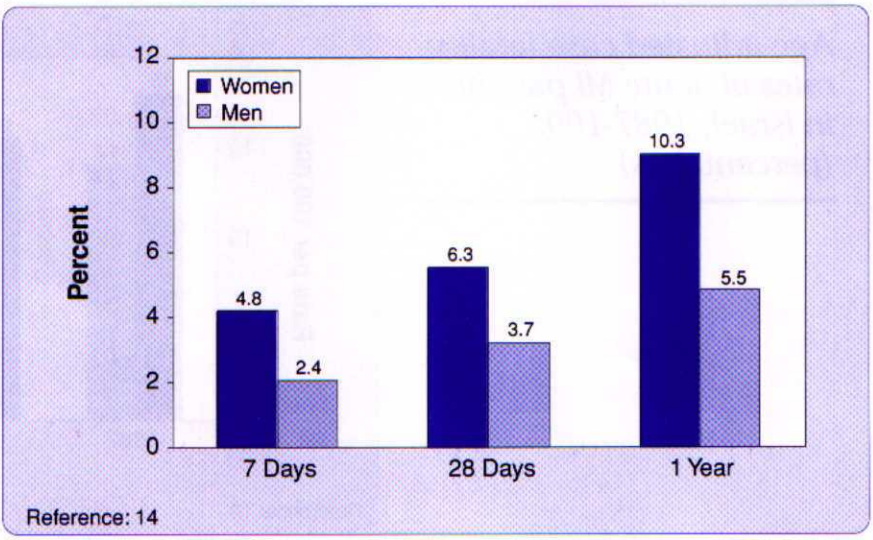
Register in the Jerusalem area were considerably higher for men than for women, in the age group studied (ages 25-74). Age-adjusted incidence rates were 3.1 times higher for men than for women. In contrast to the higher incidence of acute MI among men, case fatality rates were found to be consistently higher among women, in all age groups, and at all points of time measured (pre-hospital case fatality, 28- day case fatality, and case fatality after one and two years (Figure 15) (14). These findings are similar to those reported in other countries (5,6).

Follow-up studies of patients in coronary care units

Similar findings regarding the sex differential in post-MI mortality of patients in coronary care units have been found in a number of large-scale, multi-center studies in Israel, which investigated differences in mortality after acute MI . In a follow-up study of 4315 men and 1524 women who were hospitalized after acute MI in 14 out of 21 coronary care units in Israel during 1981-83, age-adjusted in-hospital mortality was 23.1% in women and 15.7% in men (rate ratio: 1.5). The one-year age-adjusted mortality rates in patients surviving hospitalization were 11.8% in women and 9.3% in men (RR: 1.3) (9). In all age groups except one (ages 80 and above), there was excess female mortality (29). Cumulative age adjusted 1- year mortality rates were 31.8% in women and 23.1% in men (RR: 1.4). A major factor that emerged as a predictor of outcome in women was a reported history of diabetes mellitus. However, even in nondiabetics, female gender was significant, independent predictor of in-hospital mortality.

In a further study that examined the long-term survival of these patients, it was found that the early disadvantage in the prognosis of women compared with men was still evident after 12 years of follow-up (12). The survival of women was significantly poorer than that of men: the age-adjusted 12-year survival rates were 23% for women and 32% for men.



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Among women with CHD, ethnic differences have been observed with regard to mortality. The long-term follow up study of 5,692 consecutive patients with acute MI who were admitted to 13 coronary care units in Israel during 1981-1983 revealed that 10-year mortality was significantly higher among women of North African and Middle Eastern origin than those of Eastern and Central European origin and Israeli born women. The association between mortality and ethnicity was not seen among men (30).

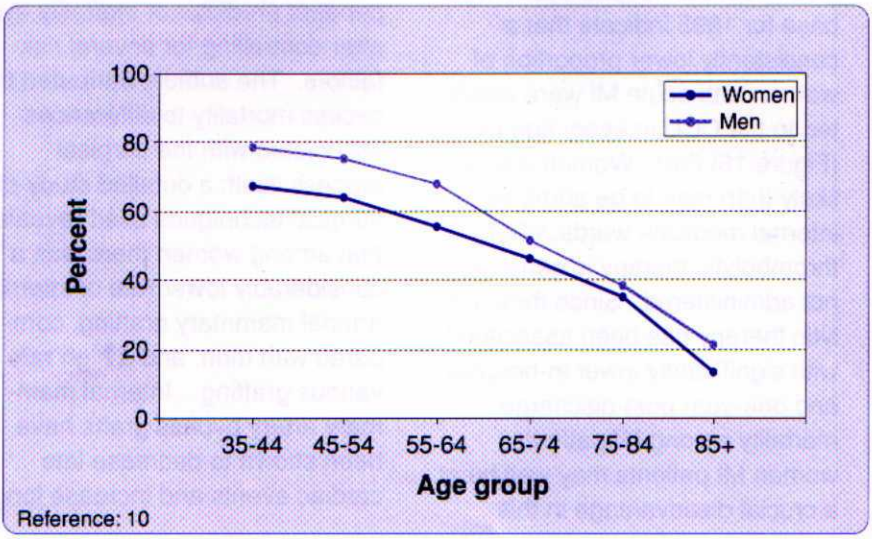
Sex differences in the management of coronary heart disease

Among the possible explanations for the excess mortality of women after MI, it has been suggested that the care that women MI patients receive may be delayed, resulting in less favourable outcomes (3,7). The question arises as to whether a gender bias exists, and whether women are referred for fewer diagnostic and therapeutic procedures than men.

The differential use of invasive and non-invasive procedures in the management of CHD has been the subject of a long-standing debate during the past decade (7,8,16-18,31).

Preliminary, unadjusted data on diagnostic and surgical procedures carried out in 15 general hospitals in Israel in 1997 indicate that angioplasty (PTCA) is performed three times more frequently in men, and coronary artery bypass surgery is carried out twice as frequently in men as in women (32); however, it is not clear whether this difference is directly related to higher rates of morbidity in men, as reflected, for instance, in the higher incidence of MI in men (14) or whether it is indicative of under-utilization of such procedures in women. Careful analysis of the data might throw further light on gender differences in the use of procedures among men and women with CHD in Israel.

In a study carried out in 1992 in the 25 operating coronary care



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units in Israel, to determine whether the therapeutic management of patients with acute MI was related to the patient's sex, it was found that after age adjustment, the only procedure that was performed more frequently in men was coronary angiography (26). After the diagnostic stage, no sex differences in the utilization of angioplasty, thrombolytic therapy, or coronary bypass surgery were found . These two findings may be a manifestation of what has been termed "the Yentl syndrome" (16), that is, a woman may be less likely to be referred for diagnostic procedures (if referral bias is indeed present); however, after she has been objectively diagnosed as having severe coronary artery disease, she is treated as a male patient would be.

It is important to bear in mind that these findings relate only to patients hospitalized in coronary care units, as it has been suggested (13) and later confirmed (10) that women MI patients are less likely than men to be admitted to coronary care units, where thrombolytic treatment is administered. Data from the Ministry of Health central hospitalization data base for 1995 indicate that a consistently lower proportion of women with acute MI were admitted to the CCU in every age group (Figure 16) (10). Women are more likely than men to be admitted to internal medicine wards, where thrombolytic therapy is generally not administered. Since thrombolytic therapy has been associated with significantly lower in-hospital and one-year post-discharge mortality among MI patients, women MI patients may well be at a crucial disadvantage in this respect, in that the selection process taking place at admission may reduce their chances of receiving this highly beneficial treatment.

Another significant finding was that the most frequent reason for the non-admission of women to thrombolytic treatment was the fact that they were admitted to the coronary care unit at a relatively late stage of the disease (26). This finding reinforces the hypothesis that women's symptoms are often not accorded the degree of seriousness that they should be, and consequently by the time they reach a critical stage, they may no longer be eligible for therapeutic interventions which could have increased their chances of survival after myocardial infarction.

Sex differences in mortality after coronary artery bypass grafting

Surgical procedures have been found to entail a higher risk among women: a recent study has reported a threefold mortality risk in Israeli woman patients after coronary artery bypass grafting (11). Female sex was an independent predictor of mortality even after controlling for several risk factors. The authors attributed the excess mortality to differences associated with the surgical process itself: a detailed study of surgical techniques used revealed that among women there was a considerably lower rate of internal arterial mammary grafting, compared with men, and a high rate of venous grafting. Internal mammary artery bypass grafts have been shown to decrease late cardiac events and increase long term survival compared with vein grafts (7,8). However, emergency surgery has been considered a relative contraindication to the use of internal mammary artery grafts because their construction takes significantly longer than saphenous vein grafts. Advanced age has also been considered a contraindication to mammary artery grafting. The older age, as well as the worse risk factor status of the women, may therefore have contributed to the significantly lower rate of mammary artery bypass grafting in women in this study. If this is the case, earlier referral of women patients could possibly have increased their rates of mammary artery grafting and thus their chances of survival. As Wenger has pointed out (3), "...if deferral of evaluation and intervention results in procedures being undertaken at an older age, often with a more adverse symptomatic status, ...then deferral must be considered as a variable contributing to inferior outcomes."

A number of inter-related studies have been planned (33) which examine gender differences among MI patients in Jerusalem at various stages of the diagnostic and therapeutic process: differences in pre-hospital care (determinants of the delay in referring women, and differences in symptom recognition), differences in both in-hospital and out of hospital care, including risk factor management (blood pressure, cholesterol levels, smoking) after MI. The findings will be of great value in understanding the sources as well as the consequences of sex differences in the diagnosis and management of coronary heart disease in Israel.

Risk factors and Prevention

The major known risk factors for coronary heart disease (CHD) for women and men are hypertension, elevated total and LDL cholesterol levels, low HDL cholesterol levels, obesity, diabetes, cigarette smoking and sedentary lifestyle. In addition, certain psychosocial and behavioral factors have been implicated as increasing the risk of CHD in women.

Hypertension

Hypertension, or high blood pressure, has consistently been identified as a major independent risk factor for all forms of cardiovascular disease, in both women and men (34-36), and is considered to be one of the most important modifiable determinants of mortality in the adult population of Israel (37). In a community study in Jerusalem, it was estimated that as much as 36% of 10-year mortality among women was attributable to hypertension, as compared with 19% among men (37,24).

In a preliminary report of the National Health Survey of 1996-1997, based on a sample of 4,500 households, the self-reported prevalence of hypertension (defined as whether a physician had at some time diagnosed the individual as being hypertensive) was higher among women than men at all ages, and increased steadily with increasing age. Forty-five percent of women aged 75 and above, as compared with 32% of men, were reported to suffer from hypertension (21). These data, based on self- and proxy reports, may be an underestimate. Data from the U.S.A. (based on physical examinations) indicate that in 1988-94, approximately 77.3% of women and 64.2% of men aged 75+ had hypertension (27).

A survey of women's health, conducted in 1998 on a national sample of women aged 45-74 (20), found that hypertension was reported by 29% of Jewish women and 25% of Arab women (Table 2). In both Jewish and Arab women, the self-reported prevalence of hypertension increased with age, and at ages 65-74 reached 41.7% in Jewish women and 33.3% in Arab women. (*see*: Chronic Illness and Disability).

Women with coronary heart disease are more likely to be hypertensive than men. In a study of 5,839 patients hospitalized consecutively with myocardial infarction in 13 coronary care units in Israel between 1981 and 1983, age adjusted rates of pre-infarction hypertension were 35% higher among women than men (9); and in a 1993 study of 1,626 patients under age 65 with first MI who were hospitalized in 8 hospitals in central Israel, hypertension was found to be 60% more prevalent among women than men (36).

Serum cholesterol

The majority of research on cholesterol and coronary heart disease has focused on middle-aged men (38). However, a number of prospective, observational studies carried out abroad have reported positive associations between total cholesterol levels and CHD in women (39,40). A low level of high-density lipopoprotein (HDL) cholesterol has been found to be a risk factor for CHD in younger as well as older women (35) and a stronger predictor of CHD mortality in women than in men (35,36,38,40). In a number of clinical trials, women have been shown to benefit from cholesterol-reducing drugs following MI (41).

High cholesterol in Israeli women

In Israel, in a 1998 national survey of women's health (20), 27% of women aged 45-75 reported that they had been diagnosed by a physician as having high cholesterol levels (Table 2). Approximately 78% of these women reported that they were currently taking cholesterol-lowering medication. In the U.S.A., the prevalence of high cholesterol in women (based on physical examinations) ranged from 27% (ages 45-44) to 41% (ages 65-74) (27). Recent data on sex differences in the distribution of serum cholesterol in the population of Israel are not presently available; however, a population based community study conducted in the 1970's (42,43) indicated that the prevalence of high levels of serum cholesterol increased with age and was higher in Jewish women over the age of 45 than in men. In younger men (under age 45), cholesterol levels were higher than in women. In a national study of workers in 1986 (44), a similar "crossover" effect was noted: elevated levels of cholesterol, which were more frequent in younger men, were found to be more prevalent among women than men from age 55.

A number of studies on hospitalized patients in Israel show marked sex differences in lipid profiles. In the above-mentioned 1993 study of first MI patients under age 65 who were hospitalized during the period of one year in 8 hospitals in central Israel, elevated levels of cholesterol were found to be approximately twice as prevalent among women as among men (36). In the screening stage of a large-scale multicenter clinical trial (45), total lipid profiles of 1,500 women CHD patients and 6,700 men patients were obtained. Levels of total cholesterol were significantly higher among women than men, at ages above 50.

Obesity

Obesity has been demonstrated to be an independent predictor of coronary risk among women (34,35,38), and it is commonly associated with many other coronary risk factors, such as high total and LDL cholesterol, diabetes, hypertension, and a sedentary lifestyle.

Obesity in Israeli women

At present, comprehensive, updated data on the prevalence of obesity among the different groups of women and men in the Israeli population are not available; however, self-reported weight and height data from a 1998 national survey of women (20) indicated that among women aged 45-74, approximately 22% of Jewish women and 35% of Arab women were overweight (BMI >30) (Table 2). Less recent studies, such as the Kiryat Yovel community health study (42), as well as the CORDIS study of workers (46) have indicated that obesity was more prevalent among women, especially among older women. In the CORDIS study, approximately 33% of women aged 45-64, as compared with approximately 15% of men, were found to be overweight. (*see*: Health Behavior). The 1999 national nutrition survey will provide a profile of the weight status of the population, which will in turn serve as a basis for planning interventions for the reduction of obesity and other diet-related cardiovascular risk factors.

Table 2: *Self-reported prevalence of cardiovascular risk factors in Jewish and Arab women aged 45-74, ICDC Women's Health Survey 1998 (percentages)*

Risk factor	Jewish women	Arab women
Hypertension	29	25
High cholesterol	29.1	20.1
Diabetes mellitus	9.4	16.9
Smoking	17.1	8.7
Overweight*	22	35
Physical inactivity	57	85.9

*BMI>30, as calculated from self-reported height and weight

Reference: 20

Diabetes mellitus

Diabetes is a major risk factor for CHD in women, even more so than in men (23,38,47). In the Nurses Health Study, diabetes was associated with a three- to sevenfold increase in cardiovascular events (41). Women hospitalized with MI and women undergoing heart surgery are more likely to have diabetes than men , and this has been linked with their poorer post-infarction and post-operative prognosis (23,48)

Prevalence of diabetes in Israeli women

In Israel, self-reported data from the national health survey of 1996-7, based on approximately 4,500 households, indicate that over age 65, diabetes is more prevalent among women than men (21), particularly at ages over 75, when reported rates of diabetes were 34% higher among women (18.1%) than men (13.5%).

In a national survey of women (20), among women aged 45-74, 9.4% of Jewish women and 16.9% of Arab women reported suffering from diabetes (Table 2). Among both Jewish and Arab women, the prevalence of reported diabetes increased with age, from 5% of Jewish women and 13% of Arab women at ages 45-54 to 13% of Jewish women and 21% of Arab women aged 55-74. (*see*: Chronic Illness and Disability)

Diabetes in women with CHD

Among patients with MI hospitalized in coronary care units and among those undergoing heart

surgery (PTCA and coronary artery bypass graft), a higher prevalence of diabetes is found in women than in men, in Israel as in other countries (9,11,36). For instance, in a study of 1,046 patients who underwent coronary artery bypass grafting between 1987-89, 36% of women patients had diabetes, as compared with 23% of men (11); and in a study of 5,839 consecutive patients with acute MI admitted to CCU's during 1981-1983, 29% of woman patients were diabetic as compared with 18% of men (9). In this study, marked ethnic differences were evident among women with CHD: the prevalence of diabetes was found to be almost twice as high for Israeli Arab women (45.4%) and for Jewish women of North African origin (45.8%) as for women of Israeli and of Eastern European origin (27.4% and 21.4% respectively) (30).

Diabetes is commonly associated with obesity, hypertension and high serum cholesterol; this combination of risk factors was found to be two to three times more prevalent among women than among men, in a study of patients hospitalized for a first MI (36).

Studies in Israel have found that diabetes has an adverse effect on both the short- and long term prognosis in patients with CHD, particularly following myocardial infarction, and this adverse effect is greater for women than for men (9,12,49). In a study of the long-term prognosis of over 5,800 men and women surviving myocardial infarction, it was found that the mortality risk for women with diabetes was almost 50% higher than for men with diabetes (12). This is consistent with the findings reported in other countries (34,47,50). It has been suggested that diabetes is a major factor underlying the prognostic disadvantage of women with MI, (12,51) and that research efforts should concentrate on clarifying the mechanisms underlying this phenomenon.

Smoking

Cigarette smoking is considered the most important behavioral risk factor for CHD and stroke among both women and men. Smoking more than doubles the risk of MI in women (35), with the greatest risk found in women with additional coronary risk factors and in older women (23). Cessation of smoking has been shown to be effective in reducing CHD mortality in women (36,23,52). Former smokers decreased their cardiovascular mortality by 24% within 2 years of smoking cessation, regardless of the duration of smoking or number of cigarettes smoked, and within 3-5 years of cessation, their coronary risk level approached that of non-smokers (41).

Smoking in Israeli women

In Israel, in a 1998 national survey of health behavior conducted on a representative sample of approximately 3,000 men and women over age 18 (53), the overall prevalence of smoking in the population was estimated at 25% in women and 33% in men. In the U.S.A., by way of comparison, an estimated 23.1% of women and 27.8% of men are smokers (27). In a survey of women's health conducted in 1998, the highest rates of smoking (29%) were reported in the 35-44 age group (20). Among women aged 45-74, 17% of Jewish women and 9% of Arab women were smokers (Table 2). Large surveys of young women in the military (aged 18-20) have reported that the prevalence of smoking is increasing among women in this age group, and in 1997 reached 32% (54). Although rates of smoking in the population have been declining during the past 20 years, the decline is less marked in women than in men (55), and increasing smoking trends among younger women in Israel are a source of considerable concern. (*see*: Health Behavior).

Physical activity

Physical inactivity is an independent risk factor for CHD in women (23). The majority of epidemiological studies that have been conducted to assess the relation of exercise to CHD have not included women; however, the few studies that have included women, indicate that physically active women have a 50% lower risk of CHD than inactive women (35,38). Even among older women, the effect of regular exercise has been shown to be beneficial in reducing coronary risk (23).

Physical activity in Israeli women

Data on physical activity in Israeli women are based on a number of surveys conducted over the past 10 years; comparisons cannot be directly drawn, due to differences in the study populations and survey methods employed.

In a study of industrial workers in Israel conducted in 1985-87 (46),

it was found that a lower proportion of women than men exercised regularly, and exercise rates declined with age. Among women over the age of 45, when the risks of coronary heart disease are elevated, only 9% engaged in physical activity, as compared with 20% of men (*see*: Health Behavior).

More recent data, based on the 1998 Women's Health Survey (20), have indicated an increasing trend in rates of physical activity: 31% of women aged 21-44 and 37% of women aged 45-74 reported exercising regularly, with the highest proportion (40.4%) in the 55-64 age group. Among Jewish women, rates were significantly higher (43%) than among Arab women (14) (Table 2). (*see*: Health Behavior). In the U.S.A. a 1991 survey reported rates of weekly exercise ranging from 49% (Hispanic women) to 64% (white women) (56).

Stress

A number of psychosocial factors, including personality and behavior patterns and work- and family-related stress have been found to be associated with higher prevalence of CHD in women. In the Framingham study (57,58), women with coronary heart disease scored significantly higher on Type A behavior, emotional lability, tension and anger symptom scales. Rates of women holding clerical jobs were particularly high, with the most significant predictors of CHD among these workers being suppressed hostility, having a non-supportive boss, and decreased job mobility. Clerical workers who had children and were married to blue collar workers were at highest risk of developing CHD. Findings from more recent studies have suggested that the association between hostility and coronary heart disease, which has been more thoroughly established in men, should be further investigated in women (59,60). In Israel, it was hypothesized several decades ago that psychosocial stress may play a role in the relatively high rates of coronary heart disease in women (25). This important subject area has yet to be investigated in Israeli women in a systematic manner.

Prevention

In light of the fact that the majority of risk factors for coronary heart disease are to a large extent behavior-related and therefore potentially modifiable, the importance of prevention as a basic health care priority for women has been stressed by most leading experts in the field A considerable number of studies have indicated that lifestyle changes (for example, smoking cessation, adopting healthy eating patterns, engaging in moderate physical activity and hypertension and cholesterol control) are beneficial for reducing CHD and improving overall health. Most studies have included men only, however, when women were included, positive effects were found to be equally great for women (36).

A well-known community program in Israel for the reduction of coronary risk factors is the CHAD program (61) which was conducted in a Jerusalem neighborhood during 1970-1975, following a health survey in 1970 which found a high prevalence of hypertension, CHD and diabetes in the population (42,43). The intervention program, which was integrated into the routine primary health care and implemented by family physicians and nurses, was based on standardized examination methods, guidelines for counseling and treatment and defined surveillance regimes. Patients received counseling encouraging them to reduce their intake of calories and saturated fats, to stop smoking, and to increase physical activity. Hypertension was controlled by diet and medication. The effectiveness of the program was evaluated by comparing the changes that took place with those observed in a control neighborhood. Reductions were found in the prevalence of hypertension, overweight and hypercholesterolemia, in both women and men. (Figure 17).

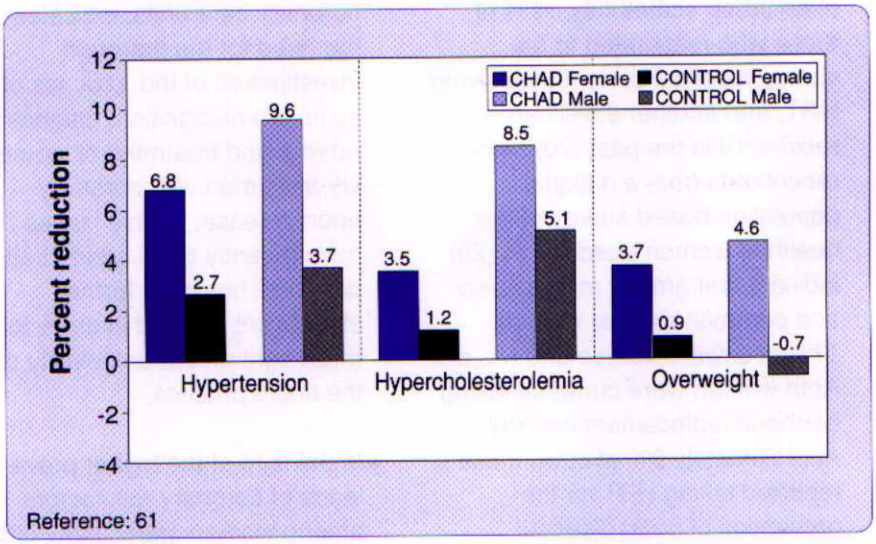
This program provided encouraging evidence that primary and secondary prevention efforts centered in primary health care can be effective in reducing cardiovascular risk factors among women and men in the community.

Postmenopausal Hormone Replacement Therapy

One of the most important claims cited for the use of hormone replacement therapy (HRT) in post-menopausal women is the reduction of coronary heart disease. To date, no data are available from population-based prospective studies. Findings from The Women's Health Initiative, which is the first such trial to examine the effects of HRT, will

Figure 17:

Changes in CHAD and control populations: reduction in age-standardized prevalence rates of hypertension, overweight and hypercholesterolemia by sex, 1970-1975.



become available within the next few years (62). Data from several observational studies show a consistent reduced risk of coronary heart disease associated with postmenopausal hormone use (23,35,63,64). A meta-analysis of over 20 of these studies found an overall risk reduction of approximately 50% (65). The Nurses Health Study (63) reported a 37% lower mortality for current users than for non-users; however, there was no survival benefit for past users, and the benefit for long term users was offset by the increased risk of breast cancer (43% elevated risk after 10 years of taking hormones.) The benefit of hormone therapy was greatest for women at high risk of CHD .

Among postmenopausal women, 17% of Jewish women and 5% of Arab women use HRT.

The possibility of a "healthy woman selection bias" is an inherent weakness of the above observational studies. It has been repeatedly documented that estrogen is typically prescribed for women who are better educated and more affluent. In the Healthy Women's Study of premenopausal women who were followed through menopause (66), those who subsequently took hormones were healthier in terms of characteristics associated with cardiovascular risk; and, as pointed out by the authors, some of these biases may represent large potential differences in mortality. Thus, the amount of cardioprotection attributed to hormone replacement therapy may be an overestimate, and should also be assessed in relation to the increased risks of breast cancer and venous thrombosis, which have been shown to be associated with hormone use (63,67,68).

Contrary to the observational studies noted above, recent findings from a large, randomized clinical trial in the U.S.A. have indicated that among post-menopausal women with heart disease, there was no overall benefit in terms of secondary prevention of coronary heart disease during the 4 years of the trial (69).

In Israel, two studies provide data on hormone replacement therapy. In a survey of women aged 50

years or over, conducted in 1996 in an urban community, 12% of those who responded to the survey reported currently receiving HRT, and another 9.5% had received it in the past (70). More recent data from a national, population-based survey of the health of women aged 45-75 (20) indicate that among menopausal and peri-menopausal women, 17% of Jewish women and 5% of Arab women were currently taking hormone replacement therapy. Approximately 9% of current users reported taking HRT for the prevention of heart disease. Rates of HRT use are low in comparison with other western countries, such as the U.S.A., where an overall national rate has been estimated at approximately 24% (71) and in certain European countries, where rates range from 18-35% (72) (*see*: Reproductive Health).

Conclusions and recommendations

The available data on heart disease in women in Israel indicate that a number of areas are in need of attention in terms of in-depth investigation and intervention.

- The worse prognosis of women with heart disease, as revealed in post-MI and post-operative survival, in contrast with their lower rates of admission to coronary care units, indicates the need for the thorough investigation of the process of symptom recognition, diagnosis, referral and treatment of women vis-a-vis men with coronary heart disease. These issues have recently been addressed in part (73); however, further studies are needed in order to throw light on the complexity of the entire process.

- In the light of the higher prevalence of coronary risk factors among women, particularly older women, as well as the poor prognosis of women with heart disease, it would seem that population-based preventive interventions for the reduction of coronary risk are a basic health care priority for women.

- The examination of attitudes towards heart disease among women and men, as well as among physicians, would be of great importance not only in the investigation of possible gender differences in the diagnosis and aggressiveness of treatment of coronary heart disease in women, but also in terms of the implications for the primary prevention of heart disease. If women (and possibly their physicians) are not totally aware of the risk of heart disease in the context of risks of other diseases, they may not be aware of the necessity for appropriate, preventive health behavior. In the light of findings from abroad (41) indicating that women do not generally perceive coronary heart disease to be an important health problem, a careful investigation of attitudes and subsequent planning of health promotion and health education strategies should take place.

- One weakness of much of the data on the incidence and prevalence of heart disease among men and women in Israel is that they are limited to individuals under age 75. Since the risk of coronary heart disease among women is predominantly in older women, it is crucial to have accurate information on the 75+ age group, both in terms of incidence and in terms of case fatality.

- The differences evident between Jewish and Arab women in Israel, both in terms of the mortality disadvantage among Arab women and in terms of their greater reported prevalence of risk factors, indicate the need for the closer study of the health status of Arab women. The availability of and access to preventive and curative health services for Arab women, as well as the quality, appropriateness and continuity of care, are issues that require systematic and comprehensive research.

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