

STUDIES IN
MIDDLE EASTERN HEALTH

Edited by

JOSEPH WINCHESTER BROWN
ROBIN BARLOW

University of Michigan

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Preface

In March of 1997, a two-day conference on the theme "Health Issues in the Middle East" was held at the School of Public Health, University of Michigan. The papers presented at the conference were chosen from those submitted in response to an internationally advertised Call for Papers. This book offers a selection of the conference papers, along with two new papers which we have contributed as editors. Other papers presented at the conference have been published under the title *Reproductive Health and Infectious Disease in the Middle East* (Ashgate, 1998).

The papers in this book have been grouped according to the region covered. The first three chapters deal with the *Middle East* as a whole. Robin Barlow notes the trends of health indicators in Middle Eastern countries since 1950. Haroutune Armenian looks at the long tradition of epidemiological studies by researchers based at the American University of Beirut. Kathleen O'Connor discusses traditions in Islamic medicine.

The next three chapters examine health conditions among the Arab populations of *Israel* and *Palestine*. Elias Nigem analyses the general levels of mortality among Arabs in Israel. Yoav Horn and Calvin Zippin focus on the cancer patterns found in patients at a West Bank clinic. Jay Schnitzer and Sara Roy look at health care services in Gaza.

Next, three chapters are concerned with *Egypt*. Khalil Mancy describes a project in Suez for the re-use of wastewater. Scott Moreland and Nanda Kumar present survey results on health care expenditures by households. Joseph Winchester Brown examines household data on family planning.

In the last chapter, Nabil Kronfol assesses health policy in the *United Arab Emirates*.

As editors of the book, and organizers of the conference, we would like to acknowledge the indispensable help we received from many people. We are particularly grateful to the International Institute and the School of Public Health at the University of Michigan for funding the project, and also express our sincere thanks to David William Cohen, Director of the Institute, and Noreen Clark, Dean of the School, for

providing encouragement and support in many ways besides the financial.

The conference was a major project of the Center for Middle Eastern and North African Studies, University of Michigan. The Center provided important financial and staffing support. We much appreciate the contributions made by the Center's energetic staff: Elizabeth Barlow, Celina Cabello, Jodi Forrester, Joshua Greenbaum, Dana Jones, and Mary Mostaghim. We thank the Center's current director, Michael Bonner, for his willingness to include this book in the Center's *Michigan Series on the Middle East*.

Others who helped greatly were Rashid Bashshur, Flora Dallo, Nadeem Dlaikan, Avedis Donabedian, Michelle Heerey, Janet Heindel, Lama Jamjoum, Khalil Mancy, Ernest McCarus, Brinkley Messick, Arnold Monto, Jennifer Olmsted, and Rabia Shafie. Special thanks for many months of dedicated logistical effort go to Bill Trythall. The manuscript was expertly processed by Kathryn Clark.

A final word on modes of address. In the literature on health sciences, the names of authors are usually accompanied by their professional titles, honorifics, and credentials. We have not done that here, preferring instead the egalitarian conventions of our own social science disciplines, which are sociology and economics respectively. We hope our medical colleagues will understand. The reader may rest assured that all of our authors, and even the editors, possess qualifications sufficient for the task at hand.

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HEALTH TRENDS IN THE MIDDLE EAST, 1950–95

ROBIN BARLOW

The purpose of this chapter is to provide a survey of health trends in Middle Eastern countries over the last half-century. The main indicator which I use for the health of each national population is life expectancy at birth. This indicator is a summary measure of the mortality conditions existing at all ages in a given year, and so is broader than other commonly used indicators of mortality, such as the infant mortality rate or the child mortality rate.¹ Life expectancy at birth (or "life expectancy" for short in the rest of this chapter) cannot provide a full picture of a population's health status, but it is probably the best summary measure available of that status. Measures which attempt to go beyond mortality by reflecting overall rates of sickness or disability in a population are in general less accurate.

Life expectancy is normally estimated from the mortality information available in national censuses, sample surveys of households, and official systems of death registration. The quality of this information is uneven across countries and across periods, and the resulting estimates of life expectancy are also subject to political manipulation. We must be aware of these defects in interpreting the data presented below.

Besides noting the ups and downs of life expectancy in each country over the half-century, I also attempt to identify some of the major reasons for these changes. My method is aggregative and quantitative: I select eight indicators of social, economic, and environmental conditions, and note how their trends can collectively explain what happened to life expectancy in each country. These indicators are widely believed to have important direct or indirect influences on mortality, and include per capita income, literacy, nutrition, fertility, access to safe water, access to adequate sanitation, and

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two types of immunization coverage (against measles and diphtheria-pertussis-tetanus).²

The direct and indirect influences of the eight factors on mortality can be summarized as follows. Higher *per capita income* usually facilitates higher expenditures on food, health care, water supply, sanitation, and housing, and usually leads to lower fertility. Lower *fertility* is associated with higher maternal ages at first birth, with longer intervals between births, and with less competition for resources within the family, all of which tend to reduce health risks for both children and mothers. Better *nutrition* reduces the incidence of diseases of malnutrition like kwashiorkor, and strengthens the body's defenses against infectious disease. Higher parental *literacy* often raises standards of hygiene, nutrition, and medical care in the home and elsewhere. Better *water supply* and *sanitation* reduce the incidence of a variety of water-borne, soil-borne and insect-borne diseases. The two *immunization* programs are important in reducing the incidence of certain childhood diseases which are sometimes fatal. These two programs may also serve as markers in each country for the quality of other public health services with major impacts on mortality, such as oral rehydration therapy for acute diarrhea in young children.

Before turning to the individual Middle Eastern countries, I look in Section I at the health trends of the Middle East as a whole, in comparison to other regions of the world. In Section II, I turn to the Middle Eastern countries, dividing them into four geographical areas: North Africa, the Fertile Crescent, the Arabian Peninsula, and the Northern Tier. Tables and charts present the trends for each country on life expectancy and the social, economic, and environmental factors. Section III offers some conclusions.

Health Trends in World Regions

Over the last half-century, most parts of the developing world have experienced a remarkable improvement in life expectancy. The Middle East has shared fully in this experience.

The outlines of the improvement are shown in Table 1.1. In the world as a whole, life expectancy rose by about 18 years over the period from 1950-55 to 1990-95. This amounts to an average of nearly half a year of added life expectancy for each calendar year elapsed, a sustained improvement which is probably unprecedented in human history.

Table 1.1
Life Expectancy in Middle Eastern and Other Regions, 1950–55 and 1990–95

	1950–55	1990–95	Percentage Increase
Middle East			
Northern Africa	41.8	62.1	48.6
Western Asia	45.2	66.3	46.7
Other Regions in Africa			
Eastern Africa	36.3	46.7	28.7
Middle Africa	36.0	51.0	41.7
Southern Africa	44.2	62.1	40.5
Western Africa	35.7	49.5	38.7
Other Regions in Asia			
Eastern Asia	42.9	69.7	62.5
South-Central Asia	39.2	60.4	54.1
Southeastern Asia	40.5	63.7	57.3
Latin America and Caribbean	51.4	68.5	33.3
North America	69.0	76.2	10.4
Europe	66.1	72.7	10.0
Oceania	60.9	72.9	19.7
World	46.5	64.3	38.3

Note: Life expectancy at birth in years, for both sexes. Data are population-weighted averages.

Source: United Nations (1998), Table A-32.

Among the developing regions of the world, the improvement was substantially larger than the average, in both absolute and relative terms. The largest increase in life expectancy, both absolutely and relatively, occurred in Eastern Asia, with China dominant. Life expectancy in that region rose by nearly 27 years over the forty-year period. The two Middle Eastern regions of North Africa and Western Asia enjoyed gains of 20 and 21 years respectively.

It is unlikely that the world as a whole will experience an improvement of these magnitudes again. With life expectancy in the world as a whole already at 64 years, a large part of the world's population has reached a state of sharply diminishing returns, where further improvements

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in living standards produce only small gains in health. This is clearly the story of the last half-century. In North America and Europe, life expectancy rose by only seven years despite large increases in per capita income and per capita health expenditures.

Health Trends in Middle Eastern Countries

I now look at life expectancy trends in the individual countries of the Middle East, omitting the West Bank and Gaza.³ Also examined are the eight socioeconomic indicators which help to explain those trends. First, the sources of information on life expectancy and the eight indicators must be noted. In all cases I have used sources outside the region itself, like agencies of the United Nations. It should be recognized that these sources do not themselves collect primary data but obtain most of their information from the national statistical agencies. The outside sources then make various adjustments to the national information, to correct for supposed shortcomings and to make the data comparable with other countries. In the resulting publications, these adjustments are rarely identified or explained in detail. Tracking the derivation of any published statistic is a major challenge. If a particular number seems strange, it is difficult to know whether that reflects reality on the ground, or incompetence (or malfeasance) on the part of the national agency, or an unwarranted adjustment applied by the outside source.

The data on life expectancy and fertility are taken from the United Nations (1998). The World Bank (1998) provides the data on literacy, immunization, water supply, and sanitation. The Bank's own sources for this information include UNESCO (for literacy) and the World Health Organization (for the other three variables). The data on nutrition come from the Food and Agriculture Organization of the United Nations (FAO, 1998). The data on per capita income come from the Penn World Table (1995). The Penn data offer two major advantages over the per capita income numbers conventionally employed: (a) in the conversion of income estimates expressed in national currencies into estimates expressed in dollars, exchange rates reflecting the true purchasing power of the national currencies are used, rather than official rates; (b) the income estimates reflect not only changes in the physical volume of a country's product but also changes in its terms of trade.⁴

The United Nations (1998) expresses life expectancy data over five-year periods. Indeed, the underlying information from censuses and other sources does not usually justify making annual estimates. The same is true for the fertility data reported by the United Nations. Among the fertility variables available, I choose the total fertility rate for the present analysis.⁵ The five-year periods run from July 1 of a given year to July 1 five years later. The same time-span is used here for the information on nutrition (per capita calorie consumption) and per capita income. The sources provide annual estimates, and from these I derive five-year averages.

The data on literacy (the percentage of adults able to read and write) contain too many gaps for individual countries in individual years to permit taking five-year averages. For this variable, I have used its estimated value at the midpoint of each five-year period.

The gaps for the remaining variables (immunization, water supply, and sanitation) are so numerous that there are not enough five-year values to justify plotting trends. These variables are therefore not charted. For each country, I show in tabular form only one "early" value and one "late" value (Tables 1.2 and 1.3).

North Africa (Figures 1.1 – 1.5, Tables 1.2 and 1.3)

In *Algeria*, life expectancy rose by 24 years between 1950-55 and 1990-95. This was the largest increase among the North African countries. The increase was fairly steady throughout the period, reflecting the steady improvements which also occurred in literacy and nutrition. Immunization against the childhood diseases increased markedly towards the end of the period. A further impetus aiding life expectancy was provided by the rapid decline in the total fertility rate after 1975-80. Contributions were also made by increases in per capita income, at least until 1980-85. The subsequent decline in per capita income, caused by falling prices for Algerian oil exports among other factors, was apparently not steep enough to offset the developments favoring health. Data on water supply and sanitation are too scanty to permit conclusions about their role.

Life expectancy in *Egypt* increased by 21 years. Factors contributing to this result included improvements in nutrition and literacy (over the entire period for which data are available), reductions in fertility (starting as early as 1965-70), and increases in per capita income (until 1980-85, after which the economy stagnated). Immunization coverage and

Table 1.2
Immunization Coverage in Middle Eastern Countries, 1980 and 1995
(percentage of children under 12 months)

	Measles Immunization (1 dose)		DPT Immunization (2 or 3 doses)	
	1980	1995	1980	1995
North Africa				
Algeria	17 ^a	69	33 ^a	75
Egypt	78	82	84	91
Libya	65	81 ^c	60	96
Morocco	17 ^b	87 ^g	43 ^a	90
Sudan	1 ^a	74	1	77
Tunisia	65	89	36	92
Fertile Crescent				
Iraq	35	88	13	91
Israel	69	94 ^g	84	92
Jordan	29	92	30	100
Lebanon	23 ^c	65 ^f	4 ^b	94
Syria	13	98	13	92
Arabian Peninsula				
Bahrain	...	...	...	...
Kuwait	48	93	67	100
Oman	22	98	18	100
Qatar	26	86 ^g	61	91 ^g
Saudi Arabia	8	94	41	96
U.A.E.	34	90 ^g	11	90
Yemen	2	49	1	53
Northern Tier				
Afghanistan	11	40 ^g	4	12
Cyprus	29	76 ^d	34	96
Iran	39	88	32	99
Turkey	27	65	42	66

Source: World Bank (1998).

... Not ascertained.

^a 1981

^c 1985

^e 1992

^g 1994

^b 1982

^d 1989

^f 1993

Table 1.3
Access to Safe Water and Adequate Sanitation in Middle Eastern
Countries
(percentage of total population)

	Access to Safe Water ^a		Access to Adequate Sanitation ^b	
	1970	1993	1982	1993
North Africa				
Algeria	77 ^d	77 ^f	...	59 ^f
Egypt	93	64	70	11
Libya	58	90 ⁱ	70	91 ^e
Morocco	51	52	50	40
Sudan	19	50	5 ^c	22
Tunisia	49	99 ^g	46	96 ^g
Fertile Crescent				
Iraq	51	44 ^h	69 ^c	36 ^{h*}
Israel	98 ^e	99	95 ^c	70
Jordan	77	89 ⁱ	76	100 ^h
Lebanon	92	89 ^c	59	75 ^e
Syria	71	85	45	56
Arabian Peninsula				
Bahrain	...	...	...	...
Kuwait	51	100 ^f	100	100 ⁱ
Oman	52 ^c	63 ^g	39 ^c	79
Qatar	95	100	100 ^f	100 ^h
Saudi Arabia	49	93	76	86
U.A.E.	100 ^d	98 ^h	75	95
Yemen	...	52	...	51
Northern Tier				
Afghanistan	3	10 ^h	2 ^c	8 ^h
Cyprus	95	100 ⁱ	100	100 ⁱ
Iran	35	83 ^g	60	67 ^g
Turkey	52	92 ⁱ	93 ^c	94 ^h

Source: World Bank (1998).

* 87% reported for 1995.

... Not ascertained.

^a "Reasonable access to an adequate amount of safe water (including treated surface water and untreated but uncontaminated water, such as from springs, sanitary wells, and protected boreholes)."

^b "Adequate excreta disposal facilities that can effectively prevent human, animal, and insect contact with excreta."

^c 1975

^e 1985

^g 1992

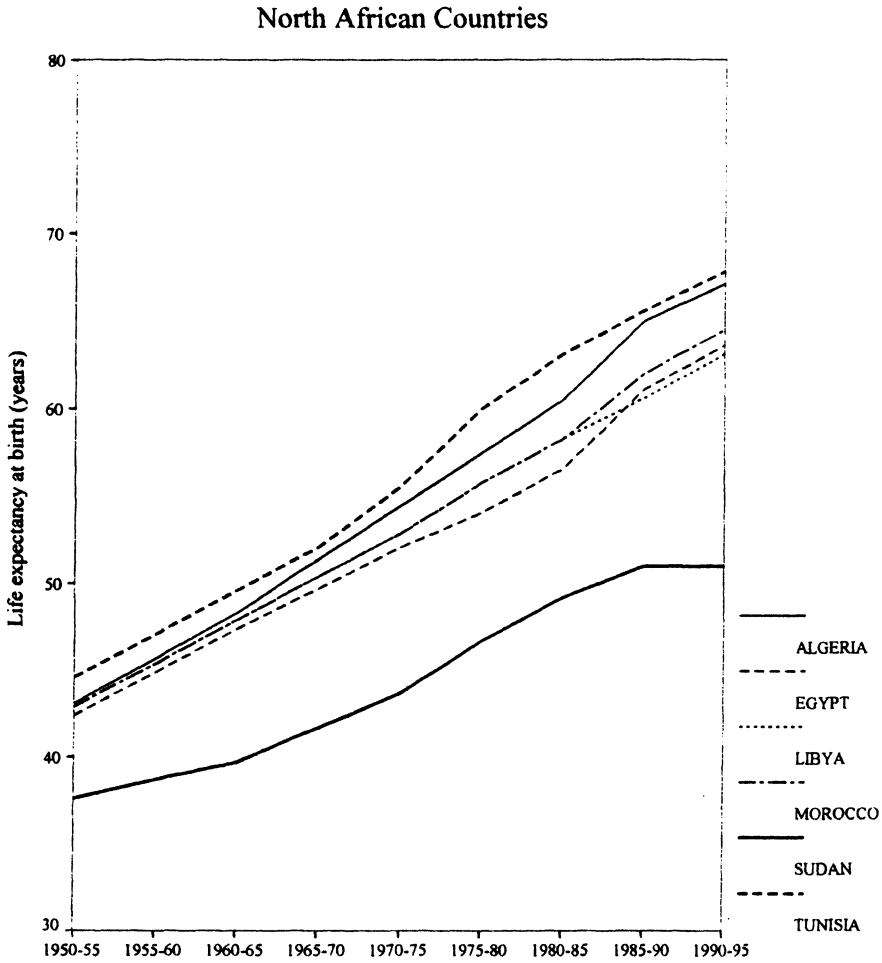
ⁱ 1995

^d 1982

^f 1988

^h 1994

Figure 1.1
Life Expectancy at Birth, 1950-95



Libya & Morocco reportedly have the same life expectancy thru 1980-85.

Source: UN (1998).

Figure 1.2
Per Capita Income

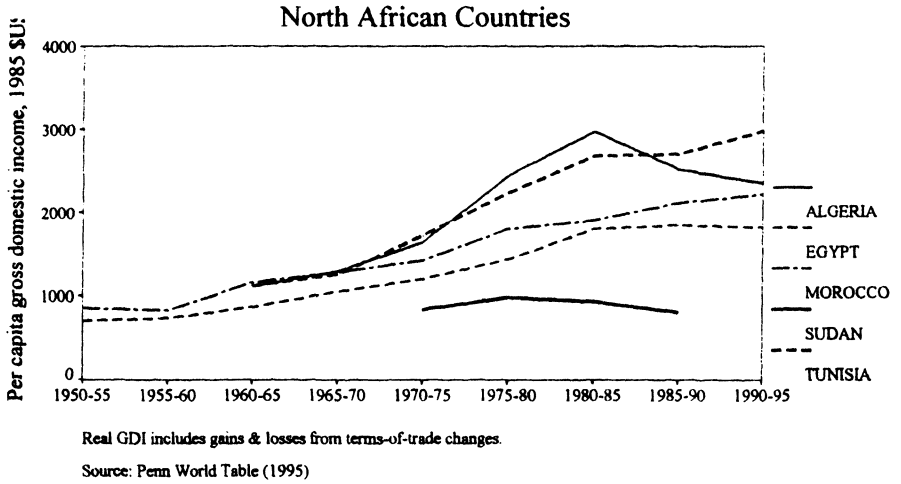


Figure 1.3
Literacy

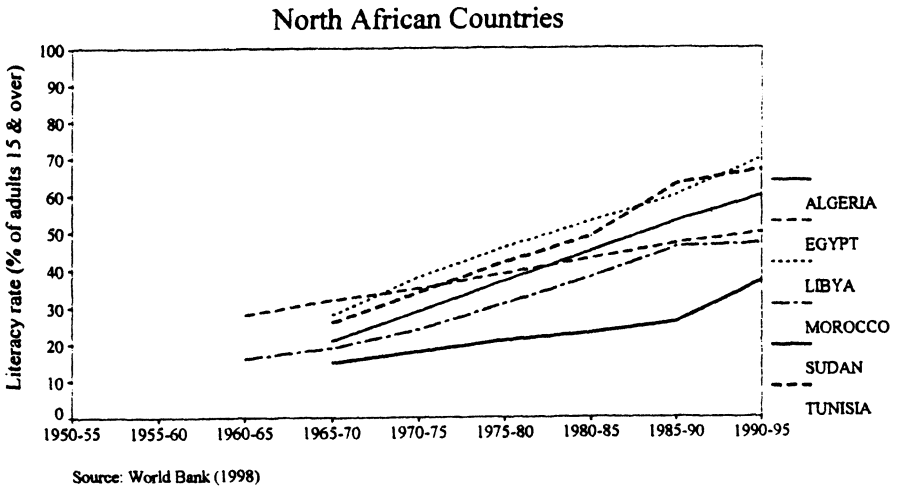
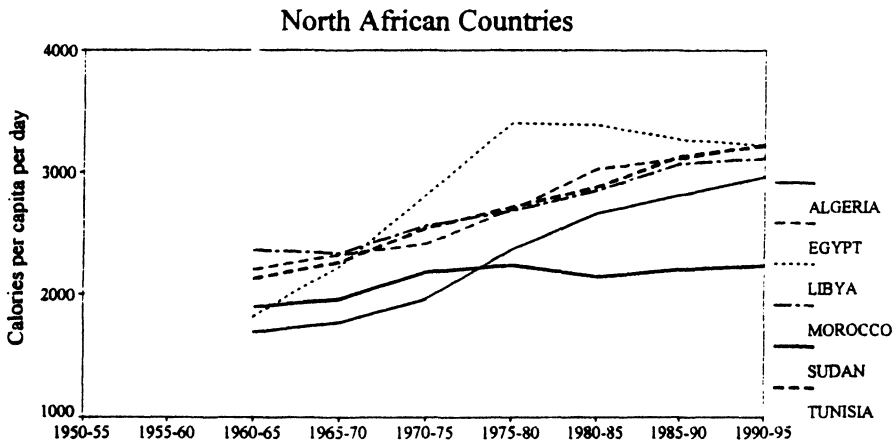
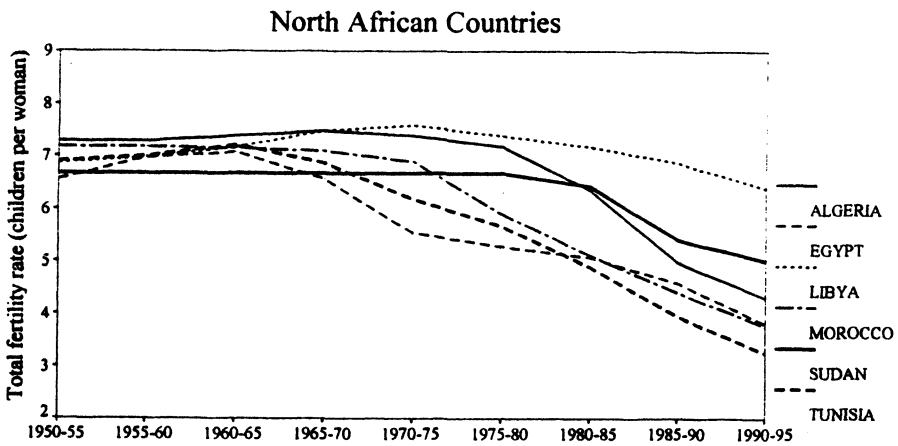


Figure 1.4
Nutrition



Source: FAO (1998).

Figure 1.5
Fertility



Source: UN (1998)

access to safe water and adequate sanitation had reached fairly high levels as early as 1980.⁶

Life expectancy in *Libya* increased by 20 years. Health improvement may have been held back by the failure of nutrition to increase after 1975-80, and by the continuation of high fertility. By 1990-95, *Libya* had the highest total fertility rate among the six countries of the North African region, at 6.4 children per woman. These negative forces were countered by steady increases in literacy (*Libya* leading the region on that indicator at the end of the period) and by the high levels of immunization, water supply and sanitation attained. As regards per capita income, the Penn World Table does not provide estimates for *Libya*. It is clear, however, that *Libyan* income is largely determined by the production and price of oil. This implies (a) large increases in per capita income before 1973 due to the rising volume of oil production; (b) further large increases in income for short periods after 1973 and 1979 due to the OPEC price rises of those years; and (c) declines in income after 1986 due to oil price declines. The price decline starting in 1986 may explain the stagnation in nutritional levels during the last part of the period.

Morocco experienced an increase of 22 years in life expectancy. There were favorable movements in most of the socioeconomic indicators analyzed: per capita income (increasing consistently after the attainment of political independence in 1956), literacy (until a leveling-off at the end of the period), fertility (starting to decline in 1975-80), nutrition, and vaccination coverage. Only the water supply and sanitation indicators remained stagnant.

Sudan is the poorest country in North Africa. On attaining political independence in 1956, it had the lowest per capita income in the region, and its subsequent development was held back by the ongoing civil war between North and South. Life expectancy increased by only 13 years, despite starting the period at the low level of 38 years. Per capita income stagnated, nutrition and literacy improved only slightly, and fertility started to fall from its traditionally high level only in 1985-90. By contrast, respectable levels of vaccination coverage were attained, and there were some improvements in water supply and sanitation.

In *Tunisia*, life expectancy rose by 23 years. All eight of the socioeconomic indicators improved considerably. By 1990-95, *Tunisia* led the North African region in water supply, sanitation, measles immunization, and the extent of its fertility decline, and surpassed all of the other countries

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except Libya in per capita income, literacy, nutrition, and DPT immunization.

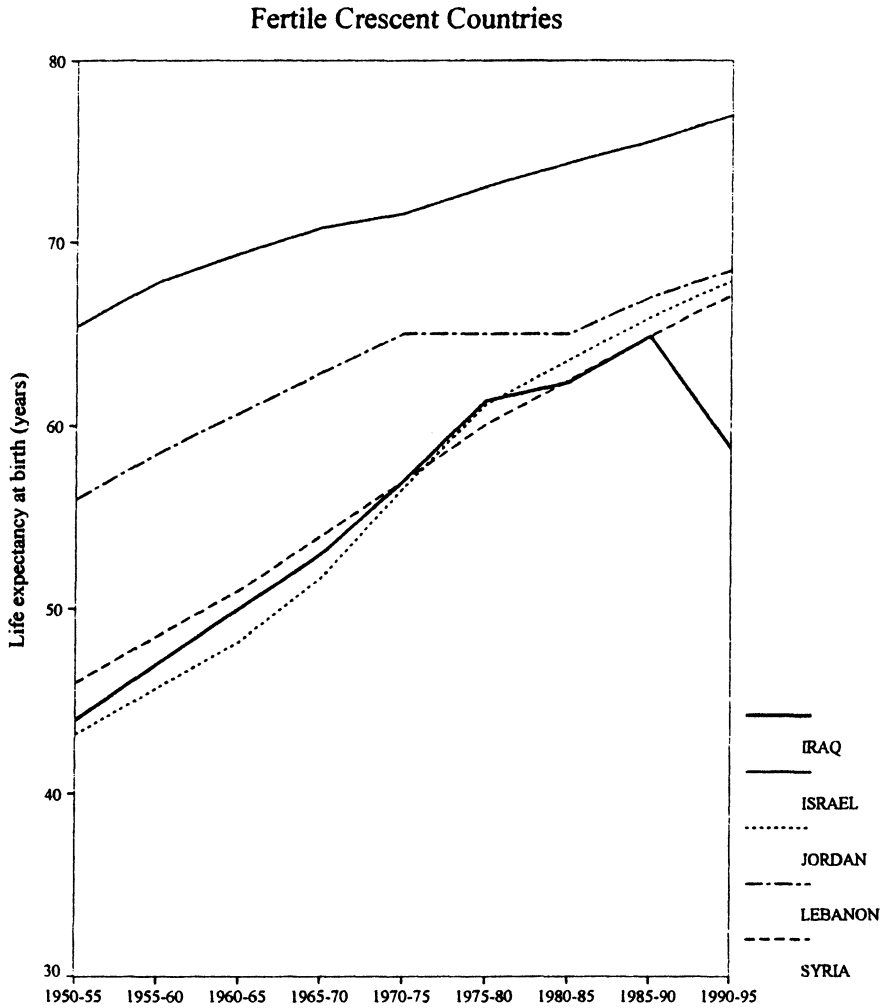
Fertile Crescent (Figures 1.6 – 1.10, Tables 1.2 and 1.3)

Life expectancy in *Iraq* rose by 17 years between 1950-55 and 1975-80, responding to increases in per capita income, nutrition, and literacy. This progress was then brought to a halt by two political catastrophes: the Iran-Iraq War of 1980-88 and the Gulf War of 1990-91. The war with Iran was a major cause of the 18% decline in per capita income between 1975-80 and 1980-85. The Gulf War was followed by prolonged hardship during the period of United Nations sanctions. Per capita income data for that period are not available, but the severity of the shock is reflected in Figure 1.9, showing a 30% decline in per capita calorie supply between 1985-90 and 1990-95. Between those same periods, the United Nations (1998) reports a loss of six years in life expectancy, and a doubling of the infant mortality rate from 64 to 127 per thousand births.

The Iraqi experience in the 1990s is the only case since 1950 among Middle Eastern countries where life expectancy as reported by the United Nations decreased from one five-year period to the next. That experience has been the focus of much international debate since the Gulf War. Two points not often stressed in the debate are worth making here. First, the magnitude of the deterioration in health is not well established. At one extreme, a frequently cited study implies a figure of about 220,000 excess deaths per year on the average since the war (Zaidi and Fawzi, 1995). "Excess deaths" here means the difference between the actual number of deaths (at all ages) and the number which would have occurred if prewar conditions had continued. The United Nations data cited above and reflected in Figure 1.6 imply excess deaths of about 75,000 per year. Towards the other end of the spectrum, one review of the evidence arrives at an estimate of about 30,000 (Lopez and Cortright, 1998), while one study in Baghdad suggests no significant impact on mortality at all (Zaidi, 1997). The Iraqi government has preferred to cite the bigger numbers, using them as its major weapon in an effort to swing global opinion against the sanctions.⁷

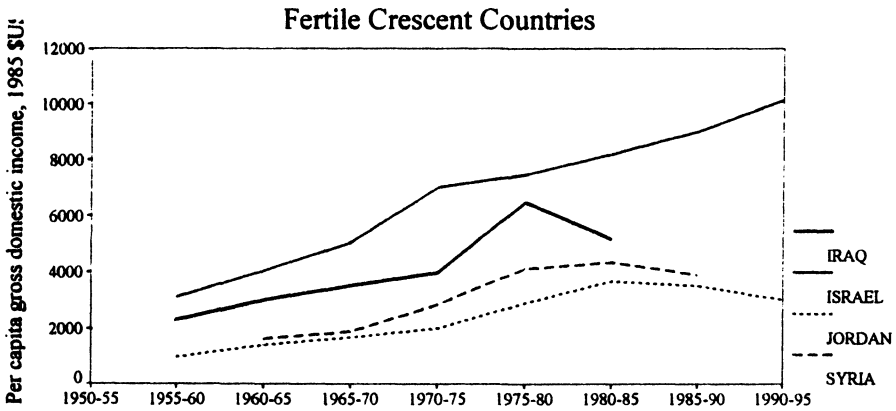
Second, whatever the actual number of excess deaths, the Iraqi government was in a position to prevent many of them. Other governments under economic pressure have chosen to give higher priority to health. An instructive comparison is with Cuba, a country impoverished by American

Figure 1.6
Life Expectancy at Birth, 1950–95



Source: UN (1998)

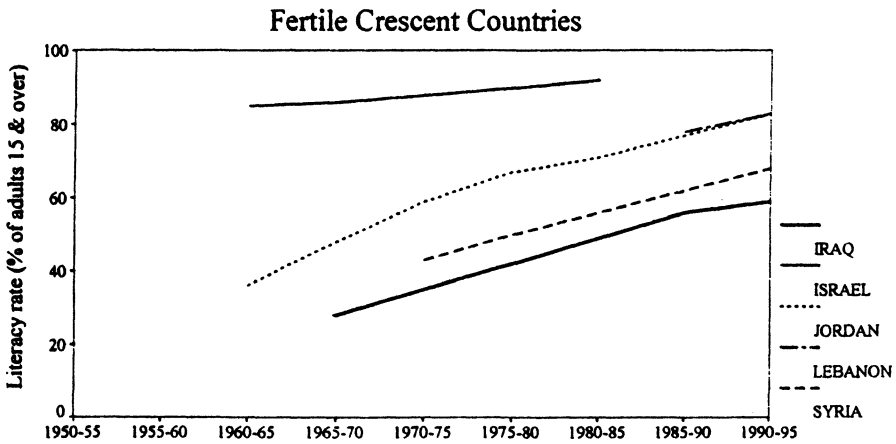
Figure 1.7
Per Capita Income



Real GDI includes gains & losses from terms-of-trade changes.

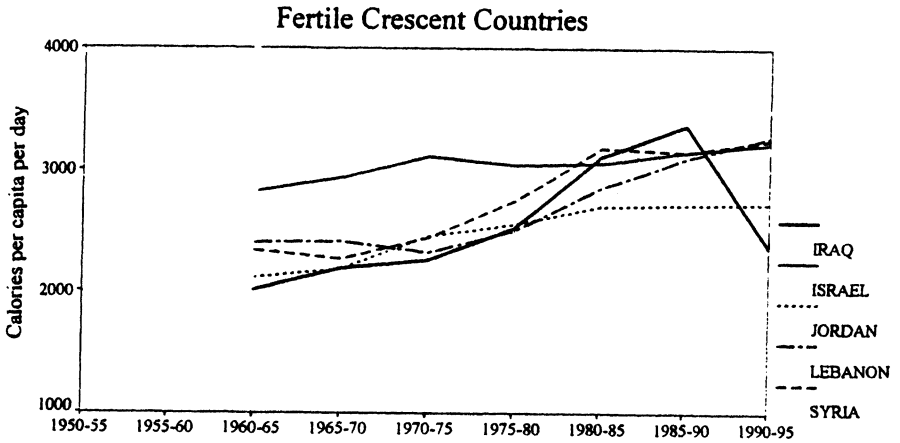
Source: Penn World Table (1995)

Figure 1.8
Literacy



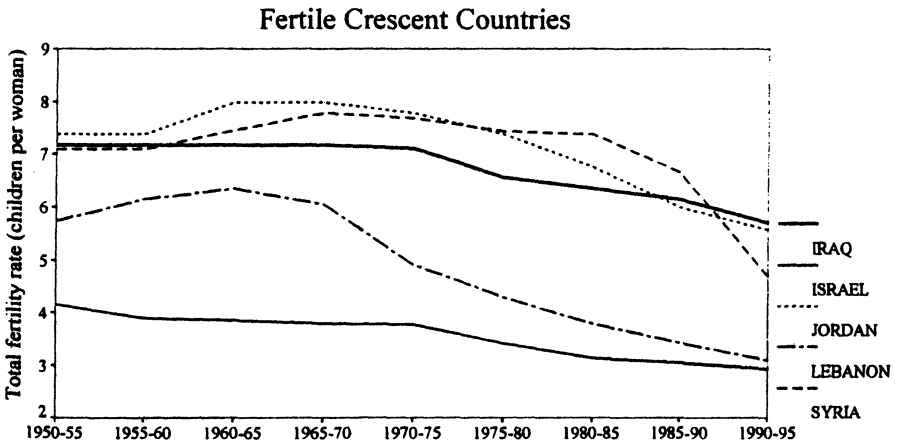
Source: World Bank (1998).

Figure 1.9
Nutrition



Source: FAO (1998).

Figure 1.10
Fertility



Source: UN (1998)

sanctions (and other factors) to about the same degree as Iraq. But the Cuban government has made resource allocation decisions resulting in an infant mortality rate of only 10 per thousand births in 1990-95 (United Nations, 1998).

With its population predominantly of European origin, *Israel* experienced an increase in life expectancy paralleling what happened in Europe and North America. Starting from a high level of 65 years in 1950-55, an additional 12 years had been added by 1990-95. The main force driving this improvement was undoubtedly the growth of per capita income, which roughly quadrupled during the period. After 1970 or so, there was not much improvement in literacy, nutrition, immunization, water supply, or sanitation, but that was because those indicators had already reached high levels. Fertility declined gradually throughout the whole period, reaching a level of 2.9 children per woman in 1990-95.⁸

Life expectancy in *Jordan* rose by 25 years. Until about 1985, the increase was driven by rising levels of per capita income, nutrition, and literacy. After that, per capita income and nutrition stagnated, because of declining oil prices (affecting Jordan indirectly through such mechanisms as worker remittances) and because of the Gulf War. But literacy kept increasing, fertility started to decline, and the immunization, water supply, and sanitation programs continued to expand.

In *Lebanon*, the upward trend in life expectancy was severely interrupted by the civil war of 1975-90, with the result that life expectancy grew by only 12 years between 1950-55 and 1990-95. The interruption was caused not only by the large number of violent deaths which occurred, but also by the deaths caused indirectly by economic disruptions. The Penn World Table does not provide any estimates of Lebanese income, but it is clear that there was a prolonged boom before 1975 and an economic recovery after the end of the civil war. During the recovery period, there were improvements in nutrition, immunization, water supply, and sanitation, and fertility continued a decline which had started in 1970-75. Literacy data for Lebanon are limited, but indicate that by 1990-95, Lebanon along with Jordan had achieved the highest rate among Arab countries, with 83% of the population aged 15 and over able to read and write.

Syria did not experience major political violence during the period, and life expectancy there rose steadily by a total of 21 years. Literacy increased throughout the period. Per capita income, nutrition, and sanitation improved until 1980-85 and then stagnated. However, those negative

developments towards the end of the period were offset by declines in fertility and by continued improvements in immunization and water supply.

Arabian Peninsula (Figures 1.11 –1.15, Tables 1.2 and 1.3)

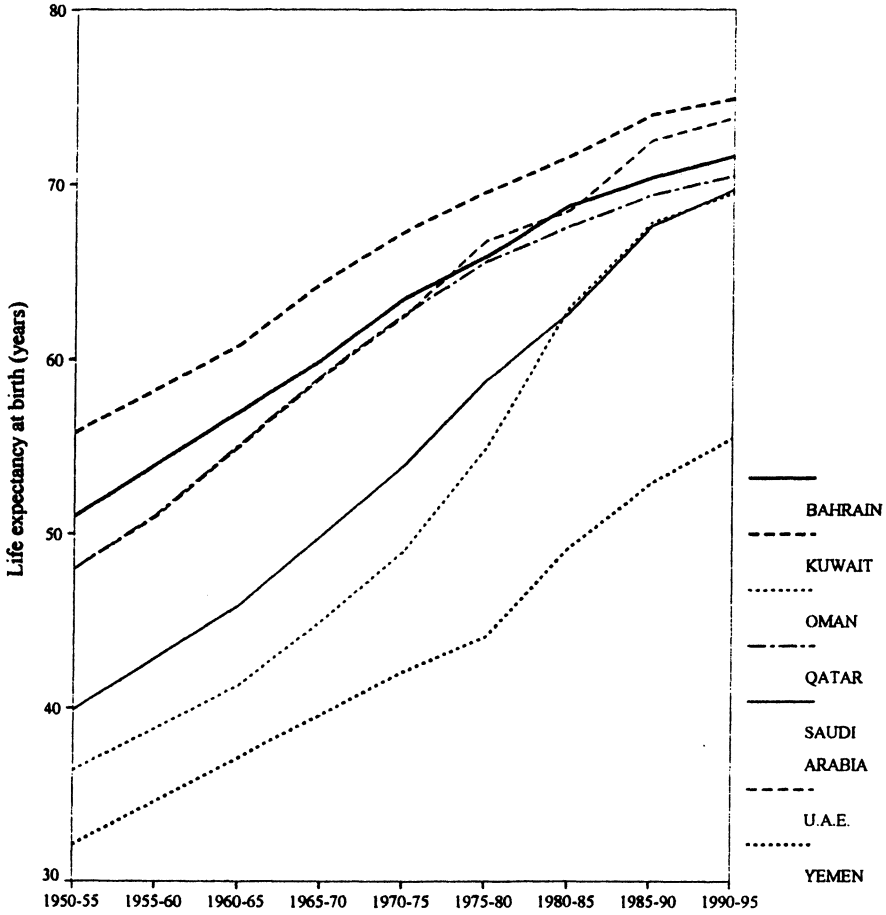
With the exception of Yemen, the states of the Arabian Peninsula have derived most of their income over the last half-century from the export of oil. The growth of per capita income in each case follows the oil-state profile already noted above in connection with Libya: rapid growth in most years, with occasional setbacks due usually to declines in the price of oil. *Bahrain* fits this pattern, and enjoyed in consequence an increase of 21 years in life expectancy during the period. Data on the socioeconomic indicators explaining health status in Bahrain are not available in the sources used, except for fertility. The transition to lower fertility in Bahrain started in 1970-75, earlier than elsewhere in the Peninsula. This reflected Bahrain's early start in producing oil and in undergoing the major socioeconomic transformations which that production entailed.

In *Kuwait*, oil income increased rapidly throughout the whole period until 1980-85. Life expectancy rose by 19 years, reaching 75 years in 1990-95, the highest among the Muslim countries of the Middle East. Literacy and nutrition did not increase much after 1970-75, but by that time had already reached relatively high levels. The fertility transition, once started, proceeded faster in Kuwait than elsewhere in the Peninsula: the total fertility rate fell from 6.9 children per woman in 1970-75 to 3.1 children twenty years later, a decline of East Asian dimensions. The indicators of immunization, water supply, and sanitation were all close to maximum possible levels by the end of the period, despite disturbances in 1990-91 due to the Gulf War.

Oman is the Middle Eastern champion in terms of health improvement over the half-century. Life expectancy almost doubled, from an African level of 36 years in 1950-55 to a European level of 70 years in 1990-95. Unfortunately the statistical record of this accomplishment is sparse. Oman was a latecomer as an oil state, and the big advances in per capita income did not start there until the late 1960s. Its late arrival is also reflected in its total fertility rate, which in 1990-95 still showed no signs of diminishing. The water supply and sanitation services were also still incomplete at that point.

Figure 1.11
Life Expectancy at Birth, 1950-95

Arabian Peninsula Countries



Qatar & UAE reportedly have the same life expectancy thru 1970-75.

Source: UN (1998)

Figure 1.12
Per Capita Income

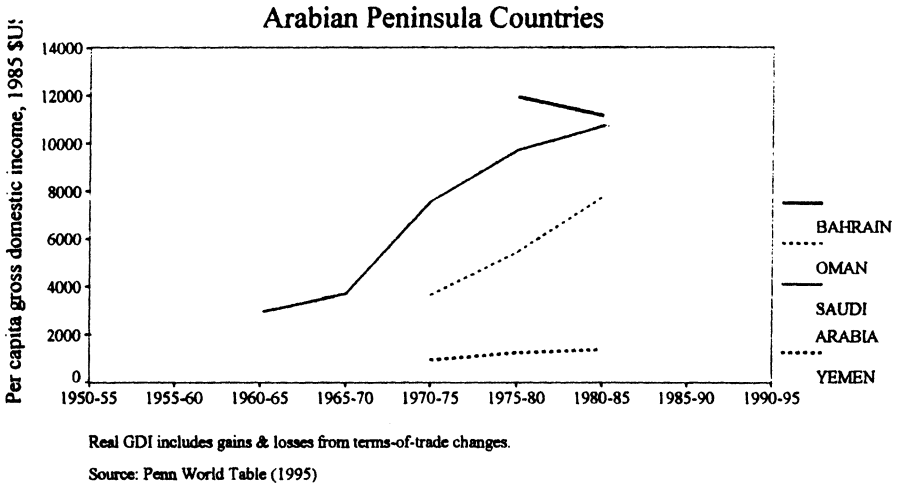


Figure 1.13
Literacy

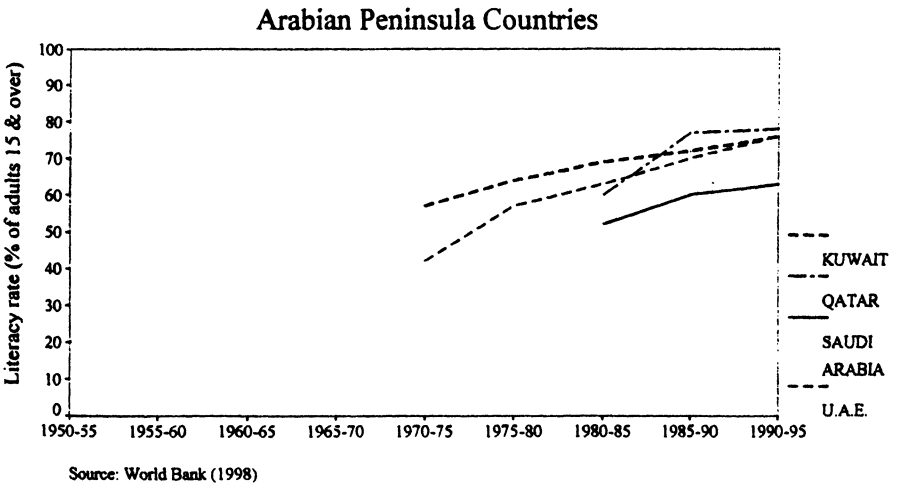


Figure 1.14
Nutrition

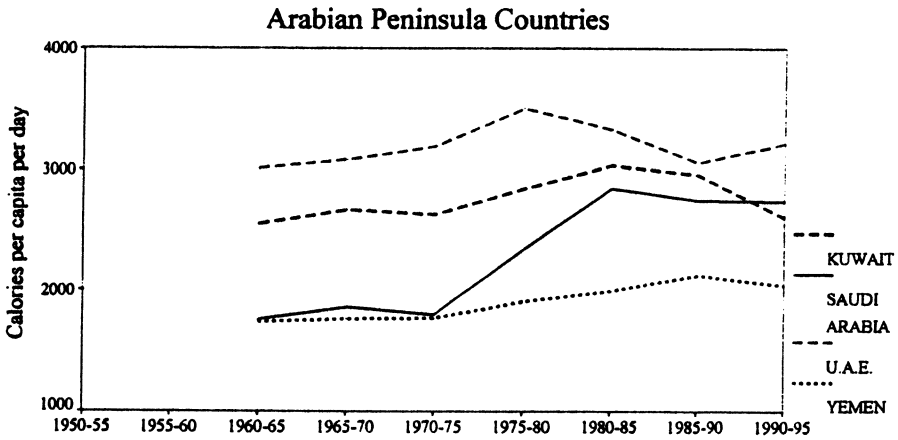
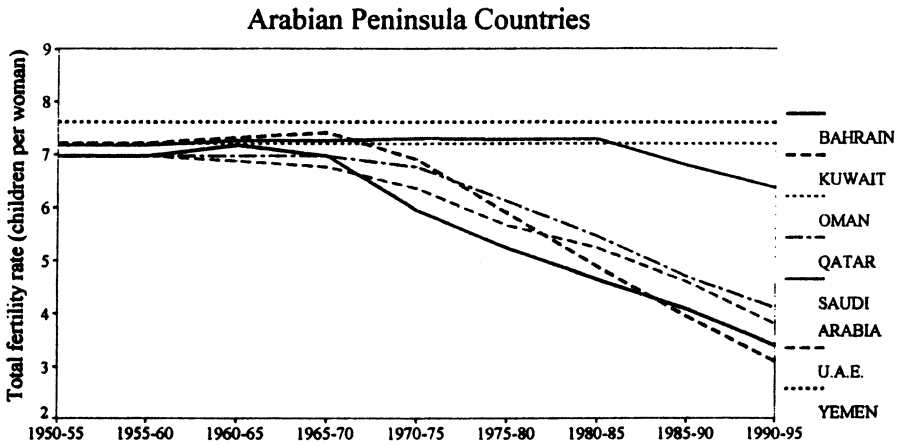


Figure 1.15
Fertility



Enjoying a tranquil career as an oil state, *Qatar* saw life expectancy increase without interruption by 23 years. Per capita income growth slowed after 1980-85, but further gains in health were then made possible by rising literacy and falling fertility. As in Kuwait, the great majority of the population was fully covered by immunization, water supply, and sanitation services by the end of the period.

Saudi Arabia added 30 years to life expectancy during the period. As an oil state, it enjoyed rapid growth in per capita income and nutrition until 1980-85. After that, the immunization, water supply, and sanitation services continued to expand. But at the end of the period, literacy still remained at modest levels, and fertility was still high. The cultural choices producing these conditions in Saudi Arabia may be costly in health terms.

The *United Arab Emirates* have followed a Kuwaiti rather than a Saudi pattern as an oil state, moving more quickly to a regime of high literacy and low fertility (by Peninsular standards). Life expectancy rose by 26 years during the period, reaching a level of 74 years. The immunization, water supply, and sanitation services covered almost the entire population by the end of the period.

On all of the available socioeconomic indicators, *Yemen* lagged behind the other states of the Peninsula throughout the whole period. But since its initial level of life expectancy was so low, at 32 years, the modest improvements which then occurred in per capita income, nutrition, immunization, water supply, and sanitation were able to generate sizeable gains in health. Life expectancy increased by 23 years during the period.

Northern Tier (Figures 1.16 – 1.20, Tables 1.2 and 1.3)

Afghanistan also started the period with a life expectancy of 32 years, but was then able to add only 12 more years by 1990-95. A major explanation was the disruption caused by the Soviet occupation during the 1980s. The nutritional indicator used here shows declines during that decade, and again during the subsequent period of civil war. By the end of the period, literacy had reached a level of only 30 percent; the immunization, water supply, and sanitation services were seriously deficient; and fertility was still at its traditionally high level.

In 1950-55, life expectancy in *Cyprus* was already at the relatively high level of 67 years. Despite subsequent periods of political turmoil, an additional 10 years had been added by 1990-95. All of the socioeconomic

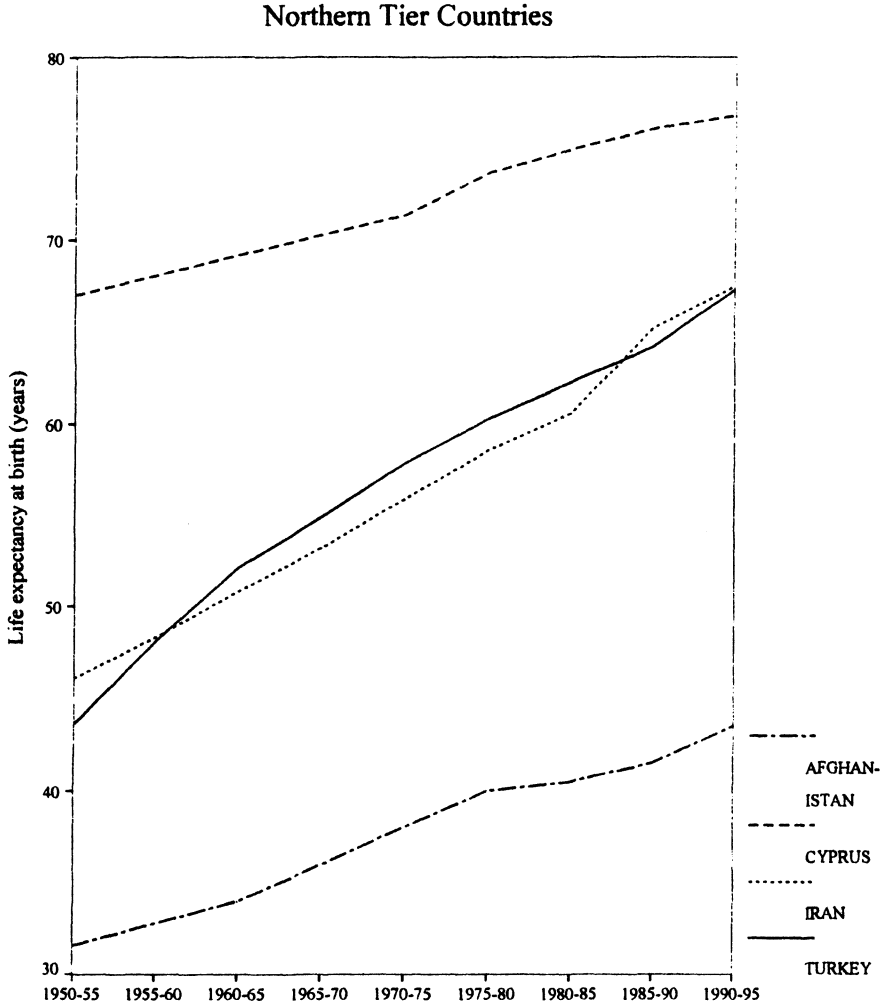
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indicators moved favorably. Per capita income more than quadrupled; nutrition and literacy reached high levels; the transition to low fertility was completed by the 1970s; and the immunization, water supply, and sanitation services achieved full coverage of the population.

Iran also experienced much political turbulence, but was able to add 21 years of life expectancy. During the first thirty years of the period, with the Shah in power, there was general improvement in the socioeconomic indicators. Per capita income and nutrition rose substantially, assisted by the OPEC price increase of 1973. Under the banner of the Shah's "White Revolution", literacy increased and the transition to lower fertility began. Soon after the advent of the Islamic Revolution in 1979, the long war with Iraq and other stresses such as the "brain drain" and the revolutionary reorganization of society caused severe economic difficulties. Per capita income and nutrition stagnated, and the fertility decline was reversed. Life expectancy suffered, especially in 1980-85. After the end of the Iraqi war in 1988, all of the socioeconomic indicators improved, with corresponding increases in life expectancy.

In *Turkey*, the determined pursuit of socioeconomic development which had been launched by Ataturk in the 1920s continued unabated. Life expectancy rose by 24 years. Per capita income almost tripled; nutrition increased substantially; literacy reached the relatively high level of 82%; the fertility transition proceeded steadily; the water supply and sanitation infrastructure was largely completed. The eastern part of the country, however, remained relatively underdeveloped, and further significant increases in national life expectancy would probably require the expansion of social services and income-generating activities in those regions.

Figure 1.16
Life Expectancy at Birth, 1950–95



Source: UN (1998)

Figure 1.17
Per Capita Income

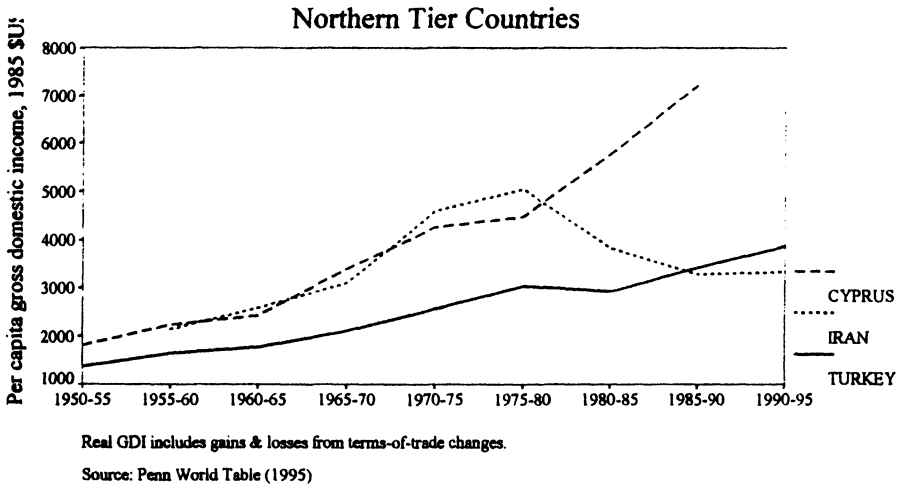


Figure 1.18
Literacy

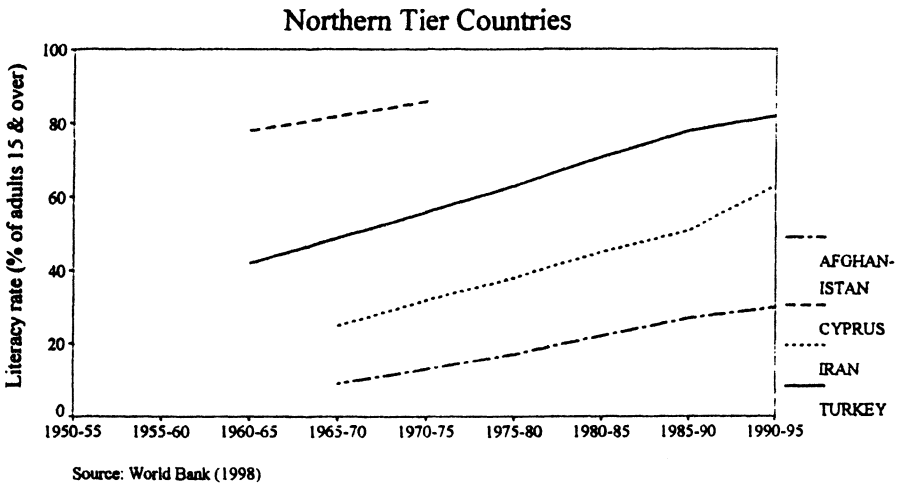


Figure 1.19
Nutrition

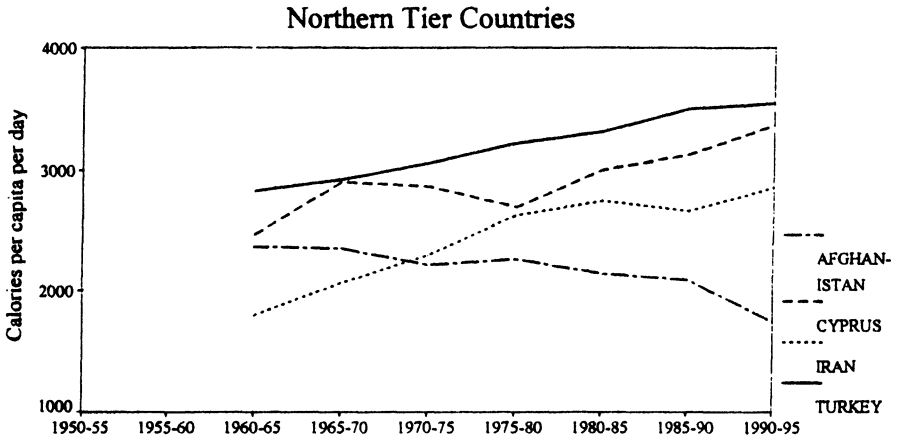
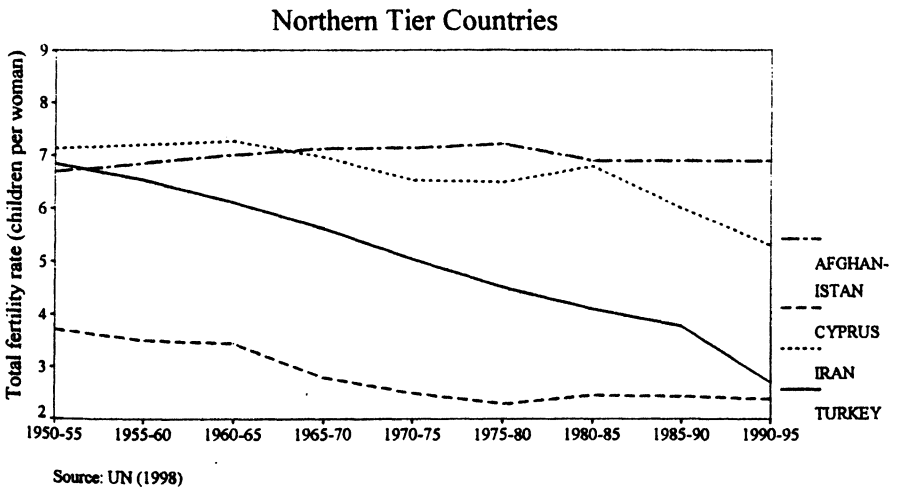


Figure 1.20
Fertility



Conclusions

This chapter has attempted to paint a broad-brush picture of health trends and their determinants in the countries of the Middle East. It is obvious that more detailed pictures are possible for individual countries. There is much to be told about the causes and effects of specific epidemics in specific countries, or about the achievements of specialized programs of public health. As an example, one can cite the discussion about how Egypt achieved an unusually large increase in life expectancy in 1985-90, despite a background of economic stagnation. One school of thought attributes the success to the rapid expansion of the government's oral rehydration therapy program after 1984, and the consequent reduction in infant and child deaths from acute diarrhea (Miller and Hirschhorn, 1995).

The broad-brush approach, however, does suggest a certain number of explanations for the health trends in the case of each country. It also shows clearly that health outcomes result from several different influences which are often in conflict with each other. Large and sustained increases in per capita income tend to produce favorable movements in all the other factors influencing health, but in the absence of a prolonged boom, there are often cases when, say, literacy is increasing while nutrition is falling. A complex model of causation is required for the understanding of health trends.

The picture which emerges for the Middle Eastern countries is one of great improvement in life expectancy, generally speaking. The exceptions are seen to have political explanations for the most part. Over the last half-century, the region has suffered from many episodes of military invasion, armed insurrection, and civil strife, all with negative effects on the economy and the health services. Remarkably, the countries afflicted have usually managed to rise Phoenix-like from the ashes, and the health indicators have resumed their positive trends. Examples of such recovery are seen in Cyprus, Iran, Kuwait, Lebanon, and Yemen. Their experience provides hope for other places presently in severe political crisis.

Notes

- 1 The *infant mortality rate* is the number of deaths at ages under 12 months, per 1,000 births. The *child mortality rate* is the number of deaths at ages 1-4, per 1,000 children aged 1-4. *Life expectancy at*

- birth* in, say, 1995 is the mean number of years which would be lived by individuals born in 1995 if they were subject throughout their lives to the age-specific death rates prevailing in 1995.
- 2 For a cross-national statistical analysis of how social, economic, and environmental factors affect life expectancy, see Barlow and Vissandjée (1999).
 - 3 No analysis is attempted here for the West Bank and Gaza, because the information available on both life expectancy and the socioeconomic indicators is sparse and often disputed. The United Nations (1998) reports that life expectancy in Gaza rose from 43 years in 1950-55 to 66 years in 1990-95, but offers no estimates for the West Bank. The World Bank (1998) reports that life expectancy in the West Bank and Gaza combined was 67 years in 1992 and 68 years in 1996.
 - 4 A country's terms of trade is the ratio of its export price index to its import price index. If the prices of its exports rise, the country can pay for an increased volume of imports and enjoy a higher standard of living even though the physical quantity of its production (GDP) has not increased. In the Middle East it is particularly important to recognize this source of change in per capita income, because of the major fluctuations in oil prices which have occurred. As late as July 1999, the Penn World Table data on real gross domestic income (GDI) were available only through 1992. In order to estimate real GDI per capita for 1990-95, I have assumed for each country that the annual percentage changes in real GDI per capita between 1992 and 1995 were the same as those reported by the World Bank (1998).
 - 5 The *total fertility rate* in, say, 1995 is the total number of children which a woman would bear during her lifetime if at each year of her age, she were subject to the age-specific fertility rates prevailing in 1995.
 - 6 As seen in Table 1.3, the World Bank (1998) then reports major declines in the access variables by 1993. These reports are hard to believe, since the period in question was one when large-scale investments in water supply and sanitation were made in Cairo and elsewhere.

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- 7 Another Middle Eastern example of a mortality indicator subject to political manipulation is given by Schnitzer and Roy in Chapter 6 of this book. In the mid-1980s, the infant mortality rate in Gaza, then under Israeli occupation, was reported as about 30 per thousand births by the Israeli side, and as about 100 by the Palestinians.
- 8 For a description of mortality trends among the Jewish and Arab parts of the Israeli population separately, see Chapter 4 by Elias Nigem in this book.

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FROM WAR TO DISASTERS: THREADS OF EPIDEMIOLOGIC RESEARCH AND PUBLIC HEALTH ACTION IN THE MIDDLE EAST

HAROUTUNE K. ARMENIAN

Epidemiologic research has made important contributions by investigating unusual or *unexpected patterns of disease*, like epidemics. The information gained from these investigations of unusual disease patterns has allowed us to prevent the future occurrence of such disease patterns. However, the primary concern of most epidemiologic research nowadays is not with the unusual patterns of disease but with the most common endemic priority problems. One approach for investigating such common problems is to focus on *unusual situations in human populations* where one may be able to learn from associations observed under a set of circumstances that are different from those where a majority of the cases occur.

This chapter provides examples of research that were conducted in the Middle East in populations that were exposed to unusual situations and or lived in an unusual environment. At the conclusion of the chapter I highlight the need for an integrated approach in epidemiologic research in such complex situations.

Examples from History

The first set of these examples takes us back to 1866 and the founding of the

American University of Beirut (AUB). Events and research at the AUB have reflected very well the changing environment of the Near East for over 130 years.

Established in 1866 as the Syrian Protestant College, the AUB was dedicated to the “service of all classes of men without regard to color, nationality, race or religion” (American University of Beirut, 1986). The School of Medicine at the College was started within one year of AUB's foundation, highlighting the importance ascribed by its founders (who were mostly missionaries) to healing in all its forms.

The faculty was initially drawn from the ranks of missionaries working in Syria and Lebanon. Thus the College necessarily became involved with the needs for the community around it. Most of the early faculty members continued in their dual roles as missionaries and professors. For example, Cornelius Van Dyck, professor of Medicine and Anatomy, also helped in the translation of the Bible into Arabic (Penrose, 1941). Hovhannes (John) Wortabet taught anatomy, physiology and public health, prepared an English-Arabic and Arabic-English dictionary which is still in use today, and published an account about his “Researches in the Religions of Syria” (Penrose, 1941; Wortabet, 1954, 1860). Wortabet, a corresponding member of the Epidemiological Society of London, and the son of an Armenian-Protestant preacher, was also the model of a clinical professor. In addition to teaching the course of hygiene, he was engaged in research on the epidemiology of a number of diseases which were then prevalent in the region. His investigations of outbreaks of trichinosis in villages near the sources of the Jordan river, linking the source of infection with the ingestion of wild boar meat, are classic examples of epidemiologic studies of the etiology and transmission of this disease. Two reports on these investigations were eventually published in the *Lancet*, in 1881 and 1883 (Wortabet, 1881, 1883). Another major contribution of Wortabet was his publication of popular literature concerning the causes and prevention of the endemic and epidemic diseases of that time. His was probably one of the earliest efforts towards public health education in modern Arabic literature.

Harris Graham was another member of this second generation of professors at the medical school. He served the University from 1885 until his death from epidemic encephalitis in 1922. He was the first to demonstrate in 1902 that dengue fever was a mosquito borne disease (Shuman, 1924a). His investigations constituted an early demonstration of experimental methods in epidemiology. In these experiments, he was able to show that transmission of the disease did not occur in a mosquito free room, however intimately the diseased and non-diseased lived in that room. He extended his work to the

laboratory identification of the mosquito and the suspected parasite, but he failed in both instances. His epidemiologic inference that the disease was transmitted by the mosquito was correct but he mistakenly identified the mosquito as the more common *Culex* rather than the *Aedes* which was demonstrated to be the culprit some 15 years later, in Australia (Graham, 1903; Hitti and Khairallah, 1946).

By the time of World War I there were several epidemiologic research projects as well as an established teaching program in hygiene and public health at the University. William Thomson Van Dyck, third son of Cornelius Van Dyck, had joined the faculty as lecturer on material medical, hygiene and zoology (Penrose, 1941). In 1916 he published, in Beirut, a book entitled "Syllabus of Lectures on Hygiene" (Van Dyck, 1916). Besides serving as an excellent summary of the state of the art in public health, at a time when the first of the U.S. schools of public health was established at the Johns Hopkins University, this book demonstrates a quite modern perspective regarding the scope of public health, as may be illustrated by its table of contents (Table 2.1).

Table 2.1
Contents of W. T. Van Dyck's Syllabus of Lectures on Hygiene

General Hygiene
Hygiene at Different Ages
School Hygiene
Sexual Hygiene
Hygiene of Occupation
Municipal Hygiene
Military Hygiene
Naval Hygiene
Prevention of Communicable Disease
Demography and Vital Statistics
Heredity

Source: Van Dyck, 1916.

The following excerpt from a letter sent to the *Medical Herald* by one of the faculty members of the medical school, J. W. Shuman, illustrates the philosophy that guided the school during the first period of its existence.

“The raising of the general health standard of people everywhere, thereby increasing their general usefulness and their happiness, is certainly a Christian act. This must be done through sanitary and health service to prevent disease, and involves housing, labor, age and private and public enterprise, etc., for conserving health. If we are not clear on these programs here at home we cannot expect as much from our medical missionaries over there” (Shuman, 1924b).

The 1930s and 1940s saw a rising interest by the students and faculty at the AUB in community involvement and field activities. Village welfare leagues were formed, and students and faculty spent long summer months in the villages of Lebanon, Syria and Palestine working on a variety of community development projects. As a professor of sociology at the University, Stuart Carter Dodd was one of the faculty members involved in such projects. He was also one of the first to introduce sociometric methods in the assessment of health problems. In his book, “A Controlled Experiment on Rural Hygiene in Syria”, published in 1934, he described the results of an intervention study, testing whether a mobile health facility, which conducted education on hygiene, would have any demonstrable impact on the health of villagers as compared with villages where no such service was offered. No significant difference between his experimental and control villages could be demonstrated. This was ascribed to the fact that the control villages were “not sufficiently isolated from the experimental to prevent diffusion of new hygiene culture patterns.” An interesting observation was that the village peddler “if supplied with proper medicines and first aid knowledge, might be made an effective, self-supporting, and health promoting agent” (Dodd, 1934).

Similar developments in epidemiology and public health were occurring in other parts of the Middle East. For example, in her excellent treatise on public health in nineteenth century Egypt, "Lives at Risk", LaVerne Kuhnke describes the various epidemics of cholera, plague, and smallpox that provided a major impetus for the development of the model public health services in the country (Kuhnke, 1990). With its resources and the size of the health problems, Egypt provided a positive environment for the implementation of a number of epidemiologic investigations.

At a time when Goldberger was carrying out his epidemiologic investigations into the causes of pellagra in the United States, William H. Wilson, professor of physiology in the School of Medicine in Cairo, was carrying his own experiments with a high protein diet to prevent pellagra recurrences in the Abbassia Asylum for the Insane in Cairo. In 1916, the British authorities were faced with an epidemic of pellagra in the camps of

the Armenian refugees in Port Said. About 3,840 refugees who had survived the genocide in Turkey and had endured great physical hardships, were brought by the British to Port Said in September 1915. When Wilson was contacted, he changed the diet to one with a higher protein content. The last case of pellagra left the hospital in June 1917. "Wilson without any knowledge of the vitamin, niacin, had, in fact, increased the niacin content of the refugees' diet so as to meet their requirements" (Wilson, 1921).

Examples from Disasters and War

The next set of examples will present epidemiologic research done during the civil war in Lebanon and investigations following the 1988 earthquake in Armenia. These illustrate the potential for learning about the role of massive environmental stressors on both physical and mental health from such research (Armenian, 1986, 1989).

There is a rich literature of studies that have looked at the relationship of disasters to psychopathology. Whether it is following a hurricane, an earthquake or war, it is well established that as a result of a major disaster there is a high level of psychopathology in the exposed population (Bromet and Dew, 1995).

Psychopathology in Wartime

A number of studies have reported increased psychiatric illness in persons exposed to war stress. These reports include high rates of psychiatric disorders among concentration camp survivors following the Second World War (Eitinger, 1962, 1969), in East European refugees (Krupinski et al., 1973), and in Vietnamese evacuees (Murphy, 1977). Many of these studies have a clinical focus and few are population based.

While the protracted war in Lebanon was in progress, we have conducted a number of investigations that have assessed the role of stressors on illness in the population. During the siege of Beirut, in the summer of 1982, we conducted an Emergency Health Surveillance Project that was designed to provide ongoing information on the health status of Beirut residents and to quickly identify health problems requiring assistance and intervention (Faculty of Health Sciences, 1984). As part of this project we conducted a population based household survey of about 1,345 families in Beirut and its suburbs. The analysis of the survey data revealed that, parallel

to high rates of common infections, this population also reported high rates of psychological distress symptoms (Hourani et al., 1986). The frequency of these symptoms in this population was related to worsening physical health and loss of home and income.

In a separate study of children in schools and orphanages in Beirut, and using various psychological tests, it was observed that being disadvantaged in wartime, as in an orphanage, increased the probability of the child having psychological problems (Day, 1986).

Psychopathology Following an Earthquake

Psychiatric morbidity following disasters, particularly post-traumatic stress disorders (PTSD), is a major public health problem. Estimates of PTSD following disasters vary between 2 and 60 percent (Saigh, 1992). Although measurement issues may explain some of the differences in these estimates, it is more probable that they could result from differences in the nature of the disaster and the sociocultural environment within which these disasters occur.

Following the earthquake of December 7, 1988, in Armenia, we embarked on a number of population based epidemiological studies of the determinants of death and injury during the earthquake as well as of the long term effects of the earthquake in a cohort of 33,000 survivors of the disaster. Within this population, a geographically stratified sample of 1,785 persons between the ages of 16 and 70 were interviewed using a special psychiatric questionnaire over a period of one year. Within two years following the earthquake, about 60 percent of this adult population had symptoms that could fulfill the diagnosis of either PTSD and or depression. The risk of PTSD and depression was related to the amount of loss in the individual's family. Thus the intensity of the ensuing loss from the disaster was related to the intensity of the psychiatric morbidity in this population (Armenian et al., 1997).

Physical Illness and Stressors

The role of psychosocial stressors in physical illness has been highlighted in a number of studies. The ongoing war in Lebanon provided an opportunity to assess the impact of war stressors on coronary artery disease (CAD) within a case-control study at the American University of Beirut. A total of 127 patients who underwent coronary angiography were individually matched

with visitor controls free from any evidence of clinical CAD. Arteriographic cases were compared with two control groups: arteriographic controls with entirely normal coronaries, and visitor controls. Cases reported a significantly higher number of exposures to acute war events compared to both control groups. Crossing the "green line" separating the two fighting factions in Beirut, considered as an attribute of war-related chronic stress, was more frequent in cases compared to both control groups. Adjusting for the effect of well established CAD risk factors did not alter the above reported findings (Sibai et al., 1989).

Conclusions

The review of these studies has highlighted once more that the relationships between psychosocial stressors, physical and mental illness are not simple. In order to understand these relationships one has to use more complex models of etiology. If we consider the role of social and demographic characteristics, in addition to factors affecting access to and utilization of health services within the framework of these relationships, the need for a more integrative approach to etiologic research has to be underscored. Such an approach is dependent on the use of more complex models of etiology, like the *web of causation* of MacMahon, and newer approaches of investigation and analysis.

One such approach that epidemiologists could learn from and could adapt to their needs is systems analysis. Epidemiologists need to view disease and wellness within systems of interacting elements. Such systems have inputs, processes and outcomes, and are integrated within systems at higher levels. Also, outcomes in one system are inputs to other systems. The relationship of psychopathology and physical illness that was discussed here is a good example where such an approach could possibly be more productive than existing approaches.

Epidemiologists have primarily focused on simple models of etiology where the direction between *one* primary independent variable is studied as it affects *one* outcome. Multivariate analyses in such a context are used to hold constant or adjust for other determinants of this primary relationship of interest. The underlying philosophical model for such an approach to etiology is essentially univariate and simple. Progress in epidemiology is contingent on adapting our powerful computing and statistical tools to study more complex models of interacting factors within identifiable systems.

We need to study how the whole web of causation works rather than just how a thread or a knot is held within the web.

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PROPHETIC MEDICINE AND QUR'ANIC HEALING: RELIGIOUS HEALING SYSTEMS IN ISLAM

KATHLEEN MALONE O'CONNOR

Religious healing systems in Islam call upon the life-giving blessings of divine speech in the Qur'an; the blessedness inherent in the friends of God including the Prophet Muhammad, the Shi'i Imams and the Sufi saints; and the organic and god-given healing powers of the natural world in plant, animal, and mineral forms. The codification of those powers is found in Islam in three intersecting approaches to health and healing: the medical lore and technology of the Greeks (including elements of Persian/Zoroastrian and Indian/Ayurvedic medicine); the indigenous pharmacognosy of the Bedouin and other peoples of the Muslim world; and the lore of the Prophet Muhammad on nutritional, herbal, and spiritual healing, particularly on the paraliturgical and healing uses of the Qur'an. This paper will outline the "Greek" approach and genre of Islamic medicine in order to address the full dimensions and interaction of the prophetic and qur'anic approaches to healing/health throughout medieval Islam and their legacy in the modern world.¹

Much of the medical belief and practice documented here, whether Greek or prophetic/qur'anic in origin, has been relegated to the fringes of "Islam" by Islamic studies scholarship and for very different reasons by both reformist and modernist Muslim perspectives. Pre-modern Islamic approaches to healing, however, should be placed at the very center of magico-scientific-religious thinking in medieval Islam which integrated the beliefs and practices of Greek-trained Muslim physicians and medical astrologers, Muslim scholars trained in the

religious sciences who codified prophetic and qur'anic materials for their magico-medical use, Muslim religious healers (often Sufis or descendants of a Sufi family) whose practice blended both Greek and Islamic tradition, and ordinary Muslims who had recourse to this range of approaches to healing. Often deemed primitive and irrational superstition in opposition to rational religion and Islamic "orthodoxy," these religious healing systems have been bracketed and diminished by such terms as "popular medicine" or "folk healing." In contrast to this perspective, I would characterize traditional Muslim medical beliefs and practices as "vernacular," rather than "popular" or "folk," in a conscious attempt to see them as authentic and universal expressions of Islamic religiosity and not as "superstition," pre-Islamic/non-Islamic "survivals," or isolated expressions of Islamic regional culture.²

The long history and legacy of ordinary Muslims' recourse to magical or spiritual cures in addition to, or in lieu of, any other empirical means of healing has been particularly marginalized as "unorthodox," not real "Islam," i.e. part of the perceived gap between everyday Muslim practice (implicitly deviant and "heterodox") and the Muslim ideal ("normative" religion, text-based religion, in this case, religion defined by the Shari'a). In terms of understanding Islam, both as an historical tradition and as a living tradition, however, such absolute distinctions deflect and distort the complex, interactive, and negotiated relationship between religious institutions, the community, and individual believers/practitioners. Thus, although there are certainly normative institutions in Islam and bodies of interpretive coding generated within the various communities which are normative for those communities, the distinction between some abstract "normative" Islam versus the actual practices of Muslim believers is not useful in understanding medical beliefs systems or any other contexts of religious belief and practice. Use of the concept of "vernacular religion" and, in this case, "vernacular medicine," for religious healing systems such as prophetic and qur'anic medicine circumvent the inherent problems of terminology which relies upon the normative concept of Islamic "orthodoxy."³

Pre-modern Islamic medicine also tends to be dismissed by the history of science/history of medicine perspective as misguided/misinformed physiology and pathology, employing ineffective techniques and treatments, and generating at best mere placebo effects and at worst actually harming rather than genuinely curing. The continued belief and recourse to "traditional medicine" and supernatural

or "magical" efficacy in modern times, or in otherwise secularized or westernized contexts when modern medical alternatives are available, is therefore often ignored or dismissed as the irrational clinging to customs and traditions of the past rather than rational and progressive science. The ongoing practice and belief in traditional medicine in modern times parallels the scholarly debate regarding the definition and relationship of magic, science, and religion begun in the nineteenth century and continuing on through the twentieth. I will not attempt to replicate that debate here since there are numerous summaries of the major theoretical positions and their proponents in print (among them Geertz and Thomas 1975, Winkelman 1982, Penner 1989, Tambiah 1990).⁴ By far the greater weight in this scholarly debate has been a rationalist bias against magic. Traditional medicine, with its combination of natural, psycho-spiritual, and supernatural methods/means, can easily be framed within this debate. Magic, like religion (and thus, magico-religious healing), has been predominantly characterized, on the one hand, as not real by functionalist/empiricist scholarship, what Hildred Geertz called the utilitarian approach: "Beliefs are to be understood primarily in terms of the needs which they serve,...these needs are assumed to be individual and, in the final analysis, psychological."⁵ The psychologizing of believers' magical world views and practices relating to healing has often been accompanied by an unfortunate stigmatization of magical medicine and religious healing systems as individual and/or social illusion, confusion, ignorance, or fraud justified by a scholarly assumption of an irrational or pathological psychology.

By the same token, the relationship of magical and religious healing to scientific medicine is often constrained in scholarly representation by the historical "success" of the Western definitions of rationality and empirical method. "Science" in the Western mode is credited (by early anthropologists such as Tylor and Frazer, as well as the history of science point of view) as the empirically-based, technically proficient, and experimentally sound realization of its earlier and evolutionary precursor "magic."⁶ In medical terms, disease causality is posited in the West in terms of purely mechanical, empirical, and interior/psychological/individual agency, rather than the psycho-spiritual, metaphysical, and cosmological agency of traditional healing. The medieval Islamic systems of healing knowledge and practice which may be called magical, ranging from Greek and astrological medicine to prophetic medicine and Qur'anic talismanry, become demoted to "pseudo-

science" which is another way of saying "bad science" or "no science." Medieval Islamic medicine from the history of science approach becomes an interesting anachronism, a failed cultural and intellectual paradigm, a flawed experimental model based on insufficient empirical evidence and incorrect interpretation of the evidence available.

My treatment of medieval Islamic medicine and religious healing (like the parallel/overlapping medieval systems of the Islamic occult sciences)⁷ and the continuation of "traditional medicine" in the modern world goes beyond the terms of the magic-science-religion debate identified above. My response to the functionalist and empiricist negation of magico-religious healing which explains it away as addressing purely human social and psychological needs is that in medieval Islam, like Christianity and Judaism any time before the modern era, such spiritual healing was considered real and effective for both body and soul above and beyond its social and psychological dynamics. My response to the history of science approach to medicine and healing is that I see no reason to judge the holistic methods and goals of medieval Islamic healing systems by the purely empirical and psychological standards of Western allopathic medicine. That these Islamic sciences did not achieve the same results or establish the same paradigms as the modern Western physical sciences does not invalidate or diminish their activities. The history of science approach to them, however, does tend to distort and even block scholarly perception of the unity of that other "science" with magic and religion.⁸ The works on medicine by Fazlur Rahman and on the sciences as a whole by Sayyed Hossein Nasr make it clear that Islamic science and Islamic revelation, or science and religion, go hand in hand. The effort to separate them in the study of the pre-modern era and the continuing neglect of their interdependence in traditional medical belief and practice of the modern era distort them both. The ongoing problems, for example, of public health programs throughout the Muslim world (whether within the Middle East, in Africa, South Asia, Southeast Asia, as well as Muslims living in non-Muslim cultural contexts in Europe and North America) to institute changes or improvements in medical care (especially in the areas of infectious disease control, sexual and reproductive health, and family planning)⁹ and the resistance, non-compliance, or dissatisfaction of the recipients of this care are due in great part to the cultural gap between Western and traditional Muslim beliefs regarding what constitutes the healthcare provider, the experience of healing, and health maintenance. Even in the West, recourse to

"alternative" healing systems (incorporating both natural and spiritual means) is increasing due to the gap between allopathic definitions of health and more holistic models of body-mind health. Allopathic reliance on atomistic approaches to the body, invasive and symptomatic curative methodologies, with their tendency to focus exclusively on pathology and the goal of surmounting disease, are complemented and even challenged by a rich diversity of holistic approaches with their greater emphasis on systemic and non-invasive cures, self-healing through preventative as well as curative methodologies, and the comprehensive goal of "wellness."¹⁰

Understanding Islamic medicine as it evolved and came to be practiced during the early Islamic era and throughout the Islamic middle ages to the rise of modernity requires tracking several parallel systems including those coming from outside the revealed traditions of Islam and healing systems which derive from within those traditions. The primary outside or "foreign" system which defined Islamic elite medical theory and practice was late Greek medicine and medical technology. "Greek" or "foreign" medical science as it was absorbed, transmitted and elaborated in Islam included a range of empirical approaches to the body, healing and health such as diet and nutritional therapy, medicinal treatments, and surgery/cupping, along with Hellenistic philosophical concepts of the body, its ills and treatment such as the quaternary system of elements and bodily humors and astrologically based techniques of diagnosis and prescription. The movement to translate Greek and other scientific resources (9th-11thC) via public libraries and research institutions such as Dar al-Hikma (founded in Baghdad by the Abbasid Caliph al-Ma'mun, d. 833) and Bayt al-Hikma (founded in Cairo by the Fatimid Caliph al-Hakim, d. 1021) and the system of public hospitals, clinics, and medical schools (modeled on the Nestorian Christian college of Jundeshapur under Sassanid rule) form a crucial link in the chain of transmission of classical and late Greek, Persian, and Indian medical and philosophical learning into Arabic and the environment of Islam, and in a later period (late 12th-13th C) from the Muslim world to the West (along with the original philosophical and technological contributions of Greco-Islamic learning). The principal translated works (originally from Syriac and Pahlavi to Arabic and later directly from Greek into Arabic) that form the impetus of Greek medicine in Islam are the foundational works of Galen (Summaria Alexandrinorum drawing upon Platonic, Stoic, and Peripatetic physiology and Alexandrian anatomy), Hippocrates (Corpus

Hippocraticum including the Aphorisms, De natura hominis, De officina medici, and De aere aquis locis), the dietary theory and nutritional therapy of Rufus of Ephesus and others, the materia medica of Dioscurides, and Greek magical healing teachings/techniques of Alexander of Tralles.¹¹ Ayurvedic and Zoroastrian medicine played a role in the formation of the Islamic medieval medical complex. One of the influences of Ayurvedic medicine is shown in the categorization and prescription of drugs according to their pleasant taste, and that the healing drugs most agreeable to the body are sweet tasting (sugar was originally considered a powerful drug in India).¹² Zoroastrian/Babylonian astrology as well as Indian astrology, with their emphasis on lunar phases and transits, also played a role in the diagnostic techniques of astrological medicine (iatromathematics) discussed further below.

Some of the most noteworthy Islamic physicians had a strong impact on medieval Western science. In the Eastern Muslim world, Muhammad ibn Zakariya al-Razi (Rhazes), a 10th century Persian scientist, was known for diagnosing the difference between smallpox and measles, and Abu Ali al-Husayn ibn Abdallah Ibn Sina (Avicenna), an 11th century Central Asian from Bukhara, wrote the famous text, *Canon of Medicine*, a basis for Western medicine until the 17th century. And in the Western Muslim world, Ibn Zuhr (Avenzoar) and Ibn Rushd (Averroes), in 11th and 12th century Spain respectively, contributed significantly to medieval philosophy and medicine in the West even more than in the Muslim world. The strong influence of Islamic/Arabic medicine and science on European thought and practice was through the transmission of Greek texts in Arabic translation and original Arabic scientific works from the 11th through the 13th century. Western medical science and scientific perspective developed from this foundation until European medicine overtook and transformed Greco-Islamic medicine during the era of widespread colonization of the Muslim world by Europe in the 19th and 20th century.

The basics of Islamic scientific perspective add acute physical observation, categorization, and experimentation to the abstract foundation of Greek theory. The Greek study of nature and the natural world as part of an ordered, if indifferent and mechanical, cosmos, becomes in the Islamic context the worship of nature and cosmos as God's animate creation. Islamic medicine versus Greek is strong in observation and diagnosis, and in the development of pharmacology/toxicology based on plant, animal, and mineral substances.

It is weak in surgery and anatomy, lacking any sterilization or anesthesia techniques, and forbidding dissection and autopsy as a violation of the body.¹³ The Muslim world established among the first public hospitals for the study, teaching, and treatment of the sick including special facilities or wards for the treatment of the mentally ill¹⁴ [according to medieval sources, over 50 hospitals each in both Western and Eastern centers of the Muslim world, Cordova and Baghdad, and large private collections devoted to the philosophical sciences in libraries such as Dar al-Hikma (Baghdad, founded by the Abbasid Caliph al-Ma'mun, d. 813) and Dar al-'Ilm (Fatimid Cairo)].¹⁵ Unfortunately, although religious institutions such as masjids (mosques) and madrasas (legal colleges), and charitable public institutions such as hospitals were funded by waqf, or perpetual foundation, such philosophical libraries were not, and thus, the record and institutional context of the philosophical sciences as a whole was more ephemeral than that of the religious sciences.¹⁶ Islamic scientist philosophers tended to be omnivorous in knowledge, practicing and writing in several or all of the scientific disciplines. Physicians, for example, were at the same time also practitioners, teachers, and authors of astrology, astronomy, mathematics, botany, zoology and alchemy.

The associative links between medieval Islamic alchemy and medical theory can be seen in both the techniques and tools of the "Great Work." The alchemical vessel and its organic process which generated a living product is a symbol for the body and its biological processes, particularly the development of the human embryo which generated a living child.¹⁷ The alchemical process which cooks the mixture in the "belly" of the vessel is a metaphor for the process of digestion and assimilation of nutrients.¹⁸ Finally, the alchemical product or elixir (al-iksir), which homeopathically transforms into itself the material matrix in which it is placed, is a direct analogy for the healing drug or medicine and its transformation of the body into health. The elixir was often described as the best medicine, the perfect "cure" for the imperfections of the matrix, transforming it into the perfect living stone.¹⁹

The Greco-Islamic medical purview encompassed traditional Greek categories of nature within the monotheistic framework of a divinely created universe schematizing nature into inorganic and organic matter according to the 4 Greek elements (air, earth, fire, water) and natures (cold, hot, dry, wet) of pre-organic matter, and the 4 humors (blood, phlegm, yellow and black bile) and temperaments (sanguine, phlegmatic, irascible, choleric) of organic beings. The Greco-Islamic

concept of pathology or cause of disease was the imbalance of these humors whether innate or acquired through 1) immoderate eating or drinking, 2) neglect of internal cleanliness of the body, or 3) disruption of the 6 rhythms of life (movement/rest, sleeping/waking, inhalation/exhalation, eating/drinking, retention in the bowels/evacuation from the bowels, and the soul's "moods").

The practice of "astrological medicine" (iatromathematics) and its interactive influence on Islamic medical theory and practice is an example of the relative position of Greek thought within Islam. Islamic astrology and astrological medicine absorbed astrological theory from Indian, Babylonian, Persian and Greek astrology. Islamic emphasis on lunar "mansions" (derived from Indian astrology) became applied in medicine to the celestial properties of medicines and to the propitious timing of treatment according to the transits of the heavenly bodies, especially the moon in its monthly course across the horizon, and its waxing and waning phases.²⁰ The orientation to the moon is explained by its immediate effect on the sublunar earthly sphere as it is the nearest of the heavenly bodies, and thus it affects tides and all watery bodies (including the human body, with its liquid "humors"). Persian astronomer/astrologers such as Masha'allah (d. 815/820) and Nawbakht (d. 776) brought Persian knowledge of astrology into the philosophical arena of Islam. Al-Kindi (d. 870), among the famous early philosophers of Islam, absorbed astrology into an Islamic frame of reference by his interpretation of Q. 55:5 "the star and the tree do obeisance," placing the stars' influence in the sublunar sphere and in human affairs under the force of God's will and command.²¹ "Al-Kindi's theory implies that everything emits rays. With this theory al-Kindi can also explain the curative properties of medicaments: every medicament, whether it is applied internally or externally, emits rays through the body which are the carriers of its curative properties."²²

Because of the celestial nature of astrological influence versus the physical nature of the body and its systems, astrology came to have a preeminence and distinction, and its practitioners (such as al-Kindi's famous pupil, Abu Ma'shar al-Balkhi, latinized as Albumasar, d. 886) often considered themselves superior to mere physicians.²³ Although competitors in some ways, the physician and astrologer were seen to work in tandem in medieval Islamic medical practice: "The physician is the brother of the astrologer. He has much affinity to him, and the situation of them both is very similar, because the former conceives how

to preserve health by means of an agreeable diet, and how to cause the disease to vanish by means of sound advice. Medicine as a science is nobler than its subject, whereas the subject of astrology is nobler than the science of it."²⁴ Source books on the lives of Muslim physicians show that by the 9th and 10th centuries and continuing much later, astrological prognostication came to operate parallel to and in many cases to have precedence over medical prognosis in terms of course and outcome of disease, and proper timing of treatment.²⁵

The Islamic response to this Greek system of the categorization of nature, the body, and healing/health drew upon the inspired and revealed knowledge of the Prophet Muhammad, manifested in his sunna (customary behavior and speech) and recorded in the Hadith literature. From approximately the tenth century through the fifteenth, a series of works were written embodying the Islamic system of prophetic medicine which combined 1) prophetic health practice and prescriptions; 2) spiritual medicine using the incorporeal powers of the Qur'an through prayer and recitation and its material powers through charms and amulets; and 3) the pharmacognosy belonging to the Bedouin peoples of pre-Islamic Arabia (which included knowledge of the physical and magical uses of natural medicines of herbal and animal origin). In some sense, prophetic medicine develops as a response and alternative to the dominance of Greek philosophical and scientific thinking in medieval Islam, and from Muslim objections to Greek medicine's foreign origin and lack of revealed authority within Qur'an and Hadith. In practice, however, both systems interpenetrated one another and neither operated exclusive of the other. Greek medicine in medieval Islam, based on Greek source texts, included independent observation and analysis of illness, treatment, and cure and includes both material/natural and spiritual/magical systems of efficacy. And the indigenous systems of Islamic healing combined medicinal and magical uses of nature (whether plant, animal, or mineral substances) with some of the more pervasive Greek categories, structures, and philosophical techniques. Islamic medicine, in all its aspects, displayed the Islamicization of Greek tenets, for example, the One God of Islam supplanted the Greek Gods of healing (as in the Hippocratic oath which Muslim physicians were required to take). The 4 elements/natures/ temperaments, the application of astrological categories to body systems and illness outcomes, and the association between the alchemical process and diet, digestion, and nutrition are some of the most important Greek aspects which can be

found within prophetic medicine.

The pharmaceuticals used in prophetic medicine are both simple (pharmacology) and compound (pharmacy). Simple medicines and treatments were preferred, with the naturopathic and homeopathic perspective the dominant approach to health and healing. Reporting God's provision of natural remedies from the Qur'an: "And the earth, We have spread it out, and We have set firm mountains on it, and We have made every kind of beautiful growth to grow on it (Q. 50:7)," al-Suyuti's *Medicine of the Prophet* says "and 'every kind' are full of uses."²⁶ Plants applied topically or medicinally (internally) whether as flowers, fruit, vegetables, grasses and herbs; animal products as nutritional therapy or topical preparations; and minerals for their topical or medicinal applications were discussed by "temperament" (meaning the Greek natures hot, cold, dry, moist), action, preparation, dosage, and use. And compound pharmaceuticals, based on combinations of the three orders (vegetable, animal, mineral) with strong emphasis on herbalism and indigenous pharmacology, are discussed within various preparation techniques of liquid suspension (such as infusion and decoction, paralleled by related alchemical techniques of distillation and sublimation), dry oral formulations (powders, pills), and vaginal and anal suppositories and purifications (enemas, douches).

Medieval Islamic perspectives on the appropriateness of medical treatment, whether Greek or prophetic/qur'anic, were grounded within the religious concept of tawakkul, or "trusting in divine providence." Islamic application to sickness and healing contexts of the absolute trust in God (tawakkul) assumes that illness is sent as a test of one's faith, or a measure of one's submission (islam) to God's will. The exegesis of this concept of trust in God can in extreme pietism or asceticism discourage recourse to external medical help or any form of physical intervention, but more commonly in the context of religious healing (both Sunni and Shi'i) it channels such help via the authority of the Prophet, the Imams, and the Qur'an.²⁷ "True dependence is the heart's relying on Allah. This never contradicts ways and means, and most means are dependent on dependence. So the wise practitioner does what must be done, and then relies on Allah as regards the outcome. Allah the Almighty says: '...and let them take their precautions and their arms (Q. 4:102)' and the Prophet, may Allah bless him and grant him peace, said: 'Trust in Allah--but hobble your camel!'"²⁸ Medicine in Islam, and particularly prophetic medicine, then, is the obligation of believers to live in trust but act

sensibly and take what precautions and use what means are provided by God and tested by experience for human aid.

Various widely disseminated popular treatises were generated from earlier Hadith compilations throughout the later Islamic middle ages as home guides to health and handbooks of medicines and treatments of illness reported by the Prophet, such as *Beneficial Selections from Medicine* by Ibn al-Jawzi (d. 1200), and *Prophetic Medicine* by al-Dhahabi (d. 1348). Examples of prophetic medicine will be explored here from three well-known medieval texts, two relatively late (14th and 15th Century) Sunni medical texts by Ibn Qayyim al-Jawziyya and Jalal ud-Din Abd al-Rahman al-Suyuti, both called *Medicine of the Prophet (Tibb al-Nabbi)*, and a third for balance compiled from the early Twelver Shi'i tradition, called *Medicine of the Imams (Tibb al-A'imma)*, by Abu 'Atab Abdallah and al-Husayn, two sons of a companion of the 6th and 7th Imam, Bistam b. Sabur.

These texts on prophetic medicine define two basic types of illness: those of the body and those of the heart. Bodily illnesses can be treated in practical ways (through cleansing, abstaining from food and drink or purging, or use of curative or restorative herbs/simples) and also in spiritual ways (through interior prayers, invocations of the divine names of God, verbal spells, and physical charms). Illnesses of the heart, on the other hand, are spiritual, emotional, and mental both in origin and in cure. They are caused by heart sickness, defined as emotional and mental states such as suspicion, doubt, and loss of faith, or they can be caused by sins of commission such as desire or allurements. Regarding the relationship between the "heart" and the body, God's messenger said: "Every disease has a cure...the illnesses of the body and those of the heart are alike....For every illness of the heart God created, He also created a cure that is its opposite. When someone whose heart is sick recognizes his disease and counters it with its opposite, he will recover, by God's leave."²⁹

Liturgical uses of the Qur'an, such as the Sufi technique of dhikr, the rhythmic chanting of phrases of divine attribution, divine names, or syllables of God's name, or the public recitation of the Qur'an or tajwid, are recommended as forms of spiritual healing using the means of sound. The prophetic medical texts report that dhikr, or "remembrance" of the names of God or phrases from the Qur'an, is a form of "divine medicine that no disease can resist...invoking the divine attributes and names will sharpen one's hearing and sight and sustain his faculties."³⁰ The power of

the living God, through invoking His names of attribution, can be applied as the best cure: "The Absolute life, al-Hayy al-Qayyam, is the opposite of all ailments and sufferings. Therefore, calling upon His attribute, the Living-Controller, will surely cure the illness."³¹ The positive impact generally of sound is described in the case of tajwid, or qur'anic recitation, as an aesthetic dimension which conveys a profound spiritual nourishment and renewal: "Listening to recitation is the perfume of the souls, the calmer of hearts, and the food of the spirits. It is one of the most important psychological medicines. It is a source of pleasure even to some animals."³² Hearing the word of divine speech recited encourages and incites the listener to follow it. "So give good news to my savants, those who listen to the word and then follow the best of it" (Q. 39:17-18). In addition to the musicality of qur'anic recitation for healing, even the use of secular music therapy was practiced in hospitals, especially for mental or spiritual disorder. "We are told that three types of musicotherapy were developed: one for the general patients in order to soothe them, a second for depressed patients, and a third for mad patients. This music was developed through experimentation with its effect upon the rhythm of the pulse and emotional response."³³

Prophetic medicine strongly favors the importance of diet as primary therapy for all physical ills, and a useful corrective even for spiritual or emotional imbalances. Examples of nutritional/herbal therapy are grounded in the belief in the therapeutic value of specific foods and plants. Regarding the sovereign value of honey, "God's Messenger said: 'Make use of two remedies, honey and the Qur'an.' In this saying he linked human medicine and divine medicine; remedies for the body and those for the soul; the natural factor and the spiritual one."³⁴ Honey is described as having internal detergent and tonic properties for the arteries and bowels and expectorant for the lungs while also being a beneficial hair softener and skin emollient when applied topically. According to the Prophet, "it sweetens and lightens the heart," a prescription based on the Qur'an which states clearly: "Your Lord predisposed the bees to make their hives in mountains, trees and trellises, and suck from all fruits and flit about the unrestricted paths of their Lord. A drink of various hues comes out of their bellies which contains medicine for men (Q. 16:68-69)."³⁵

As the honey of bees absorbs the medicinal virtues of fruits and flowers, other animal products also absorb the food value of plants or plant essences and may be used as topical preparations. For the treatment

of dropsy with wormwood, "God's Messenger said: 'You should seek the camel herd of sadaqa (charity) and drink from its urine and milk' especially after the herd has eaten wormwood plant. Diuretics and laxatives are a most approved remedy for dropsy--such are the medicinal properties of the she camel's urine and milk at the time of their estrous cycle."³⁶ Clearly animals' absorption and assimilation of the medicinal virtues of the plants they eat can transform a potentially powerful but also toxic herb like wormwood and make it usable to humans in homeopathic dosage. A similar method is described in the prescription for sciatica in the use of melted fat tail of the Arabian sheep and drinking it on an empty stomach in three parts, one each morning. "When the animals' feed includes such hot plants as cohosh root, root of plants of the myrtle family, wormwood plant and cypress among other vegetations, their medicinal properties become part of the animal's meat and fat. One can also use such plants as herbs--use them as liniment and rub along the sciatic nerve or apply them as hot pads."³⁷

The second basic principle of prophetic medicine is that of moderation in food and drink and the prescription of fasting as treatment and cure for many physical ailments. The Qur'an advises: "Eat and drink but avoid excess, for Allah does not like the intemperate." (Q. 7:31)³⁸ The Prophet goes even farther: "The stomach is the abode of every disease." The medical text concludes that "abstinence from food for a sick person during the early stages of his illness is the best medicine before taking medicine and when medicine is essential, abstinence prevents complications in treatment."³⁹ The path of moderation is modeled on the Prophet's example and preferences in all things: food, drink, dress, rest habits, as well as specific health advice in the Hadith.

Islamic indigenous medicine as encoded by the prophetic medicine texts takes a wider view of the role of healer than modern Western medicine does. It defines the doctor-patient relationship to include the broadest range. Thus, the roles of the medieval Muslim physician were defined 1) as the diagnostician, who prescribes and treats, an herbalist dispenser and pharmacist, 2) as anyone who practices any of the healing arts including the manufacture and sale of medical formulas, 3) as the surgeon, 4) as the orthopedist, and 5) as the veterinarian.⁴⁰ Not only human but animal patients are legitimate subjects of a physician's care and cure. Since God provides for humanity by giving animals into their care and dominion, humans are responsible for their welfare. A wonderful charm from the Shi'i prophetic medical tradition is given for a

mare at the time of her time of delivery to be written on gazelle parchment and fastened to her groin. It reads as follows: "Oh Allah, dispeller of grief and remover of sorrow, the Merciful and Compassionate of this world and the next, have mercy on so and so, son of so and so [fill in the blanks], the owner of the mare, with a mercy which will make him free of mercy from other than you. Dispel his grief and sorrow, relieve his anxiety, keep his mare from harm and make easy for us its delivery."⁴¹ Similar charms for human as well as animal labor and delivery also use verses from the Qur'an: "Surely with hardship there is ease" (Q. 94:5) or "Your Lord may bestow His mercy on you and facilitate your affair." (Q. 18:16)

Clearly, the use of prophetic example, advice and prescription is based upon the unique authority and blessedness of the Prophet Muhammad through his intimacy with God and his elevation as messenger of divine revelation. The other prime source of blessedness in physical form as well as in its contents is the Qur'an itself as a representation of divine speech. The paraliturgical and magical use of the Qur'an for healing and protection is the second major component of the prophetic medicine tradition in Islam.

Qur'anic healing and prophetic medicine find their proper context within the larger framework of spiritual mediation in Islam. Spiritual mediation, or intercession to improve, ameliorate, and sustain one's circumstances in life, is a belief which had currency throughout medieval Islam and into the modern era. Mediating individuals operated within a specific context of meaning, that of baraka, the blessing which can be conveyed and absorbed by association with the holiness of God's intimates such as that embodied by the Prophet Muhammad and his children; the Sufi saints; and in a more diffused concentration, that trace found within the sharif who belongs to the various familial lines of descent from the prophetic line. Baraka can also be transmitted through objects which have absorbed the holiness of persons (clothing, hair and bodily detritus, personal belongings or objects of ritual use) as well as contact with places of birth, habitation, or death which become objectified in devotion as sanctuaries and sites of pilgrimage.⁴²

There is, however, another class of object which is perhaps the most universally accessible vehicle of blessing and amelioration to Muslims, and that is the Qur'an itself. The objectification of the Qur'an is the result of its unique status as divine speech which has inherent creative and actualizing powers. It is not simply the thoughts implicit in the

Qur'anic text which are creative, but its actual words which as divine speech reify reality, that is, make as objects of itself all existent creation everywhere. By being the uncreated agent of divine creation, divine speech in the Qur'an causes creation to come into existence, and causes created existence to be sustained. This reifying power applies to all its contents, but in relation to human needs and wants, particularly to its words of blessing and favor, knowledge and wisdom, craft and skill, healing and restoration, sustenance and fruitfulness, success and triumph.

As the sacred scripture of Islam, the Qur'an exists in faith and public practice through ongoing attention to the process of prophecy and revelation, through the minutest analysis of its morphological forms and semantic contents, through extrapolation of its legal and ritual prescriptions, and through the exacting fidelity of its liturgical performance and public recitation. It has been in the sphere of private devotion, however, that the Qur'an has always permeated every aspect of the individual Muslim's life. It is in this sphere that interactive liturgical and paraliturgical engagement with the Qur'an has taken place and continues to take place in the contemporary era. The Qur'an is, at the same time, a vehicle of worship and of spiritual and material action, encompassing parameters most often inappropriately segregated by scholarship as religion and magic. The Qur'an in Muslim life and practice is, thus, the central arena for observing the permeability of licit magic in Islam.⁴³ As Islam's most religiously authoritative, rigorously liturgical, and legally conservative source, the Qur'an is also its most intimately negotiated, vernacularly creative, and magically effective venue of religious action.

Various genres of this vernacular practice draw upon both the reifying power of Qur'anic speech and the transmissibility of Qur'anic baraka. They involve the use of the Qur'an in a variety of paraliturgical contexts which might be called Qur'anic "magic."⁴⁴ The distinction found in medieval Islamic occult science and magical texts of licit vs. illicit magic engages Muslims with the same agency and techniques, but via the use of different means and purpose, that is, what benefits people and what is used specifically to counter evil magic has not been forbidden. The liturgically accepted forms of personal prayer (du'a) and the paraliturgical techniques and contexts of magical use for the Qur'an overlap and it is, therefore, difficult to distinguish clearly one type of use of the Qur'an, "this is magic," from another, "this is not magic." The designation of magic tends to apply when the physical form of the Qur'an,

or any part of its verbal or written contents, is used as an object of inherent power, to achieve either superhuman faculties (such as foreknowledge) or to invoke direct divine mediation as in healing "magic" and physical protection. The difference, however, is often in the style, context, and intention of performance, as well as the ritualization of objects, rather than contents which are often the same or similar. The essential qur'anic justification for the material use of the Qur'an refers to its god given purpose as a healing and a mercy: "What We have sent down of the Qur'an is a healing and a grace for the faithful" (17:82). Thus, Muslim spell- and talisman-making, especially for spiritual or psychological ills (such as madness, possession, etc), although surrounded by ongoing medieval legal debate, draws for its validation upon the range of positive juristic opinion that it "cannot be the act of unbelieving (*kufir*) if the process brings benefit and especially if the content is from the Qur'an."⁴⁵

These vernacular qur'anic practices fall into three overlapping categories, each of which can be used for religious healing. The first is qur'anic divination by means of *istikhara*, or "cutting" the Qur'an, and *fal*, or "divining" an event's full meaning and context with the Qur'an.⁴⁶ Divining can be applied as healing in the case of spiritual illness of a psychological or emotional nature. Its most common application is as a form of diagnostic technique which contains within itself the qur'anic "prescription." The second verbal category is the "magical" performance of prayers, recitations, and spells using qur'anic formulae, such as *isti'adha*, or "refuge-taking" and *tasliya*, or "calling down blessing" particularly upon the Prophet to intercede with God.⁴⁷ Even the Prophet himself is recorded as making use of the protective recitation of the Qur'an in a prayer of refuge-taking or *isti'adha* to alleviate fear: "I seek refuge in the protection of God's perfect words from His wrath, from His punishment of evildoers, from any evil that may spur from His creation, and from the prodding of the devils, and I seek His protection from their coming near me."⁴⁸ Another form of verbal spell is "invoking divine intercession" through recitation of the divine names, *al-asma' al-husna*, the *bismallah*, and glorifying/praising God (*tasbih*).⁴⁹ The last type of verbal performance is swearing by the power of passages from the Qur'an, such as the Fatiha, or opening chapter, which is thought to include implicitly the substance of the entire revealed Book. The third category includes material representations and utilizations of qur'anic contents in the creation of amulets and talismans (protective, subjugative,

and medicinal). The techniques and performance of qur'anic talismanry have a kinship with the wider practice of alchemical and magical talismanry and the creation in Islam of theurgic and prophylactic images. Prophetic testimony from the Hadith supports the healing use of the Qur'an as verbal performance, written amulet, and material erasure or internal medicine. "Abi Khuzama asked God's Messenger: 'O Messenger of Allah! You see all these amulets (ruqa) we carry, prayers we recite, medicines we take, and other preventive routines we use for recovering from illness--do any of them obstruct God's decree?' God's Messenger replied: 'They are part of God's decree'.⁵⁰ And even more direct affirmation is the Messenger's statement that: "There is no objection to writing qur'anic verses, washing the contents in water, and giving it to the sick person to drink."⁵¹

Prayers of protection or warding against evil or demonic powers which are not in themselves necessarily magical are often used in a magical context or manner of performance, thus, the non-magical and magical uses go hand in hand. From a handbook of prayers come descriptions of talismanic and other devotional practices.

Ibn Amr used to teach these words [verses of refuge-taking in God (isti'adha), Q. 23:97-98 and 5:199] to all his children who were capable of learning them, and for a child not yet able to learn them he used to write them and hang them on the child's person (from *al-Kalimu al-tayyib min adhkari al-nabi*, ascribed to Taqi al-Din Abu al-'Abbas al-Dimashqi, p. 23).⁵²

Based upon the evidence of devotional prayer manuals widely circulated throughout Islamic history, "refuge-taking" (isti'adha) was and is used magically against natural and unnatural evils like the evil eye; as relief from tyrants and oppressors; to uncover and circumvent the snares of the envious and deceivers, the negative workings of magicians, and the betrayal of traitors to overcome the hostility of enemies and the calumny of slanderers; warding malicious mischief; and even against the dangers of inner temptation and the urges of the lower self (nafs). The two classic refuge-taking chapters, the last two of the Qur'an, Daybreak (S. al-Falaq) and Humankind (S. al-Nas), became the frequent object and *materia medica* of talismanic and amuletic activity.⁵³

The use of the bismallah from the Qur'an ("In the name of God the Compassionate and the Merciful," a formula which begins every

chapter) enabling any special action or event as well as insuring the safety and success of everyday life and activities is virtually omnipresent in Muslim life. It has not only inaugurated virtually every area of religious obligation but hallowed the minutiae of social and material life from the inception of Islam to today. But its status as a kind of qur'anic magic is ambiguous. What is the distinction between something said as custom or habit, as a casual gesture toward "good fortune," or out of genuine and conservative piety, and something said as a magical enunciation?⁵⁴ It is not a distinction that can always be made clear and fast in these examples. Certainly, the sunna of the Prophet encouraged these everyday pieties, and the Hadith corpus enshrined them in endless permutations. Belief in their power and efficacy by generations of Muslims seems to have evolved magical applications of them, such as the belief in "laying on" (wudi'a 'ala) the divine names.⁵⁵ "Thy names of moral beauty (al-asma' al-husna) to which all things upon which they are laid are subdued" (from *Khalasatu al-maghnam* of 'Ali Hasan al-'Attas); and "All thy names of moral beauty which, falling upon anything cause its body to be subdued" (from *Hizbu Ahmad al-Buni, majmu'atu al-ahzab*, p. 365).⁵⁶ Not only names, but parts of the Qur'an, such as its opening chapter, the Fatiha, can be used in this way: "I ask thee by virtue of Fatihatu al-Kitab [the Opener of the Book] to subjugate all things to me" (from *al-Hizbu fawatihi al-basa'ir*, attributed to 'Abd al-Qadir al-Jilani).⁵⁷

The metaphor of "qur'anic tincture" can be used to describe the infusion of qur'anic contents and methods of discourse throughout not only the religious sciences of qur'anic study proper, but the philosophical and occult sciences as well. The phenomenon of qur'anic "erasure," an amuletic use of writing all or part of the Qur'an, is another type of "qur'anic tincture" of an altogether more medicinal nature found documented in the prophetic medical corpus and texts on qur'anic magic and healing as well as manifested in the living practice of religious healers throughout every region of the Muslim world. The Berti, as a contemporary example of this form of qur'anic healing, are a Muslim people of the northern Sudan, whose leaders or fakis (from the Arabic faqih, or learned jurisprudent) perform the traditional Islamic social and educational roles in a society with little general knowledge of Arabic and incomplete Islamic acculturation. These social and educational roles are complemented and even subsumed by their functions as healers, diviners, dream interpreters, and providers of amulets based upon qur'anic magic.

It is in this socio-religio-magical milieu that qur'anic "erasure" has meaning.

...Another important activity of the faki is to write some Koranic verses on both sides of a wooden slate (loh) using a pen made of a sharpened millet stalk and ink (dawai) made of a fermented paste of soot and gum arabic. The written text is then washed off with water which is drunk by the faki's clients. The water is referred to as mihai (from the verb yamha, to erase) and, following al-Safi [*Native Medicine in the Sudan*, 1970, p. 30], I have translated this term as "erasure."⁵⁸

Although the Berti's only partial knowledge of Arabic may produce an "occultation" of the Arabic text of the Qur'an and encourage an instrumental approach to it by the believer, the process of interpretation of the text through the agency of the faki is as much an Islamic one as any found in other more fully acculturated (i.e. Arabized) settings. The interpretation is one which operates relatively innocent of received tradition, however, and returns to the text unencumbered by previously established meanings. The example of an erasure created and prescribed to induce pregnancy in a woman who has not born children shows a magical qur'anic application in which human creation of life via the power of divine speech is possible. This fertility erasure is based upon writing a single verse from the Chapter of the Family of 'Imran (*S. Al 'Imran*) because it invokes the creative act of conception and God's absolute power of realization, "It is he who forms you (yusawwirukum) in the wombs (al-arham) as he wishes. There is no God but he, the Almighty and All-Wise" (3:6).⁵⁹

Nineteenth-century Islamic talisman texts using the Qur'an from the Guinea Coast of West Africa recommend the erasure (called here "text water/writing water") of specific verses calling upon divine powers: S. al-Tawbah 9:1-2 for travel, S. Maryam 19:1-7 for blessing, S. al-Mulk 67:1-2 for sovereignty, S. al-Fath 48:1-2 for victory, S. al-Rahman 55:1-7 for beneficence.⁶⁰ Traditional categorizations of qur'anic verses are found in Arabic talismanic manuals (ayat al-hifz for protection, ayat al-shifa' for healing, futuh al-Qur'an for "opening" or victory, ayat al-harb for overpowering enemies, and ayat al-latif for kindness) as well as the use of verses which contain all the letters of the alphabet (3:148, 48:29) against all fear and sorrow and all disease.⁶¹ S. Ya Sin (Ch. 36) and other specific

suras used in both talismanry and erasure, employ diverse materials for magical writing (stone, clay, iron, silver, copper, cloth, animal bones, particularly shoulder blades and neck vertebrae--used in their own right as a form of divining called scapulomancy) and the liquids for "erasure" (rose water, musk, saffron, ink, honey, mint juice, grape juice, grease).⁶² These texts and contemporary anthropological accounts of qur'anic talismanry and erasure report not only drinking the remedy but incorporating it into food (by, for example, inscribing it directly onto unleavened bread) and eating it oneself or giving it to one's animals to eat (for fertility, ease in calving, recovery from illness).⁶³ The use of qur'anic charms and erasure for the benefit of animals is found along with the un-Islamic practices of inscribing qur'anic words or letters on a living animals and sacrificing them as a form of magical transference and expiation, or "scapegoating," often associated with malefic or cursing magic.⁶⁴

The written text of the Qur'an, existing historically as an aide de memoire and parallel to the oral performative text, also exists via the doctrine of the umm al-kitab before the creation of the world. Thus, the creation of the world is attributed equally to the oral and the written word of divine speech, to the divine Pen (qalam) which inscribes the heavenly book on the Tablet (lawh) and, thereby, all creaturely creation. As a South Indian Muslim healer, Amma, has said, justifying and grounding her written practice of qur'anic amuletry: "There would be no world without paper and pen!"⁶⁵ She and her husband, a Sufi teacher, both rely in their spiritual teachings and healing practice on the physicality of baraka in the Qur'an, that it is intended by God to be used for good as a "Book of Service (khidmatwali kitab) and that it is "powerful magic" (bara jadu).⁶⁶ In a more elite context, that of the male saint of a Muslim shrine in the Punjab, the transmission of baraka via written amulets forms the public outreach of the saint to the community. "At the same time that Baba Farid instructed his elite group of initiates (khalifas) in the mysteries of his order, he also handed out ta'widh or amulets to the common masses, who saw in these ta'widh a protection against evil, a boon for good fortune, or an agent for the cure of an illness....Baba Farid's giving of ta'widh or amulets, and the devotees' giving of futih or gifts, provided the structural framework upon which the subsequent devotionism of the shrine rested. In a religious sense the ta'widh-futih system defined and sustained Baba Farid's intermediary status between the devotee and God, as a conduit through whose intercession with God

one's wishes may be fulfilled."⁶⁷ The written transmission of baraka can also operate as sympathetic magic, such as Amma's ritual of "exorcism" removing illness, evil spirits, and other manifestations of spiritual oppression or malaise by writing qur'anic verses on an object (which she calls ta'viz, a Persian form of the Arabic ta'widh), piercing it and burying it, or writing on paper and burning it.⁶⁸

Another form of written qur'anic magic is the use of the magic square in which Arabic phrases, words, letters and numbers are placed in a grid of squares, or other geometric shape, the names or attributes of God, angels, prophets or their numerological equivalents (jafr or abjad). The magic square has played a large role in the medieval occult sciences (particularly in magical and alchemical texts which emphasize number and letter mysticism) and has continued as a vernacular healing technique into the contemporary era.⁶⁹ Many of the "spells" of a collection of 19th century manuscripts of the Asante in West Africa, now Ghana, incorporate verbal performance, or incantational prayer, along with visual/physical representations of divine speech in the magic square (called khawatim, or "seals/rings").⁷⁰ The khatim serves a variety of purposes and is immediately effective upon the written execution of squares. When inscribed with Gods' names these "seals" command effect whereas with other qur'anic passages they only supplicate, indicating a hierarchy of power in the different forms of divine speech privileging divine names (al-asma' al-husna, the "beautiful names," as well as the ism akbar, the "great" or secret name of God) as most powerful and magically efficacious. This use of the magic square is also found in contemporary South Indian Muslim healing ritual where it is both diagnostic tool and talismanic prescription.⁷¹

Like prayers of refuge-taking or other verbal uses of the Qur'an, erasures address various spiritual and material needs, bodily healing (whether the direct cause is known or unknown) and restoration or fulfillment of physical powers (such as childbirth), promoting intelligence, insuring safety when traveling, protecting against malicious forces, warding off slander, as well as the comprehensive protection of the community, or collective erasure (jumla). This use of the power of the Qur'an can be directed in the most final way to inflict death upon those who practice negative magic against or within the community.⁷² Thus, qur'anic magic brings this discussion of religious healing full circle, suggesting in the human use of the power of divine speech to create and un-create, the Creator who gives both life and death. Although the

examples discussed of the Berti and Asante of East and West Africa, the Gayo of Indonesia, and Muslim religious healing in North and South India show the evolution of magical qur'anic practice in contexts of incomplete Islamic acculturation (i.e. only partial Arabic literacy) and reflect their diverse cultural contexts, it is important to reaffirm that qur'anic magical practices are an integral function of vernacular Islamic religiosity throughout the Muslim world, not an anomalous exception due to "survivals" or "syncretism" of non-Islamic "local" belief and practice. Erasure has both justification in the prophetic medicine texts, drawn from Hadith, and a wide application in various world Muslim cultures.

Another related qur'anic remedy, used externally rather than internally, relies upon the materialization of the baraka of recitation rather than the more common use of written erasure as a physical "residuum" of qur'anic baraka. "Effect healing by using recitation, which is known as 'al-nushra,' that is, when verses are recited over some water, which is then left out and used by a sick person for washing himself."⁷³ An extension of this baraka conveyed by the verbal articulation (and breath) of qur'anic recitation is its use accompanied by magical gestures conveying the personal life force or essence of the performer (such as spitting and blowing) which the Qur'an itself disallows to pre-Islamic magical practitioners such as poets and priests. The inclusion within the body of the sunna of traditional magical methods regardless of their forbidden status in the Qur'an is a paradoxical aspect of these magico-medical texts. Through recitation/prayer, the Qur'an seems to physically invest the breath of the Prophet with its essence or baraka which is transmitted via touch. "The Messenger used to recite S. Ikhlas [the chapter of God's Oneness]...and then blow into the palms of his hands and wipe his face and whatever parts of his body his hands could reach."⁷⁴

In another report, it is blowing the essence of the Fatiha, the opening chapter of the Qur'an, which conveys the healing virtue of the whole Kitab or Book. Via the words, breath, and saliva of the believing lay healer, following the example of the Prophet, this medicinal recitation is an exorcism of evil spirits encompassing both spiritual and physical efficacy: "...if one's faith, soul and spirit are strong, and if he adapts himself to the essence of the opening chapter, and by God's leave, by reciting its holy words and blowing them on the affected person followed by his spittle upon the victim, God willing, such reading will incur the reaction of evil spirits and cause the elimination of their evil act--and God

knows best."⁷⁵ The South Indian Muslim healer, Amma, for example, marshals her spiritual "medicine" in exorcising patients possessed by spirits (manifested as loss of speech, rational capacity, deep depression, and immobility or conversely unnatural physical strength) through the use of qur'anic recitation accompanied by "blowing" *du'a* (or prayers for healing intercession which include qur'anic formulae or verses, divine names, etc) over the person and even inside the mouth.⁷⁶

Throughout the Islamic Middle Ages and into the modern era, as the above examples have shown, vernacular qur'anic healing practices have been widely and fervently espoused in Muslim practice (if not theory) and generated an extensive body of "how-to" literature. This instructional literature informed and guided local practitioners on the procedures and methods of interpretation of all these qur'anic arts and included a variety of sub-genres such as encyclopedias of dream interpretation, chapbooks of qur'anic prayers/spells for magical effect and manuals on the creation of qur'anic talismans and "erasures."⁷⁷ The use of qur'anic speech in magical images of power and blessing, as talismans against harm and amulets for sickness, forms part of a range of vernacular expression encompassing a diverse popularly disseminated talismanic literature and practice, leaving an extensive manuscript and print record in recipe books and how-to manuals into the 18th and 19th centuries which have been reprinted or lithographed throughout the 20th century.⁷⁸ Books of instruction, such as the *Majma' al-dawat*, as well as professional practitioners of these extra-canonical qur'anic "sciences" were numerous throughout medieval Islam and into the modern era. Special Qur'ans were/are published with marginal notation on methods of divination and apposite verses for magical or talismanic use. Treatises on the preparation and use of qur'anic talismanry and prophetic medicine interacted with and were influenced by a variety of "occult" works of magical medicine such as Ali ibn Sahl al-Tabari's *Paradise of Wisdom* (*Firdaws al-hikma*), one of the earliest works of Arabic medicine completed in 850 CE, as well as the magical cures included in larger works such as Muhammad ibn Zakariya al-Razi's tenth-century *Book of the Magician* and his *Book of Natural Sciences*, as well as the genre of occult medicine, the *Books of the Tested* (*Kutub al-mujarrabat*), that is, magical techniques "tested" by experience.⁷⁹

Classic anthropological theory has noted the phenomena of "words of power" and belief in the magical efficacy of speech and verbal performance, but tended to distinguish such belief and practice as

"mechanical" or "instrumental" and therefore not part of religion proper.⁸⁰ Although some recent theory has explored the interactive relationships of magic, science, and religion, the categorical distinction and exclusion of "magic" still continues.⁸¹ There is much in medieval Islamic magico-religious healing systems and their modern legacy which is religious in the ritual sense: the strong ritual components of verbal and material activity, expressive drama, transformation of self and cosmos, as well as rich affect, power and energy. Islamic magic also claims many of the mental and emotional features of Islamic religion (intentionality, visualization, and interior verbalization). The continuing Islamic Studies and modern reformist/revisionist Muslim perspectives which relegate paraliturgical and especially "magical" uses of the Qur'an and other media of magical healing and efficacy in Islam to 1) a Muslim past filled with "superstition" which is now outgrown, an assumption that this is not "real" Islam, i.e. legal/textual/institutional Islam and 2) existing only on the periphery of Islam as a result of syncretisms with indigenous pre-Islamic cultures are mistaken on both counts. As the data have shown, such vernacular medicine is neither a thing of the past, nor is it peripheral to Islam or the result of simple "syncretisms" or non-Islamic "survivals."

Thus, the marginalizing view is motivated more by ideological investments in rejecting the reality of magical belief and practice within Islam and in the modern world than by either the historical/textual or contemporary/anthropological evidence available. The prevalence of these practices and their theoretical elaboration in both elite and popular texts throughout the Islamic Middle Ages is too well documented here and elsewhere to require further justification. The social evidence for qur'anic "magic" and religious healing systems in Islam within their living contexts of practice, as described by 19th and 20th century anthropological investigations of Islamic "popular" or "folk" belief and practice, display a wide and dispersed enough geographical range (notably North Africa and Egypt, sub-Saharan East and West Africa, Iran, India, and Indonesia) to support the contention that these beliefs and practices are part of the universality of Islam as a world tradition.⁸² I believe that further examination of other Muslim cultural regions yet to be examined in this way (Central and Western Europe, Central Asia, the ex-Soviet Union, China, and North America) will also confirm this hypothesis.

Although belief in the magical efficacy of qur'anic talismanry and engagement with it has been greatly reduced in scope and popular

conviction, the practices of qur'anic talismanry continue as one can see in any Muslim country today through casual observation. Despite the modern context of description, however, the practices and the popular literature which supported them were medieval developments. To name only two contexts of qur'anic "magic" I have personally observed among Egyptian, Lebanese and Palestinian Muslims while I was in Egypt and Israel, as well as immigrant, expatriate, and indigenous Saudi, Pakistani, Indonesian Muslims and African-American Muslims in England and the United States, are qur'anic medallions worn on the person engraved with names of God, the throne verse (ayat al-kursi, 2:255) or other particular verses for protection (ayat al-hifz, or ayat al-latif, vss. of divine "kindness" as protection from one's enemies) and success or victory in any endeavor (futuh al-Qur'an, vss. of "opening"); qur'anic amulets hung from taxi-cabs' rearview mirrors or a miniature Qur'an mounted on the dashboard, or more often, in the rear window spaces to protect against accident; and posters or woven hangings with qur'anic verses or names of God used inside or in storefront windows both for protection/blessing and in the West for advertisement to attract Muslim customers.⁸³ The uniquely prophylactic value of qur'anic medallions in people's beliefs still holds true even among those who are otherwise highly secularized. The traditional healing beliefs and expectations of expatriate or ex-colonial Muslims in the West show the continuity and vitality of religious healing systems complementing the use of Western medicine especially for spiritual, emotional or mental illness.⁸⁴

The use of qur'anic words as healing images and the widespread process of qur'anic image-making highlight the strong creative interaction of authoritative sources and actual belief and practice in medieval and modern Islam. Further, these practices encourage a reexamination of a commonly promulgated concept in contemporary scholarly and non-scholarly discourse of "real" or "normative" Islam which seems all too often to mean an Islam whose legal, doctrinal, and institutional foundations are separate from and elevated beyond its actual beliefs and practices, particularly those of the commonality of believers. The power of the Qur'an bridges the gap in perception between "normative theory" and "actual practice." It is precisely because of its ability to create form through expression, being simultaneously a material representation of divine speech and a constant verbal reenactment of divine creation, that its power to bless, heal, protect and ward is manifest. Thus, the varieties of commonly performed acts of qur'anic "magic" stem not from a

deviation from the Islamic tradition but arise at the center of its religious authority. Whether as oral performance in spoken invocations, verbal formulae, or supplicatory prayers, or as material representation in medallions, wall-plaques, written amulets or their residuum (the "erasures"), the verbal and material images of the Qur'an have the ability to constantly manifest the creative, prophylactic, and curative powers of divine speech and its ongoing role in the everyday lives of Muslims. These are only a sample of the range of indigenous physical and spiritual systems of healing in medieval Islam. Although medieval Greco-Islamic medicine in the Muslim world fell into disuse and was supplanted by updated Greek medical theory and scientific methods of Europe by the 19th century, the religious healing systems of prophetic medicine, particularly the "magical" and spiritual uses of the Qur'an and indigenous herbalism, continue into the present as part of vernacular religious belief and practice and might be understood as the "alternative medicine" of modern Muslim cultures.

Notes

- 1 A general introduction to the medicine in Islam with a particularly detailed chapter on hospitals, medical clinics, and medical education as well as on medical ethics in Islam is provided by Fazlur Rahman, *Health and Medicine in the Islamic Tradition: Change and Identity* (New York: Crossroad: 1987). See also his "Islam and Health/Medicine: A Historical Perspective," in *Healing and Restoring: Health and Medicine in the World's Religious Traditions*, ed. Lawrence Sullivan (New York: Macmillan, 1989), pp. 149-172.
- 2 R. Patai's "Folk Islam," *The Encyclopedia of Religion*, ed. M. Eliade (1987), gives a classic example of the misuse of the concept of "survivals" and reifies the artificial separation represented by the "folk"/"official" dichotomy in the study of Islam. See also J. Waardenburg, "Official and Popular Religion as a Problem in Islamic Studies" in *Official and Popular Religion: Analysis of a Theme for Religious Studies*, eds. J. Waardenburg and P. Vrijhof (The Hague: Mouton, 1979), whose more sensitive and subtle presentation criticizes but still preserves problematic dichotomies in the study of Islam such as normative/popular, normative/valid,

and valid/actual. Waardenburg prefers "normative" to "official" but does not answer the inherent problem in dichotomizing religion. See, finally, an interesting critique of the notion of "survivals" in relation to contemporary African and North African Islam and Islamic cults of spirit possession (*zar* in Egypt and the Sudan, and *bori* among the Hausa) in I. M. Lewis, "The power of the past: African 'survivals' in Islam," *Religion in Context, Cults and Charisma* (Cambridge, UK: Cambridge University Press, 1986).

- 3 My use of "vernacular" is drawn from the works of Leonard Norman Primiano (*Intrinsically Catholic: Vernacular Religion and Philadelphia's Dignity*, Ph.D. diss 1993, Indiana University Press, forthcoming, and "Vernacular Religion and the Search for Method in Religious Folklife," *Western Folklore* 54 (January 1995): 37-56) who has explored similar terminological and conceptual problems within the intersection of folklore and folklife and religious studies in work on contemporary Catholicism. His coining of the term "vernacular religion," and his emphasis on the negotiations and vernacular creativity of "actual believers" as individuals which form the collective of any religious community is directly apposite to the study of Islam in general, but particularly to magico-religious healing systems in Islam. See also Bonnie Blair O'Connor, *Healing Traditions: Alternative Medicine and the Health Professions* (Philadelphia: University of Pennsylvania Press, 1995), ch. 1, p. 6, for the application of this concept to what she calls "vernacular health systems."
- 4 Hildred Geertz and Keith Thomas, "An Anthropology of Religion and Magic, Two Views," *Journal of Interdisciplinary History* 6, no. 1 (1975): 71-109; Michael Winkelman, "Magic: A Theoretical Reassessment," *Current Anthropology* 23, no. 1 (February 1982): 37-66; Hans Penner, in *Religion, Science, and Magic: In Concert and in Conflict*, eds. J. Neusner, E. Frerichs, and P. Flesher (New York: Oxford University Press, 1989); Stanley J. Tambiah, *Magic, Science, Religion, and the Scope of Rationality* (Cambridge: Cambridge University Press, 1990).
- 5 Geertz and Thomas, 1975, p. 77. Cf. also D. O'Keefe, *Stolen Lightning: The Social Theory of Magic* (New York: Vintage Books, 1982) for a sociologically oriented psychological analysis of magic. See, however, M. Spiro's "Religion: Problems of Definition and

- Explanation," in *Anthropological Approaches to the Study of Religion*, ed. M. Banton (London: Tavistock Publications, 1966) for a critique of the functionalist orientation within anthropology as a "science of social systems" which assumes that "an explanation of society" is "an explanation of religion" (p. 122). Both magic and medicine insofar as they overlap with religious belief and practice can be read here for "religion" and the critique would be just as valid.
- 6 See S. Sharot, "Magic, Religion, Science, and Secularization," in *Religion, Science, and Magic* (1989), pp. 261-283; and S. Tambiah (1990), chapter three, "...Is Magic False Science or Meaningful Performance?," for the history of distinctions between magic and religion, and magic and science, as etic categories of observation among social scientists, and magic as "pseudo" or "false" science.
 - 7 See my work on Islamic alchemy and the occult sciences, *The Alchemical Creation of Life (Takwin) and Other Concepts of Genesis in Medieval Islam*, Ph.D. dissertation, University of Pennsylvania, 1994.
 - 8 Fazlur Rahman, *Health and Medicine in the Islamic Tradition* (New York: Crossroad, 1987) and "Islam and Health/Medicine: A Historical Perspective," in *Healing and Restoring: Health and Medicine in the World's Religious Traditions*, ed. Lawrence E. Sullivan (New York: Macmillan, 1989) and the earlier works of Sayyed Hossein Nasr in the overlapping context of the occult sciences, *An Introduction to Islamic Cosmological Doctrines* (Boulder: Shambhala, 1978); *Islamic Science--An Illustrated Study* (World of Islam Festival Publishing Company Ltd, 1976); *Science and Civilization in Islam* (Lahore: Suhail Academy, 1983/1968); *Islamic Studies, Essays on Law and Society, the Sciences, and Philosophy and Sufism* (Beirut: Librairie du Liban, 1967).
 - 9 For traditional views on sexuality, reproductive biology, and contraception in Islam, see Basim F. Musallam, *Sex and Society in Islam* (Cambridge: Cambridge University Press, 1983) and *Society and the Sexes in Medieval Islam*, ed. A. L. al-Sayyid-Marsot (Malibu, CA: Undena, 1979).
 - 10 For the rise of alternative approaches to medicine in the West and particularly the U.S. in relation to the perceived failure of allopathic medicine, see *Other Healers: Unorthodox Medicine in*

- America*, ed. Norman Gevitz (Baltimore: The Johns Hopkins University Press, 1988); Meredith B. McGuire, *Ritual Healing in Suburban America* (New Brunswick, NJ: Rutgers University Press, 1988); *Herbal and Magical Medicine: Traditional Healing Today*, ed. James Kirkland, et al. (Durham, NC: Duke University Press, 1992); and Bonnie Blaire O'Connor, *Healing Traditions* (see note 3 above for full citation).
- 11 See summary discussion of Greek and other (Egyptian, Babylonian, Persian, and Indian) medical theory and practice and their transmission, absorption and elaboration in Islam in Manfred Ullmann, *Islamic Medicine* (Edinburgh: Edinburgh University Press, 1978) and *Die Natur- und Geheimwissenschaften im Islam* (Leiden: E. J. Brill, 1972); J. Christoph Bürgel, "Secular and Religious Features of Medieval Arabic Medicine," in *Asian Medical Systems: A Comparative Study*, ed. Charles Leslie (Berkeley: University of California Press, 1972), pp. 44-62; Michael W. Dols' introduction to his work *Medieval Islamic Medicine, Ibn Ridwan's Treatise "On the Prevention of Bodily Ills in Egypt"* (Berkeley: University of California Press, 1984), pp. 3-24; and Emilie Savage-Smith, "Islamic Medicine" in *An Encyclopedia of Arab Science*, ed. R. Rashed (London: Routledge, 1991).
 - 12 Felix Klein-Franke, *Iatromathematics in Islam: A Study on Yuhanna Ibn as-Salt's Book on Astrological Medicine* (Zurich: George Olms Verlag, 1984), pp. 72-73.
 - 13 As a substitute for human dissection, animals (such as monkeys and sheep) were used as an example and guide to human anatomy. This disapproval of human dissection or autopsy stems from its general association with the pre-Islamic practice of muthla, the mutilation of the bodies of fallen enemies on the battlefield in order to make an "example" (mithal) out of them. The early Islamic community, in its struggles with the Meccan and other tribes, proscribed such practice as contravening the dignity of the human body. Islamic jurisprudence thereafter generally advocated its prohibition. See Ullmann, *Islamic Medicine*, p. 67, and Rahman, *Health and Medicine in the Islamic Tradition*, p. 106.
 - 14 For Islamic perspectives on mental illness and insanity, see Michael W. Dols, "Insanity in Byzantine and Islamic Medicine," in

Symposium on Byzantine Medicine, ed. John Scarborough, Dumbarton Oaks Papers, No. 38 (Washington, D.C., 1984).

- 15 Rahman, "Islam and Health/Medicine: A Historical Perspective," pp. 158-159. See also discussion of the founding of hospitals in the introduction to *Natural Healing with the Medicine of the Prophet, by Ibn Qayyim al-Jawziyya (1292-1350 CE)*, tr. Muhammad al-Akili (Philadelphia: Pearl Publishing House, 1993).
- 16 Rahman, *Health and Medicine in the Islamic Tradition*, pp. 60-65, for waqf and the endowment of hospitals. An isolated exception to the exclusion of philosophical institutions from waqf is that of the Fatimid library-academies (Dar al-Ilm) which were founded as Isma'ili waqf but did not politically survive, being destroyed and reconstituted in a Sunni education framework during Ayyubid rule. See George Makdisi, *The Rise of Colleges: Institutions of Learning in Islam and the West* (Edinburgh: Edinburgh University Press, 1981), pp. 35-74, 308-311, and Y. Eche, *Les Bibliothèques arabes publiques et semi-publiques en Mésopotamie, en Syrie et en Egypte au moyen âge* (Damascus: Institut français de Damas, 1967).
- 17 See *Sirr al-khaliqa* (U. Weisser, *Buch über das Geheimnis der Schöpfung und die Darstellung der Natur-: Buch der Ursachen/von Ps. Apollonius von Tyana*, 1979 ed., 518.2-519.8) for the astrological symbolism and alchemical resonance in the development of the human embryo within the womb leading to birth.
- 18 The corpus of the legendary early Islamic alchemist, Jabir ibn Hayyan, yields a number of classic metaphors for the alchemical "cooking" process which leads to the creation of the philosopher's stone, in particular "leavening" the "bread" and "cooking" the "baby," in texts discussing the artificial generation of life (takwin). The *Book of Extrusion* (*K. al-ikhraj*) refers to "the water that cooks (yatbakhu) under the developing creature" and the *Book of Explication* (*K. al-idah*) mentions "the secret of the leavening (sirr al-khamira)." Treatise 18 of the *Book of Seventy* (*K. al-sab'in*) reports that alchemical solutions "require continuous cooking...like the duration of the cooking of nature which does not change," and the *Book of Gathering* (*K. al-tajmi'*) maintains that "the success of that (alchemically) created being is its cooking (al-tabbakh) which is proportionate to the duration of its existence...and when the

cooking is slowed, the days of life of the creation increase, and when it is quickened, the creature's days grow less." *K. al-tajmi'* links the cooking metaphor and the gestation of the mixture in the vessel to the embryo in the womb, "arising within the belly [of the vessel] over a period of months and its natural cooking has it suspended within it." Finally, in the "Discourse on Plants," *K. al-tajmi'* reports the teachings of the philosopher alchemists, Socrates, Pythagorus, and Porphyry, on 4 elemental methods (by earth, fire, air, or water) of cooking the three categories of living stone (animal/vegetable/mineral). See translations and analysis by Kathleen Malone O'Connor, *The Alchemical Creation of Life (Takwin) and Other Concepts of Genesis in Medieval Islam*, Ph.D. Dissertation, University of Pennsylvania, 1994, pp. 80, 99, 139, 172, 174, 179.

- 19 "The elixir is a beneficial medicine for all illnesses. It is the poison of poisons, and the significance of a poison is that it is like it [the elixir]. It is said regarding intense medicine...that it is poison, and each medicine is a curative for a particular illness, thus it is the 'poison' of that illness," from Jabir ibn Hayyan, *Book of Extrusion (K. al-ikhraj)*, see K. M. O'Connor, *The Alchemical Creation of Life (Takwin)*..., p. 64.
- 20 "The medical prognosis formed together with astrological predictions one coherent system based upon the sympathy of macrocosm and microcosm." Klein-Franke, *Iatromathematics in Islam*, p. 19, and see also pp. 2-4 and p. 101 on effects of the moon on health.
- 21 Op. cit., p. 47.
- 22 Op. cit., p. 49.
- 23 Op. cit., pp. 50-52.
- 24 Klein-Franke quoting al-Tawhidi, pp. 60-61.
- 25 Op. cit., pp. 56-61. Arabic source books include catalogues and biographical encyclopedias such as the *Fihrist* of Ibn al-Nadim, *Tarikh al-hukama'* of al-Qifti, and the *Uyun* of Ibn Abi Usaibi'a. See also the extant manuscript literature on Arabic medicine for the period up to 1040 in vol. 3 of *Geschichte des arabischen Schrifttums*, by Fuat Sezgin, and up to the 17th century in Ullmann, *Die Medizin im Islam*.

- 26 From the section on "simple remedies" in chapter four, "Properties of Foods and Remedies," *As-Suyuti's Medicine of the Prophet*, tr. Ahmad Thomson (London: Ta Ha Publishers, 1994), p. 33.
- 27 Rahman, *Health and Medicine in the Islamic Tradition*, pp. 27-28, 37-38. Rahman's assessment of the strain of martyrdom in Shi'i thought precluding access to healing is denied by the similarity of prescription, treatment, and cure espoused in such Shi'i prophetic medicine texts as *Tibb al-A'imma*. Cf. Andrew Newman's discussion of Rahman and the prophetic medical tradition in Shi'ism, *Islamic Medical Wisdom: The Tibb al-A'imma*, tr. Batool Ispahany, ed. Andrew J. Newman (Qum: Ansariyan Publications, n.d.), pp. xv-xvi.
- 28 *As-Suyuti's Medicine of the Prophet*, p. 125.
- 29 *Natural Healing with the Medicine of the Prophet* (From the *Book of the Provisions of the Hereafter* by Imam Ibn Qayyim al-Jawziyya, 1292-1350 CE), tr. Muhammad al-Akili (Philadelphia: Pearl, 1993), p. 14.
- 30 *Medicine of the Prophet* (al-Jawziyya), pp. 91-92.
- 31 *Medicine of the Prophet* (al-Jawziyya), p. 165.
- 32 *As-Suyuti's Medicine of the Prophet*, p. 199.
- 33 Rahman, "Islam and Health/Medicine: A Historical Perspective," pp. 159-160; and *Health and Medicine in the Islamic Tradition*, pp. 56-57. Cf. the music of the spheres and the effects of music on the soul in the *Rasa'il Ikhwan al-Safa'*.
- 34 *Medicine of the Prophet* (al-Jawziyya), p. 27.
- 35 *As-Suyuti's Medicine of the Prophet*, pp. 78-79.
- 36 *Medicine of the Prophet* (al-Jawziyya), pp. 34-35.
- 37 *Medicine of the Prophet* (al-Jawziyya), pp. 49-50.
- 38 *As-Suyuti's Medicine of the Prophet*, p. 11.
- 39 *Medicine of the Prophet* (al-Jawziyya), pp. 72-73.
- 40 *Medicine of the Prophet* (al-Jawziyya), pp. 102-103.
- 41 *Islamic Medical Wisdom: The Tibb al-A'imma*, p. 125.
- 42 The concept of physical blessedness used for healing and protection is documented anthropologically since the nineteenth

century in a wide variety of Muslim cultural contexts, from Morocco and Egypt in the work of Edward Westermarck and Edward Lane, *The Manners and Customs of the Egyptian People*, to specific expressions of healing and protective baraka through qur'anic and other forms of oral performance in daily speech, as well as in spell magic and talismanry drawn from historical sources still in common use, such as Constance Padwick's *Muslim Devotions: A Study of Prayer-Manuals in Common Use* (London: SPCK, 1961).

- 43 See J. Christophe Bürgel's work, *The Feather of Simurgh, The "Licit Magic" of the Arts in Medieval Islam* (New York: New York University Press, 1988) for the development of distinctions articulated in early magical texts such as the tenth century Isma'ili encyclopedia of occult science, *Rasa'il Ikhwan al-Safa'*, between licit magic and illicit magic, i.e. magical activity which serves Islam and is in concord with revelation (magical models of Moses and Solomon who commanded magical powers in the Qur'an), versus magical activity which is malign, sometimes categorized as "black" magic including cursing magic and the active use of the evil eye. See also my discussion of the categories of sihr halal (licit magic) and sihr haram (illicit or forbidden magic) in the *Rasa'il*, in O'Connor, *The Alchemical Creation of Life...*, 1994, pp. 205-206.
- 44 The complex internal debate on paraliturgical and magical use of the Qur'an within the Islamic religious sciences of law and hadith is too lengthy to address fully here, but reflects both negative and positive opinions based upon qur'anic and hadith materials addressing this issue. In the end, religious healers in Islam who have used prophetic hadith or qur'anic verses and names/attributes of God as prayers, spells, amulets or talismans have cited hadith and Qur'an to validate it as have those who disapprove or disavow such activities. See examples in contemporary anthropological accounts of male and female Muslim healers in South India and the Punjab as well as in Indonesia, Flueckiger, "Muslim Healer in South India"...; Richard M. Eaton, "The Political and Religious Authority of the Shrine of Baba Farid," in *Moral Conduct and Authority: The Place of Adab in South Asian Islam*, ed. Barbara Daly Metcalf (Berkeley: University of California Press, 1984); and John Richard Bowen, *Muslims through Discourse: Religion and*

- Ritual in Gayo Society* (Princeton, NJ: Princeton University Press, 1993), chapter four "Spells, Prayer, and the Power of Words."
- 45 Abdullahi Osman El-Tom, "Drinking the Koran: The Meaning of Koranic Verses in Berti Erasure," in *Popular Islam South of the Sahara*, eds. J. D. Y. Peel and Charles Stuart (Manchester, UK: Manchester University Press, 1985), pp. 33-34, discusses the opinions of religious scholars, early and late, in favor of the permissibility of qur'anic talismanry etc. which were used as justifications for local practice in sub-Saharan East and West African Muslim contexts from the 18th through the 20th century. See also a brief survey of historical views (pro and con) on magic from within Islamic tradition as background for a nineteenth-century West African collection of qur'anic magical texts, ch. 2 "Islam, Magic, and the Use of Charms" in David Owusu-Ansah, *Islamic Talismanic Tradition in Nineteenth-Century Asante* (Lewiston: The Edwin Mellen Press, 1991).
- 46 See discussion of qur'anic divining techniques in Iran and Shi'i texts describing the practice and its system of interpretation as encouraged by the mullahs in Bess Allen Donaldson, "The Koran as Magic," *Moslem World* 27 (1937): 254-257.
- 47 See Constance Padwick, *Muslim Devotions, A Study of Prayer-Manuals in Common Use*, London: SPCK, 1961), rpt. 1996, pp. 83-93, for verbal (as well as written) spells/charms using "refuge-taking"; pp. 152-172 for "calling down blessing" on Muhammad or other prophets of Islam; pp. 37-47 and 235-244 for concepts and verbal/material practices of prayerful "intercession" (wasila, shafa'a) or mediation via the Prophet Muhammad or other Islamic prophets, the Ahl al-Bayt (the prophet's family and descendants, the Shi'i Imams), and the Awliya' or "friends" of God, the male and female saints of Islam; and pp. 108-120 for liturgical and paraliturgical uses of qur'anic recitation in Muslim devotions, particularly recitation as protection.
- 48 *Medicine of the Prophet* (al-Jawziyya), p. 172.
- 49 Padwick, 1961, pp. 70-74, for vernacular/"magical" uses of tasbih, and pp. 94-107, for magical uses of the bismallah and numerological uses of the letters of the divine names.
- 50 *Medicine of the Prophet* (al-Jawziyya), p. 11.

- 51 *Medicine of the Prophet* (al-Jawziyya), p. 139.
- 52 Padwick, 1961, p. 87, and see also pp. 113-114.
- 53 Padwick, 1961, pp. 84-85, and also Donaldson, 1937, pp. 257-258.
- 54 It is necessary to be aware of a natural range of devotion and observance within a religious community (from non-observant to devout) even in the medieval context of universal affiliation when the religious world view was determined exclusively by the limits of Islam. In respect to the modern context, those who are only occasionally observant or only participate actively in major festivals have in recent sociological scholarship been called "Id Muslims" (Yvonne Y. Haddad and A. T. Lummis, *Islamic Values in the United States*, 1987, pp. 9, 33), parallel to the expressions "Sunday Catholic" or "Yom Kippur Jew," for members of religious communities in the modern world whose affiliation and observance is primarily social and familial and who are in the process of becoming acculturated away from Islam as their sole or dominant mode of self-identification.
- 55 Padwick, 1961, Part II, for full discussion of the paraliturgical uses of the Qur'an in relation to devotional prayer and daily speech.
- 56 Padwick, 1961, p. 106.
- 57 Padwick, 1961, p. 109.
- 58 El-Tom, 1985, p. 415.
- 59 El-Tom, 1985, p. 419, and cf. Donaldson, 1937, p. 266.
- 60 Owusu-Ansah, 1991, pp. 47-48. See use of "text water" or "writing water" in curing a cow, p. 79, and curing smallpox in humans, p. 86. Owusu-Ansah (p. 109, and note 33) reports the wide use of "text water" in northern Ghana and the Dyulus of the Ivory Coast, thus supporting its incidence in Muslim West as well as East Africa (the Berti). See Phyllis Ferguson, "Islamisation of Dagbon: A Study of the Alfanema of Yendi," Ph.D. Thesis, Cambridge Univ. 1972, pp. xxvi-xxvii, Interview 7, pp. 143, 193; and Robert Handloff, "Prayers, Amulets and Charms: Health and Social Control," *African Studies Review* 25, 2 (June 1982): 187.
- 61 James Robson, "The Magical Uses of the Koran," in *Transactions* (University of Glasgow Oriental Society serial) 6 (1929-1933): 53-

- 56 and 58-60; and "Islamic Cures in Popular Islam," *Muslim World* 24 (1934): 34-43.
- 62 Donaldson, 1937, pp. 258-263. See also the falita, or immersion of qur'anic writing in drinking water, and the capati, qur'anic writing on unleavened bread, in the practice of a female Muslim healer of South India, described by Joyce Flueckiger, "The Vision was of Written Words: Negotiating Authority as a Female Muslim Healer in South India," in *Syllables of Sky: Studies in South Indian Civilization*, ed. David Shulman (Delhi: Oxford U, 1995), pp. 251, 257.
- 63 Flueckiger, 1995, for feeding a qur'anic charm written on chapati to dogs as surrogates for "errant husbands or disobedient children."
- 64 Ibid., for use of animal sacrifice implicit in the use of "bits of animal skin burned in the fire to 'close the mouth' of an adversary," and Owusu-Ansah, 1991. For magical transfer and sacrifice of a hen, see "Offensive Amulets: to bring evil upon the enemy," p. 58.
- 65 Flueckiger, 1995, p. 251.
- 66 Flueckiger, 1995, p. 255. In the context of "jadu," the local word for magic encompasses both positive, healing, beneficent magic as well as malefic, cursing, evil magic. See discussion of the antinomian qalandari Sufis called malang of the Punjab and their preemptive use of jadu against insult, the evil eye, or other evil wishes, by Katherine Ewing, "Malangs of the Punjab: Intoxication or Adab as the Path to God?," in *Moral Conduct and Authority*, ed. Barbara Daly Metcalf (1984), p. 369. This context of jadu as cursing magic, casting the evil eye, or counter-witchcraft in such situations parallels the Arabic conception of sihr and the practice of sahir, or "evil mouth," among the Muslim Rubatab of the Sudan. See Abdullahi Ali Ibrahim, *Assaulting with Words: Popular Discourse and the Bridle of Shari'ah* (Evanston, IL: Northwestern University Press, 1994), ch. 4; and Edward Westermarck for the same practice in Morocco (1926, vol. 2).
- 67 Eaton, 1984, pp. 336-337.
- 68 Flueckiger, 1995, p. 259. The practice of burning the amulet is probably a cross-over influence from the context of Hindu practice of burnt offerings. Burning the amulet is not found in other qur'anic

amuletic contexts. Oral communication from Sarah Caldwell, anthropologist on Hindu Goddess traditions in South India.

- 69 The science of numbers ('ilm al-jafr) generated the magic square in alchemical works such as the corpus of Jabir ibn Hayyan and the mystical numerology of the *Rasa'il Ikhwan al-Safa'*, and the texts devoted to magic and occult science, such as *Ma'arif al-Ma'arif* by Shams al-Din al-Buni. See relationship of mathematics to mystical numerology and magical uses of numbers such as the magic square in S. H. Nasr, *Islamic Science, An Illustrated Study* (World of Islam Festival Pub. Co., 1976), pp. 79-81. See also the jadwal or magic square in early modern practice based on abjad or numerological equivalence of letter of the Qur'an, divine names, angels, prophets and saints with numbers on a grid, as described by E. Westermarck, *Ritual and Belief in Morocco*, Vol. 1, pp. 141-147, and E. Doutté, *Magie et religion dans l'Afrique du Nord* (Algiers, 1909), pp. 190 on.
- 70 Owusu-Ansah, 1991, pp. 96-98.
- 71 Flueckiger, 1995, pp. 251, 257-258.
- 72 El-Tom, 1985, p. 429. This use of licit magic here to fight "illicit" or negative magic to the death may be more related to African tribal traditions of magic than the larger Islamic context, although the opposition of licit Islamic magic to illicit is considered permissible. Cf. Evans-Pritchard, *Witchcraft, Oracles, and Magic among the Azande*, 1937; and Mary Douglas, "Witch beliefs in central Africa," *Africa* 37, no. 1 (1967): 72-80, and ed., *Witchcraft Confessions and Accusations* (1970), as examples of a vast anthropological literature documenting "witch doctoring," or the magical battle often to the death against the practice of magic with evil intention in the larger African context of tribal societies.
- 73 *Medicine of the Prophet* (al-Suyuti), p. 172. Although this practice is reported in the context of disapproval, it is clearly reporting something in practice and can be seen in relation to the companions of the Prophet who are said in the Hadith and Sira (hagiographical) literature to have collected the Prophet's washing water, fingernail and hair clippings, for their traces of baraka. The residual baraka of this prophetic "wash" and qur'anic "wash" are clearly connected to the larger phenomena of qur'anic erasure.

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- 74 *Medicine of the Prophet* (al-Jawziyya), p. 142.
- 75 *Medicine of the Prophet* (al-Jawziyya), p. 139. Slightly below this statement, the Prophet combines the application of saltwater with blowing his "blessed breath" and reciting Qur'an to heal a wound.
- 76 Flueckiger, 1995, pp. 259-260.
- 77 Books of instruction, such as the *Majma' al-dawat*, as well as professional practitioners of these extra-canonical qur'anic "sciences", were numerous throughout medieval Islam and into the modern era. Special editions of the Qur'an were/are published with marginal notation on methods of divination and apposite verses for magical spells or talismanic use. See Donaldson, 1937, p. 258, and El-Tom, 1985, p. 429.
- 78 Robson (1929-1933), Donaldson (1937), and Flueckiger (1995) all report that manuals of qur'anic spells or talisman making, and other books of magical healing in the *Mujarrabat* genre, are in print and available for consultation by contemporary professional and lay practitioners in the Arab, Iranian, and Indian Muslim context. These contemporary manuals have been generated from earlier talisman manuscript collections such as the one documented by Owusu-Ansah (1991) for 19th century Asante of Ghana.
- 79 Such as the *Mujarrabat* of Ahmad al-Dairabi and Abu Abdallah Muhammad ibn Yusuf al-Sanusi.
- 80 J. G. Frazer, *The Golden Bough*, 1935; B. Malinowski, *Magic, Science, and Religion and Other Essays*, 1948; E. E. Evans-Pritchard, *Witchcraft, Oracles and Magic among the Azande*, 1937; R. Horton, "African traditional thought and Western science," *Africa* 37:51-71; S. J. Tambiah, "The Magical Power of Words," *Man* 3 (1968): 175-208. The standard assumption of the origin of magic in African Islam is that it is due to indigenous magical "survivals," El-Tom, 1985, p. 415. See I. M. Lewis, "The power of the past: African 'survivals' in Islam," *Religion in Context, Cults and Charisma* (1986), for an interesting critique of the notion of "survivals" in relation to contemporary North and Sub-saharan African Islam and Islamic cults of spirit possession (zar in Egypt and the Sudan, and bori among the Hausa).
- 81 M. F. Brown, *Tsewa's Gift: Magic and Meaning in an Amazonian Society*, 1985; H. Geertz, "An Anthropology of Religion and

- Magic, I," *Journal of Interdisciplinary History* 6:71-89; and M. Winkelman, "Magic: A Theoretical Reassessment," *Current Anthropology* 23, no. 1 (Feb. 1982):37-66. See discussion of classic versus the "new" anthropology which sees magic and religion interactions in the "efficacy of spells" in Bowen, 1993, pp. 87-88.
- 82 See Edward Lane's *Manners and Customs of the Modern Egyptians* (1817), Doutté (1909), Westermarck (1926) on North African/Egyptian magic and healing; Robson (1929-1933, 1934) for historical and early modern surveys of the Arabic speaking Muslim Middle East; E. G. Browne's *Arabian Medicine* (1921); Bess Allen Donaldson (1937) and Cyril Elgood, *A Medical History of Persia* (Cambridge, 1951) for Shi'ite Iran; Owusu-Ansah's manuscript work (1985) on 19th century West Africa and El-Tom's ethnographic work (1985) on contemporary Sudan; Flueckiger's (1995) analysis of lay healing in South India, and Eaton and Ewing's articles on Sufi healing and magical practice in the Punjab in a 1984 anthology on South Asia. Finally, Bowen (1993) does the same for qur'anic healing via spells and talismanry among the Gayo in Indonesia.
- 83 See Juan E. Campo, *The Other Sides of Paradise: Explorations into the Religious Meanings of Domestic Space in Islam* (Columbia, SC: University of South Carolina Press, 1991) and Barbara Metcalf, *Making Muslim Space in North America and Europe* (Berkeley: University of California Press, 1996) for explorations of the sacred materiality and marking Muslim space in contemporary Islamic life within the Muslim world and the Muslim diaspora.
- 84 Peter Antes, "Medicine and the Living Tradition of Islam," in *Healing and Restoring: Health and Medicine in the World's Religious Traditions* (1989), esp. pp. 181-191.

MORTALITY ASSESSMENT OF THE ARAB POPULATION OF ISRAEL

ELIAS T. NIGEM

Introduction

The dramatic decline in world mortality in the last one hundred years is one of the most significant accomplishments in the history of the human species. The continuous decline in mortality, in particular in developing countries, has accelerated in the last 50 years and the world crude death rate (CDR) stands now around 9. No country has a CDR of over 22 and only 21 countries have a life expectancy at birth of less than 50 years. For all countries the average life expectancy is 66 years (PRB, 1996). Without sudden catastrophic events or unexpected epidemic diseases, further declines in mortality, adjusting for age, are likely to continue in many developing as well as developed countries.

Despite the worldwide mortality decline, differences between and within countries still exist. Although these differences may in part stem from biological factors, the larger part is attributed to socio-cultural factors. One important factor, for example, is that of the availability and distribution of medical resources (Friedlander, 1995; Weeks, 1995; Reiss, 1991). Societies that lack medical resources are likely to exhibit higher mortality, as are groups within societies. In societies where medical resources are unevenly distributed, mortality differences are likely to occur along the lines of this distribution. An explanation of the uneven distribution of resources is found in theories that explain the structure of societies in terms of power or class relationships. Simply stated, societies

that are characterized by class structure are likely to exhibit uneven distribution of medical resources. Consequently, mortality differences are likely to reflect the class structure of society. That is, those groups that are in power (dominance) or high in the class structure are likely to have the largest share of medical resources; hence, low mortality (Axelrod, 1990; Guzman, 1989; Ruzicka, 1989; Bouvier and Vanda Tak, 1976; (Kitagawa and Hauser, 1973).

In this paper the mortality rates of the Israeli population are examined. A comparative analysis between Jews and Arabs is the objective. Some differences in mortality rates within each group will also be examined. The data provided for this study are mostly derived from recent publications of the Statistical Abstracts of Israel, 1993-1995, and the special series of Israel Central Bureau of Statistics, Socio-Demographic Characteristics of Infant Mortality. Although the data in general are acceptable, one should be alerted to possible inaccuracies. The quality of the vital events recorded, as well as census data of the Arab population, are inadequate in some areas, which raises difficulties both in analysis and interpretation (Friedlander, 1995).

Population Characteristics

The Israel population is composed of two major ethnic groups, Jews and non-Jews (Arabs). These two groups can be further divided into separate ethnic and religious subgroups. Jews can be classified into three subgroups: Western Jews, sometimes called Ashkenazi, who have immigrated to Israel from Europe and the Americas; Eastern Jews, sometimes called Orientals or Sephardim, who have migrated to Israel from Asia (mostly from Arab countries) and Africa; and Sabras, who were born in Israel or were part of the population of Palestine before the establishment of the state of Israel. The indigenous Israel-Arab population can be classified in terms of their religious affiliation: Moslems, Christians, and Druze.

In 1994, the total population of Israel was 5,475,500, consisting of 81.2% Jews and 18.8% non-Jews (Arabs) (Central Bureau of Statistics, 1995). Of the Jewish population, 61.0% were born in Israel-Palestine, 13.3% were born in Asia-Africa, and 25.7% were born in Europe-America. The recent increase in the proportion of those born in Europe-

America is largely the result of the large number of immigrants from Europe (former USSR) to Israel.

In contrast to the Jewish population, the Arab population of Israel is mostly indigenous. Its growth, primarily, is a function of natural increase. Of a population of 1,028,642, 77.8% are Moslems, 12.4% are Christians, and 9.2% are Druze (Table 4.1).

Table 4.1
Demographic Characteristics of Israel Population 1960-1994

	1994	1990	1980	1970	1960
Population					
Total	5,471.5	4,821.7	3,921.7	3,022.1	2,150.4
Jews	81.2	81.9	83.7	85.4	88.9
Moslems	14.3	14.1	12.7	10.9	7.7
Christians	2.9	2.4	2.3	2.5	2.3
Druze	1.7	1.7	1.3	1.2	1.1
Jews-Total	4,441.1	3,946.7	3,282.7	2,582.0	1,911.2
Israel Born	61.0	61.9	55.9	45.8	37.4
Born in Asia-Africa	13.3	15.0	19.5	26.3	27.6
Europe-American	25.7	23.1	20.0	27.9	35.0
Jews in Israel as % of World Jewry	34.2	30.0	25.0	20.0	---
Selected Age Groups					
Total: 0-14	29.7	31.0	33.2	32.9	36.0
65+	9.5	9.1	8.6	6.8	5.0
Jews: 0-14	27.3	28.7	30.4	30.1	35.1
65+	11.0	10.5	9.7	7.2	5.2
Arabs & Others: 0-14	39.8	41.3	47.4	49.7	45.6
65+	3.1	3.1	3.1	3.9	4.5

Source: Statistical Abstract of Israel, 1995, p. 3.

Mortality Assessment***Crude and Age Specific Mortality Rates (ASMR)***

Prior to the establishment of the state of Israel, the general health condition of the Palestinian population was fair, and better than that of its neighboring populations (Weeks, 1995). With the establishment of the state of Israel and the development of a national health system, the health condition of the population continued to improve rapidly for most of the Palestinian population and more so among the younger age groups, in particular the infant population.

In general, the crude death rate for the population of Israel has not changed much since 1950. Once infectious diseases were controlled, the mortality conditions for the population as a whole stabilized. There was, however, a noticeable improvement within the non-Jewish population as well as in the infant segment, as the data in Table 4.2 show. For the Jewish population, the crude death rate basically remained the same since 1970. For the Arab population, the crude death rate dropped from 7.6 in 1950 to 3.0 in 1994. The low crude death rate of the Arab population, however, in comparison to that of the Jewish population, is

Table 4.2
Crude Death Rate, Infant Mortality Rate by Population Group and Religion, 1950 – 1994

Population Group	1950	1960	1970	1980	1994
Total Population					
CDR	6.9	5.7	7.1	6.8	6.2
IMR	47.3	31.3	27.7	15.6	7.5
Jews					
CDR	6.5	5.5	7.3	7.2	6.9
IMR	46.2	27.2	18.9	12.4	5.7
Non-Jews					
CDR	7.6	6.6	6.3	4.2	3.0
IMR	66.0	49.7	42.5	26.0	12.1

Source: Statistical Abstract of Israel, 1995, p. 4.

Note: Non-Jews refers to Moslems only.

largely due to its age structure—that is, it is fairly young. Once standardized, the differences are likely to disappear, and probably reverse. The infant mortality rate (IMR) continued to decline for both groups. The decline ranged from 46.2 to 5.7 for the Jewish population, and from 66.0 to 12.1 for the non-Jewish population. Even though the IMR of the Arab population is still higher than that of the Jewish population, it declined more rapidly and the drop was more significant (Table 4.2).

In examining the age-specific death rates (Table 4.3), we see that the Jewish population exhibits lower death rates in almost every age category than that of the Arab population for both sexes. The differences however are not that large. The same is also observed for the standardized death rate of the two groups. The standardized rate for the Jewish population is 5.5; for the Arabs, it is 6.6. For both groups, males have higher mortality rates than females in each age category. The difference in the age-specific death rates of the male population of the two groups is less pronounced than that of the female population. In addition, it appears that there is some mortality cross-over in the male population between Jews and Arabs at later ages, in particular the age group 75-84. The mortality rates for this age group are lower for Arab males than for Jewish males. It is not the case in the female population. With the exception of the age categories between 35 to 44, Arab females have higher mortality rates than their Jewish counterparts, in particular at older ages where the rates become pronounced (Table 4.3). Within the Arab population, Moslems have higher mortality rates than the others for both males and females. Respectively, the standardized death rates were: for males, 7.7 and 7.4; for females, 6.8 and 5.9.

Infant Mortality

The IMR is one demographic measure that is useful as an indicator of socio-economic disparities, in particular distribution of medical resources. It is also an extremely important measure as it represents a segment of the population (infants) where the impact of mortality on the overall health profile is dramatic.

As indicated earlier, and shown in Table 4.4, the IMR in Israel has declined for both population groups. Although the IMR is still

Table 4.3
Mortality Rates per 1,000 by Age, Sex, and Religion—1993

Age	Females				Males				Total
	Moslems ^a	Other Arabs	Jews	Total	Moslems ^a	Other Arabs	Jews	Total	
0	14.4	13.1	4.9	7.3	14.3	13.2	6.5	8.4	8.4
1-4	0.9	1.0	0.3	0.5	0.9	1.1	0.3	0.5	0.5
5-9	0.3	0.3	0.1	0.2	0.4	0.5	0.2	0.2	0.2
10-14	0.3	0.4	0.1	0.1	0.4	0.2	0.2	0.2	0.2
15-19	0.3	0.3	0.2	0.2	0.7	0.9	0.5	0.6	0.6
20-24	0.4	0.3	0.2	0.3	1.1	1.2	0.9	0.9	0.9
25-29	0.4	0.4	0.3	0.3	0.9	0.9	0.8	0.8	0.8
30-34	0.6	0.5	0.5	0.5	1.0	1.1	0.9	0.9	0.9
35-39	0.9	0.5	0.7	0.7	1.3	1.2	1.2	1.2	1.2
40-44	1.1	0.8	1.2	1.1	2.3	1.8	1.8	1.8	1.8
45-49	2.5	2.4	1.8	1.9	4.0	3.2	2.7	2.8	2.8
50-54	3.8	3.2	2.8	2.8	6.6	6.4	4.6	4.8	4.8
55-59	7.6	7.0	5.0	5.2	13.9	11.6	8.4	8.8	8.8

Table 4.3 (continued)
Mortality Rates per 1,000 by Age, Sex, and Religion—1993

Age	Females			Males		
	Moslems ^a	Other Arabs	Total	Moslems ^a	Other Arabs	Total
60-64	15.1	12.2	9.5	21.7	21.4	15.2
65-69	23.4	21.3	15.3	31.6	25.2	24.2
70-74	37.8	33.4	26.7	48.4	48.9	37.4
75-79	67.9	55.8	48.5	57.4	55.5	60.8
80-84	103.2	82.3	82.9	85.7	83.2	97.5
85+	223.4	207.0	169.3	179.4	194.9	193.8
Std. Rates	6.8	5.9	4.8	7.7	7.4	6.6
				Jews	Jews	Jews
				9.2	14.9	26.3
				48.1	81.8	167.1
				4.7	4.7	4.7

^a Average rates for 1991-1993. Source: Statistical Abstract of Israel, 1995, p. 150.

relatively high in the Moslem population, it experienced the most significant decline, from 66.0 in 1950 to 12.1 in 1994. The same is also true for the Druze population, from 54.3 to 13.7. The Christian sub-group to some degree is similar to the Jewish population, showing a drop from 48.5 to 10.4. The change in the IMR over this period (1950 - 1994) can be explained in terms of the availability of medical resources and the social

Table 4.4
Crude Death Rate, Infant Mortality Rate, and Stillbirth Rate by
Population Group and Religion—1950–1994

Population Group	1950	1960	1970	1980	1994
Total Population					
CDR	6.9	5.7	7.1	6.8	6.2
IMR	47.3	31.3	22.7	15.6	7.5
SBR	--	14.0	12.4	5.8	4.3
Jews					
CDR	6.5	5.5	7.3	7.2	6.9
IMR	46.2	27.2	18.9	12.4	5.7
SBR	15.5	13.7	10.2	4.1	3.5
Non-Jews					
Moslems					
CDR	7.6	6.6	6.3	4.2	3.0
IMR	66.0	46.4	40.1	23.0	12.1
SBR	14.3	15.0	13.2	9.1	6.3
Christians					
CDR	7.3	6.9	6.6	5.9	4.3
IMR	48.5	42.1	30.0	18.0	10.4
SBR	--	11.4	11.4	4.5	6.2
Druze					
CDR	8.2	6.8	5.3	4.4	3.2
IMR	54.3	50.1	41.4	22.7	13.7
SBR	--	9.9	11.6	6.0	9.4

Note: With the exception of 1994, all rates reflect averages of 5 years.

Source: Statistical Abstract of Israel, 1995, p. 116.

position of each group in society. For the groups that are higher in the social structure, the IMR started to decline earlier. Once resources started to filter down to the other groups, their IMR were then more likely to decline. With hospitalization, for example, stillbirths (SBR) declined in both population groups (Table 4.4).

Other measures of infant mortality (neonatal and perinatal) reflect the same phenomenon. It is in the early days of life that medical care is particularly important; the infant is very susceptible to diseases at this time. The major proportion of infant deaths occur early in the first year. This is true for both population groups, and thus it is significant that early infant death rates declined by about 50% from 1975 to 1993. For both groups female infants experience lower death rates, with the exception of the post neonatal rate for the Arab population, where infant males have lower rates than infant females. Early infant deaths as a share of all infant deaths appear a little higher in the Jewish population, where in 1989-1993 about 53% of all infant deaths occurred in the first six days of life. For the non-Jewish population the proportion is about 41% (Table 4.5).

The difference in the proportion of early infant deaths between Jews and non-Jews is probably due to three factors: the denominator, where the total IMR is lower in the Jewish population; the decline in perinatal and neo-natal mortality, which was more apparent in the Jewish population; and the weight of live newborns at birth, which was higher in the non-Jewish population. Indigenous factors contributing to infant mortality, that is, those not related to infectious diseases and other causes largely controlled by public health measures, tend to be either genetically derived or related to the health profile of the mother. These indigenous factors result in medically problematic deliveries and neonatal care, and their control is highly dependent upon medical technology and adequate hospital care. Therefore, those who are located comfortably in the social structure are more likely to avail themselves of this care and be better off in controlling these factors. This partially explains why Jews since 1970 have lowered their perinatal mortality. But why do the non-Jews have relatively lower infant deaths at this stage (0-6 days)? A partial explanation is related to the indigenous causes of death and the weight of live newborns at birth.

Table 4.5
Infant Mortality by Age, Sex, and Population Group

Age of Infant	Females				Males			
	1989-1993	1985-1989	1980-1984	1975-1979	1989-1993	1985-1989	1980-1984	1975-1979
Panel A: Total Population								
Total	8.7	10.4	13.6	17.5	9.8	12.1	15.4	20.5
< one month	5.4	6.5	8.1	10.4	6.4	8.1	10.2	13.3
0-6 Days	4.0	5.1	6.4	8.1	4.9	6.5	8.1	10.6
7-27 Days	1.4	1.5	1.8	2.5	1.5	1.6	2.1	2.7
28-364 Days	3.3	3.9	5.5	7.0	3.4	4.0	5.2	7.1
Panel B: Jews								
Total	6.5	8.1	10.7	13.1	8.1	9.9	12.8	16.8
< one month	4.5	5.7	7.4	9.1	5.9	7.1	9.1	12.1
0-6 Days	3.4	4.5	5.9	7.3	4.4	5.7	7.4	9.9
7-27 Days	1.1	1.2	1.5	2.0	1.4	1.3	1.7	2.2
28-364 Days	2.0	2.4	3.3	3.8	2.2	2.8	3.7	4.7
Panel C: Arabs and Others								
Total	14.2	17.0	22.1	30.3	14.0	17.2	22.9	31.9
< one month	7.5	9.1	10.3	13.9	7.9	10.2	12.8	17.8
0-6 Days	5.4	7.0	7.7	10.2	6.2	8.1	10.1	13.0
7-27 Days	2.1	2.2	2.5	3.8	1.7	2.2	2.7	4.1
28-364 Days	6.7	7.8	11.8	16.4	6.2	6.9	10.0	14.8

Source: Statistical Abstract of Israel, 1995, p. 162.

The major causes of death of infants born in Israel are mostly of indigenous type (perinatal in nature) such as congenital anomalies and immaturity, which accounted for approximately 70% of all infant deaths. Among the Arabs, congenital malformation in 1990-1993 caused 30% of infant deaths as compared to 24% of Jewish infant deaths. However, only 31% of deaths among the Arabs was related to other perinatal causes, including immaturity, as compared to 52% among Jewish infants (Table 4.6). As to the weight of the infant, with the exception of those whose mother is under the age of 19, regardless of the age of mother at birth, the average weight (grams) of the birth is higher in the non-Jewish (Moslem) population than Jewish. Correspondingly, the percent of newborns of less than 2500 grams is lower in the Arab population than that of the Jewish as observed from 1977-1992 (Table 4.7).

Table 4.6
Infant Death Rates (per 1,000 Births) by Population Group and Selected Causes—1970-1993

Cause of Death	1990-1993			1985-1989			1980-1984			1970-1974						
	1-11 Mon.	7-27 Days	0-6 Days	1-11 Mon.	7-27 Days	0-6 Days	1-11 Mon.	7-27 Days	0-6 Days	1-11 Mon.	7-27 Days	0-6 Days				
Grand Total	3.4	1.5	4.3	9.1	3.7	1.6	5.7	10.9	5.3	1.8	7.3	14.4	8.1	2.4	11.4	21.9
Intestinal Infectious Diseases	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	1.5	0.1	0.0	1.6
All Other Infectious & Parasitic Diseases	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.2	0.1	0.1	0.4	0.4	0.1	0.4	0.6
Pneumonia	0.1	0.0	0.0	0.2	0.3	0.0	0.0	0.3	0.5	0.1	0.1	0.7	1.4	0.3	0.3	2.0
Congenital Anomalies	0.7	0.5	1.2	2.5	1.0	0.5	1.7	3.1	1.2	0.5	1.7	3.3	2.1	0.8	2.0	4.9
Other Causes of Perinatal Mortality	0.4	0.7	2.7	3.9	0.3	0.7	3.6	4.6	0.6	0.8	4.8	6.2	0.3	0.8	8.8	9.9
External Causes	0.2	0.1	0.1	0.3	0.3	0.1	0.1	0.5	0.2	0.1	0.0	0.3	0.3	0.1	0.0	0.4
All Others	1.6	0.1	0.3	2.1	1.6	0.3	0.4	2.2	2.5	0.4	0.6	3.4	2.0	0.2	0.3	2.5

Table 4.6 (continued)
Infant Death Rates (per 1,000 Births) by Population Group and Selected Causes—1970-1993

Cause of Death	1990-1993			1985-1989			1980-1984			1970-1974			Total		
	1-11 Mon.	7-27 Days	0-6 Days	1-11 Mon.	7-27 Days	0-6 Days	1-11 Mon.	7-27 Days	0-6 Days	1-11 Mon.	7-27 Days	0-6 Days			
Arabs & Others-Total	6.6	1.9	5.6	14.1	7.0	7.6	16.8	10.9	2.7	9.0	22.6	17.0	3.7	11.4	32.1
Intestinal Infectious Disease	0.0	0.0	0.0	0.0	0.3	0.1	0.3	0.2	0.0	0.0	0.2	4.4	0.3	0.0	4.8
All Other Infectious & Parasitic Diseases	0.3	0.0	0.0	0.3	0.4	0.1	0.5	0.6	0.2	0.1	0.9	0.7	0.2	0.1	1.0
Pneumonia	0.2	0.0	0.0	0.3	0.5	0.0	0.6	1.5	0.2	0.1	1.8	3.5	0.5	0.4	4.4
Congenital Anomalies	1.6	0.6	2.0	4.2	1.7	0.8	5.4	2.0	0.6	2.3	4.9	3.0	1.1	2.5	6.5
Other Causes of Perinatal Mortality	0.7	0.7	3.0	4.4	0.4	0.8	5.3	1.0	0.9	5.4	7.3	0.7	1.3	8.0	10.0
External Causes	0.4	0.0	0.0	0.6	0.5	0.1	0.8	0.5	0.1	0.0	0.6	0.5	0.1	0.1	0.7
All Others	3.3	0.3	0.5	4.1	3.1	0.4	4.0	5.1	0.6	1.0	6.8	4.1	0.2	0.4	4.7

Source: Statistical Abstract of Israel, 1995, p. 160-161.

Table 4.7
Weight of Live Newborn at Birth, by Mother's Age, Population Group and Place of Birth, 1992

Mother's Age	Non-Jews		Jews		Grand Total
	Moslems	Total	Born in Israel	Total	
Panel A: Average weight—All births (grams)					
Total	3,230	3,230	3,200	3,210	3,220
Up to 19	3,080	3,080	3,100	3,100	3,090
20-24	3,170	3,170	3,160	3,160	3,170
25-29	3,240	3,250	3,210	3,210	3,220
30-34	3,310	3,310	3,230	3,240	3,250
35-39	3,350	3,350	3,240	3,250	3,260
40-44	3,330	3,330	3,230	3,240	3,250
Panel B: Percentage of newborns <2,500 grams					
1977-1979	6.0	5.9	6.8	6.7	6.5
1980-1982	7.0	6.9	7.5	7.4	7.3
1983	6.8	6.8	7.4	7.3	7.2
1984	6.8	6.8	7.5	7.4	7.2
1985	7.2	6.9	7.7	7.6	7.5
1986	7.1	7.0	7.6	7.5	7.3
1987	7.2	7.1	7.7	7.7	7.5
1988	7.4	7.2	7.5	7.4	7.4
1989	7.2	6.9	7.4	7.3	7.2
1990	7.0	6.8	7.6	7.5	7.3
1991	7.2	7.0	7.8	7.5	7.4
1992	7.4	7.3	8.3	8.3	8.0

Source: Statistical Abstract of Israel, 1993, p. 114.

Life Expectancy

Another way to evaluate the general health condition of a group is to examine the life expectancy of its members and their survivability at specified ages (Tables 4.8 and 4.9).

Table 4.8
Life Expectancy at Specified Ages, by Sex and Population Group,
1989-1993

Age	Total Population		Jews		Non-Jews	
	Male	Female	Male	Female	Male	Female
0	74.9	78.5	75.3	79.0	73.2	75.8
5	70.8	74.3	71.0	74.6	69.6	72.2
10	65.9	69.4	66.1	69.6	64.7	67.4
15	60.9	64.5	61.1	64.7	59.8	62.5
20	56.1	59.5	56.3	59.7	55.0	57.6
25	51.3	54.6	51.5	54.8	50.3	52.7
30	46.5	49.7	46.6	49.9	45.5	47.8
35	41.8	44.8	41.9	45.0	40.7	42.9
40	37.0	40.0	37.1	40.2	35.9	38.1
45	32.3	35.2	32.4	35.4	31.3	33.3
50	27.7	30.5	27.8	30.7	26.8	28.6
55	23.4	26.0	23.4	26.1	22.6	24.2
60	19.3	21.7	19.4	21.8	18.9	20.0
65	15.7	17.6	15.7	17.7	15.7	16.2
70	12.4	13.9	12.4	13.9	12.8	12.7
75	9.6	10.6	9.5	10.7	10.3	9.8
80	7.2	7.9	7.1	7.9	7.7	7.4
85	5.3	5.8	5.3	5.8	5.8	5.6

Source: Statistical Abstract of Israel, 1995, p. 151.

In general, the life expectancies of the population have improved to the level where most developed countries are at the present.

Expectation of life at birth for the Arab population is about 75 years (75.8 for females and 73.2 for males) and for the Jewish population is about 77 years (79.0 for females and 75.3 for males). For both groups, life expectancies are similar, more so for males than females. The same holds for later ages, with the exception of elderly Arab males who have better life expectancies than the elderly male Jews (Table 4.8). However, survivors at specified ages out of 1,000 persons born alive (Table 4.9) show better probabilities for Jews than non-Jews at all ages.

Table 4.9
Survivors at Specified Ages Out of 1,000 Persons Born Alive, by
Sex and Population Group, 1989-1993

Age	Total Population		Jews		Non-Jews	
	Male	Female	Male	Female	Male	Female
0	1,000	1,000	1,000	1,000	1,000	1,000
5	988	989	990	992	982	981
10	987	988	989	991	980	980
15	986	987	989	991	978	978
20	983	986	986	989	975	976
25	979	984	982	988	969	974
30	975	983	978	986	965	972
35	970	980	973	984	961	970
40	965	977	968	980	955	966
45	956	971	960	974	944	960
50	942	961	946	965	927	949
55	918	946	923	951	898	930
60	877	920	884	925	844	897
65	811	875	819	882	759	837
70	715	808	723	815	653	751
75	588	697	596	706	526	623
80	428	545	432	553	401	457
85	255	354	256	360	251	279

Source: Statistical Abstract of Israel, 1995, p. 152.

In general, the health conditions of the overall population have improved. Medical services are being used more so than in the past as they become available and as demands increase for the total population. Hospitalization rates have more than doubled in 30 years, 1952-1983, for both population groups. With respect to the elderly population (65+), hospitalization rates were higher and increased more for Jews. This can be partially explained by the increasing size of the elderly Jewish population and their proximity to medical services (Table 4.10).

Causes of Death

As the general health of the population improves one would expect that a higher proportion will die from neoplasm and cardiovascular diseases (Table 4.11). This would, of course, be true for both groups in Israel. However, Jews have higher proportions; Jewish deaths are more likely than Arab deaths to be caused by heart diseases and malignant neoplasms. For the Jewish population, these two major categories of diseases account for about 67% of all causes of death in comparison to approximately 49% in the Arab population. In addition, in the Jewish population with respect to these two types of diseases, females have higher rates than males. In the Arab population, males have a higher proportion than females with respect to malignant neoplasms, while females have a higher proportion with respect to heart diseases. The reason for the differences between the two groups is probably the age structure of the population. That is, Jews tend to be older and therefore are likely to die from diseases that are associated with age, such as cancers and heart diseases. Deaths due to heart diseases appears to be higher for females than males in both population groups. This also is probably due to age-structure. That is, females are likely to live longer. Consequently, they are more likely to develop heart diseases (Weeks, 1995; Nam, 1994).

Another indirect indicator of the improvement in the health condition of the population is the proportion of the population utilizing hospitals or dying in hospitals (Table 4.12). An increasing proportion of the population at all ages dies in hospitals. This is true more so for Jews than non-Jews. In 1960, about 63% of the Jewish deaths of all ages took place in hospitals in comparison to 34% of the Arabs. This was largely

Table 4.10
Hospitalization by Age, Sex, and Population Group
Rates per 1,000 Population

Age	65+	45-64	15-44	5-14	1-4	0	Total	Year
Panel A: Total Population								
Males	405	187	62	60	130	373	124	1983
Females	308	156	103	42	88	283	123	1983
Panel B: Jews								
Males	129	80	48	47	54	246	63	1952
	131	85	46	45	73	269	66	1955
	164	93	53	54	73	275	73	1957
	191	109	56	57	93	339	83	1960
	218	120	65	54	101	315	91	1965
	250	126	69	64	121	293	101	1969
	253	134	66	63	125	300	102	1970
	252	147	60	57	111	256	100	1974
	301	142	59	61	105	182	102	1976
	442	177	65	61	121	176	124	1979
	408	185	61	61	135	363	128	1983

Table 4.10 (continued)
Hospitalization by Age, Sex, and Population Group
Rates per 1,000 Population

Age	65+	45-64	15-44	5-14	1-4	0	Total	Year
Females								
	105	87	88	35	41	220	78	1952
	105	90	100	36	55	231	84	1955
	134	96	109	40	53	220	90	1957
	163	113	118	44	70	252	101	1960
	178	115	111	42	78	240	101	1965
	195	124	110	41	87	226	107	1969
	203	122	109	45	84	204	106	1970
	214	133	106	37	73	195	107	1974
	233	130	101	37	75	132	106	1976
	317	146	126	39	82	127	129	1979
	312	157	106	43	92	280	129	1983
Panel C: Non-Jews								
Males								
	73	50	36	19	29	91	36	1957
	86	59	48	29	43	167	50	1960
	131	108	54	27	57	267	65	1965
	122	80	48	32	73	291	64	1969
	117	95	89	32	80	267	64	1970
	177	111	64	37	83	352	78	1974
	298	156	47	44	91	397	87	1976
	545	192	75	63	138	348	115	1979
	344	196	66	57	115	400	102	1983

Table 4.10 (continued)
Hospitalization by Age, Sex, and Population Group

Age	65+	45-64	15-44	5-14	1-4	0	Total	Year
Females	38	44	46	13	20	60	33	1957
	41	58	55	16	32	136	45	1960
	93	67	86	20	42	189	63	1965
	91	68	79	30	43	219	61	1969
	106	79	76	24	58	173	63	1970
	108	104	85	23	60	241	73	1974
	130	...	91	30	58	192	81	1976
	372	149	120	39	87	255	108	1979
	233	140	84	38	75	289	88	1983

Sources: Statistical Abstracts of Israel.

due to the place of residence; Arabs were more likely to reside in rural areas that have, in large, lacked hospitalization facilities. By 1993, conditions to some degree had improved. The proportion of deaths in hospitals increased to 57% in 1990 for the non-Jews and to 71% for the Jews; and then declined for both groups, respectively to 56% and 67% in 1993. The proportional increase for the non-Jewish population is largely due to the dramatic increase in the proportion of deaths in hospitals at or shortly after birth (age 0). For the non-Jewish population the proportion of all births dying in hospitals increased from 46% in 1960 to 81% in 1990 and dropped to 76% in 1993. The decrease in the proportion of all deaths in hospitals for the Jews between 1990 and 1993 could be attributed to recent changes in the allocation of medical resources (privatization), which may be discouraging people from seeking hospitalization (Table 4.12).

Table 4.11
Percentage Distribution of Deaths by Cause, Population Group, and Sex, 1993

Cause of Death	Non-Jews ^a		Jews	
	Female	Male	Female	Male
Infectious Diseases	2.6	1.3	1.7	1.5
Malignant Neoplasms	11.3	13.6	24.4	23.6
Diabetes Mellitus	4.3	2.5	3.0	2.3
Heart Diseases, etc.	38.0	32.9	44.5	43.0
Natal and Peri-Natal Deaths	11.6	11.6	1.2	1.5
Malnutritional Disease	1.2	0.3	0.3	0.3
Pneumonia, Influenza, Bronchitis	2.3	1.5	1.9	1.7
Organ Malfunctions	2.8	2.9	2.9	3.2
Accidents, Suicide, etc.	4.6	12.2	3.9	6.2
Others	21.7	21.4	16.4	16.9
Total	100.0	100.0	100.0	100.0

^a Moslems only.

Source: Statistical Abstract of Israel, 1995, p. 157.

Table 4.12
Percentage of Deaths and Births in Hospitals—1960-1993

Year	Deaths		All Ages	Births	
	Aged 1+	Aged 0		Stillbirths	Live Births
Panel A: Total population					
1960	51.4	84.3	56.2	95.2	90.7
1970	66.1	84.6	67.6	99.9	94.2
1980	64.1	84.8	65.2	100.0	99.7
1990	69.0	85.9	69.6	100.0	99.9
1992	66.8	83.6	67.3	...	99.9
1993	65.9	83.4	66.4	...	99.9
Panel B: Jews					
1950	51.3	87.3	59.7	92.1	94.8
1960	59.9	88.6	63.3	97.3	99.4
1970	67.1	91.8	68.7	99.9	100.0
1980	66.5	89.4	68.0	100.0	100.0
1990	70.5	89.8	71.0	100.0	100.0
1992	68.4	88.6	68.8	...	...
1993	67.2	90.0	67.5	...	99.9
Panel C: Arabs and others					
1960	28.5	46.1	34.0	94.7	54.5
1970	35.5	67.7	45.6	100.0	91.2
1980	36.8	77.6	41.5	100.0	98.8
1990	53.4	80.7	57.4	100.0	99.7
1992	50.7	77.2	54.3	...	100.0
1993	53.1	76.4	56.1	...	99.9

Source: Statistical Abstract of Israel, 1995, p. 717.

Place of Residence

Consistent with many studies, place of residence is still related to mortality differentials. For the total population, the IMR is higher in rural areas than urban areas, 9.3 and 7.6 respectively. This fact can be

explained by the low quality of medical resources in rural areas, in particular where advanced medical technology is probably needed for infant health. This tends to be more apparent for the non-Jewish population, where the rates are substantially higher in rural areas than urban areas, 17.6 to 12.1 respectively. It is about even for the Jewish population. With respect to the CDR the relationship is not clear (Table 4.13). For the Arabs it still holds; higher rates in rural areas than in urban areas. The majority of the non-Jews live in rural areas. Those who live in urban areas tend to be relatively young (migrants). With respect to the Jewish population the reverse is true. Their residential arrangements in new rural localities (Qibbazim, Moshavim) are probably made of mostly younger groups; with their highly developed availability of medical resources, the CDR tends to be low. In addition, the majority of the Jewish population live in urban areas where a growing older population is likely to reside. The higher mortality rates of the Arab population is in part a by-product of their place of residence (rural), where the quality of medical resources is inferior (Reiss, 1991). When the quality of medicine in rural areas improves, further reduction in the mortality of the Arab population will follow.

Table 4.13
**Crude Death Rate and Infant Mortality Rate by Type of Residence,
Population Group, and Religion—1994**

Population Group/Religion	Urban	Rural
Total Population		
CDR	6.4	4.7
IMR	7.6	9.3
Jews		
CDR	7.2	4.9
IMR	5.8	5.3
Arabs		
CDR	3.3	3.7
IMR	12.1	17.6
Moslems		
CDR	3.0	3.9
IMR	12.5	18.3

Source: Statistical Abstract of Israel, 1995, pp. 136-137.

Conclusion

This chapter examined the mortality conditions of the population of Israel. A comparative analysis between Jews and non-Jews was made by using several mortality measures. In general, the health conditions of the Israeli population have improved to a level where most developed nations are at present. This is largely as a result of a nationalized medical program that may be in jeopardy. Despite the improvement in the health condition of the population in general, mortality differentials remain. Mortality is higher in the Arab population, in particular in the early years of life. This existing difference between Jews and Arabs is attributed to a large extent to the inferior quality of medical facilities in rural areas where most Arabs live, and to their relatively low socio-economic status. This is a by-product of their subordinate position in the Israeli state, a position that may continue in the future. And as long as the Arabs remain in this position, mortality differences will not disappear. Indeed, it is possible that because of recent changes in the distribution of medical resources, these differences may increase.

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CANCER PATTERNS AMONG PALESTINIANS DIAGNOSED AND TREATED AT THE WEST BANK CANCER UNIT, 1978–95

YOAV HORN AND CALVIN ZIPPIN

Introduction

Origin of Project

Between 1967 and 1995, Israel was responsible for providing health services to the West Bank Palestinian population. Among others, this included cancer treatment services, whose previous availability in the region had been limited. The model chosen for this purpose was based on an Israeli hospital in which one of the authors (YH) had initiated a similar service. The Israeli hospital was the Assaf Harofeh Medical Center (AHMC), a government facility with 800 beds near Tel Aviv. There, an oncology program with a cancer registry to assure regular patient follow-up was initiated in 1977. Palestinian authorities who became aware of this program explored the possibility of developing a parallel effort to serve the Palestinian population. A collaborative program with Assaf Harofeh Medical Center was opened at the Beit Jala government hospitals (Bethlehem area) in 1978. This was followed by a second similar service for the northern part of the West Bank initiated at Watani hospital in Nablus. The two services together (Beit Jala and Nablus) formed the West Bank Cancer Unit (WBCU). This service lasted through

1995 when cooperation was discontinued by the Palestinian Authority, as it took over responsibility for health care.

A single medical team headed by one of the authors (YH) served the WBCU clinics, and provided clinical training to Palestinian medical and nursing personnel assigned to the program. The early steps of initiating the program also included developing a patient record system and establishing a computerized format for transferral of patient material of the West Bank. This permitted statistical analysis and comparison with the experience of Israeli cancer patients.

A series of publications including clinical and epidemiological observations have appeared, based on the accumulated experience (Barak et al., 1988; Horn, 1985; Horn et al., 1981a, 1981b, 1991, 1993). One of these (Barak et al., 1988) compared the characteristics of female breast cancer patients, their disease and approaches to management among the WBCU and AHMC groups, as well as that of a major medical center in the United States. The WBCU patients were diagnosed at an earlier age overall and with more advanced disease than among the other patient populations. The latter observation was interpreted as reflecting differences in awareness of breast cancer and its symptoms and underscoring the need for educational and early screening programs.

A study (Horn et al., 1993) on cancer patients under the age of 20 showed the five most common cancer sites (hematopoietic system, bones and joints, soft tissue, urinary tract, brain and nervous system) were the same at both WBCU and AHMC, although not in the same order. The WBCU experience was also compared with data for all Jews in Israel. This showed, for both sexes combined, statistically significant differences in relative frequencies of tumors of soft tissue, eye and orbit, brain and nervous system, and thyroid gland.

The Present Study

With the termination of the collaborative program, the present report summarizes the experience among 7,009 cancer patients from the West Bank who were entered into the reporting system between 1978 and 1995. Data included demographic characteristics (ethnicity, age, sex, marital status), basis of diagnosis, extent of disease and anatomic site or form of cancer.

Tumor site comparisons were made with data from the ongoing cancer registry at AHMC in Israel whose patient population is mostly Jewish. The histologic characteristics of the tumors were taken from pathology reports, and categorized by the morphology code of the International Classification of Diseases for Oncology. Available demographic and clinical data were recorded and computerized. The most recent computerized program employed was C/Net 2 provided by the California Public Health Foundation, Sacramento, CA.

It should be noted that some patients from the West Bank Cancer Unit area may have looked for medical attention at other facilities within Israel or may not have received medical attention at all. The data available from this study should not be regarded as incidence data. Although it is difficult to estimate precisely the completeness of coverage provided by the West Bank Cancer Unit centers, the data may be regarded as general indicators of the cancer experience in the population served.

Figure 5.1 presents the distribution of cases admitted to the West Bank Cancer Unit by accession year. The counts ranged from a high of 668 in 1979 to a low of 160 in 1994 during the phase-out of the program. The average number of cases accessioned per year between 1978 and 1993 was 423.

Figure 5.2 shows the age distribution of patients entered into the program. The largest number of cases were in the age group 60-69 followed by the age group 50-59.

Among the 6,552 patients in the system whose age and sex were known, 3,349 (51%) were males and 3,203 (49%) females.

Table 5.1 shows the age distribution by sex. The average age of females was younger than that of males. For males of known ages, 44% were age 60 and above, contrasted with 29% for females. Among males, 9% were in the age group 0-9 years, compared with 6% of females.

Figure 5.1
Distribution of Cases by Accession Year

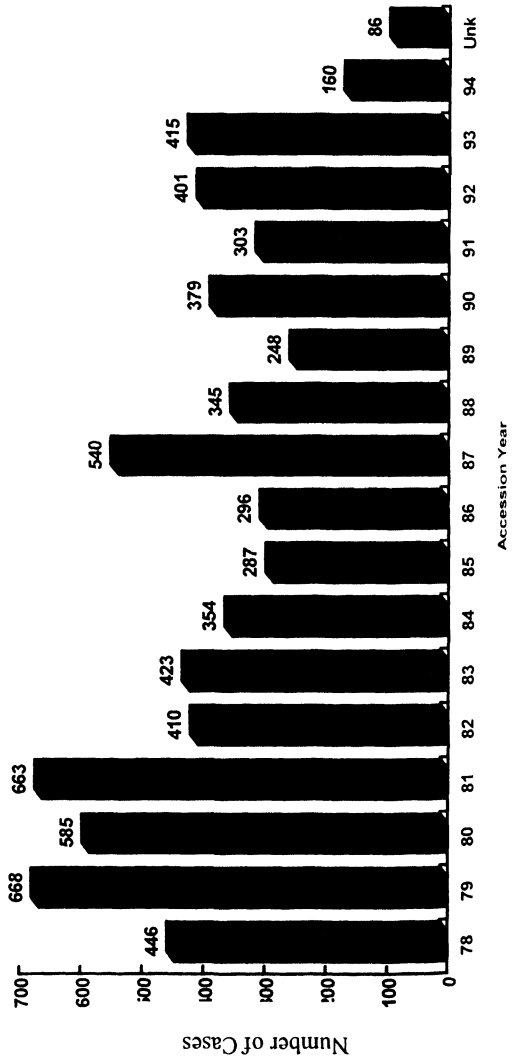


Figure 5.2
Distribution of Cases by Age at Diagnosis

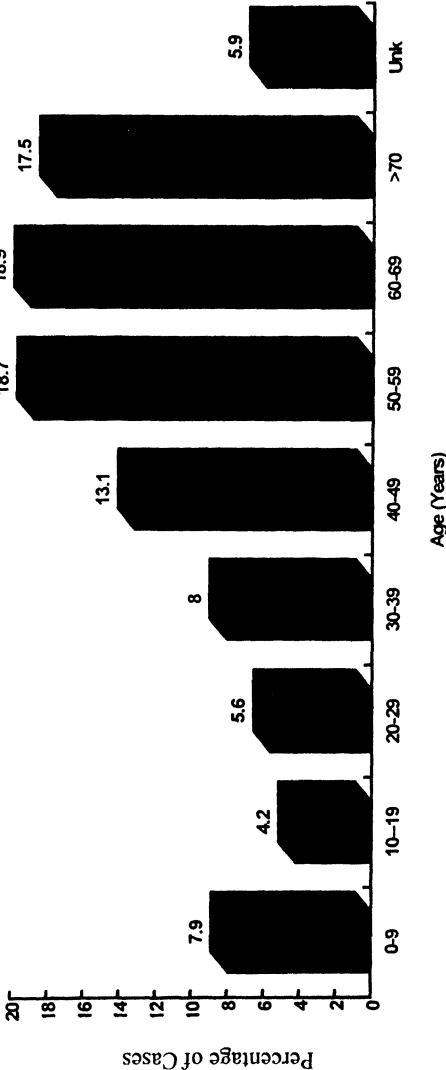


Table 5.1
Age Distribution by Sex

Age (years)	Male		Female		Unknown (Sex)		Total	
	No	%	No	%	No	%	No	%
0-9	333	9.3	196	5.8	28	68.3	557	7.9
10-19	143	4.0	153	4.5	1	2.4	297	4.2
20-29	174	4.9	217	6.4	2	4.9	393	5.6
30-39	234	6.5	325	9.6	1	2.4	560	8.0
40-49	299	8.4	620	18.3	2	4.9	921	13.1
50-59	603	16.9	708	20.9	3	7.4	1,314	18.7
60-69	752	21.0	571	16.8	1	2.4	1,324	18.9
>70	811	22.7	413	12.2	2	4.9	1,226	17.5
Unknown	228	6.3	188	5.5	1	2.4	417	5.9
Total	3,577	100.0	3,391	100.0	41	100.0	7,009	100.0

Table 5.2
Religion

Religion	Cases	Percentage
Moslem	5,994	85.5
Christian	530	7.6
Unknown	485	6.9
Total	7,009	100.0

Table 5.2 shows that patients entered into the WBCU were predominantly Moslem (86%). Less than 8% were Christian and the remainder were of unknown religion.

Table 5.3
Marital Status

Status	Cases	Percentage
Single	927	13.2
Married	3,950	56.4
Widowed	119	1.7
Divorced	27	0.4
Unknown	1,986	28.3
Total	7,009	100.0

Slightly over half the patients were known to be married at time of diagnosis. Marital status was unknown for 28% of the cases (Table 5.3).

Table 5.4
Number of Children

Number of Children	Cases	Percentage
0	1,089	15.5
1-5	1,360	19.4
6-10	2,156	30.8
>10	100	1.4
Unknown	2,304	32.9
Total	7,009	100.0

Over thirty percent had at least 6 children. The number of children was unknown for approximately one third of the cases (Table 5.4).

Table 5.5
District of Origin

District	Cases	Percentage	Approx. Pop.	Percentage
Hebron	1,170	16.7	331,680	21.6
Nablus	1,654	23.6	224,040	14.6
Jenin	498	7.1	224,040	14.6
Tul Karem	566	8.1	215,520	14.0
Ramallah	1,120	16.0	214,320	14.0
Jerusalem	423	6.0	162,000	10.5
Bethlehem	875	12.5	142,440	9.3
Jericho	65	0.9	21,960	1.4
Unknown	628	9.0	...	...
Total	7,009	100.0	1,536,000	100.0

Table 5.5 gives counts of cases by geographic district of residence within the West Bank. Also shown are population estimates for these regions in 1994, shortly before responsibility for all health facilities was transferred. The table shows that the referral patterns to the WBCU tended to draw more patients from certain areas on the West Bank than from others. Approximately 24% came from the Nablus district, whose population represented only 15% of the total population on the West Bank, while 17% came from Hebron representing 22% of the population. The next largest number of referrals were from the cities of Ramallah and Bethlehem, communities with higher educational levels and a more Western life style.

Table 5.6
Basis for Diagnosis

Diagnostic Method	Cases	Percentage
Histology	4,274	61.0
Cytology	98	1.4
Clinical	82	1.2
Laboratory	139	2.0
Isotopic	10	0.1
Unknown	2,406	34.3
Total	7,009	100.0

The basis for diagnosis was unknown for one third of the cases. Of the remainder, almost all were microscopically confirmed (i.e. by histology or cytology) (Table 5.6).

Clinical stage of disease was recorded for 2,548 cases or 36% of the total. Most of these cases (89%) were assigned a stage indicating that disease had spread beyond the organ of origin (Stages II, III or IV) (Table 5.7).

Table 5.7
Clinical Stage at Admission

Clinical Stage	Cases	Percentage
In situ	9	0.4
I	282	11.1
II	500	19.6
III	918	36.0
IV	839	32.9
Total	2,548	100.0

Cancer Site Groups

Table 5.8 gives by rank order the counts and relative frequencies of cases falling into a number of diagnostic group categories indicating the original anatomic site or form of cancer. This is provided for male and female patients at the WBCU. Cases from the “unknown” category (other ill-defined tumors, unclassified, missing information) were dropped from the table.

For comparison purposes, similar tabulations are also provided for Jewish male and female cancer patients diagnosed and/or treated at the Assaf Harofeh Medical Center (AHMC) and entered into the AHMC cancer registry between 1978 and 1994. This medical facility is located near Tel Aviv and provides medical care to a primarily Jewish population living mostly in central Israel.

Cancer in Males

Among males seen at WBCU, cancers of the digestive system, respiratory tract, lymphatic system, urinary tract, and male genital systems were the five most frequently diagnosed cancers. These were also the five most frequent site groups at AHMC, although not in the same order. These five groups accounted for 69% and 86% of male diagnoses, respectively.

Table 5.8
 Distribution of Cases by Sex and Site Groups at WBCU and AHMC

WBCU		AHMC	
	Cases	Percentage	
Panel A: Males			
Digestive system	602	18.4	Digestive system
Respiratory	546	16.7	Urinary
Lymphatic	425	13.0	Male genital
Urinary	424	12.9	Respiratory
Male genital	266	8.1	Lymphatic
Skin	248	7.6	Skin
Oral cavity	240	7.3	Blood & bone marrow
Brain & nervous	141	4.3	Soft tissue
Soft tissue	113	3.4	Brain & nervous
Blood & bone marrow	105	3.2	Bone
Bone	81	2.5	Endocrine
Endocrine	58	1.8	Breast
Eye	22	0.7	Oral cavity
Breast	5	0.2	Eye
Total	3,276	100.0	Total
			Cases
			Percentage
			Percentage
			1,205
			826
			668
			511
			272
			175
			96
			72
			67
			46
			46
			3
			23
			14
			4,051
			29.7
			20.4
			16.5
			12.6
			6.7
			4.3
			2.4
			1.8
			1.7
			1.1
			1.1
			0.7
			0.6
			0.3
			100.0

Table 5.8 (continued)
Distribution of Cases by Sex and Site Groups at WBCU and AHMC

	WBCU		AHMC		
	Cases	Percentage	Cases	Percentage	
Panel B: Females					
Breast	1,047	33.7	Breast	1,509	33.8
Digestive system	484	15.6	Digestive system	1,053	23.6
Female genital	463	14.9	Female genital	620	13.9
Lymphatic	229	7.4	Urinary	287	6.4
Skin	176	5.7	Lymphatic	227	5.1
Brain & nervous	116	3.7	Skin	220	4.9
Urinary	107	3.4	Respiratory	168	3.8
Respiratory	99	3.2	Endocrine	145	3.2
Oral cavity	97	3.1	Blood & bone marrow	65	1.5
Blood & bone marrow	89	2.9	Brain & nervous	62	1.4
Soft tissue	76	2.4	Soft tissue	56	1.3
Endocrine	70	2.3	Bone	28	0.6
Bone	39	1.3	Oral cavity	20	0.4
Eye	16	0.5	Eye	9	0.2
Total	3,108	100.0	Total	4,469	100.0

At WBCU the relative frequencies of cancers of the respiratory system (17%) and the lymphatic system (13%) among males were significantly higher than among males at AHMC, where the relative frequencies were 13% and 7%, respectively. On the other hand, the relative frequencies of digestive system (18%), urinary tract (13%) and genital system cancers (8%) among males were lower than at AHMC, where the corresponding figures were 30%, 20%, and 17%. Among the less frequent site groups, higher relative frequencies were noted at WBCU than at AHMC for skin cancers (8% vs. 4%), cancers of the oral cavity (7% vs. 1%), and brain and nervous system (4% vs. 2%).

Cancer in Females

Among females the five most frequent site groupings accounted for 77% of cases at WBCU and 83% at AHMC. The most frequently diagnosed cancer at both WBCU (34%) and AHMC (34%) was cancer of the breast. This was followed at both centers by cancers of the digestive system (16% at WBCU; 24% at AHMC), and female genital cancers (15% at WBCU; 14% at AHMC). Lymphatic malignancies ranked fourth at WBCU (7%) and fifth (5%) at AHMC, following tumors of the urinary tract (6%). The fifth most frequent group at WBCU was skin cancer (6%). As among males, cancers of the digestive tract among females were considerably less frequent among females at WBCU compared with AHMC.

Among other findings from Table 5.8, the relative frequency of cancers of the brain and nervous system and oral cavity was twice as high for females at WBCU as at AHMC.

Table 5.9 gives in rank order the ten most frequent individual sites of cancer for both sexes combined. These represented 58% of all cases.

By far the most frequent diagnosis, as already shown in Table 5.8, was cancer of the female breast which alone accounted for 15% of cases at WBCU.

Table 5.9
Most Frequent Cancer Sites at WBCU

Site	Cases	Percentage
Breast (female)	1,047	14.9
Unknown primary	524	7.5
Lung	452	6.4
Non-Hodgkin's lymphoma	388	5.5
Bladder	369	5.3
Melanoma of skin	288	4.1
Stomach	274	3.9
Colon	257	3.7
Rectum; rectosigmoid; anus	230	3.3
Brain	223	3.2
Other sites	2,957	42.2
Total	7,009	100.0

The next most frequent diagnosis was “unknown primary”, including cases such as those with advanced disease which at the time of diagnosis had been found in a site to which it had spread without definitive identification of the site of origin.

This was followed in turn by lung cancer, non-Hodgkin's lymphoma, bladder cancer, melanoma of the skin, and cancers of the stomach, colon, anus-rectum (including rectosigmoid), and brain. No other cancer represented as many as 3% of total cases.

Conclusions

1. The cancer experience at the West Bank Cancer Unit (WBCU) demonstrates a need for enhanced cancer control measures.
2. Educational programs should be strengthened to encourage cancer prevention and early diagnosis of some common cancers.

3. For those cases where the clinical stage of disease was recorded, almost 90% were in stages II, III, or IV, indicating that disease had spread beyond the organ of origin at the time of diagnosis, with reduced chance of cure.
4. Among males, respiratory cancers, primarily of the lung, accounted for one-sixth of all cases. These highly fatal cancers are largely attributable to smoking practices. Educational programs directed toward reducing smoking could impact the cost in lives from such cancers, as is now being observed in the United States.
5. In females, fully one-seventh of the cases at WBCU were of the female genital system. Such cases would lend themselves to earlier diagnosis with the availability and use of facilities for mammographic and pap smear examinations.
6. In an earlier study comparing the various forms of cancer at WBCU with those of a primarily Israeli population seen at the Assaf Harofeh Medical Center (AHMC), we observed among males significantly lower relative frequencies of cancers of the digestive, urinary and genital systems at WBCU than at AHMC. In contrast, significantly higher relative frequencies were noted for cancers of the lung and of the head and neck at WBCU. These findings are consistent with those noted in the present study.
7. Females at WBCU also had a reduced frequency of cancers of the digestive system and urinary tract compared with women at AHMC, and a similar relative frequency of genital cancers. Again, the previous and present studies indicate higher frequencies of cancers of the head and neck at WBCU, the same pattern as for males.
8. If confirmed in more definitive studies, the differences in risk among the two study populations may be attributable to differences in life styles and possible exposure to environmental influences. Differences in risk of digestive system cancers may reflect, for example, differences in dietary practices (Civil Administration, 1994). Oral cancers and those of the head and neck region generally are related to tobacco usage, as are those of the lung and respiratory tract.

9. The high frequency of bladder tumors at both WBCU and AHMC in our experience is an unusual observation. Although the reasons for this are unexplained, known risk factors include smoking and exposure to aromatic amines. It is also known that schistosomiasis is a risk factor for adenocarcinoma of the bladder. At our two centers the bladder cancer cases were primarily transitional cell carcinomas.

10. Continued comparative studies of cancer risk among different population groups have in the past been valuable in helping to elucidate factors associated with the risk of various forms of cancer. This is also to be encouraged in the Middle East, where much remains to be learned about the magnitude and the nature of the cancer problem in entire geographic populations. Such efforts may lead to improved methods of cancer control to benefit all populations in the region.

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HEALTH CARE IN THE GAZA STRIP AFTER THE OSLO AGREEMENTS: IMPEDIMENTS TO THE DELIVERY OF CARE AND THE CRISIS OF MEDICAL EDUCATION

JAY J. SCHNITZER AND SARA ROY

Introduction

In September 1993 Israel and the Palestine Liberation Organization (PLO) entered into an historic agreement known as the Declaration of Principles (DOP). Under the terms of the agreement, Israel transferred responsibility over several sectors, including health, to the newly established Palestinian National Authority (PNA, PA). Subsequently, in May 1994, the parties signed the Cairo Agreement which, in part, formalized the transfer, and by November 1994, the PA and its health authority had assumed full responsibility for health care in Gaza and Jericho.

Ironically, the implementation of the Gaza-Jericho plan came at a time of unprecedented accelerating economic, social, political, and institutional disintegration in the Gaza Strip. Gaza's societal breakdown has been caused, in large part, by Israel's repressive occupation and, most recently, to a prolonged economic closure of the occupied territories, beginning in March 1993. The closure brought an already weakened Palestinian economy to the point of near total collapse. The provision of basic relief, long restricted to a small minority of people in the Gaza Strip

and West Bank, has become the concern of a growing segment of the population. Production has given way to survival, unity to fragmentation. Conditions are most acute and most dangerous in the more bereft Gaza Strip where malnutrition, unemployment, and violence are now characteristic features of daily life (Roy and Schnitzer, 1996).

Demographic Characteristics

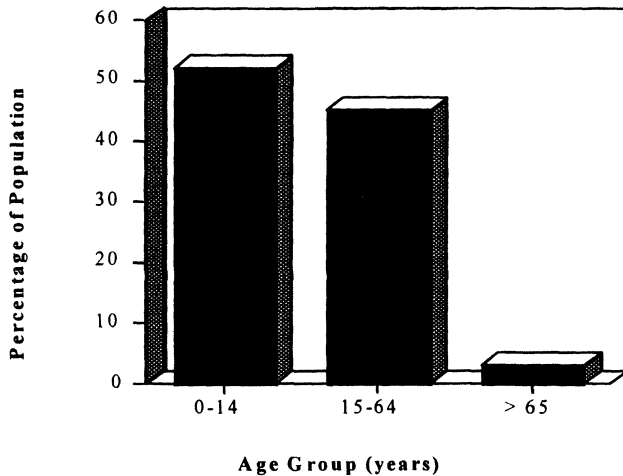
Of the approximately 950,000 people inhabiting Gaza, 99% are Sunni Muslim Arabs (Roy and Schnitzer, 1996). About 74%—more than 600,000 people—are refugees of the 1948 Arab-Israeli war, or their descendants. Approximately half of the refugee population live in eight refugee camps located within the Strip, first established in 1950. The remainder of the population live in 13 cities and towns. The five largest and most populous centers are Gaza City, Khan Younis, Rafah, Jabalya, and Deir el-Balah. Since the annual population growth rate in Gaza is at least 4%, one of the highest in the developing world (Roy, 1994a), by the year 2005, Gazans are expected to number 1.7 million. The Gaza Strip population is extremely young with 60% under 16 years of age (Figure 6.1).

At nearly 6,000 people per square mile, the population density of the Strip is among the highest in the world. The comparable figure for Israel is 80 people per square mile. However, when calculated on the basis of Arab-owned land alone, Gaza's population density exceeds 12,000 people per square mile, which surpasses the density levels of many major American cities. Inside the refugee camps where living space is particularly scarce, density levels are very high, approaching 197,000 people per square mile (Roy, 1995), over three times that of Manhattan Island.

The Gaza Strip Before 1967

Gaza, a Canaanite city-state in 3200 BC, is one of the oldest cities in the world. Gaza's present debilitation seems antithetical and paradoxical when viewed against its remarkable history of resilience and growth. It experienced a continuous succession of conquerors beginning with the

Figure 6.1
Age Distribution of Gaza's Population



Egyptian pharaohs, followed by Assyrians, Scythians, Babylonians, Persians, Romans, Muslims, Crusaders, Mamelukes, Ottomans, British, Egyptians, and ending with the Israeli army.

Gaza's geography has clearly shaped its contentious history. Gaza was of crucial importance to the ancient intruder attempting to invade Egypt from the north or Palestine from the south. Situated on the *Via Maris*, a road that stretched from Egypt along the coast of Palestine and Phoenicia, Gaza also served as a key commercial bridge between Egypt and other ancient empires. Gaza was a crucial outpost and provisioning center for caravans engaged in commerce between Asia and Africa (Roy, 1995).

Before World War I, Gaza was part of the Ottoman Empire. Traditional attitudes and approaches to medicine and health prevailed, and few, if any, records or medical data exist from this time. Following World War I, Gaza town and the Gaza region were under British Mandatory rule (1920-1948); the Strip as such had no territorial demarcations but existed as part of the southern district of Mandatory Palestine. During the British Mandate the Gaza region was largely rural. Gaza town was predominantly Arab and relatively underdeveloped compared to some other Palestinian towns and cities, particularly those

that had a mixed Arab-Jewish or largely Jewish population. Not surprisingly, therefore, infant mortality in Gaza and its surrounding hinterland averaged around 150 deaths per 1000 births (State of Israel Ministry of Health, 1994) which was higher than many other parts of Palestine.

The declaration of Israeli statehood in May 1948 and the subsequent Arab-Israeli war precipitated the birth of the Gaza Strip. A tiny area of only 140 square miles (28 miles long and 5 miles wide), the Strip is situated on the eastern Mediterranean, bordered by Israel to the north and east and Egypt to the south. Within days of its geographic delineation, this small region was inundated by 250,000 refugees fleeing the war in Palestine. Falling under Egyptian military control (1948-1967), the Strip's population tripled almost overnight, and the internal dynamics of the territory were altered forever.

The Gaza Strip During Direct Israeli Occupation 1967–1993

As a result of the 1967 Arab-Israeli War, the Gaza Strip and West Bank fell under Israeli military occupation. The impact of the occupation on the health care and development of the Gaza Strip has been defining and marked.

Since 1967, settlement patterns have been shaped to a significant extent by Israeli government policy. The government has directly confiscated or otherwise assumed control of at least 50% of Gaza's land—some government officials estimated 58%—large portions of which were allocated to the establishment of 16 Jewish settlements largely concentrated across the entire length of Gaza's coastline. Although they comprised one-half of 1% of the territory's total population in 1993, Israeli settlers were allotted, per capita, 84 times the amount of land allotted Palestinians, and they consumed close to 16 times the amount of water.

Israeli policy also constrained Palestinians economically. Prior to 1967, Gaza's economy was underdeveloped despite some limited growth. The occupation of the Gaza Strip brought the Strip's small and unorganized economy into direct contact with Israel's highly industrialized one. Since 1967, the Gazan economy has undergone specific changes, the most significant of which is the employment of Gaza labor inside Israel. From 1970 and 1987 the number of Gazans traveling to work in Israel grew from 10% of the total labor force (5,900

people) to over 70% (80,000 people). Since demand generated in Gaza by Palestinians commuting to Israel increased consumption and trade, wage income earned in Israel was critical in promoting local economic growth and improving Gaza's gross national product (GNP). This growth was greatest in the first decade of occupation, when Israel's own economy was growing. However, increases in GNP, which were largely attributable to external payments in the form of salaries earned in Israel and foreign remittances, nurtured extreme economic dependence on Israel in particular, at the cost of internal economic development. Indeed, the economic development of the Gaza Strip was something the Israeli authorities actively and deliberately restricted, instead pursuing a policy of "de-development" (Roy, 1995). Contributing only 2% to GNP in 1968, external payments increased to almost 50% of GNP in 1987, a striking indicator of Gaza's internal economic weakness. By 1993, Gaza's economy accounted for only 1% of Israel's GNP (Roy, 1994a). Currently, Gaza's per capita GNP is estimated at \$750-1000, well below the 1987 level of \$1150, and near the average of all underdeveloped countries, \$950.

Under the combined impact of the Palestinian uprising or *Intifada* and the Persian Gulf War, Gaza's weakened economy experienced further deterioration. Between December 1987 and January 1991, Gaza's GNP fell by at least 30% due to significant declines in output and trade with Israel, a dramatic loss in wage income earned in Israel due to Israeli restrictions barring workers, and a serious fall in remittances received from Palestinians working abroad. For Gaza's highly dependent economy, the loss of income from work in Israel and of remittances proved devastating. For example, the number of Gazans working in Israel declined from 80,000 before the uprising to 30,000 after the Gulf War. Given Gaza's debilitated economy, these jobs, whose loss equaled at least \$300 million, could not be recreated domestically. By April 1991, the termination of remittances from Palestinians living in the Gulf and of direct aid from the Gulf states amounted to an additional loss of \$350 million. Losses to the PLO in the form of direct aid from the Gulf were estimated at \$480 million, a large percentage of which was channeled to Gaza and the West Bank. A series of curfews and closures imposed by the Israeli authorities during and after the Gulf crisis added another \$40-50 million in losses to the Gazan economy. By June 1991, the United Nations Relief and Works Agency (UNRWA), whose responsibility has always been for the refugee population only, was feeding an unprecedented 120,000 refugee and non-refugee families in the Gaza

Strip—almost the entire population—and 165,000 families in the West Bank. During 1992, UNRWA distributed an additional 430,000 family food parcels in Gaza and 119,000 in the West Bank to people with emergent need (Roy, 1994b).

Beginning in March 1993, in response to heightened levels of Palestinian violence against Jews in Israel, the Israeli government imposed a closure on the Gaza Strip that has never once been lifted. Closure has restricted the movement of labor and goods between Gaza and Israel, and the movement of the population between Gaza and the West Bank, including students, professionals, health workers, and patients. The cumulative effect of closure has been devastating. By April 1995, for example, the number of Gazans allowed to work in Israel fell to 8,000, or 10% of 1987 levels. Today, no more than 20,000 have permits to work in Israel. Unemployment stands at nearly 60%. Purchasing power has declined precipitously, consumption patterns have changed noticeably, and the standard of living has fallen dramatically. The income shortage has periodically produced widespread food shortages, and for a time, a significant percentage of Gazans required some form of emergency food assistance. According to UNRWA, at least 90,000 people in Gaza alone are now totally dependent on food or cash assistance without which they would go hungry. The result—malnutrition—has been most harmful for children under three years of age. In 1993, symptoms of malnutrition were reported in 35% of children in Gaza (Barghouthi, 1993). More recently, the incidence of moderate and severe stunting (low height for age) was found to be 8.2% in Gaza, the incidence of moderate and severe wasting (decreased weight for height) was 3.7%, and the incidence of moderate and severe underweight (decreased weight for age) was 5.2% (Palestinian Central Bureau of Statistics, 1996a).

The Delivery of Health Care in Gaza: The Health Care System Inherited by the Palestinian Authority

Not surprisingly, the health status of the Gaza Strip has always been an issue of great controversy, especially in the last few years. Official Israeli government sources have consistently reported improvements in the Gaza health care system under occupation, citing declines in infant mortality rates (IMR), increasing immunization rates, and improved medical facilities and access. While acknowledging Israeli achievements, Palestinian and foreign non-governmental sources, however, often

described a very different picture that was characterized by an inadequate health service infrastructure. According to these sources, health care in Gaza suffered from discriminatory practices that resulted in poorly equipped and maintained hospitals, inadequate supplies of medicine and medical equipment, poor community outreach, neglect of the public health infrastructure, and inadequate insurance coverage (Roy, 1986).

Under direct Israeli occupation, health care was provided by a four sector system: Israeli government, UNRWA, non-profit nongovernmental organizations (NGO's), and private facilities. Approximately 40% of services were provided by the Israeli government, 40% by UNRWA, and 20% by NGO and private facilities (Task Force, 1993). Inpatient facilities consisted of six hospitals, five government (819 beds) and one private (80 beds), with a total of approximately 900 beds (State of Israel Ministry of Health, 1994). Outpatient services included 27 primary care government clinics (expanding to 29 by 1993) scattered throughout the Strip and 9 UNRWA primary care health centers in the refugee camps. The UNRWA clinics assumed the primary responsibility for the health of the refugees (Lilienfield et al., 1986), generating 50-100 patient visits per physician per day. There were also a smattering of private clinics and popular committee clinics; more recently there were 15 NGO clinics and 17 charitable clinics, although their patient volume was comparatively small (Daibes and Barghouti, 1996).

Some improvements in health care delivery in Gaza have been documented since the beginning of Israeli military rule. Perhaps the most hotly disputed issue is the decline in infant mortality rates (IMR) due, in large part, to successful programs in childhood immunization (especially polio), improvements in maternal and infant health and nutrition (Guinena, 1977), and improvements in oral rehydration treatment of pediatric diarrheal diseases (Lasch et al., 1983).

From 1977 to 1987, for example, according to official Israeli sources the infant mortality rate (IMR) dropped from 100-150 deaths per 1000 live births to 29 (Lasch, 1990; Association of Israel and Palestinian Physicians, 1990). However, there is controversy with regard to these data. In contrast, a study sponsored by the US Agency for International Development (USAID) found an IMR in 1982 of 51-54 (Vermund, 1985), the United Nations reported an IMR of 70 in 1985 (Roy, 1986), and the Palestinian Medical Relief Committee suggested that the rate was closer to 100 (Anon., 1986). The most recent official Israeli statistics show that the IMR was 86/1000 in 1970, 43/1000 in 1980, 23.6/1000 in 1990, increased to 28.3/1000 in 1991, and 31.3/1000 in 1992 (State of Israel

Ministry of Health, 1993). However, these data are based on compilations from death certificate reporting, which may be inaccurate. For example, in 1993, the fertility rate in Gaza was 7.4 (one of the highest in the world), and 50% of all reported deliveries were conducted at home. It has been suggested that many deaths go unreported, which of course would result in an underestimate of the IMR. A UNICEF survey reported an IMR in Gaza of 40/1000 in 1991 (State of Israel Ministry of Health, 1994) while the Israel Section of the Defense for Children International (1993) found an IMR of 51/1000 in 1993, a rate equivalent to that in Jordan, Syria, and Lebanon. The IMR in Israel, by contrast, has been 9-10 per 1000 live births since the late 1980's (World Bank, 1991). In 1993, the main causes of infant mortality were pneumonia, prematurity, congenital abnormalities, and diarrhea. More recently, the Palestinians have estimated the IMR in Gaza to be 32, with a clear improvement over the previous 10 years (Palestinian Central Bureau of Statistics, 1996b).

Several advancements also have occurred in the prevention and treatment of infectious diseases. By treating diarrhea-causing gastrointestinal infections with oral rehydration solution (ORS), as recommended by the World Health Organization (WHO), Israeli health officials reported that diarrheal-related mortality was cut by 53% and total deaths among children 0-3 years of age reduced by nearly 42% (Guinena, 1977). Similarly, by using a novel immunization strategy of a combination of trivalent oral poliovirus vaccine with parenteral inactivated poliovirus vaccine, the incidence of polio fell from 10 cases per year per 100,000 inhabitants in 1977 to 0.16 in 1985 (Tulchinsky et al., 1989; Lasch et al., 1984, 1986). Indeed, this new approach serves as a model for other developing countries for the eradication of polio (Goldblum et al., 1994). Immunization rates for tetanus in Gaza have reached at least 95% (State of Israel Ministry of Health, 1989), causing tetanus rates to fall from 32.9 per 100,000 population in 1968-1972 to 1.7 in 1988-1989, while the rate in Israel for 1988-1989 was 0.07 (Tulchinsky et al., 1990b). Although over 90% of the population of Gaza have been immunized against measles, measles has persisted in epidemic waves in the region (Tulchinsky et al., 1990a). Rates have dropped from 663 cases per 100,000 people per year in 1968-1972, to 78 in 1983-1987, but still remained higher than the Israeli rate of 27 from 1983-1987 (Tulchinsky et al., 1990a). Rates continued to fall to 19.0 in 1990, 16.0 in 1991, and 0.1 in 1992 (State of Israel Ministry of Health, 1993). From 1970 to 1985, among the refugee population, the rates of trachoma fell from 94 to 0.9, and for tuberculosis, from 18 to 8; in 1985, there were no

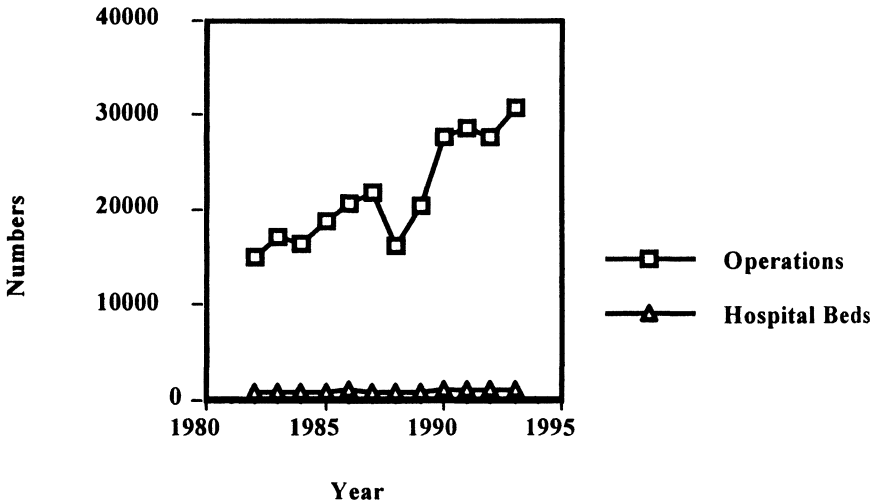
reported cases of cholera, diphtheria, leprosy, plague, rabies, relapsing fever, syphilis, or typhus (Lilienfield et al., 1986).

While the Israeli government has focused its efforts on preventing epidemics, which it did with considerable success, it failed in a number of other respects: low government expenditures on health care, restrictions on the improvement and expansion of health care services, and neglect of the public health infrastructure.

Throughout Israeli occupation, expenditures on health care were very low particularly when compared to health care expenditures inside Israel. By 1993, for example, after almost two decades of Israeli rule, per capita expenditure on health care was \$350 in Israel, \$65 in the Gaza Strip and West Bank combined, and \$45 in the Gaza Strip alone (an increase from \$30 in 1986). During that time, the Israeli military government in Gaza admitted that operating and development budgets for health care were based on conditions that existed in Gaza ten years prior. A review of 10 years worth of government budgets for the Gaza Strip revealed that although the health sector absorbed on average nearly 30% of the ordinary budget (government expenditure), it received on average no more than 15% of the development budget (government investment). It should also be noted that when measured in absolute dollar amounts, these expenditures are quite small. The resulting low level of services resulted in severe understaffing, inadequate medical equipment (including basic supplies), and poor maintenance of hospital and other health facilities. By 1993, for example, the Gaza Strip contained 0.8 physicians per 1000 people compared with 2.9 per 1000 in Israel (3.5 times more) (Schnitzer and Roy, 1994), and 1 hospital bed per 1000 population versus 6 beds per 1000 in Israel (Information Division, 1995). And although the total number of surgical procedures performed in Gaza nearly tripled between 1982 and 1993, the total number of hospital beds remained virtually constant (Figure 6.2, Palestinian Bureau of Statistics, 1995).

The underfinancing of the health sector was exacerbated by numerous official restrictions on its expansion. Consequently, the health care infrastructure was almost entirely dependent on the Israeli government system (Association of Israeli and Palestinian Physicians, 1990) with little, if any, control left to indigenous Palestinian health institutions, whose development has also been severely constrained by the occupation authorities (Giacaman, 1993). For example, any Palestinian institution wishing to engage in any kind of health care

Figure 6.2
Numbers of Surgical Procedures and Hospital Beds in the Gaza Strip



related project had to obtain permission from the Israeli military authorities, which was more often than not denied. Permission also had to be obtained for patient referral to hospitals in Israel, physical expansion of clinics or hospitals, staff additions, board meetings, curriculum development, or departmental changes. On occasion, the military government even closed the surgical suite at Gaza's main government hospital, and there were several instances where the military had restricted the number of operations performed in government hospitals (Roy, 1986).

Permission was also required before any medical or health related organization or institution could accept foreign or local donations. Fundraising was subject to criminal prosecution if it occurred without official approval, as was the acceptance of research or development grants or awards. Restrictions also existed on the importation of various kinds of medical equipment. Before 1994, for example, there was no dialysis machine in the entire Gaza Strip. X-ray machines, electrocardiogram units (EKG), and cardiac monitors were in extremely short supply and requests for such equipment by local hospitals were typically rejected. Indeed, prior to 1990, the x-ray department of the

government's largest hospital in Gaza had no facilities for angiography, radiotherapy, or radiodiagnostic procedures. Basic equipment needed by hospital laboratories was also lacking. Hemoglobin testing could only be performed visually and histological and oncological tests could not be performed at all (Roy, 1986).

Health conditions are of course greatly affected by the level of infrastructural development as well. In the Gaza Strip, government neglect of infrastructure—that is, inattention to the development of appropriate infrastructural systems, particularly with regard to the installation of proper sewage, waste disposal, and water treatment systems—has been severe and the repercussions damaging.

The outbreak of the Palestinian uprising in December 1987 had a tremendously detrimental impact on the already stressed infrastructural system. The most obvious and direct effect was the sudden, unexpected large burden of casualties. Early in the *Intifada*, most of the injuries were beatings and high velocity gunshot injuries (Geiger et al., 1988). Many of the injured were children under 16 years of age: during the first two years of the uprising (December 1987-December 1989), 69 children were killed in Gaza, and over 12,000 injured (Nixon et al., 1990). Later, the so-called 'plastic' bullets – which were actually 70% metal and had ballistic properties between a .38 special and a .45 automatic handgun (Table 6.1) – were introduced by the authorities to control demonstrators, adding to the numbers of injuries and deaths (Schnitzer, 1992; Yellin et al., 1992; Schnitzer and Fitzgerald, 1993). Between December 1987 and December 1992 UNRWA documented 370 fatalities and 59,110 injuries in Gaza (UNWRA, 1993). Although these numbers underestimate the total number of casualties, they do indicate the vast number of people requiring rehabilitation services, a sector that is highly underdeveloped and underfinanced.

It should also be noted that following the imposition of the March 1993 closure, a majority percentage—almost 75%—of the Gaza Strip population lacked any medical insurance. By law, Palestinians working in Israel must purchase medical insurance which is paid through their workplace. During the closures, workers were unable to return to their jobs and their insurance was terminated. This resulted in the deaths of seriously ill children who, because of lapsed insurance premiums, could no longer receive treatment and died. Similarly, residents of the Gaza Strip and West Bank who were undergoing treatment in Israeli hospitals

Table 6.1
Comparison of Ballistic Properties of Selected Firearms and Bullets

Caliber (in or mm)	Bullet (grains)	Velocity (ft/sec)	Energy (ft-lb)
.25	45	815	66
.22 long rifle	36	1080	93
.32	60	970	125
.38 special	148	710	166
M-16 plastic	14	3240	331
.45 automatic	200	917	373
9 mm	95	1355	387
.357 magnum	125	1450	583
.44 magnum	180	1610	1036
.223 M-16 standard	55	3240	1282

Source: Schnitzer, 1992.

before a closure order was imposed are unable to travel to Israel because the Israeli government now requires special entry permits which are extremely difficult to obtain. In one case, an Israeli doctor from Jerusalem who was treating a three-year old cancer patient from a village near Hebron in the West Bank had to cross an Israeli roadblock in her own car and smuggle the young child and her father into Israel so that the child could receive treatment. She did this after all her attempts to get an entry permit through official channels failed (Israel Section, 1993). More recently, the proportion of the population insured has increased to 77% in Gaza, due in large part to an aggressive program by the PA Ministry of Health (Palestinian Central Bureau of Statistics, 1996a; Fishman, 1997). Whether this will have a positive impact on the health of the population remains to be seen.

The Health of Gaza's Population: Public Health Issues

Certainly the most urgent public health issue facing the Gaza Strip is the rapidly decreasing supply of fresh water. International development

experts have estimated that at current levels of domestic and agricultural consumption, the Gaza Strip will run out of fresh water in 10-15 years (Roy, 1995)

In the Gaza Strip, water is supplied by local wells and by the Israeli water company, Mekorot, supplemented by some UNRWA wells. Water quality has deteriorated substantially due to overpumping (Gaza Civil Administration, 1986). Overpumping of Gaza's existing fresh water supplies allows seawater to enter underground reservoirs and causes rising salinity and brackishness (Bellisari, 1994). As a result, Gazan water supplies are becoming increasingly unfit for human consumption. They have high levels of chloride, one measure of water purity, ranging from 200-1000 mg/liter, which consistently exceeds the European Community's maximum recommendation of 200 mg/liter for drinking water (World Bank, 1993a). Inadequate natural replenishment of the water supply greatly exacerbates the problem. Indeed, the natural renewal of the ground water by rain has been estimated at 35 million m³/year; however, current total pumping rates are 100-125 million m³/year, dangerously lowering the groundwater table (Bruins et al., 1992). If this rate of overpumping persists, the consequences will be disastrous. Seawater is already filtering in and chemical analyses demonstrate leaching of sewage into the groundwater aquifer as well (Murray et al., 1994). Seepage of sewage into underground water supplies produces nitrate contamination, adding to the deterioration of water quality in the Strip (Gaza Civil Administration, 1986). In Gaza City, the largest population cluster in the territory, a growing number of households no longer consume municipal water.

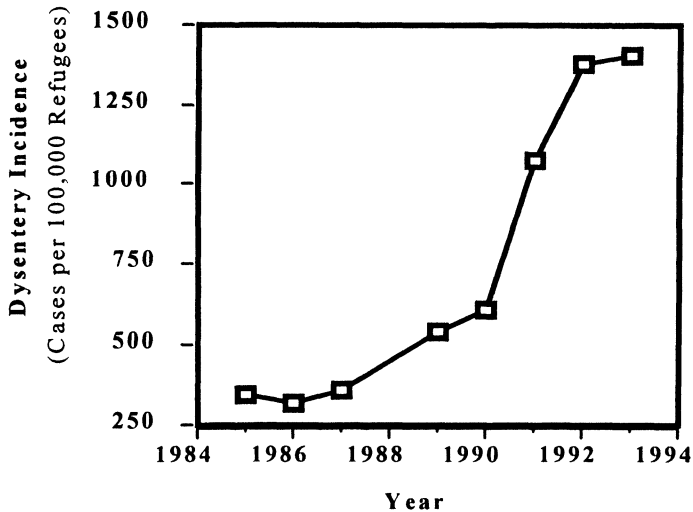
Prior to 1992, adequate sewage removal and treatment were available in only three of fifteen localities, and all of the refugee camps were entirely dependent on open sewers (Roy, 1986). By 1994, the situation had not appreciably improved, although the international donor community and UNRWA did begin to implement a program to rehabilitate the sewage infrastructure in some refugee camps. Approximately 65% of Gaza City is served by a functioning sewage system, parts of which were built during Mandate times. The Israeli authorities installed a new system in the 1970's that was designed to service a much smaller population than it currently serves. Since current demand far exceeds the carrying capacity of the Gaza City system, raw sewage can be seen flowing down Gaza City streets, even those in the more wealthy areas. Most other towns and villages in the Strip lack a piped system altogether. Open drainage ditches continue to serve most of

the refugee camps which drain either directly into the sea or into low lying areas. These ditches were originally designed for "gray water," i.e., waste from bathing, laundry, and cleaning. Human fecal waste was originally designed for disposal in unsealed vaults that would periodically be emptied for transfer to Gaza City sewage lagoons. Many of these vaults, filled to capacity, are now inaccessible and fecal waste runs directly into the open drainage ditches.

Fortunately, even with these constraints, there had been no documented widespread epidemics of serious infectious diseases since the 1960s (Lilienfield et al., 1986), but luck ran out on November 4, 1994 when the first case of culture-confirmed cholera was reported from the Shejaia neighborhood of Gaza City. The organism was characterized by the local laboratory, and confirmed by Israeli Ministry of Health and US Centers for Disease Control and Prevention (CDC) laboratories. The Palestinian Ministry of Health responded quickly by forming a cholera coordinating committee, designating three hospitals as cholera treatment centers, and contacting the US Agency for International Development (USAID) for assistance. By November 21, there were 82 cases of culture-positive infections, 69 of whom were symptomatic with diarrhea. There was one death reported, that of a two year old boy who arrived at the hospital severely dehydrated, for a case-fatality ratio of 1.4% (Murray et al., 1994).

Due in part to severe overcrowding and inadequate infrastructure, prevalent diseases in Gaza include roundworm, infectious hepatitis, amoebic dysentery, anxiety, depression, hypertension, and blindness (Anon., 1986). The incidence of dysentery (amoebic or bacterial) in the refugee population in Gaza has increased sharply since the *Intifada* (Figure 6.3, Palestinian Bureau of Statistics, 1995). The incidence of diarrheal disease in Gazan refugees ages 0-3 increased 10-fold during the *Intifada* (Figure 6.4, Palestinian Bureau of Statistics, 1995). Unfortunately, there are no published prevalence data for chronic non-communicable diseases in Gaza. In contrast to the West Bank, this information has been conspicuously absent from the official Israeli reports (State of Israel Ministry of Health, 1993), and Palestinian groups were prohibited from collecting such data prior to 1994. Furthermore, West Bank health care issues are substantially different and less severe than those in Gaza, so that pooled data from the two territories are of little value in determining Gaza's needs (World Bank, 1993a). Thus, it has not been possible to evaluate demographic trends or patterns of cardiovascular disease, hypertension, cancer, or diabetes by location or

Figure 6.3
Incidence of Dysentery in Gaza's Refugee Population

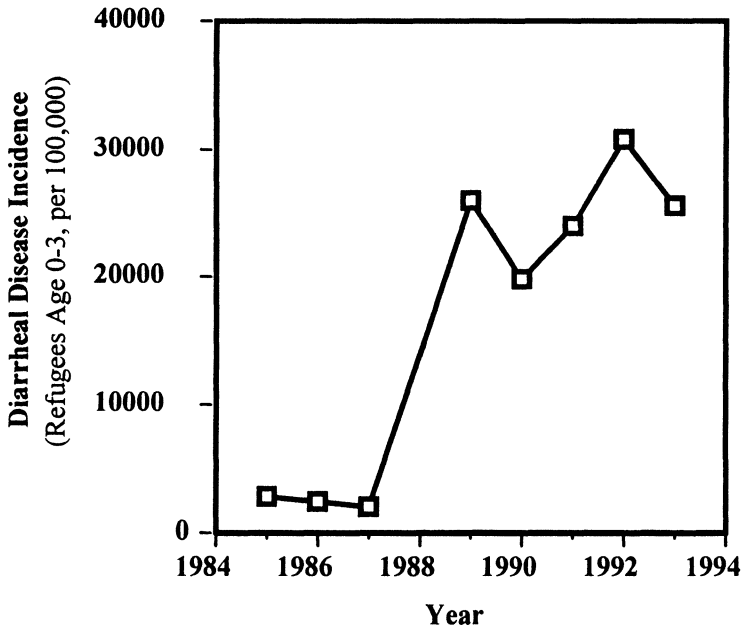


over time. This will have two major implications for future planning under autonomy: lack of historical data will hinder the accuracy of future predictions for the requirements for specific treatment units, and the lack of infrastructure for data collection and handling will require immediate attention by the new leadership.

Mental Health

The psychological effects on Gazans of disorder, violence, and deprivation are not to be underestimated. Everyone in Gaza has been traumatized. Children have been the most vulnerable. Nearly 70% of the Gaza Strip population is 25 years of age and younger, and have known nothing but occupation. Just under 50% are 14 years or less, and have spent their formative years during the uprising. This is a generation that has never known peace.

Figure 6.4
Incidence of Diarrheal Diseases, Gaza, Ages 0-3



In 1992 and 1993, the Gaza Community Mental Health Programme (GCMHP), the largest and oldest mental health facility in the territory, surveyed close to 3,000 Palestinian children between the ages of 8 and 15 and found the following: 93% were teargassed; 85% had their homes raided; 55% witnessed their fathers beaten; 42% were beaten themselves; 31% were shot; 28% had a brother imprisoned; 19% had been detained; 3% had suffered a death in the family; and 69% were exposed to more than four different types of trauma (Semenuik, 1995). UNICEF further estimates that between 1988 and 1993, one out of every five male children in the Gaza Strip between the ages of 11 and 15 years had been injured. Of all children 15 years of age and younger, they state, almost 23,000 had been wounded. Of these, 55% were beaten, 16% were

injured by live ammunition fire, and 11% by plastic coated metal bullets or the so-called 'rubber' bullets (Israel Section, 1993).

Until very recently, the death of a child, a brother or sister, was not an extraordinary event in Gaza; injured and maimed children were not uncommon. Gaza has become a society devoid of childhood. For many years, children in Gaza have been absent more and more from the home and the classroom, two critical sources of socialization, and the impact has been devastating. Children are increasingly incapable of conceptualizing authority in traditional terms since parents and teachers, unable to protect the young from constant abuse and threat, have ceased to exist as authority figures (Roy, 1993). For too long, law and order did not exist in Gaza—some would argue this is still the case—and therefore children had no boundaries or markers for distinguishing good behavior from bad. In 1995 Dr. Eyad el-Sarraj, founder of the GCMHP, found that 40,000 Gazan children were in need of some form of immediate psychiatric care (Semeniuk, 1995). Furthermore, he and his colleagues have shown a substantial incidence of severe posttraumatic stress disorder (PTSD) among Palestinian former political prisoners in the Gaza Strip (El-Sarraj et al., 1996).

Education

There are no medical schools and no residency training programs in the Gaza Strip. For years, Gazans wishing to obtain medical training were compelled to travel to Western Europe, Egypt, or Eastern Europe. Furthermore, there have been no programs for licensing, certification and recertification, or continuing medical education, and no mechanisms for assuring standards and quality. Recently a new medical school has been opened in the West Bank in East Jerusalem at the Al-Quds University under the direction of Dr. Nael Shihabi, Dean of the Faculty of Medicine. There are also a limited number of postgraduate programs (e.g., some residency programs at Makassad Hospital), nursing schools, and paramedical training programs in the West Bank. Despite these programs, there is no way to guarantee an adequate number of qualified medical and paramedical personnel over time, particularly in Gaza. The situation is made worse by the fact that, at the current time under closure, Gazans cannot travel to the West Bank to enroll in these programs.

Recent Plans

In response to the signing of the Israeli-PLO peace agreement in September 1993, a variety of plans for the development of the Palestinian health sector emerged. The principal outside actors involved are the World Health Organization (WHO), the World Bank, the United Nations Relief and Works Agency (UNRWA), and for a short time, the United States Agency for International Development (USAID) (Schnitzer and Roy, 1994).

WHO (1994) responded to the September 13 signing with a preliminary plan to develop and implement a program to help transfer health services to an interim Palestinian authority and to provide emergency assistance as needed. The World Bank plan included both long and short term objectives, and was based on the premise that a large (~10%) and probably unsustainable fraction of the gross domestic product (GDP) is currently committed to health care in the territories (World Bank, 1993b). UNRWA responded with a list of several health projects, appropriately prioritized, and each requiring 6-9 months for completion (Task Force, 1993). The USAID program, estimated at \$23 million, was designed to assist the Palestinian health authority to build public and private sector capacity for primary health care in the Gaza Strip and West Bank (Fishman, 1994). However, this program was canceled in March 1995 due to a restructuring of USAID's strategy in the area (Fishman, 1995). Unfortunately, the new strategy seems short-sighted and contradicts previously articulated highly prioritized goals.

A more comprehensive plan has been prepared under the auspices of the PLO: The National Health Plan for the Palestinian People (National Health Plan Commission, 1994). This plan was based on previous versions by the Palestine Red Crescent Society (PRCS) and the Palestine Health Council (PHC) (Palestine Red Crescent Society, 1993). The PRCS was created in 1969 by the Palestine National Council, the legislative body of the PLO, with the responsibility of addressing the health needs of Palestinians in the occupied territories; the president of the PRCS is Dr. Fathi Arafat, the brother of President Yasser Arafat. The PHC, in turn, was formed in July 1992, endorsed by the PLO, and helped coordinate the formation of the Palestinian Ministry of Health. Following the signing of the agreement, the PRCS and the PHC formulated a preliminary plan to deal with the transition period (Palestine Red Crescent Society, 1993), which had three stated objectives: to sustain the existing health care system, to improve the health care system, and to

develop a five year plan. The newest version, the 1994 National Health Plan (National Health Plan Commission, 1994), is based on four guiding principles: 1) that behavioral, biologic, and environmental factors are the major determinants of health status; 2) that promotion of health and prevention of disease are the most effective approaches to health care; 3) that making the most of what already exists provides the greatest efficiencies; and 4) that barriers to health services should be eliminated. From these principles, the plan articulates a number of rational goals and strategies which stress many of the concepts alluded to above. The successful implementation of these principles, of course, remains to be seen. An annual operating budget for Gaza of \$31 million has been estimated. It is further estimated that an additional \$46 million will be required per year for the West Bank, plus \$34 million for administrative costs, for a total annual operating budget of \$111 million.

Issues Raised by the New Political Situation: Summary of Current Health Care Problems in Gaza

A number of new questions and problems have emerged from the new post-Oslo reality: What is the new structure? What are the budgetary needs, how will the money be raised, and how much outside assistance is required? How will development aid be absorbed? What will happen if insufficient money arrives from outside donors? Who is directing and coordinating health care, and who are the decision-makers? What will the priorities be, who will set them, and how will they be implemented? Furthermore, the need for developing an institutional infrastructure in health, combined with the absence of strategies for health care development and nationally adopted standards, and an unprecedented need for mental health care and rehabilitation services, in particular, exacerbate the complexity of the challenges ahead.

There have been some concerning developments "on the ground" during the past year. Until very recently, the Makassad Islamic Charitable Society owned and ran the Makassad Hospital in Jerusalem, and functioned as the largest Palestinian NGO. On January 19, 1997, a newly "appointed" hospital board of directors (organized unilaterally by the Palestinian authority) broke into the administration's office and took over the hospital. This interference by the PA in the affairs of the this NGO appears unjustified and unprecedented, and what the impact will be on future NGO activity in medicine will need to be carefully monitored. In

another instance, the United Nations has been committed to a project to build a new hospital in the Khan Younis region of Gaza. The building structure is nearly complete after spending an enormous sum of money, but there are no immediate plans to open the facility because of a lack of operating funds and trained personnel.

In response to the deteriorating economic status on the ground in Gaza, unfortunately the US State Department instructed the US Agency for International Development (USAID) to respond with ill-conceived damage control measures. USAID diverted funds, previously promised, budgeted, and allocated to worthwhile successful programs in Gaza, to create temporary menial labor jobs in Gaza, lasting at most weeks to months. There is no coordinated program, no long term economic development strategy, and no chance for sustained improvement.

An illustrative example is the case of the Society for the Care of the Handicapped (SCH) in Gaza. This organization, under the direction of Dr. Hatem Abu Ghazaleh, FRCS, is a community organization which has served mentally and physically handicapped children in the Gaza Strip since 1976. The primary goal of SCH is to provide handicapped and otherwise disabled individuals the skills with which to live productive lives. The SCH had been a recipient of USAID grants for over 10 years which were critical to the survival and success of the center. The SCH's most recent budget was cut by nearly \$1 million, assuring that 160 skilled employees out of 245 (65%) supported by US government grants, and who in turn support over 1200 people, lost their jobs. Even worse, nearly 2000 children, either mentally or physically handicapped or at risk, lost badly needed services. This action (in the name of creating immediate employment) actually destroyed jobs and obliterated health and social services desperately needed by the community (Schnitzer, 1995).

Recommendations for the Future

To say that Palestinians face enormous challenges in the development of their health care sector is self-evident. While unencumbered control of health care delivery and adequate financing for health care reform are necessary (and as yet unattained), they are not sufficient. Hence, certain approaches should have priority over others (Schnitzer and Roy, 1994).

First, any approach or strategy must address the serious medical education, certification, and credentialing issues that exist. Palestinians need access to education and training at all levels: college, nursing

schools, paramedical training programs, medical schools, and postgraduate residency programs. Presently, these services are largely unavailable to Palestinians in the Gaza Strip and West Bank and in Israel. Access to programs outside Gaza should be facilitated and encouraged; concomitantly, needed programs should be started within the occupied territories and sustained with international support, both economic and intellectual.

Second, any plan must include, integrate, support, and coordinate all four of the existing functioning health care sectors in Gaza (government, UNRWA, NGO, and private) without bias, at least in the short term. Third, the new Palestinian Health Ministry must deal effectively with the “inside” versus “outside” leadership problem and make use of the best medical leaders, regardless of their political affiliation or personal connections. Particular emphasis should be given to physicians from the occupied territories who are most conversant with the problems and issues of their community.

Fourth, the level of donated technology should be carefully combined with cultural sensitivity and matched to the technological sophistication of the recipient society. Palestinians should avoid the tendency to be seduced by technologically sophisticated gadgetry and expensive, large-scale construction projects. High-technology monuments of bricks and mortar are much less helpful in the short term than education, educational programs, and development of systems that guarantee reliable, continuous sources of essential materials and supplies. Indeed, well-trained personnel in a mediocre facility provide much better patient care than mediocre personnel in a state-of-the-art facility. Unfortunately, the ill-fated United Nations hospital project in Khan Younis is an excellent example of this phenomenon.

Fifth, the new system should support, encourage, and foster the NGO's and primary care programs already active and successful in Gaza. Noteworthy in this regard are several Palestinian health care NGO's that have provided critical primary health care services, and have apparently been “eased-out” of the mainstream programs during the past three years. The case of the Makassad Hospital “takeover” is of special concern.

Sixth, the new system must assure a continuous and reliable flow of necessary daily operating materials and supplies, both in terms of financing and availability. Financial mechanisms (e.g., a banking system, currency) must be installed that will allow the absorption of development aid and reduce the fraction of GDP devoted to health care to sustainable levels and to develop adequate funding. Sustained and effective efforts

must be initiated to reduce costs, and attempts must be made to reduce the deleterious effects of the closure.

Seventh and last, but certainly not least, are issues related to water. The approaching water crisis demands immediate attention. Measures must be found to insure conservation, eliminate over-pumping, and explore all potential alternate sources, including desalinization and the importation of water.

Medical Education: A Plan

The key to the future delivery of excellent health care in Gaza is the development of human resources. The centerpiece of a system of medical education should be a medical school, as has been initiated at Al-Quds University in East Jerusalem. This should be integrated with a system of postgraduate clinical residency training programs, in conjunction with standardized credentialing, licensing, and certification programs, in order to assure universal quality. The establishment of continuing medical education programs is essential to maintain skills and keep health care workers "up-to-date" as well as to enhance the skills and training of more senior members of the medical community. To be successful, the medical school requires excellent faculty and students; pre-clinical and clinical curricula; classrooms, laboratories, library, books, syllabus, and pathology specimens; and clinical material and instruction, both hospital- and outpatient-based.

Organization of residency programs should start with the basic disciplines: internal medicine, surgery, pediatrics, and obstetrics/gynecology. Once these are firmly established, additional specialties should be added as resources become available, including, but not limited to, pathology, radiology, cardiology, infectious disease, hematology-oncology, gastroenterology, orthopedic surgery, and urology. This will require a core of teaching hospitals and clinics, with appropriate high quality, well-trained, and motivated faculty. A curriculum will be required for each residency, as will a series of standardized examinations. All of these programs must be integrated in a logical manner with the medical school.

While these areas are not the only areas in need of attention, they should receive highest priority. The future of health care in Gaza depends upon it.

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TECHNICAL AND HEALTH IMPLICATIONS OF THE WASTE WATER REUSE OPTION IN THE MIDDLE EAST

KHALIL H. MANCY

Water Shortage and Wastewater Reuse

The Middle East is one of the most arid regions of the world. The availability of fresh water has been a determining factor in the economic, social and cultural aspects of this part of the world. From Morocco to Iraq about 80% of the land is barren desert. Population settlements are concentrated along the few major rivers where there are arable soils and in coastal areas with higher rainfall than the desert interior.

The water shortage problem is exacerbated by the high population growth rate (average 3.5% per year) and increasing urbanization and industrialization. The result has been stiff competition between water demands for urban centers and rural/desert communities and water demands for agriculture. Similar to other regions in the world, priority for fresh water allocations is given to urban demands. Consequently, farmers are often left with no choice except to use, directly or indirectly, effluents from urban areas. This haphazard and mostly covert practice poses serious threats to public health and it has been the main cause of widespread epidemics.

Municipal and domestic wastewaters in the developing regions of the world usually do not receive adequate treatment before they are discharged into receiving waters. This is the case with most of the countries in the Middle East, in spite of huge investments in water supply and sanitation (WSS) projects. These facilities are usually based on high technology and they are difficult to operate and maintain. Consequently, in most cases, municipal and domestic wastewater effluents are not suitable for direct reuse in agriculture or fish farming.

The earliest known planned reclaimed water system was built in Rome almost 2,000 years ago, where an aqueduct carried an unwholesome water that could not be used for consumption purposes. Greece and China have been farming with sewage and sewage effluents for more than two millennia. The first documented municipal wastewater reuse system in agriculture was initiated in Germany in the 16th century. In the late part of the 19th century, irrigation of crops with municipal sewage was an established practice in England, Australia, Germany, France and the United States. However, although sewage effluents have been used for agricultural production since ancient times, widespread interest is comparatively recent. Increasing population and increasing consumption of water per capita mean that increasing amounts of wastewater are produced in both rural and urban areas. The nutrients contained in wastewater were recognized as a valuable resource, especially for agriculture. In many areas, planners who were searching for economic and effective ways to augment or conserve water supply have turned to reuse as a viable option to promote future development without the need to find new freshwater sources. Finally, the increasing interest in environmental and health issues favors reuse as a way to dispose safely of wastewater. The reuse conservation ethic called for by these imperatives focuses on reclaimed water as a valuable resource that should be preserved and exploited, not as a waste product that requires disposal.

Considerations for Implementation of Wastewater Reuse Projects

Planning for wastewater reuse application involves many complex factors which could be summarized as follows:

Demographics

Population growth causes major water resource problems, especially in arid and semi-arid regions. Population and per capita demands increase while water resources remain limited. Rapid growth brings both problems and prosperity to a community, and development needs must be balanced with available water resources. As demographic figures change, so do the competing uses for existing water resources: domestic, industrial, agricultural, recreational, and releases for in-stream requirements. Also the amount of wastewater produced in all sectors will increase with the demand for potable water, when the total population itself is increasing. Such a situation may trigger the need to initiate a water reclamation project in order to utilize the increasing effluent stream in a beneficial way. Secondary factors to consider with respect to demographics include: current and future water supply, existing and projected water demand, existing and projected wastewater generated, current and projected wastewater treatment and disposal capacity. Experiences indicate that the use of reclaimed water for nonpotable purposes can satisfy a significant portion of the water demand of a given community.

Public Reactions

Public opinion and emotions can complicate and impede present and future wastewater reuse programs. It is important to consider public concerns, attitudes, beliefs and culture. Potential negative environmental and health concerns often predominate and the benefits of wastewater reuse are underestimated. In this case, public education is needed in order to create a positive response to the reuse concept. Public acceptance is also related to the type of reuse that is proposed, and unfavorability varies directly with the degree of human contact with the water that will ensue - the less the contact, the greater the acceptability. Frequently, public media exacerbate negative attitudes by promoting worst case scenarios, which in turn compound concerns, ignorance, misconceptions, and fear of the unknown.

Collaboration with the public should begin early in the planning stages and requires that water professionals have a sincere desire to listen to other perspectives, and work with the public to develop a reuse plan

that will be mutually acceptable and beneficial. Clear statements favoring a healthy environment, financially sound WSS utilities, a prosperous local economy, or a reliable and high quality water supply can help establish common ground between officials and the public.

Public Health/Water Quality

The public health implications are one of the most critical elements in the treatment and use of sewage effluent. Wastewater contains disease-bearing bacteria, viruses, parasites, as well as heavy metals, organics, and possibly other toxic substances from industrial effluents (Rose, 1986). However, several recent studies have not shown any adverse health effects from reusing water for nonpotable purposes (Feachem et al., 1983; Shuval et al., 1986; Edwards, 1992). The necessary level of treatment does depend on the ultimate destination of the reclaimed water. Continual monitoring and evaluation should also be essential requirements of any project that uses treated wastewater; they can ensure that water quality changes are discovered and corrected before causing serious health or environmental hazards.

Water Supply and Distribution

Quality and quantity of water are no longer independent issues. Nearly all of the existing water reuse practices utilize treated municipal wastewater for nonpotable purposes to reduce the demand on potable water supplies, thus making water reuse an important component of water resources management.

Getting the water delivered to where it is needed is the other water quality issue. Many communities are faced with inadequate or deteriorating infrastructures, especially with respect to water distribution systems. As these systems undergo repair or are upgraded, it may be feasible to implement a reclaimed water system quite cost-effectively. Wastewater treatment plants vary greatly depending on the processes mandated by the most sensitive end use. If a treatment plant is built solely to supply reclaimed water for nonpotable purposes, the water will require less treatment than when being discharged into a receiving water body,

thus reducing the capital costs. At the same time, this reduces the amount of water treated to potable quality level and can increase the life of a treatment plant which is reaching or has reached capacity.

The most effective method of distributing reclaimed water is through a dual system (Okum, 1969, 1983) using two sets of pipes to distribute two grades of water to the same service area, one potable and one nonpotable reclaimed water. These systems are not necessarily inexpensive, but they can be installed fairly easily since the pipelines basically run the same route as existing lines. As stated earlier, communities also have an opportunity to develop reclaimed water systems at the same time they have to upgrade current municipal water infrastructures. Once installed, they provide many years of service to a community with routine maintenance.

Economic Factors

Reclaimed wastewater may be the most economical option for increasing water resources in a community. The cost of upgrading wastewater treatment and providing reclaimed water for nonpotable uses is generally lower than the cost of providing the same quantity of potable water. Cost savings can accrue to the producer, the user, and the community at large. The producer may gain from the lessened treatment and disposal costs and from the sale of reclaimed water, although it is generally priced lower as an incentive. The community benefits also by conserving valuable fresh water resources.

Two categories of costs are involved in water reclamation and reuse projects: capital costs and operations and maintenance (O & M) costs. It is generally true that the construction and operation costs of a treatment facility increase in direct proportion with the quality of the discharged water. Tracing the benefits and distributing the costs can be complex due to the number of stakeholders involved in the projects. Therefore, economic analysis is rarely based entirely on technical considerations and economic evaluations are extremely complex. They are also unique for each different reuse project.

A major difficulty is that most costs are quantifiable in monetary terms whereas most benefits are not. These benefits can be classified as avoided costs, alternative costs, or into intangible benefits such as

aesthetic improvements and enhanced environmental quality. We can also distinguish between direct and indirect primary benefits. If the former include public benefits from the low production cost of reclaimed water, indirect primary benefits encompass spillover effects induced by the project, such as an increase in agricultural activity resulting from an increased use of irrigation water.

Institutional Considerations

The policy for wastewater reuse must be backed up by adequate legislation, clearly establishing the regulatory measures governing the collection, treatment and distribution systems and defining the responsibilities and scope of various government agencies. Priority in policies must be given to public health and environmental considerations, due to the potential hazards associated with this practice. Health considerations are centered around survival rates of pathogenic organisms, particularly in relation to the irrigation of health-sensitive crops (including fruits and vegetables eaten uncooked). Associated environmental hazards are the contamination of groundwater and the accumulation of heavy metals and toxic organics in surface soils and water. In agriculture, the major concerns are salinity, reduction in soil permeability and specific ion toxicity.

In 1986, the World Bank published the report authored by Shuval et al. (1986), where health criteria and treatment requirements were indicated for irrigated crops grown for various purposes.

Furthermore, the World Health Organization published in 1989 guidelines for wastewater reuse in agriculture and aquaculture. These guidelines were based on epidemiological studies and fundamental research on water-related infections, their transmission and environmental control. In order of importance, it attaches greatest concern to helminthic pathogens, specifically intestinal nematodes (*Ascaris*, *Trichuris*, and the hookworms), followed by excreted bacterial infections, and finally excreted viral infections.

Benefits and Limitation of Water Reuse

Nonpotable reuse becomes a viable option for developing a public water supply when there are low health risks and a high public acceptance. It can potentially benefit the public health and the environment, and it may also have economic and technological advantages. These could be summarized as follows:

- Properly planned and monitored wastewater reuse can significantly reduce environmental and health-related hazards which have been observed with traditional disposal practices in developing countries.
- Nonpotable water reuse allows conservation of freshwater resources when these are limited; higher quality water supplies are reserved for drinking and other purposes which require such quality.
- Wastewater reuse often offers an expedient approach to pollution abatement. It helps particularly to prevent an eutrophication of water bodies by preventing overloads of nutrients.
- In coastal areas, salt water intrusion into aquifers can be prevented by recharging the groundwater with reclaimed water.
- Reclaimed water is a reliable resource during periods of water shortage. Reuse projects can be investigated as alternatives to costly, environmentally destructive projects such as dams and reservoirs; they provide a locally controlled supply and avoid the creation of pipelines from one region to another.
- Reuse is a cost-effective means for water disposal. Treatment costs are typically lower than those needed to discharge into a receiving water body; in the meantime, it allows a beneficial utilization of valuable nutrients.

The decision to implement one water supply alternative over another must be based on weighing the evidence for and against the different available options. A wastewater reuse project may not always be a feasible alternative. Two major issues of concern are the water quality - including physical, chemical, biological, and radiological characteristics - and quantity, or how reliable the reclaimed water sources will be for domestic, commercial, and/or industrial users. Moreover, topographical considerations, facility requirements, economics, and social attitudes

must all be evaluated prior to implementing a reuse project. Some other concerns might also be present, e.g.:

- The deficiency of epidemiological data on the potential effects of organic and inorganic compounds that have been identified in wastewater.
- The suitability of monitoring techniques to indicate and identify the presence of harmful constituents to human and environmental health.
- The establishment of realistic and suitable standards for the contaminants likely to be present in reclaimed water.

The Suez Experimental Station

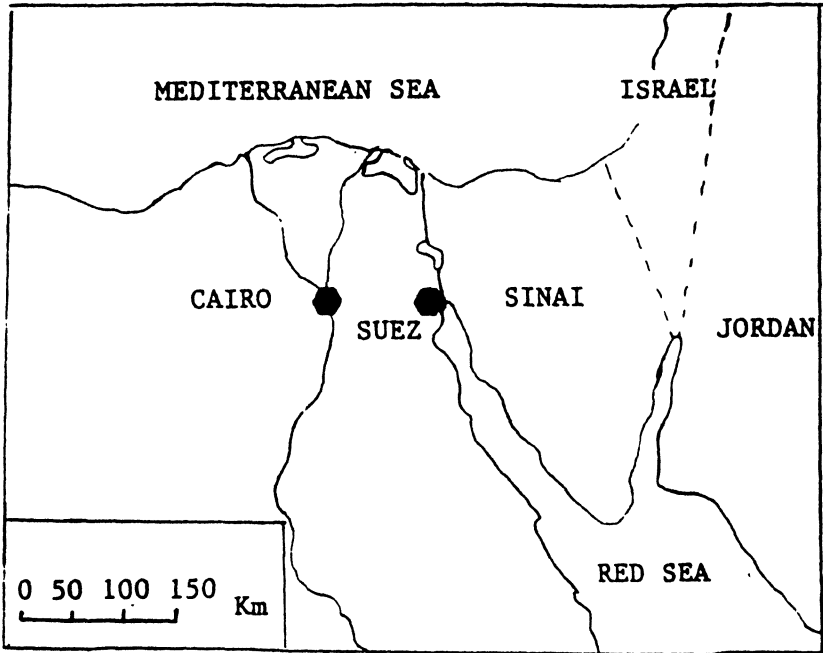
Egypt is a riverine oasis in the vast North Africa Sahara desert, where 95% of the population live on the 3% of the land irrigated by the Nile. Recent development in Egypt has been directed towards expanding the area of arable land and reducing the population pressure in the Nile Valley. This has entailed creating population settlements in the desert with adequate WSS services. Wastewater reuse is considered to be an attractive option for providing affordable and sustainable services.

The rationale for the adoption of wastewater reuse application in the new desert communities is based on conserving the limited fresh water available for human consumption and reclaiming the generated wastewater for agriculture, aquaculture, and industrial applications.

A full scale project was initiated in 1992 with the goal of demonstrating the benefits and limitations of the reclamation of domestic wastewater. This was a collaborative effort between the University of Michigan, USA, the Egyptian Academy of Scientific Research, the Hebrew University of Jerusalem, and the City of Suez, Egypt.

This collaborative effort resulted in the development of the Suez Experimental Station (SES) which occupies an area of 20 acres on the outskirts of the City of Suez, as shown in Figure 7.1. About 400 cubic meters per day of raw sewage, diverted from the City Sewage Treatment Plant, are treated using a low cost sustainable technology, i.e. waste stabilization ponds (Okun, 1983). A schematic diagram of the treatment system is shown in Figure 7.2.

Figure 7.1
Regional Location



The raw sewage input was predominantly of domestic origin, with little or no industrial contribution. Extensive monitoring of the effluent at each step of the treatment process includes analyses of physical properties (flow, temperature, solids, pH, salinity, and dissolved oxygen), organic loading (BOD and COD), inorganics (calcium, boron, magnesium, sodium, sulfates, and chlorides), nutrients (ammonia, nitrates, and total phosphorus), metals (lead, cadmium, zinc, and copper), pathogens (total coliform, fecal coliform, and helminth eggs) and plankton (chlorophyll a, distribution counts of phytoplanktons).

The treated effluent in the SES conformed to the World Health Organization standards for unrestricted agriculture/aquaculture applications. Typical results obtained from monitoring the treated effluent for pathogens gave average counts of 1.2 fecal coliform per 100 ml and showed no viable helminth eggs per 1000 ml sample. The fecal coliform counts were far below the World Health Standards of 1000 fecal coliform per 100 ml (WHO, 1989). In fact, the treated effluent was of better quality than the canal water which was supplied to the City of Suez (Easa et al., 1995; Shereif and Mancy, 1995; Shereif et al., 1995).

A major achievement of the wastewater treatment component of the study is that we have been able to demonstrate the suitability and applicability of the Waste Stabilization Pond (WSP) systems (Easa et al., 1995; Shereif et al., 1995). Surprisingly, WSP systems have yet to be successfully applied in Egypt. We believe that WSP systems are ideal for small to mid-size sewered communities where low cost land is readily available.

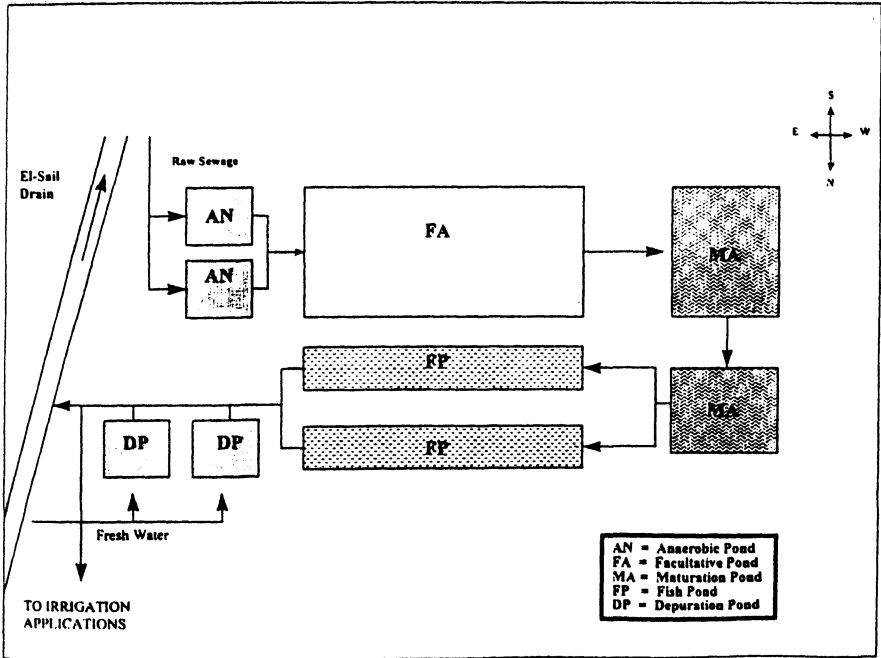
WSP systems are capable of more effectively treating sewage effluents than the unsustainable and largely unaffordable conventional treatment currently being used in Egypt. WSP are inherently inexpensive, low-technology operating systems, and are particularly suitable for application in regions with moderate and arid climates.

Aquaculture Applications

The SES includes Fish Ponds (FP) and two Depuration Ponds (DP), as shown in Figure 7.2. The FP were constructed for the purpose of rearing fish using the treated effluent from the WSP. The DP were constructed for the purpose of removing any contaminants which may exist in the fish, prior to harvesting.

A variety of fish species was investigated. The process of selecting suitable fish species focused on: (a) ability to grow in a treated waste effluent, (b) ability to enhance the treatment process by the removal of nutrients from the effluent, and (c) marketability. Two types were selected. The first type included the bottom feeders *Mugil cephalus* and *Mugil capita*. The second type were surface feeders, including *Tilapia nilotica*, *Tilapia aureus*, and *Tilapia zilli* (Easa et al., 1995; Shereif et al., 1995).

Figure 7.2
Suez Experimental Station Treatment System



Monosex cultures of fingerlings were introduced and were allowed to grow (without additional feed) in the fish ponds. The rate of growth and biomass transformations were investigated. In addition, the fish were monitored for bacterial and parasitic pathogens and for any chemical contamination.

Fish production capabilities, without supplemental feeding or pond aeration, can reach 5-7 metric tons/hectare/year. Studies are underway to assess optimal production conditions.

One of the most important achievements in this project is that the fish, grown in treated sewage effluent, were found to be free from human parasites and are quite acceptable for human consumption (Easa et al., 1995; Shereif et al., 1995). Nevertheless it is important to note that all the fish produced in the study have been used strictly for research purposes and have not been consumed by humans.

Besides providing the benefit of producing high protein food, the fish ponds have also improved the quality of the treated effluent and have rendered it more suitable for use in irrigation. Marked reductions in the concentrations of phytoplankton and suspended solids in the effluent were achieved during retention in the fish ponds. This is important because these substances tend to clog irrigation systems and may reduce soil porosity.

Irrigation Applications

The effluent from the fish ponds was used in a variety of agricultural applications. Due to the unexpectedly high levels of salinity in the soil, emphasis was given to (a) soil conditioning and (b) the cultivation of plants which can tolerate high salinity. Soil conditioning also included the use of treated sewage sludge to increase the nutrient levels of the soil.

The treated effluent was applied to the land using surface irrigation techniques. One of the first uses of the treated wastewater was for the cultivation of a perimeter of trees surrounding the project area. To date, 2500 Casourina trees have been planted along the perimeter, and they have reached an average height of 2.5 meters in less than one year.

In addition, irrigation experiments included cultivation of barley, maize, broad bean, rape seed, sugar beet, chamomile, tomatoes and ornamental plants. Sewage sludge was used advantageously in soil conditioning, which significantly increases soil fertility.

Irrigation using the treated sewage effluent produced faster growing plants with more yield than plants irrigated by raw surface water. This has been attributed to the nutrients present in the treated

sewage. Monitoring of the soil and plants for human pathogens and parasites has revealed no undesirable health concerns.

The advantages of implementing this model of wastewater treatment and reuse can be conceived of in three tiers. The first tier is comprised of the economic, health and environmental benefits that are gained by using the low-cost and effective waste stabilization ponds for treatment of municipal sewage. This alone perhaps could be sufficient to justify the widespread implementation of the design.

Second are the economic benefits from the production of fish in the aquaculture ponds. Studies have shown that wastewater-fed ponds produce higher fish yields because of an increase in the supply of natural food organisms. Fertilization of the fish ponds with the organic matter contained in the treated effluent reduces the need for costly supplementary feeding. The sewage effluent serves the same purpose as inorganic fertilizers by liberating nitrogen, phosphorus and trace elements which stimulate the production of fish food organisms in the culture system. Productivity is enhanced through the release of nutrient elements to the primary producers such as zooplanktons and phytoplanktons, as well as by the increase in the population of insects which are also a food source for the fish.

The third tier of potential economic benefit from the reuse of wastewater is in agriculture. The treated wastewater in the fish ponds is of high quality and is rich in nutrients, and thus could be advantageously used for the irrigation of crops following its use in fish production. This third component of the integrated wastewater reuse system is crucial because the nutrient-rich effluent from the fish ponds, if discharged directly into a receiving water body, could create eutrophication and pollution problems.

A community of 100,000 people with a moderate domestic water use of about 140 liters per person per day could generate about 5 million cubic meters (Mm^3) of water per year, enough to irrigate 1,000 ha (hectares), using efficient irrigation methods. With inefficient irrigation methods, that volume of wastewater could still irrigate 250 to 500 ha in arid areas.

Furthermore, wastewater contains significant amounts of nitrogen, phosphorus and potassium, which may reduce the need for artificial fertilizer. It is estimated the five Mm^3 of wastewater could contain as much as 250,000 kg of nitrogen, 50,000 kg of phosphorus and

150,000 kg of potassium. In addition, the lack of ample water in the region makes the reuse of wastewater economically attractive. Studies in the USA (California) and Israel have shown that in areas where the demand for irrigation water exceeds the supply of fresh water, investment in reuse projects may be economically justified by subsequent increases in productivity (Shuval et al., 1986).

Socioeconomic Considerations

The reuse of human sewage for aquaculture and agricultural applications challenges the traditional public health view that human waste is a nuisance to be avoided. While it is clear that contact with raw human excreta can result in the transmission of pathogens such as bacteria, viruses and parasites that can cause disease, suffering and death, it is increasingly recognized that human wastes, if treated and handled responsibly, can yield important benefits. This alternative viewpoint is based on the premise that potential health effects associated with wastewater reuse can be avoided if the wastes are treated sufficiently, and furthermore, that the water and nutrients in the wastewater are finite resources that should be recovered and not wasted.

The integration of aquaculture and/or agricultural applications into the wastewater reuse system will generate both costs and benefits which must be taken into consideration in the economic evaluation of wastewater reuse, an undertaking which has yet to be achieved. Costs to be considered are those of capital inputs such as land and construction, implementation and maintenance of the system, and promotion and education about wastewater reuse. Economic benefits include reductions in the cost of wastewater treatment as compared to that associated with conventional treatment, the market value of the food produced, and the reduction in irrigation costs associated with reusing wastewater as compared to obtaining other sources of water. Benefits such as the effects of reducing the amount of untreated wastewater being released into the environment, and the reduction to transmittable disease that could be achieved through the concurrent improvements in sanitation, are some of the non-monetary factors to be considered.

Assessing the economic potential of the fish and crop production associated with the components of the wastewater reuse system will

require an estimate of the market value of the foods. In order to arrive at a realistic estimate, it will be necessary to assess consumer attitudes toward the reuse of wastewater in food production. The market value of foodstuffs produced by using wastewater would be low if people were unwilling to purchase and consume such products, or if they would purchase them only at prices that were significantly lower than those of foods grown under other conditions. If such were the case, the fish and other products might be sold primarily for animal fodder or as fertilizer. In our study, the assessment of consumer attitudes and preferences was achieved through a series of carefully planned focus groups involving members of the community from the City of Suez.

Regional Cooperation

One of the most valued aspects of this study was that it provided an opportunity for Egyptian and Israeli scientists and engineers to collaborate in a significant development project, yielding substantial benefits to both Egypt and Israel. Significant achievements of the project, in terms of regional cooperation, include the development of the milieu and mechanisms for effective interaction between Egyptian and Israeli scientists and engineers, and a coordination of efforts to address pressing needs in the region. Furthermore, the project succeeded in involving qualified Palestinian-Israelis in the planning and implementation of the study. Care was taken to insure that links were maintained with policy- and decision-makers, on both the national and local levels. To this end, the project facilitated the establishment of durable, long-term links between individuals and institutions in Egypt and Israel, and demonstrated the utility and benefits to be achieved through such interaction.

In addition, the project provided an opportunity for the involvement of local communities in the planning and development of the project. In the City of Suez, community involvement included the participation of the City Council, the local university, and local government.

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HOUSEHOLD EXPENDITURES ON HEALTH IN EGYPT: EVIDENCE FROM TWO RECENT SURVEYS

SCOTT MORELAND AND A. K. NANDA KUMAR

Health care is an important social sector in Egypt. Total health spending in Egypt is estimated to be between 5% and 6% of GDP. Government spending on health care amounts to about 30% of health spending, with the rest paid by individuals. Consequently, Egypt has a large and ubiquitous private health care sector. Moreover, the borderline between public and private sectors is often difficult to draw, since many drugs are subsidized and public sector doctors often run private clinics which see patients referred from public clinics staffed by the same doctors.

But much of what is described is anecdotal in nature and there is not a well defined and comprehensive profile of household health care use and spending in public and private sectors. This lack of information on health care use and spending means that it is difficult to design strategies for planning in the public sector and for policy analysis in the health sector as a whole.

Despite recent gains in slowing Egypt's population growth rate, the population will continue to grow and will surely double before it may stabilize, perhaps in the range of 125 million to 130 million (Moreland, 1995). This alone will put an increased strain on government resources to pay for essential public services including health care. With increasing attention to cost recovery measures, it is therefore essential that we have accurate and up to date information about households' health care

behaviors and spending patterns. Also, the related social and economic correlates of health spending need to be understood so that adequate interventions can be designed, and behavior in the face of policy changes can be predicted.

This chapter attempts to assemble the emerging picture of household health spending from evidence revealed in two recent and (almost) concurrent surveys of Egyptian households. The *Expenditures on Egyptian Children Survey*¹ (EECS) collected household spending data on a variety of categories including health spending. The *Egypt Household Health Care Use and Expenditures Survey*² (EHHUES) concentrated on health spending and health care use. Both surveys were conducted in the same time period and used the same sample frame, although the latter survey was a two-round survey with a larger sample. While both surveys are completed, data analysis continues and in some cases may eventually supersede the data reported here.

Issues Regarding Collection of Expenditure Data in Households

Because income data were not essential for the analysis in the EECS study, it was decided not to attempt to collect income data. The reluctance of people to answer income questions is well known. Rather than jeopardize the willingness of respondents to provide expenditure information, which was the main priority, the survey collected data about household possessions, which were used to develop indicators of households' economic condition.

An important issue in collecting household expenditure data is: "Who is the appropriate respondent?" While women are more likely to be available to respond to such surveys (because of their low levels of participation in the formal labor market), their knowledge about household resources and expenditures may not be complete. For example, research has shown that in some Egyptian families, husbands control the household budget; in others, wives have either partial or complete control; and in others, the husband and wife make joint decisions about the household budget (Hoodfar, 1988).

In addition to the issue of control over household resources, there is also the issue of multiple contributors to household resources. When there is more than one contributor to household resources, who is the appropriate respondent? For example, there are large households (e.g., 20

members) in Egypt with multiple contributors. Who can speak for household expenditure in such households?

The strategy adopted in the EECS to obtain a complete accounting of household expenditures was the following: (1) either the household head or spouse provided information about household expenditures, excluding education expenses; (2) mothers in the household provided information about education expenses; and (3) all household members who had a source of income, including the household head or spouse, were asked about their total monthly contribution to the household and their expenditure on personal items.³ Individual household members were asked about personal expenditure items on the assumption that the household head or spouse would have no knowledge about these expenditures. It was assumed, however, that the household head or spouse *would* know about the contributions to common household expenditures, such as food and housing, made by individual household members.

Other strategies have been used in Egypt to collect household expenditure data. For example, CAPMAS regularly conducts the A.R.E. Household Income, Expenditure, and Consumption Survey (CAPMAS, 1993). The strategy used in this survey is for households (i.e., the person in the household who is willing and able) to keep a daily, detailed record of household members' expenditures and consumption (e.g., kilograms of tomatoes consumed) for one month. Interviewers regularly visit households (i.e., up to ten times per month) in order to transfer household records to a formal expenditure and consumption schedule. Interviewers also assist illiterate households in completing daily records during these visits. This strategy, while intensive in both household members' and interviewers' time, yields very detailed expenditure data in many expenditure categories. Another strategy for collecting expenditure data is found in EHHUES. The strategy used in that survey was for household heads or their spouses to provide information to interviewers about expenditures on broad classes of household expenditure during the previous month or year. Information about health expenditures was obtained from interviews with all household members sixteen years and older.

Still another way to obtain household expenditure information from large, complex households was used by Al-Achkar and Sly (1987) in rural Syria. Their strategy was to first ask the household head for total annual household expenditures by category. Then they asked the household head to report the expenditures by category for each household

member. This strategy assumed that the household head could estimate, for example, what part of food—or, more problematic, housing—expenses went to each household member.

Another challenge in the development of an expenditure questionnaire is to account for the economic transfers that occur between households. For example, the following situation has been found in the field: separate households (married children) were found to be eating meals together at the home of the father. The father paid for these meals, although the children made contributions in the form of fruit or meat when they could. Apart from eating meals at their father's home, the married children conducted their economic affairs separately.

This example highlights the importance of obtaining accurate transfer data so that a full picture of the household's income and expenditure can be obtained. This example also raises the issue of what are the appropriate boundaries of "economic units" in Egypt. It appears that parents continue to spend substantial amounts on their children even after they are married. Apart from gifts on special occasions, parents may continue to give their married children a monthly cash allowance, they may provide meat or meals for their children on a regular basis, or they may provide financial assistance in emergencies.

Expenditures on Egyptian Children Survey (EECS)

While much research has documented how the levels of and differentials in fertility and education have changed over time, the processes by which these changes have occurred (and hence, could be facilitated) have been less fully studied. Studies of the determinants of fertility or educational attainment in Egypt that explore the intimate relationship between parents' family size desires and the resources that they allocate to children do not exist. Lack of data linking information about fertility to household expenditures on children is the reason for this gap in the research.

The purpose of the Expenditures on Egyptian Children Survey (EECS) was to begin to fill that gap with results from a new data source. Data from the survey, undertaken in 1995, were used to explore how monetary expenditures on children in Egypt were related to family size. In addition to estimating the magnitude of monetary expenditures on children, this study also presented evidence on:

1. household decision-making about expenditures on children,
2. efforts of household members to produce income for the household and children,
3. participation of household members in child care and other domestic tasks, and
4. the monetary and non-monetary benefits of children.

The 1995 EECS collected cross-sectional data on the expenditure patterns of 3,799 households. The survey involved two types of questionnaire: a household questionnaire and an individual questionnaire for women. The household questionnaire obtained a listing of all usual household members. For each of the members, information was collected on the relationship to household head, age, sex, marital status, education, income source, occupation, and daily work hours. Questions about the household's economic condition, expenditures, and savings were also asked. Finally, all household members with a source of income were asked a set of questions about their personal expenditure patterns in the Personal Expenditure Schedule (PES).

The individual questionnaire for women was administered to all ever-married women. The following topics were covered:

- background characteristics,
- educational expenditure on each child,
- child-rearing responsibility and decision-making,
- reproduction and family planning,
- women's role in family decision-making, and
- costs and benefits of children.

Sample Design of the EECS

The survey's sample design was based on the 1992 Egypt Demographic and Health Survey (EDHS (92)) sample frame of urban and rural households from Upper and Lower Egypt. A target sample size of 3,500 completed household interviews was identified. This target sample size was inflated by 10%, i.e., to 3,900, to account for potential nonresponse. The sample was distributed in proportion to each region's population size

in order to make the sample roughly representative of the Egyptian population. Hence, 780 households from urban governorates were targeted, 1,716 from Lower Egypt, and 1,404 from Upper Egypt.

Cairo was chosen as the urban governorate because there was little variation in the Standard-of-Living Index among the urban governorates, and it was the only governorate with a sufficient number of cases to select the required number of households.

How were households selected? In order to save time and money in sample selection and in the calculation of new weights, the same segments and household listings used in the EDHS(92) were used in the EECS. Households were selected using the same formula used in the EDHS(92); however, different random numbers were used. Of the 4,193 sampled households, 3,957 were located. Of these households, 96% of households and ever-married women completed interviews. The 3,799 EECS households contained 21,559 members. Of these members, 4,768 were ever-married women, or an average of 1.3 ever-married women per household. These households also contained 12,628 unmarried children and 8,931 adults, including parents and others.

Egypt Household Health Care Utilization Survey (EHHUES)

The goal of the EHHUES was to provide up-to-date data on the use of health care services, spending on health care, and a variety of social, economic, and behavioral determinants of health care use and spending for Egypt's population.

Specific objectives of the survey included estimating:

- rates of self-reported illness for the population and specific sub-groups in the population,
- rates and quantities of health care services used by those reporting acute and chronic illnesses,
- types of providers used for different types of health problems and for different population groups,
- amounts spent seeking treatment,
- perceptions of quality of care for different types of providers, and
- perceptions of problems and issues for Egypt's health care system.

Survey Design and Sampling for the EHHUES

The survey collected data on the socio-demographic characteristics of the household, the health status of each member of the household, insurance coverage, factors affecting the decision to seek care, utilization of outpatient and inpatient services, choice of provider, and out-of-pocket expenditures on health care. In addition, a set of questions on ability to perform activities of daily living were included, as were questions on the individual's perceptions of the quality of health care. In order to adjust for seasonal differences the survey was carried out in two rounds—once during winter and once during summer. The first round of the survey was conducted from November 1994 to early February 1995, and the second round was conducted from July 1995 to August 1995.

Sample Selection

The sample for the survey was designed to provide national estimates of all major variables as well as estimates for different types of areas and for the five geographic regions: urban governorate, rural Lower Egypt, urban Lower Egypt, rural Upper Egypt, and urban Upper Egypt.

Like the EECS, the sampling frame used was the same as that of EDHS (92). The frame consisted of 546 segments (208 rural and 338 urban) covering 21 governorates. Out of this a self-weighted sample of 362 segments (191 urban and 171 rural) was selected for the survey. Half of the sample was selected from each segment for the winter round of the survey, and the other half was surveyed in the summer round.⁴

Questionnaires of the EHHUES

Two types of questionnaire were used in data collection: a household questionnaire, and an individual questionnaire. The household questionnaire was designed to collect socio-demographic information on all members of the household who were usual residents. Two individual questionnaires were used: one for individuals below the age of sixteen and the other for those age sixteen and older. The individual questionnaires covered the individual's employment, income, utilization of health services, expenditures on health care, and perception of his or

her health status. A two-week recall was used for outpatient care and a one year recall was used for hospitalization.

Sample Coverage and Response Rates

A total of 10,664 households were selected for the survey. Of these, 9,931 were successfully interviewed, giving a response rate of 93.13%. There were 53,824 individuals living in the interviewed households. Of these, 50,984 were actually interviewed, which is a response rate of 94.72%. The overall response rate for the individual questionnaire was 88.21%.

Comparing the Samples of the EECS, EHHUES, and EDHS(92)⁵

Because the EECS and the EHHUES are based on the EDHS(92) sample frame, the characteristics of the two samples should be roughly similar to that of the EDHS(92). Some characteristics, however, might have changed during the three-year period between the EDHS(92) and the EECS and the EHHUES.

Comparison of the structures of the sample populations in terms of age, gender, education, and residence location are shown in Table 8.1. It can be seen that the populations are comparable. The EECS population is slightly more rural and slightly younger than the EHHUES population.

Results of the EECS

The Pattern of Expenditures in Egyptian Households

The EECS collected a variety of expenditure data that was used to calculate total annual expenditure. A measure of total annual expenditure was created from the following items: household expenditure on various items, education expenditure (as reported by mothers), the value of the consumption of home-produced food, the value of contributions to other households, the value of food and gifts from other households, and the value of expenditure on "self" as reported in the personal expenditure schedule. (See Moreland et al. (1996), for a description of how total

annual expenditure and other expenditure groups were calculated from the EECS.)⁶

Table 8.1
Comparison of Sample Characteristics: Three Surveys

	EECS	EHHUES	EDHS(92)
Population under Age 15 (%)	39.6	44.2	41.2
Population with No Education (%)	30.9	30.4	31.7
Female Population (%)	50.7	50.6	--
Rural Households (%)	53.5	51	46.8
Upper Egypt Households (%)	38.8	35	33.4
Urban Gov. Households (%)	17.5	24	28.9
Mean Household Size	5.7	5.3	5.6

According to the EECS, Egyptian households spent 7,812 LE on average in the year prior to the survey, with mean per capita annual household expenditures of 1,513 LE (Table 8.2). Median annual household expenditures were 6,573 LE in urban areas and 5,569 LE in rural areas (Table 8.3).

Table 8.2
Mean Total and Per Capita Annual Household Expenditure (LE), EECS

Background Characteristic	Total Annual Expenditure	Per Capita Annual Expenditure
Place of Residence		
Urban	8,687	1,937
Rural	6,988	1,205
Cairo	9,393	2,364
Urban Lower Egypt	8,086	1,761
Rural Lower Egypt	7,749	1,382

Table 8.2 (continued)
Mean Total and Per Capita Annual Household Expenditure (LE),
EECS

Background Characteristic	Total Annual Expenditure	Per Capita Annual Expenditure
Urban Upper Egypt	8,039	1,515
Rural Upper Egypt	6,050	1,001
Sex of Head of Household		
Male	8,391	1,493
Female	5,261	1,674
Number of Children in Household		
0	5,020	3,142
1	6,317	2,223
2	8,700	2,164
3	8,258	1,593
4	9,244	1,500
5	8,324	1,136
6	8,781	1,051
7+	9,057	809
Education of Head of Household		
None	6,070	1,128
Primary	7,812	1,429
Preparatory or Secondary	8,380	1,737
University and Above	12,330	2,864
Standard-of-Living Index		
Low	4,808	968
Medium	7,325	1,384
High	12,325	2,328
Household Structure		
Nuclear Family	7,749	1,689
Extended Family	8,053	1,093
Total	7,812	1,513

Computed for households with completed Personal Expenditure Schedule (PES) data, which are based on a sample of 2,488 as shown in Table 3.3 of Moreland et al. (1996).

The EECS data reveal patterns in the way expenditures vary across socioeconomic groups. Total and per capita expenditures are higher among households in urban areas, in Cairo, with more educated household heads, and with a higher standard of living. Per capita expenditures are higher in nuclear-family households (1,689 LE vs. 1,093 LE) and are highest in childless households.

Table 8.3
Quartile Values (LE) of Total Annual Household Expenditures, by Urban-Rural Residence, EECS

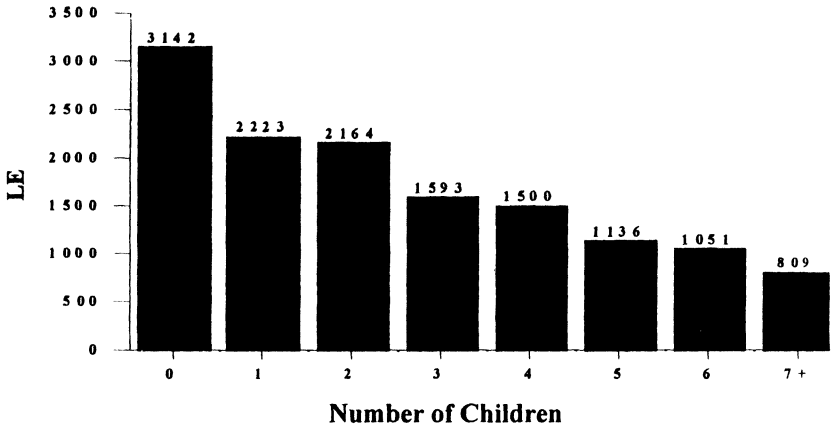
Region	25th Percentile	50th Percentile (Median)	75th Percentile
Urban	4,140	6,573	10,919
Rural	3,434	5,569	8,912
Total	3,700	5,980	9,814

Source: Moreland et al. (1996), Table 4.2.

Per capita expenditures decline dramatically as the number of children increases (Figure 8.1). In general, this decline in per capita expenditures with increasing numbers of children occurs regardless of the place of residence, the sex or education of the household head, the standard of living, or household type (i.e., nuclear and extended households; see Moreland et al. (1996), Appendix E, Table E.14).

The decline in per capita expenditures that occurs as the number of children or household size increases may be caused, in part, from economies of scale. Some household expenditures in Egypt, such as rent, are not likely to change as the number of children increases. The decline in per capita expenditures with increasing numbers of children may also reflect parental decisions about the number of children they want, and the level of resources they want to devote to their children. Parents who desire more-educated children (who require greater financial investments) may also desire fewer children. (This negative relationship may also reflect constraints on expenditures that greater numbers of children impose.)

Figure 8.1
Mean Per Capita Household Total Expenditures, EECS



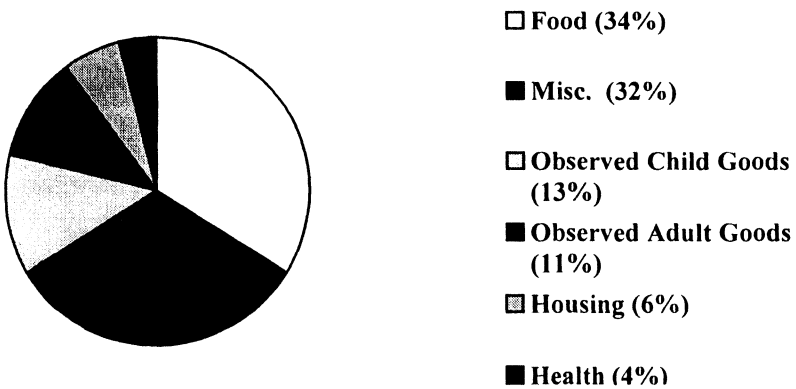
Patterns of Household Expenditures in the EECS by Expenditure Items

The EECS provides information about household expenditures on different categories of items. These are classified here as those that are either observed adult expenditures; observed child expenditures; or expenditures on food, housing, and health. Mean total annual expenditures for food are 34% of all expenditures (Figure 8.2). For observable child items it is 13%, for observable adult items 11%, for housing 6%, and for health 4%.⁷ Miscellaneous expenditures here were calculated as a residual from total expenditures and as such constituted a large category, i.e., 32%.⁸

Comparisons Between the EECS and the EHHUES

Comparing expenditure estimates from different surveys is complicated by differences in the purposes and methodologies of the surveys. Differences in definitions create an additional complication. Nevertheless, it is useful to undertake broad comparisons of various expenditure estimates.

Figure 8.2
Distribution of Household Expenditures in the EECS



The estimate of mean total annual expenditure obtained in the EECS (7,812 LE) differs from that obtained in other recent surveys. For example, mean total annual household expenditure for the first six months of the 1995/1996 A.R.E. Household Income, Expenditure, and Consumption Survey (HIECS) was 7,105 LE (Cardiff, 1996). For the EHHUES, mean total annual expenditure was 8,885 LE (special tabulations of El Zanaty et al., 1996).

What explains these differences? One important factor that makes the EECS measure of total annual household expenditure larger than the HIECS, for example, may be the inclusion of the personal expenditure of individuals with a source of income in the calculation of total annual household expenditure. When that element is removed from the calculation, mean total annual expenditure in the EECS becomes 7,077 LE, very close to the HIECS estimate. This suggests that obtaining information from individuals with a source of income about their personal expenditures (i.e., expenditures other than contributions to the household) may be a fruitful way to obtain a wider accounting of household expenditure. However, ways to reduce the problem of nonresponse (discussed earlier) need to be explored.

The expenditure share on food in the EECS is similar to that found in the EHHUES, where it was 32% (special tabulation of El Zanaty et al., 1996). The food shares of the EECS and the EHHUES were lower than that found for the first six months of the HIECS, which was 49.6% (Cardiff, 1996). One factor that contributes to the lower food shares in the

EECS and EHHUES is the higher level of total annual household expenditure in these surveys. Another factor is the lower level of mean total annual food expenditure (i.e., 2,876 LE in the EECS compared to 3,151 LE in the EHHUES and 3,481 LE in the HIECS (Cardiff, 1996)). Because of the detailed recording of food expenditure and consumption in the last study, it is not surprising that higher absolute levels of food expenditure are found.

Utilization of Health Services: Results of the EHHUES

Before looking at patterns and factors affecting health spending, it is first useful to look at the use of health services. The EHHUES collected information on the use of services in the last two weeks prior to the survey for outpatient visits and drug purchases, and in the previous year for inpatient visits.

The EHHUES data indicated that 9.5% of the sampled population had had an outpatient visit in the two weeks prior to the survey, whilst 3% had had an inpatient stay in the last year. National use rates were computed by combining the results of the two rounds. As indicated in Table 8.4, the annual utilization rate per capita was 3.5 visits as outpatients and 0.027 admissions as inpatients. Significant differences across genders, regions, and income classes can be seen.

Health Expenditures in the Household: EECS and EHHUES Results Compared

In terms of health expenditures, the EECS shows that on average, Egyptian households spent 396 LE on health in the year prior to the survey. Average annual per capita health expenditures were 71 LE (Table 8.5).

As the number of children increases in the household, per capita health expenditures decline dramatically (Figure 8.3).

Table 8.4
Annual Utilization Rate Per Capita, EHHUES

	Outpatient Visits	Inpatient Visits
Total sample	3.51	0.027
Urban	4.48	0.039
Rural	2.75	0.019
Regions		
Urban Governorates	5.17	0.048
Urban Lower Egypt	4.38	0.026
Rural Lower Egypt	2.90	0.020
Urban Upper Egypt	3.38	0.034
Rural Upper Egypt	2.57	0.017
Gender		
Male	3.25	0.027
Female	3.75	0.027
Income Quintiles		
Quintile 1: (<560 LE)	2.32	0.018
Quintile 2: (560-804)	2.91	0.023
Quintile 3: (804-1,114)	3.40	0.024
Quintile 4: (1,114-1,704)	3.79	0.036
Quintile 5: (>1,704)	5.11	0.035
Education ^a		
Nursery	3.47	0.000
Primary	3.93	0.040
Preparatory	3.77	0.054
Secondary	4.20	0.040
Upper Intermediate	4.07	0.046
University	4.17	0.017
Never been to School	3.64	0.023

Source: Harvard School of Public Health (1997), Table 20.

^a Only individuals who are not currently in school and are above four years old are included in the education analysis.

Table 8.5
Mean Total and Per Capita Health Expenditures (LE), EECS

Background Characteristic	Total	Per Capita
Place of Residence		
Urban	441	90
Rural	352	57
Cairo	453	96
Urban Lower Egypt	496	102
Rural Lower Egypt	422	69
Urban Upper Egypt	319	58
Rural Upper Egypt	234	36
Sex of Head of Household		
Male	400	68
Female	370	102
Number of Children in Household		
0	407	239
1	376	127
2	398	97
3	374	72
4	447	72
5	347	47
6	392	46
7+	442	39
Total Members in Household		
≤ 5 Persons	381	106
6+ Persons	413	52
Education of Head of Household		
No Education	372	63
Primary	407	70
Preparatory or Secondary	396	77
University and Above	445	100
Standard-of-Living Index		
Low	280	52
Medium	389	69
High	534	94
Household Structure		
Nuclear Family	388	80
Extended Family	421	54
Total	396	71

Source: Moreland et al. (1996), Table 4.7.

Figure 8.3
Mean Per Capita Household Health Expenditures, EECS

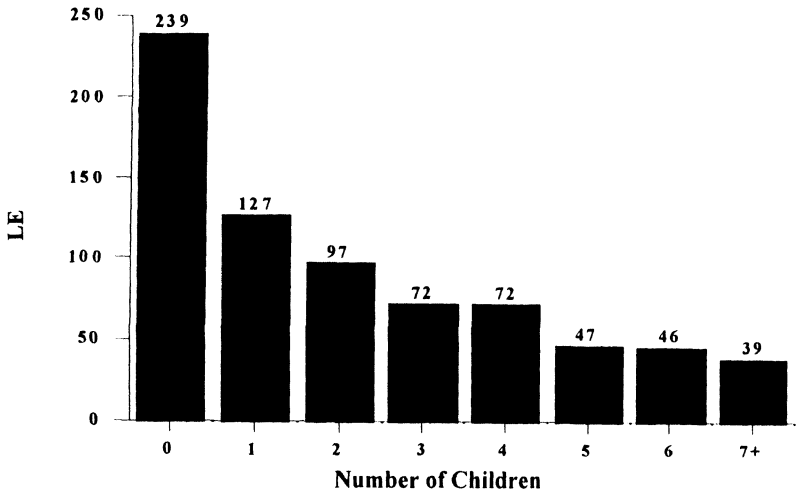


Table 8.6 shows the results of the EHHUES. Health expenditures in the EHHUES are estimated to be somewhat higher than in the EECS, but the two surveys are largely consistent. This is particularly the case in terms of how spending varies across different groups of the population. It can be seen that the average annual per capita health care expenditure in the EHHUES is about 98.3 LE (or 504 LE per household). Of this, 64% is spent on outpatient care, 31% on self-purchase drugs, and 5% on hospital based inpatient care. The figures reported here are for gross household out-of-pocket expenditures, not corrected for reimbursements by employers or insurance.⁹

The results from the EHHUES survey indicate higher health care expenditures than found in previous studies. The CAPMAS household budget survey conducted in 1990-91 suggested that urban households spent LE 243 per year on health care, with rural households spending LE 158. A limited study on private expenditures in a district of Giza conducted in 1992 showed annual household expenditures on outpatient and inpatient services to be LE 375, indicating that the CAPMAS study

Table 8.6
Annual Expenditures on Health Services Per Capita (LE), EHHUES

	Outpatient	Inpatient	Drugs	Total
Total Sample	63.22	5.15	29.98	98.3
Urban	84.81	7.76	39.69	132.3
Rural	46.43	3.11	22.44	72.0
Regions				
Urban Governorates	98.79	10.92	41.36	151.1
Urban Lower Egypt	81.35	4.97	46.24	132.6
Rural Lower Egypt	52.14	3.86	30.35	86.3
Urban Upper Egypt	64.06	5.05	30.38	99.5
Rural Lower Egypt	39.58	2.22	12.95	54.8
Gender				
Male	57.81	5.35	26.87	90.0
Female	68.49	4.95	33.02	106.4
Income Quintiles				
Quintile 1: (<560 LE)	27.53	1.87	11.85	41.2
Quintile 2: (560-804)	39.04	1.93	18.25	59.2
Quintile 3: (804-1,114)	48.36	1.88	21.20	71.4
Quintile 4: (1,114-1,704)	60.05	5.33	32.76	98.1
Quintile 5: (>1,704)	141.10	14.73	65.87	221.7
Age				
0-4	61.79	1.97	6.93	70.7
5-15	27.36	1.75	6.21	35.3
16-29	48.79	5.00	10.36	64.1
30-39	75.31	9.61	35.01	119.9
40-49	117.12	8.88	64.40	190.4
50-59	120.82	13.92	107.67	242.4
60+	143.90	7.40	135.48	286.8
Education ^a				
Nursery	17.33	0.00	56.00	73.3
Primary	87.64	10.73	54.73	153.1
Preparatory	64.46	7.19	35.75	107.4
Secondary	99.04	9.52	39.00	147.6
Upper Intermediate	125.79	2.49	11.58	139.9
University	120.23	3.04	1.35	124.6
Never been to School	61.28	2.30	32.92	96.5

Source: Harvard School of Public Health (1997), Table 29.

^aIncludes only those who are not in school and are above four years old.

might significantly underestimate household spending. Other analyses also show that the CAPMAS figures underestimate household expenditures on health care by as much as 30%.

Variations in Expenditures by Geographic Areas

For both surveys total household and per capita health expenditures on average are lower in rural than in urban areas. In the EECs, per capita expenditures are 90 LE in urban areas vs. 57 LE in rural areas, whilst in the EHHUES the pattern is 132 LE vs. 72 LE. This means that urban individuals spent between 1.6 and 1.8 times as much annually on health care compared with rural individuals. Previous studies (CAPMAS, 1993) showed a smaller difference between urban and rural household spending.

Figure 8.4
Annual Per Capita Health Expenditures by Region, EHHUES

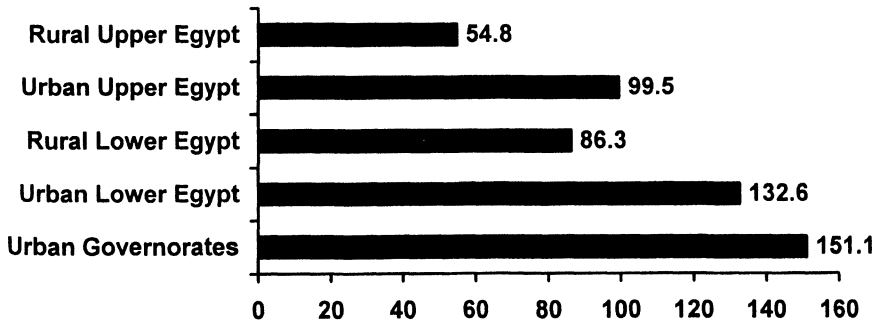


Figure 8.4 shows that there are differences in health care spending across the different regions in Egypt. In the EHHUES, individuals in urban governorates spend 151 LE per year on health care, as compared with 133 LE for individuals in Urban Lower Egypt governorates, and 99 LE for individuals in Urban Upper Egypt governorates. Individuals in Urban Governorates spend almost twice as much as individuals in Rural Lower Egypt, and three times as much as

those in Rural Upper Egypt. In the EECS the differentials are less pronounced; the ratio of Urban Governorates to Rural Lower Egypt governorates is 1.3 and the ratio of Urban Governorates to Rural Upper Egypt is 2.5.

Health Care Expenditure by Gender and by Age

Females spend more on health than do males. In the EHHUES the difference in individual health spending is about 16 LE, most of which is accounted for by differences in outpatient care expenses. In the EECS, households headed by females spend less in terms of health because they have lower levels of total expenditures (see Table 8.2), but in terms of per capita spending, female-headed households spend more (102 LE vs. 68 LE), and as a percentage of total spending female-headed households spend 7% vs. 4.7% for male-headed households.

The EHHUES shows that consistent with expectation, health care spending increases positively with age, except for children under four years old, who are in general high users of health care services (Figure 8.5). Even though the individuals older than 60 years had a lower rate of utilization than those aged 50-59, they are the highest spenders, probably reflecting severity of illnesses.

Expenditure by Education

The EECS shows that as education levels of household heads increase, per capita health spending increases, consistent with the pattern for total per capita expenditures. However, the share of health spending decreases across education levels for household heads, falling from 6% for households where the head has no education to under 3.6% for households where the head has a university level or higher.

In the EHHUES, health care expenditure by education level for individuals who are not currently enrolled in schools does not exhibit any consistent pattern (Figure 8.6). However, the drug share of health expenditure decreases with the level of education. This is probably due to more generous drug benefits offered by HIO insurance, and since individuals with a higher level of education were more likely to have HIO insurance, they tend to spend less out-of-pocket on drugs than other

Figure 8.5
Annual Per Capita Health Expenditures by Age, EHHUES

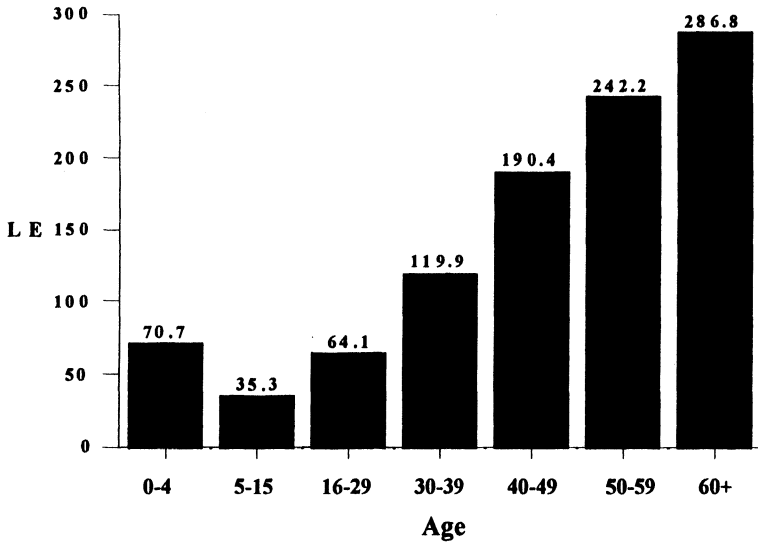
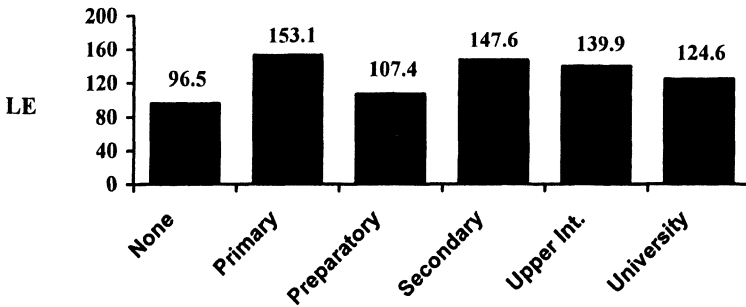


Figure 8.6
Annual Per Capita Health Expenditures by Education, EHHUES



modes of treatment. Individuals with a lower level of education seem to be more likely to rely on drugs for self-treatment, while those with a higher level of education tend to seek formal treatment for their health problems.

Expenditure by Household Standard of Living and Income

The overall level of resources available to the household is positively associated with health expenditures in both surveys as expected. In the EECS, this can be seen by looking at the pattern of expenditures across levels of the standard-of-living index (SLI). Table 8.5 reveals a positive pattern in terms of household health spending as well as per capita household health spending. There is a weak tendency for the share of total spending on health to decline as the SLI rises: households with the lower SLI levels spend 5.8% vs. 4.3% for households at the highest level.

Additional evidence on the relationship between household resources and health spending is revealed in a multivariate regression equation presented in Table 8.7. Using the EECS data set we regressed the log of per capita household health spending against the log of per capita total household spending and dummy variables for the gender of the household head and rural or urban residence.¹⁰ The results reveal that as total household spending increases, health spending increases. However, the coefficient on the spending term in the log-log regression reveals an elasticity of less than one, implying that as spending increases, health spending increases less than proportionally. It can also be seen in Table 8.7 that the signs on the rural-urban dummy are as expected—rural residents spend less per head than urban residents—and the gender dummy confirms that female-headed households spend more than male-headed households.

In the EHHUES, income is positively related with health expenditures. In other words, individuals in households with higher incomes tend to spend more on health care per year than individuals with lower incomes. Figure 8.7 shows that individuals in the highest income quintile spend the most. They spend more than twice as much as individuals in the next highest income quintile, and 5 times as much as the lowest income quintile individuals.

Table 8.7
Regression of Per Capita Household Health Expenditures, EECS

Independent Variable	B	SE B	Beta	T	Sig T
Urban/Rural	-.0564	.0394	-.0222	-1.43	.152
LN (Total HH Exp. Per Capita)	.8808	.0265	.5153	33.22	<.001
Gender	.4425	.0551	.1202	8.03	<.001
Constant	-2.9194	.2213		-13.19	<.001
Adj. R^2	.293				

Dependent Variable: LN(Health Exp. Per Capita). $n = 3,162$.

Although the level of health care expenditures is positively related to income level, the share of income spent on health care is inversely related to income level. Figure 8.8 shows that, in fact, individuals in the lowest income quintile spent the highest share of their income on health care. This is consistent with the expenditure regression estimated with the EECS data. From an equity point of view, the poor bear a larger burden of health care compared with the rich.

Figure 8.7
Annual Per Capita Health Expenditures by Income Quintile, EHHUES

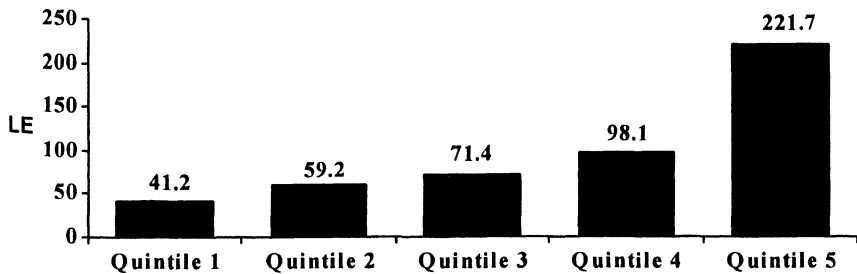


Figure 8.8
Percentage of Per Capita Income Spent on Health by Income Quintile, EHHUES

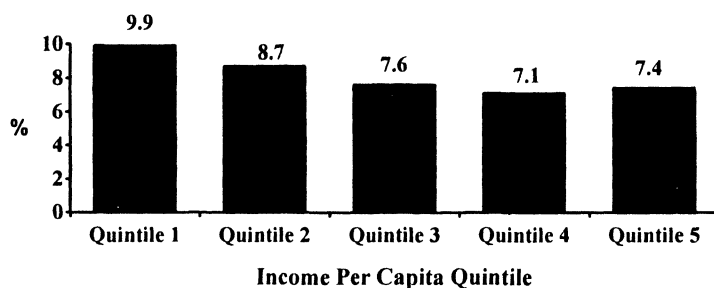


Table 8.8
Per Capita Health Care Utilization Rates and Expenditures by Insurance, EHHUES

	Insurance	No Insurance
Above 18 Years Old		
Number of Outpatient Visits	5.58	4.19
Number of Inpatient Visits	0.061	0.038
Outpatient Expenditure (LE)	110.79	89.47
Inpatient Expenditure (LE)	12.65	7.78
Drug Expenditure (LE)	60.80	54.35
Total Expenditure (LE)	184.24	151.60
Between 6-18 Years Old		
Number of Outpatient Visits	2.61	1.68
Number of Inpatient Visits	0.019	0.014
Outpatient Expenditure (LE)	27.20	25.01
Inpatient Expenditure (LE)	1.81	1.74
Drug Expenditure (LE)	5.76	5.98
Total Expenditure (LE)	34.77	32.73

Source: Harvard School of Public Health (1997), Tables 21, 30.

The Effect of Insurance Coverage on Health Care Expenditures

Table 8.8 shows the differences in health care expenditures by insurance status. Individuals with insurance spend slightly more than those without insurance coverage on health care. However, as Table 8.8 indicates, individuals covered by insurance have significantly more visits than those without insurance, implying that the out-of-pocket expenditures borne by the individuals per visit is less for those with insurance than those without.

Conclusions

In this paper we have assembled data from two recent surveys in Egypt that used the same sample frame and took place in roughly the same time period. Not surprisingly, the results are therefore similar. This similarity holds despite a difference in the levels of aggregation of the data: the expenditure data reported in this paper for the EHHUES are for individuals, whereas those in the EECS are per capita figures based on overall household spending.

The health spending data for the more health-oriented EHHUES show higher levels of health spending than in the EECS. Individuals in Egypt spent between 70 LE and 100 LE on average in 1995, or between \$25 and \$30. Most of this (about two-thirds) was on outpatient care. Drug purchases accounted for most of the rest.

But what is more interesting are the patterns of spending in terms of individual characteristics. The data in the two surveys reveal that health spending among urban households, among more educated individuals and heads of households, and where the head is female, are higher than in other households or types of individuals. These results are not surprising and confirm *a priori* expectations. The EECS data show that the number of children influences per capita spending. Households with more children tend to spend less per person. Similar patterns are found in the EECS for other expenditure items.

The influence of income or the standard-of-living level are congruent across the two surveys. Higher levels of health spending are associated with higher levels of income or of total spending. This holds in a multivariate framework while controlling for other variables. Both data sets show that health spending as a proportion of income (or of total

spending) declines with higher levels of income or spending. This means that the burden of spending for health is heavier for the poor.

Notes

- 1 Moreland et al. (1996).
- 2 Harvard School of Public Health (1997).
- 3 In the case of individuals less than 16 years of age, adults in the household were permitted to provide this information.
- 4 In addition, a sample was selected from the frontier governorate as a pilot study. The analysis of the frontier governorate will be presented separately as a case study and is not part of this study.
- 5 All EECS tables and analyses in this report are based on weighted EECS data. The weights were designed to compensate for differences in household and mother response rates across governorates as well as for disproportionate sampling of households in each governorate (i.e., disproportionate in terms of their share in the national population).
- 6 It is important to emphasize that the measure of total expenditure used here includes expenditure reports from multiple respondents: the household head or spouse, mothers, and individuals with a source of income. While this measure has the advantage of providing a wider accounting of household expenditure (than if only one household member had provided expenditure information), it has the disadvantage associated with non-response of individuals with a source of income. Because of problems with non-response, the measure of total annual expenditure could only be calculated for 65 percent of EECS households. These households have a somewhat lower mean Standard-of-Living Index (11.6) than do all EECS households (12.1). These households also disproportionately reside in Upper Egypt.
- 7 The percentage distribution of total annual household expenditures was calculated from a sample of the EECS in which all households had complete expenditure data as well as complete data on all of the expenditure categories ($N = 2,040$). The size of this sample was therefore smaller than that used in subsequent tables.

- 8 Miscellaneous expenditures include expenditures on family events, gifts and contributions to other households, debt payment, expenditure on self, purchases of major and minor appliances for the house, bicycles, motor vehicles, transportation, and other expenditures.
- 9 Further analysis to see if such corrections might be possible is currently underway.
- 10 For the variable Gender, males take a value of zero and females one; for the urban/rural variable, urban residence is zero and rural residence is one.

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PATRIARCHY, LIVING ARRANGEMENTS AND FAMILY PLANNING IN EGYPT

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In May of 1992, Dr. Nafis Sadik, director of the UN Population Fund, made this observation about women in developing countries: “choice and opportunity are largely unknown experiences. They are consigned to live a life determined by tradition, by fate and by decisions made by others, mostly men” (Sadik, 1992). The suggestion is that despite widespread economic development and cultural diversity, the persistence of patriarchal systems in developing countries limits women’s participation in reproductive decision-making. While in-depth examination of this question necessitates ethnographic techniques, demographers have helped generalize the picture using standard probability surveys (e.g., Malhotra, Vanneman and Kishor, 1995). The main problem with the latter approach is developing links between macro constructs of patriarchy and micro-level indicators of decision-making.

In this chapter, couple data from Egypt are used to describe how dimensions of patriarchy differentially influence the knowledge, attitudes, and behaviors of wives and husbands in matters of reproduction. More specifically, spousal differences in reproductive preferences are analyzed in association with measures of living arrangements and gender inequality, and the potentially mediating effect of spousal communication. These couple dimensions of family planning are examined in the context of Egypt’s essentially patriarchal system of kinship, marriage, and family formation, the effects of which vary by residence and region. The overarching questions are essential to family planning: how should we

conceptualize reproductive decision-making among Egyptian couples, and to what extent does this “planning” relate to family organization? Answers lie somewhere in the confluence of three prominent streams of demographic research: the study of gender and culture; the study of reproductive decision-making; and the literature on husband-wife communication.

The Demography of Gender Relations and Culture

The effects of patriarchy and family structure on fertility constitute a major research theme in demography and family sociology (e.g., Back and Hass, 1973; Cogswell and Sussman, 1979; Safilios-Rothschild, 1980; Dyson and Moore, 1983; Thornton and Fricke, 1987; Axinn, 1992; Desai, 1992; Desai and Jain, 1994). As a construct, patriarchy is generally used to summarize the complex and diverse set of cultural institutions which, especially operating through kinship and living arrangements, favor men and discriminate against women. Mason and Taj (1987), for example, refer to a set of social institutions that limit the chances for women to support themselves while simultaneously discriminating against them in terms of household allocation of resources and power. The result is an increased economic and emotional dependence of women on male relatives. Cain’s (1993) definition of patriarchal structure centered on the institutions contributing to women’s lack of economic autonomy relative to men’s.

Under a patriarchal system it is expected that the observed reproductive preferences of wives will significantly and systematically differ from those of husbands (Fapohunda and Todaro, 1988; Jejeebhoy, 1986; Sathar, Crook, Callum and Kazi, 1988). By contrast, the expectation is that more “nucleated” wives and husbands will both want the same number and composition of children, and have similar attitudes about family planning (e.g., Caldwell, 1976). The implication is that husband-wife differentials can be partly explained by the relative strictness of kinship, gender, and age hierarchies prevailing in each setting. More specifically, the nature of intra-household conflict over reproduction and family planning varies in association with how rigidly such dimensions of patriarchy are applied. Hypothetically, conflict in the nuclear, urban family is characterized by direct husband-wife engagement, where disputes are negotiated on the basis of the different

political, financial, and even physical resources that each spouse brings. In rural, extended family settings, the nature of conflict might involve the opposition or simultaneous functioning of mutually exclusive fertility belief systems (Stycos, 1955). Each spouse might differentially view the function of reproduction and the value of children, but rigid adherence to sex role specialization and kinship authority might preclude direct husband-wife confrontation over these differences. This is a highly stylized view, but useful to the extent that husband-wife communication about family planning is theoretically present in the former (nuclear) scenario, and absent in the latter.

The measurement of patriarchy's effect on fertility is not straightforward. One approach is to determine the extent to which reproductive preferences vary by gender (Mason and Taj, 1987). Another is to examine preferences while attempting to control for patriarchy (e.g., Morgan and Niraula, 1995). An important early example involved mapping kinship systems across India, where type of kinship served as a proxy for female autonomy (Dyson and Moore, 1983). Although usually not feasible due to data constraints, either approach might be further refined by directly contrasting wife and husband responses. Analyzing the prevalence of spousal differences in reported desired family size or willingness to use contraception helps to elaborate aspects of family organization and the wife-husband relationship.

The reactivation of patriarchal traditions is particularly striking in the Middle East. This is exemplified by such habits as the veiling of women, associated with the rise of Islamic fundamentalism. Does Islam foster conditions more favorable for the continuation of patriarchy and low women's status? In the demographic literature, Caldwell noted the propensity for Islamic nations to appear on his list of "poor health achievers" (Caldwell, 1986). This led to a tentative hypothesis relating Islam to the maintenance of traditional family structures and female subordination. Many demographers linked the rapid population growth of Arab countries with a unique "Arab fertility model," characterized by religious traditionalism, pronatalism, patriarchy, and the low status of women (Omran, 1980; Nagi, 1984; Roudi, 1988; Faour, 1989).

It is fair to characterize the Middle East as having high population growth rates and gender disparities that are quantifiably larger than in most other regions. This is true with respect to educational attainment and other crude measures of women's position, such as the traditionally large age difference between spouses. But linking these statistics with a picture

of the Middle East as a uniform plain of traditional social structures held together by Islam is obviously simplistic, and demographers have recently discounted the role of Islam in determining women's status. The revisionist view is to recognize the diversity of political and sociocultural systems operating in the Middle East, and to treat patriarchy in its appropriate political and otherwise multidimensional context (Obermeyer, 1992; Govindasamy and Malhotra, 1996; Zurayk, Younis, and Khattab, 1994). Summary statistics at the national level reveal significant gender disparities in basic health and socioeconomic variables, but a more complex picture of gender relations is derived from the wealth of ethnographic research conducted in the Arab world (this literature is summarized by Abu-Lughod, 1989).

Gender inequality is generally used as an outcome measure of some cultural or patriarchal system. When limited to typical demographic data, gender inequality is usually inferred from male-female differentials across a set of socioeconomic status indicators. Using the Basu (1992) framework, for example, the extent of gender inequality is calculated by comparing women's and men's exposure to and interaction with the outside world, and by assessing women's autonomy in decision-making relative to men's. However, just as the interpretation of women's status does not uniformly associate with patriarchy, gender inequality per se could exist at widely varying levels of women's status.¹ That is to say, low levels of female interaction with the outside world do not necessarily imply high levels of female inequality relative to males or male dominance. This is especially complex in the Arab World, where outward signs of female subordination can be viewed as part of an anti-West protest movement in defense of the traditional corporate family. In the area of decision-making, however, female levels of power and autonomy more directly relate to gender inequality.

Assuming that all reproductive outcomes result from a decision process, the actors involved in the process are conventionally viewed as the wife alone, the husband alone, or both jointly. In the last case, the gender or marital relationship might be characterized as "egalitarian." The question is how to assess the participation of these actors in reproductive decision-making. More specifically, the task is to determine the relative independence from men and other household members that women have in decision-making. Govindasamy and Malhotra (1994) investigated this autonomy aspect of women's status in Egypt. They used questions in the 1988 Egyptian Demographic and Health Survey about women's freedom

of movement outside the household and their power in decision-making. Their analysis is a more direct measure of autonomy than the conventional indicators of female education and female labor force participation. Given the phrasing of the questions about freedom of movement and decision-making power, the response task for the wife is to position herself along these lines relative to her husband. As such, the responses not only measure autonomy per se, but also help to indicate whether the couple can be categorized as "egalitarian." Demographically speaking, the salient feature of patriarchy is the extent to which a couple or household departs from this category and instead is described by characteristics of male domination or female subordination.

Where patriarchy is strongly institutionalized, one might expect not only male dominance in decision-making (whatever its shape), but also gender differentials in reproductive preferences. The implication of this relationship for demography is the continuation of relatively high fertility due to pronatalist norms. Relating wife-husband preferences for family size and use of contraception to kinship and living arrangements is one way to empirically examine this hypothesis. The general question is whether family organization systematically affects husband-wife decision-making and fertility differentials in developing countries (see Fapohunda and Todaro, 1988). The more specific question involves understanding how to fit couple divergence about reproductive goals into a decision-making framework.

In such an analysis, significant gender disparities in reproductive preferences would indicate deviation from the egalitarian type of decision-making toward a patriarchal system with correspondingly low female autonomy. Framing gender inequality in decision-making this way implies a continuum of family organization with "modern" egalitarian families at one pole, and "traditional" patriarchal families at the other. If the continuum were divided into two, the resulting measures might consist of nuclear vs. extended families. The underlying theoretical framework guiding much of the demographic research on gender and culture is dependent upon the existence of this continuum, which provides a way to relate household-level data to a broader social context, and to social change.

Demographic Approaches to Reproductive Decision-Making

The study of patriarchy and gender borrows heavily from anthropology and sociology. Essential fertility relationships are analyzed across cultural and social systems. By contrast, the demographic literature on reproductive decision-making is characterized by its singular focus on the household. It is distinguished by the disciplinary approach of economics, especially by the two main variants of rational actor models: the new home economics (Becker, 1981) and Easterlin's relative income hypothesis (Easterlin, 1980).

In new home economics, basic microeconomic theory explains the reproductive behavior of households, focusing on differences in opportunities, and the role of incentives in predicting changes in behavior. Husbands and wives are assumed to share basic perceptions of supply, demand, and cost of children. The husband is cast as the altruistic decision-maker, and the model theoretically does not allow for intra-household conflict. As Pollak and Watkins point out, the rational actor model is "radically individualistic" (1993:481). Preferences are worked out on an individual level, and then artificially applied to the household, as if the set of preferences for all individuals within were perfectly homogeneous. This constitutes the "black box" treatment of family decision-making, where analysts "leap directly to household or family preferences without acknowledging the possibility that husbands and wives might have conflicting fertility preferences" (Pollak and Watkins, 1993:481).

The Easterlin relative income hypothesis suggests that an individual's fertility preferences are largely determined by early consumption experience, which forms a reference for expected standard of living. Against this reference, an individual assesses the extent to which having children is compatible with current economic opportunities (Easterlin, 1980). While in new home economics, fertility preferences are fixed and exogenous, in the Easterlin model preferences are produced from within, and are largely explained in the form of evolving aspirations. This allowance for endogenous preferences was a departure from orthodox microeconomics, ostensibly reflecting more of a "human factor" in couple decision-making processes. But the model is nonetheless criticized for being too rigid and economically determined: "Even though I have departed from traditional economic theory by bringing the

formation of aspirations into my analysis, some still reject my theory as too *economic*" (Easterlin, 1987:159).

The "Easterlin Synthesis" was then developed in the context of the World Fertility Survey, resulting in a household level model applicable to developing country populations. The model incorporates demand (motivational) and supply (contraceptive technologies and services) factors, where contraceptive behavior is derived from a benefit/cost assessment based on strength of motivation vs. cost (psychosocial, financial, and cultural) of contraception (Easterlin and Crimmins, 1985). The assumption is that couples weigh the benefits and costs of contraception, and arrive at a decision. And while arguably it has been the most influential framework for understanding fertility change in developing countries (Biddlecom, Casterline and Perez, 1996:3), it is less clear about how the decision-making process occurs and how it may vary with family structure and the status of women.

Other approaches more explicitly recognize the heterogeneity of reproductive preferences among family members. For example, Fapohunda and Todaro (1988) used the "transactions framework" developed by Ben-Porath (1980) to explore how perceptions of reproduction and family size are differentiated between wives and husbands in Nigeria. Their results confirmed that spouses are likely to be in conflict over reproductive goals, and that a joint household utility function was largely absent, especially in more traditional family structures. The key insight to their approach involved linking the degree of spousal divergence in preferences to family structure: "The stronger covariation of the more elite, higher income Surulere spouses' desired fertility goals implies a more interdependent decision-making process and indicates an evolving family structure" (Fapohunda and Todaro, 1988:591).

Similarly, conflict resolution, exchange and bargaining, and relative power models of decision-making essentially treat family organization and functioning as political processes, the deep structure of which is affected by the distribution of power in the family,² and by the extent of communication present in the marital dyad. Blood and Wolfe (1960), for example, pioneered the method of assessing marital power by asking the wife retrospective questions about who makes decisions on household budget, about her activities outside the house, childhood rearing, and so on. Households were categorized as husband or wife dominant (segregated conjugal roles), or egalitarian (joint conjugal roles).

The segregated conjugal role relationship is conceptualized as a more formal, less intimate pairing, largely organized according to function, specifically a prescribed household division of labor by gender.

Presumably an egalitarian outcome suggests a more *modern* couple, reflecting broader societal trends associated with fertility decline, such as enhancement of female status and greater participation by females in the non-household economy. More specifically, an egalitarian marital relationship is theoretically characterized by frequent and effective communication, while the opposite scenario is assumed to prevail in rural, extended family relationships. For example, the concept of passive decision-making has been applied to segregated conjugal role relationships, where household behaviors are ostensibly governed by conservative social norms, particularly salient for the subjects of sex, contraception, and fertility (Hollerbach, 1983). Thus passive decision-making implies a lack of husband-wife communication.

The essential research question with respect to fertility decision-making is "do couples plan?" The first constraint to answering this question has to do with data limitations. Standard demographic and health surveys, even if designed to generate couple data, offer only superficial information about household behaviors, leaving a large empirical gap for theory to fill. The inevitable problem is egregious generalization. Furthermore, researchers rarely address the concept of planning explicitly, although fertility theory often includes references to sequential or "master plan" frameworks (see Morgan, 1996; and Bongaarts and Potter, 1983). Both frameworks assume that rational thought, in the form of decision-making, governs fertility outcomes. However, neither framework is informative about who actually makes the decisions, nor whether decisions have anything to do with childbearing in the first place. In Egypt, for example, it is not so uncommon to hear a frustrated family planner remark that (traditional) Upper Egyptians "don't plan."

In an important critique of fertility transition theory, Mason (1997) points out the fallacy of assuming that pretransition parents did not plan their childbearing, that "culture" controlled fertility behavior, not couples. By extension, the critique would also apply to so-called segregated conjugal relationships today, including those in rural Egypt for whom family planning is supposedly a foreign concept. In other words, passive or "non-decisions" do not suggest a lack of planning, but rather that patriarchy and gender inequality prevent individual reproductive preferences from being realized and negotiated at the family level. The

importance of husband-wife communication is its mediating role in this dynamic, or more specifically the vehicle through which divergent preferences could eventually result in mutual fertility decisions.

Husband-Wife Communication

Research on couple attitudes toward contraception and fertility can be traced to 1950, when J. Mayone Stycos began his series of intensive interviews with lower-income wives and husbands in Puerto Rico. The objective was to refine the recently developed KAP methodology, asking deeper questions to both partners about sexuality, gender roles, attitudes, and decision-making. It was subsequently found that a large majority of Puerto Rico's population desired fewer children than they actually had, but that over a third of the study sample reported never having discussed desired family size with their partners (Stycos, Back and Hill, 1954: 1038). Further analyses demonstrated a high correlation between husband-wife communication and contraceptive adoption, although for most couples "cultural factors" impeded discussion of sex and family planning (Stycos, 1955; Hill, Stycos and Back, 1959).

The apparent discrepancy between reproductive intentions and contraceptive practice (the so-called "KAP-gap") purportedly represented an "unmet need" for contraception, indicating a pool of latent demand for fertility reduction.³ This conclusion has provided a major rationale for nearly every family planning program in the world (Freedman and Coombs, 1974; Bongaarts, 1991). In proposing husband-wife communication as the key factor in contraceptive decision-making, the early Puerto Rico studies arguably provided a framework for solving problems related to the KAP-gap long before the debates on this issue became prominent.

Demographers have vociferously debated issues relating to the KAP-gap (e.g., Nortman, 1982; Westoff, 1988a, 1988b; Bongaarts, 1990, 1991; Dixon-Mueller and Germain, 1992; Sinding, Ross and Rosenfield, 1994). However, until recently measurement approaches were limited to survey responses from married women of reproductive age. Because husband-wife communication was found to affect family planning outcomes, the implication from Puerto Rico was that couple data allowed not only more precise measurement of whether there is unmet need, but also offered additional data suggesting *why* there is a discrepancy between

reproductive intentions and contraceptive practice. Stycos proposed two explanations: that small-family ideals were vitiated by poor communication and/or conflicting attitudes toward fertility, and that the means of realizing small-family ideals either were not known or were known and objected to (Stycos, 1955: 166). The second hypothesis was rejected, but with the confirming of the first hypothesis the literature of husband-wife communication was under way.

The extent to which family planning decisions result from husband-wife consensus is thus central to the study of contraceptive decision-making. The idea is that a family's organizational effectiveness, i.e., its ability to efficiently adapt to social, economic, or intellectual change, is the most important factor in predicting change in fertility behavior. The mechanism that theoretically facilitates organizational effectiveness is communication among family members. This is the approach taken by many family sociologists investigating fertility (Stycos, 1955; Hill, Stycos and Back, 1959; Rainwater, 1965; Yaukey et al., 1965, 1967; Cogswell and Sussman, 1979; Spitze and Huber, 1982; Bean et al., 1983; Beckman, 1983). The essential view is found in this early quote:

“Puerto Rican couples are poorly equipped organizationally to undertake fertility planning. They lack the skills of communication between spouses necessary to turn concordance on goals and means into consensus so they can take effective action on their family size goals,” (Hill, Stycos and Back, 1959: 162).

The idea that communication is a central determinant of a family's problem-solving effectiveness is not new. The formalization of communication theory as it applies to the marital context has been an important area in family sociology.⁴ A critical review by Klein and Hill (1979) of the family problem-solving literature resulted in eight theoretical conclusions, and husband-wife communication was a key element in each. However, some claim that regarding verbal communication as the key prerequisite for family decision-making is a narrow and ethnocentric approach (UN, 1961; Carlaw et al., 1971; Poffenberger, 1969). In India, for example, it was suggested that the operational mode of household functioning was non-verbal, that silence

itself had a communication function involving complex levels of hierarchy and husband-dominance, wife-submissiveness.⁵

The early stream of the couple communication literature culminated in a rarely cited United Nations review document which evaluated existing studies, essentially asking whether husband-wife communication was a causal factor in contraceptive adoption or an "epiphenomenon." The tentative conclusion was that "interspouse communication is an essential causal factor in the process of deciding to practise family planning" (ESCAP, 1974:158). Though an important literature on couples and family planning has evolved since then, it has tended to represent a specialized aspect of research rather than a mainstream concern (this literature is summarized by Becker, 1997; Stash, 1997; and Brown, 1994). This is unusual, given that fertility is generally better explained through a couple framework (see especially Sobel and Arminger, 1992; Smith and Morgan, 1994; Thomson, 1983), and that future breakthroughs in demography are expected to stem from more sophisticated analysis of joint behaviors (Preston, 1993:599).

Over 10 years ago a major review of couple studies found that: "more often than not, women's and men's fertility goals are very similar. Gender differences in fertility goals tend to be small" (Mason, 1987: 632). This conclusion is based on a large number of published studies, but all of them compared reproductive goals at the aggregate level. For over 30 years researchers have pointed out the relevance of analyzing husband-wife differences in reproductive goals at the household level. Coombs and Fernandez (1978), for example, specifically found that aggregate differences on questions of reproductive goals were smaller than differences found at the individual couple level.

Despite early examples demonstrating the usefulness of couple data, most demographic and family planning research is based on single sex data, perhaps inevitably contributing to the prevailing "black box" analysis of family behavior (see Desai, 1992 and Folbre, 1986). The training and logistical work of a survey requiring independent interviews of the matched conjugal pair is expensive, but arguments for couple surveys were made even well before the World Fertility Survey of the 1970s. Safilios-Rothschild, for example, suggested that couple data would reveal more than was desired:

"It is possible that the wish to de-emphasize marital conflict and disagreement between spouses has also been responsible for this

serious methodological omission. Since, in the "ideal" American family, couples marry for love and remain "loving companions" throughout - sharing activities and decisions as well as opinions and beliefs - research methods and techniques which might challenge this cherished version of married life by indicating that it does not represent the norm tend to be avoided" (Safilios-Rothschild, 1969: 290).

Kingsley Davis argued that the practice of excluding males from surveys represented the Western tendency to view reproduction as existing solely in the female domain, and to "free men from responsibility for their offspring" (Davis, 1987: 831). Currently, however, there is renewed interest in the couple and husband-wife communication literature. This was punctuated by the 1994 International Conference on Population and Development, which contained a welter of recommendations calling for male involvement (U.N., 1994). Many conventional data sources have begun to include males, sometimes in the context of matched conjugal pairs.

To summarize, there are at least three benefits to collecting data at the couple level. First, it is not as easy to make gender-biased assumptions about the organization of the family when data are collected from both the wife and the husband. Second, theories of fertility decision-making are more appropriately tested with data from a larger set of key decision stakeholders (which minimally would include both wife and husband). Third, the concept of women's status is potentially more concrete when a wife's characteristics, beliefs, and attitudes are directly juxtaposed with those of her husband. Ironically, greater access to men in demographic surveys could allow a more refined examination of women's lives. The time is right for further exploiting the possibilities of couple data, especially in the relatively untested area of relating reproductive preferences to patriarchy and living arrangements.

Conceptual Model

Whether "tradition" and "fate" render Egyptian women powerless in decision-making is obviously not a simple question. The purpose of this analysis is to suggest that answers can be linked to Egypt's sociocultural landscape. Assuming that the importance of patriarchal systems in

influencing the daily life of Egyptians is unevenly distributed across the country, the first task is to roughly map this distribution. Within the resulting regional context, the next step is to relate measures of living arrangements and gender inequality to husband-wife variables at the household level. The pattern of spousal characteristics and responses should offer clues about the family formation process in Egypt.

In Egypt, social stratification is a complex function of socioeconomic status and patrilineal attributes, but the overall system of kinship and marriage is relatively homogeneous (Abaza, 1987; Hopkins, 1987; Adams, 1986; Nadim, 1985). Concerning patriarchy, the major stratum is region, broadly categorized into Lower and Upper Egypt, and accentuated by rural vs. urban residence. That is to say, the effect of patriarchy would be felt more directly in rural as opposed to urban areas, and in Upper compared to Lower Egypt. The latter region is characterized by a larger and more complex system of villages, towns, and cities, a less strictly agrarian-based economy, and is the area more heavily influenced by the successive penetration of Egypt by foreigners. In addition to Upper and Lower Egypt, a third relatively distinct population grouping would consist of couples living in the megacities of Cairo or Alexandria.

“Tradition” and “fate” in Egypt would therefore tend to vary by socioeconomic status and region, both of which serve as rough indicators of the proximity, or day-to-day influence of patriarchal kinship systems on female autonomy and gender inequality in the household. The prevalence of husband-wife communication could also indicate the strictness with which a patriarchal system influences the behavior of individuals in a household. More specifically, the reported reproductive preferences of husbands and wives should converge among couples from Cairo or Alexandria, and diverge among couples from Upper Egypt, especially rural couples. Reported husband-wife communication should be more prevalent in Cairo and Alexandria, and basic demographic indicators of gender inequality (e.g., substantial husband-wife differences in age, educational attainment, and media exposure) should be minimal among these couples.

Data and Methods

The relationships between indicators of patriarchy and gender inequality, husband-wife communication, concurrence on reproductive preferences,

and contraceptive use are tested at this preliminary stage through a series of bivariate cross-tabulations. The first step is to establish the extent to which these couple attributes vary with region. If the basic pattern of these measures can be consistently explained by region, then the next step is to propose a simple correlation model suggestive of a more complicated causal system. Indicators are developed using a 1988 survey of adult married Egyptians, in which a nationally representative sample of 1308 households was drawn, each containing at least one married female between the ages of 15-45 years. The sample was designed to yield robust measures by residence (rural and urban) and region (Upper, Lower, and metropolitan). In over 90% of the sampled households the same interview schedule was administered to both wife and husband. In the remaining 10% the woman's spouse was either absent or was categorized after two or more contacts as a nonrespondent (Government of Egypt, State Information Service, Center of Information, Education, and Communication, 1988). The prevalence of respondents belonging to polygamous households in the sample is not known. In another nationally representative sample, Stycos and colleagues found that only 4% of eligible women were in polygamous marriages, and that this was independent of region (Stycos et al., 1988, p. 197). Incidence of polygamy is overwhelmingly confined to illiterate couples, and is increasingly rare among newly married Egyptians (Rugh, 1985).

Table 9.1
Distribution of Governorates by Region

Region	Name of Governorate	Sample Size*
1. METRO	1. Alexandria	86
	2. Cairo	177
2. LOWER	3. Sharqia	258
	4. Kafr Al-Sheikh	137
	5. Menoufia	168
3. UPPER	6. Beni Suef	104
	7. Al Minya	184
	8. Sohag	172
Total		1286

* Sample size refers to married couples.

Region is measured in three categories: Metro, Lower Egypt, and Upper Egypt (Table 9.1). A dichotomous variable called "Rural" stratifies the respondents into either rural or urban residence, although it should be noted that Region 1 (Metro) is 99% urban. The major function of Region is to indicate patriarchy, two dimensions of which are measured by whether a household is nuclear or joint/extended, and by the extent of son preference among female respondents (Table 9.2). The same table also examines the gender inequality dimension of patriarchy, using four variables. The first of these shows the percentage of households in each of the regions where the husband is able to read but the wife is not able. The second is a combined variable indicating whether women who married at age 16 or younger had married a man at least five years older. The third and fourth measures show husband-wife variation in exposure to media. More specifically, one variable shows whether a husband is exposed to radio but his wife is not, and the other shows whether a husband watches television frequently while his wife does not.

Table 9.2
Indicators of Patriarchy and Gender Inequality, by Region
(Percentage of Total Sample)

	Region 1	Region 2	Region 3	
Residing in nuclear households	78	59	53	$p \leq .001$
Wife indicates strong son preference	24	46	63	$p \leq .001$
Husband can read; wife cannot	16	40	32	$p \leq .001$
Female age at marriage is 16 or younger; spouse is at least 5 years older	15	26	34	$p \leq .001$
Husband is exposed to radio; wife is not	3	7	12	$p \leq .001$
Husband watches television frequently; wife infrequently	14	23	26	$p \leq .001$
Sample size	258	543	456	

When one spouse's responses are cross tabulated with the other's, the results can depict situations of husband-wife inequality that arguably capture more relevance for household-level behavior than results shown at higher levels of aggregation. For example, the cross-tabulation of husband-wife literacy status shows four categories: (1) a baseline category in which neither husband nor wife can read; (2) households where the wife can read but the husband cannot; (3) households where the husband can read but the wife cannot; and (4) couples with "joint literacy" (Table 9.3). This cross tabulation allows one to speculate on particular aspects of gender inequality, such as the nature of husband-wife interaction in a household where the husband can read but the wife cannot. In the case of attitudinal questions, this kind of cross tabulation also depicts the gender specific directions of spousal agreement and disagreement.

Table 9.3
Percentage Distribution of Husband-Wife Literacy, by Region

	Region 1	Region 2	Region 3	Total
Neither husband nor wife can read	14	25	29	25
Wife can read; husband cannot	4	2	3	3
Husband can read; wife cannot	16	40	32	32
Both husband and wife can read	66	33	36	41
Total	100	100	100	100
Sample size	258	543	456	1257

The survey contained several subjective questions relating to attitudes and beliefs about family planning. Measures of wife-husband agreement about reproductive preferences were constructed for six individual items, and then the extent of couple agreement was summarized in a composite measure. The purpose of the attitudinal variables is to further show regional variation in the extent to which marital pairs agree or disagree about reproduction and fertility. An index

of contraceptive knowledge was constructed to provide some indication of exposure to family planning programs and how it varies by partner. Finally, wife-husband communication about family planning is examined as a key construct in explaining the relationship between patriarchy, preferences, and contraceptive use.

Results

Bivariate Analysis

In terms of basic demographic characteristics, Region 1 is substantially more “modern” than either Region 2 or 3 (Table 9.4). The respondents in Region 1 are older, have less children, and have been married longer than their counterparts in the other regions. Wife’s age at marriage is substantially higher in Region 1. Obviously Region 1 is nearly 100% urban, as it consists of samples drawn from Cairo and Alexandria. Similarly, the wife’s education level is higher in Region 1 (3.0 indicates the attainment of a primary school certificate), as is her level of literacy. Both education level and literacy for the husbands are higher in Region 1, but between-regional differences are not as pronounced. The husband-wife differential in level of education and literacy is substantially higher in Regions 2 and 3 than in Region 1. On the whole, demographic and other socioeconomic status characteristics tend to indicate relatively less well-off husbands and wives in Region 2 and Region 3. The latter region is characterized as more traditional, although Upper Egypt is slightly more urbanized than Lower Egypt, which presumably accounts for several measures in Region 3 performing slightly better than in Region 2. Despite this, wives in Region 3 are the youngest, and are less likely to be employed than wives in the other two regions. It should also be noted that far more Coptic Christians reside in Upper Egypt than in the other parts of the country, and that based on the interviewer’s subjective evaluation, households in Region 3 were substantially more likely to be labeled as having low socioeconomic status.

Indicators of patriarchy and gender inequality vary with region in the expected direction (Table 9.2). The percentage of Region 1 respondents living in nuclear households (78%) is much higher than in the other two regions. Conversely, compared to Regions 1 and 2, couples

Table 9.4
Descriptive Statistics for Selected Variables, by Region

	Region 1	Region 2	Region 3	
Wife's mean age in single years	34.2	31.0	30.4	$p \leq .001$
Husband's mean age in single years	42.8	38.8	38.3	$p \leq .001$
Wife's mean age at marriage	20.3	18.3	18.4	$p \leq .001$
Mean number of children	2.9	3.5	3.4	$p \leq .001$
Mean duration of marriage in single years	14.0	12.8	12.0	$p \leq .001$
Percentage urban	99.8	27.8	32.4	$p \leq .001$
Wife's mean education level*	3.0	2.3	2.4	$p \leq .001$
Husband's mean education level*	3.2	3.0	3.3	$p \leq .001$
Percentage of literate wives	70.0	35.0	39.2	$p \leq .001$
Percentage of literate husbands	81.8	72.8	67.3	$p \leq .001$
Percentage of employed wives	30.2	40.2	26.9	$p \leq .001$
Percentage who are Coptic Christian	12.8	0.9	18.9	$p \leq .001$
Percentage with low SES (observed by interviewer)	41.0	58.4	68.2	$p \leq .001$

- * 1. Did not go to school 6. Below secondary school
2. Below primary level 7. Secondary school (Thanawiya 'Ama)
3. Primary school certificate certificate
4. Below preparatory level 8. Diploma
5. Preparatory school certificate 9. University degree

from Region 3 are more likely to be living in a joint or extended household. This is despite the fact that Region 3 is more urbanized than Region 2. Son preference as measured from the wife's responses increases from only 24% in Region 1 to 63% in Region 3. The situation where husbands can read but their wives cannot is highest in Region 2 (40%), and twice as high in Region 3 (32%) as in Region 1 (16%). Prevalence of very early age at marriage for females (less than 17 years) coupled with a spousal age gap of 5 or more years is relatively small in Region 1 (15%) but increases to 34% in Region 3. Similar regional differentials occur for husband-wife variation in exposure to media. In Region 3, 12% of husbands are exposed to radio while their wives are not, and 26% watch television frequently while their wives report watching only very infrequently.

Table 9.3 shows the regional distribution of husband-wife literacy status. As expected, Region 3 has the highest percentage of couples where neither is able to read, whereas Region 1 has the highest percentage of couples where both can read. A negligible percentage of households in the entire sample consists of couples in which the wife can read but the husband cannot (3% overall). The slightly higher couple literacy rates in Region 3 compared to Region 2 are likely due to differences in urbanization, although both regions show literacy levels only about half of those of Region 1.

In response to the question: "Do you think parents benefit from a family with four or five children or more?" over three quarters of husbands and wives in Region 1 and 2 indicated that neither viewed such a family size as beneficial, compared to only half the Region 3 couples (Table 9.5). In Regions 1 and 2 husbands are more likely than wives to express pronatalist attitudes, whereas in Region 3 wives and husbands are equally likely to find large families beneficial. Husband-wife non-concurrence on this question was 20% in Regions 1 and 2, compared to 40% in Region 3. The next attitudinal item focused on expected old age support from children. The questionnaire item read: "When you grow old would you expect your children to support you financially or not?" Results from this cross-tabulation are very similar to the previous question, with 85 and 78% of responses in Regions 1 and 2, respectively, indicating that neither spouse expects to depend on children in their old age (Table 9.6). In contrast, only 60% of Region 3 respondents concur on not expecting old age support from their children, with another 30% indicating spousal discordance.

Table 9.5
Percentage Distribution of Husband-Wife Concurrence on Family Size, by Region

	Region 1	Region 2	Region 3	Total
Neither says having 4-5 children is beneficial	78	77	53	69
Wife yes; husband no	6	6	19	10
Husband yes; wife no	15	15	20	17
Both spouses say having 4-5 children is beneficial	1	2	8	4
Total	100	100	100	100
Sample size	258	543	456	1257

Table 9.6
Percentage Distribution of Husband-Wife Concurrence on Old Age Support, by Region

	Region 1	Region 2	Region 3	Total
Neither will depend on children for support in their old age	85	78	60	73
Wife yes; husband no	11	10	16	12
Husband yes; wife no	4	10	13	10
Both will depend on children for support	0	2	11	5
Total	100	100	100	100
Sample size	263	575	472	1310

An open-ended question asked: "At what age would you like your daughter to get married (supposing you had a daughter)?" As expected, respondents in metropolitan Egypt reported mean ages substantially

Table 9.7
Mean Ideal Age for Daughter's Marriage, by Husband-Wife
Response and Region

	Wife	Husband	Difference (Wife-Husband)
Region 1	21.25 (241)	21.09 (232)	0.16
Region 2	18.33 (405)	19.63 (506)	-1.30
Region 3	19.08 (404)	19.19 (419)	-0.11
Total	19.29 (1050)	19.76 (1157)	-0.47

higher than in Lower or Upper Egypt. Overall, husbands reported slightly older desired ages at marriage for their daughters than wives, except in Region 1 (Table 9.7). Mean ages at marriage reported by Region 3 wives were slightly higher than in Region 2, although non-response to this item among Region 2 wives was relatively high. The open-ended results were dichotomized to reflect the percentage of the overall sample responding with an age younger or older than 18 (Table 9.8). Nearly all husbands and wives in Region 1 answered with a daughter's age at marriage older than 18 years (82%). This percentage drops substantially in Regions 2 and 3 (58 and 54%, respectively), with nearly 20% of husbands and wives in Region 3 both reporting an ideal age younger than 18. In these latter two regions the wife is more likely than the husband to report wanting her daughter to be married before age 18. Husband-wife non-concurrence on this question was 14% in Region 1, 30% in Region 2, and 27% in Region 3.

The next item involves whether fertility itself is something that is within the couple's power to control, and was phrased: "Do you think that one can limit his/her family size to any number he/she chooses or do you think this is something one has no control over?" Over 40% of spouses in Region 3 show non-concurrence on this question, and nearly one quarter agree that fertility is beyond their control (Table 9.9). In all three regions the husband is more likely than the wife to express "fatalistic"

Table 9.8
Percentage Distribution of Husband-Wife Concurrence on
Daughter's Age at Marriage, by Region

	Region 1	Region 2	Region 3	Total
Neither think daughter < 18 should marry	82	58	54	62
Wife thinks < 18 OK, husband does not	6	19	17	16
Husband thinks < 18 OK, wife does not	8	11	10	10
Both think it's OK	4	12	18	12
Total	100	100	100	100
Sample size	263	575	472	1310

attitudes about family planning, although overall the results indicate that Region 3 has higher prevalence of such fatalism, with only 36% agreeing that fertility is within their control.

Table 9.9
Percentage Distribution of Husband-Wife Concurrence on Fertility
Control, by Region

	Region 1	Region 2	Region 3	Total
Neither believes fertility is out of their control	53	51	36	46
Wife is fatalistic about fertility, husband is not	12	14	18	15
Husband is fatalistic about fertility, wife is not	27	19	23	22
Both believe that fertility is beyond their control	8	15	23	17
Total	100	100	100	100
Sample size	263	575	472	1310

Table 9.10
Percentage Distribution of Husband-Wife Concurrence on Desire for More Children, by Region

	Region 1	Region 2	Region 3	Total
Neither spouse wants more children	69	66	43	58
Wife wants more, husband does not	3	7	12	8
Husband wants more, wife does not	9	9	12	10
Both want more	18	18	34	24
Total	100	100	100	100
Sample size	249	532	458	1239

Desire for more children is among the most fundamental items related to reproductive preferences. Obviously responses to this question vary with age and parity, and sex composition of living children, but even accepting that Region 3 couples are slightly younger and have relatively fewer children ever born, the generally pronatalist culture of Upper Egypt is evident from Table 9.10. Compared to Regions 1 and 2, nearly twice as many couples in Region 3 agree about wanting more children, and almost twice as many spouses are in disagreement about desired family size as in the other two regions. The pattern of husband-wife response discordance in Regions 1 and 2 is for the husband to want more children while his wife does not. The exception is Region 3, where discordant husbands and wives are split between wanting and not wanting more children. This pattern is also seen in responses to the next question: "Suppose you had three daughters, but no sons. Would you try to have a fourth child in hopes of having a son?" Son preference is clearly higher in Region 3, where 42% of husbands and wives agree on having another child in hopes of a son (Table 9.11). Overall, wives are more likely than husbands to express a son preference in the context of this question. The level of couple discordance is slightly higher (38%) in Region 2 than in Region 3 (36%).

To summarize, it is possible to conceptualize the variation in attitudes about reproduction and family planning according to region. Moving from Upper Egypt, to Lower Egypt, to metropolitan Egypt,

Table 9.11
Percentage Distribution of Husband-Wife Concurrence on Son Preference, by Region

	Region 1	Region 2	Region 3	Total
Neither would have another child	62	43	22	39
Wife would have another, husband would not	16	27	21	23
Husband would have another, wife would not	13	11	15	13
Both would have another	8	19	42	25
Total	100	100	100	100
Sample size	263	575	472	1310

attitudes tend to exhibit more progressive or *modern* attributes. Reproductive preferences that reflect more pronatalist or traditional attitudes, in conjunction with aspects of patriarchy and gender inequality, are more pronounced in Upper Egypt. Significantly more couples in Region 3 say that having 4 or 5 children is beneficial to the family, that they will depend on their children for support in their old age, that the ideal age for a daughter to marry is younger than 18, and that fertility is not something within the capacity of the couple to control. Significantly more Region 3 couples also report wanting more children, and indicate more son preference, than do couples in either Region 1 or 2.

The pattern of husband-wife concurrence on these attitudinal questions is lowest in Region 3 for all items except for daughter's ideal age at marriage. An index of concurrence was created where for each of the six attitudinal items a "1" is indicated for husband-wife concurrence on the item, and a zero is indicated for non-concurrence. The maximum score for this summated index is therefore 6. Overall husband-wife concurrence is significantly lower in Region 3 (4.04 compared to 4.44 in Region 2 and 4.71 in Region 1). If this summated score is dichotomized to reflect "low concurrence" (ranging from 0-4 on the summated index) and "high concurrence" (5-6 on the index), then the magnitude of concurrence among Region 3 spouses is also substantially smaller than in the other two regions. Only 40% of Region 3 couples showed high

concurrence, compared to 51% in Region 2 and 65% in Region 1 (Table 9.12).

Table 9.12
Percentage Distribution of Dichotomous Indicator of Overall Husband-Wife Concurrence, by Region

	Region 1	Region 2	Region 3	
Concurrence ranged from 0-4 on summative index	35	49	60	$p \leq .001$
Concurrence ranged from 5-6 on summative index	65	51	40	$p \leq .001$
Total percentage	100	100	100	
Sample size	263	575	472	

Table 9.13
Percentage Distribution of Husband-Wife Communication about Family Planning, by Region

	Region 1	Region 2	Region 3	Total
Neither spouse reports talking with the other about family planning	7	5	14	9
Wife reports talking; husband does not	13	7	14	11
Husband reports talking; wife does not	7	11	16	1
Both spouses report talking with each other about family planning	74	77	57	69
Total percentage	100	100	100	100
Sample size	261	569	462	1292

The prevalence of husband-wife communication about family planning is also strongly linked with region. Compared to Regions 1 and

2, couples from Region 3 are far more likely to report that no communication of this kind has occurred (Table 9.13). Fewer than 60% of Region 3 spouses concur on whether they have ever talked with each other about family planning. As in the other attitudinal variables, lack of husband-wife concurrence about family planning communication is much higher in Region 3 than in Regions 1 or 2. This result is perhaps related to husband-wife differentials in contraceptive knowledge. Table 9.14 shows the regional distribution of how many distinct methods of contraception each spouse has ever heard of. Region 3 has significantly fewer cases in which the husband knows more methods than the wife, and also significantly fewer cases in which both spouses know the same number of methods. These findings are also consistent with actual contraceptive use. Ever use of a contraceptive ranges from 85% of respondents in Region 1, to 76% among Region 2 respondents, to only 41% in Region 3. The corresponding figures for current use of a contraceptive method are 67%, 51% and 25%, respectively.

Table 9.14
Percentage Distribution of Husband-Wife Contraceptive Knowledge,
by Region

	Region 1	Region 2	Region 3	Total
Husband knows more methods than wife	20	20	16	19
Wife knows more methods than husband	52	51	63	56
Both know the same number of methods	28	28	22	26
Total percentage	100	100	100	100
Sample size	263	575	472	1310

Multivariate Analysis

It could be that several important variables such as age, marital duration, and residence could further differentiate the effect of region on gender inequality, husband-wife communication and concurrence on reproductive preferences, or contraceptive use. Multivariate analysis is

used to account for these and other alternative explanations for the strong regional patterns. Table 9.15 shows the strong statistical association between overall attitudinal concurrence on reproductive preferences between husbands and wives and spousal communication about family planning. Both of these key constructs are also highly correlated with current or ever use of contraception (results not shown). Contraceptive use is an indicator variable having a positive score if the wife reports either ever-use or current use of any contraceptive method, including “traditional” methods (i.e., withdrawal, rhythm, and douches).

Table 9.15
Percentage Distribution of Attitudinal Concurrence, by Husband-Wife Communication

	Neither Talk	Wife only Talks	Husband only Talks	Both Talk	Total
Low concurrence	61	58	52	46	50
High concurrence	39	42	48	54	50
Total percentage	100	100	100	100	100
Sample size	110	139	149	894	1292

Controlling for indicators of patriarchy, for region, as well as other demographic and background variables, results of a logistic regression model confirm the importance of communication, some aspects of joint spousal preferences, and region in explaining contraceptive use (Table 9.16). More specifically, couples are over twice as likely to use contraception if they agree about ever having discussions about family planning. Contraceptive use is also higher among husbands and wives who report no son preference, who have no desire to have more children, who live in urban areas (even controlling for region), and who are both able to read. Contraceptive use is strongly associated with couples who already have at least one child and with wives who are employed. To a lesser extent contraceptive use is associated with a low prevalence of

Table 9.16
Logistic Regression Results: Current or Ever Use of Contraception

Current or Ever Use	Odds Ratio	Std. Error	Z Score	95 % Conf. Interval
Husband-wife communication	2.36	.217	9.3***	1.97 - 2.82
Husband-wife literacy	1.21	.097	2.4**	1.03 - 1.41
Both desire for more children	0.66	.055	-4.8***	0.56 - 0.78
Both indicate son preference	0.50	.104	-3.3***	0.33 - 0.75
Overall concurrence on reproductive attitudes	0.86	.154	-0.8	0.61 - 1.22
Residence in Upper Egypt (Region 3)	0.46	.063	-5.7***	0.35 - 0.61
Residence in a nuclear household	1.33	.231	1.6*	0.95 - 1.87
Prevalence of "child marriage"	0.66	.129	-2.1**	0.46 - 0.97
Both exposure to radio	0.62	.187	-1.6	0.34 - 1.12
Both exposure to television	0.91	.194	-0.4	0.60 - 1.39
Number of living children	1.31	.076	4.7***	1.17 - 1.47
Wife is employed	1.53	.267	2.4**	1.08 - 2.15
Residence in rural area	0.27	.054	-6.5***	0.18 - 0.40

Note: Log Likelihood = -469.73; Number of observations = 1190; Chi Square (13) = 595.8; and Probability > Chi Square = < .001.

*** Significant at the 99% confidence level.

** Significant at the 95% confidence level.

* Significant at the 90% confidence level.

what is termed "child marriage," and with residence in a nuclear household.

The multivariate analysis shows that several indicators of patriarchy (other than region) have separate and significant associations with contraceptive behavior. As shown in the bivariate analysis, all of these indicators are significantly correlated with region. However, even when the patriarchy indicators are held constant, region still has an impact on contraceptive behavior, implying that region is affecting contraceptive behavior not only via the patriarchy indicators but also through other pathways not specified in the model. Research has shown that measures of overall family planning service availability in Egypt do not vary significantly by region, even though specific sources of contraceptives do vary by region (El-Zanaty, et al., 1993). For example, compared to women from Lower or metropolitan Egypt, women in Upper Egypt have access to public health clinics or private medical facilities for contraceptive services, but are significantly less exposed to contraceptive social marketing programs. These programs often have Western-oriented elements of promotion that may complement the similarly oriented television and other media outlets that are more widely viewed by women outside of Upper Egypt. Additionally, the overall number of contraceptive methods known by all respondents is lowest in Region 3.

Desire for more children and husband-wife communication are such important correlates of family planning attitudes and behavior that a closer examination is warranted. Table 9.17 shows the results of a logistic regression with couple desire for no more children as the dependent variable. Clearly, parity is the instrumental factor in explaining desire for more children, although even when controlling for parity the effect of region is considerable. Furthermore, desire for no more children is substantially higher when couples are residing in nuclear households, and when husbands and wives concur on having had discussions about family planning. Also seen in this model is the effect of high husband-wife attitudinal concurrence. The mutual desire for no more children is five times more likely to emerge among couples who tend to have substantial agreement on the six items relating to reproductive preferences. Cross tabulation between these two variables shows that 70% of couples in high overall attitudinal concurrence report wanting no more children, compared to only 46% of couples for whom overall concurrence on reproductive preferences is low (results not shown).

Table 9.17
Logistic Regression Results: Husband-Wife Desire for No More Children

Current or Ever Use of Contraception	Odds Ratio	Std. Error	Z Score	95 % Conf. Interval
Husband-wife communication	1.54	.139	4.78***	1.29 – 1.84
Residence in Upper Egypt (Region 3)	0.26	.047	-7.42***	0.19 - 0.38
Number of living children	2.81	.185	15.65***	2.47 – 3.20
Residence in a nuclear household	1.74	.292	3.30***	1.25 – 2.42
Overall concurrence on reproductive attitudes	5.07	.899	9.16***	3.60 – 7.17

Note: Log Likelihood = -470.72; Number of observations = 1196; Chi Square (5) = 684.95; and Probability > Chi Square = < .001.

*** Significant at the 99% confidence level.

Discussion

The descriptive results bolster the idea that the construct of patriarchy is more evident as one moves toward the traditional areas of Egypt. The fact that all of the measures used to represent patriarchy were more prevalent in Upper Egypt (Region 3), and far less so in metropolitan Egypt (Region 1) provides support for the idea that region itself can adequately serve as a proxy for patriarchy. More specifically, sampled respondents in Region 3 were more likely to live in joint or extended households, were more likely to favor notions of son preference, were highly sex segregated in terms of media exposure, and had a relatively high prevalence of what might be called child bride situations, where the female was married at age 16 or younger to a male 5 or more years her senior. In all of these indicators, each of which arguably denotes a degree of “traditionalism,” Region 3 respondents were significantly different from the others.

Other major surveys confirm these results. For example, the Contraceptive Prevalence Survey of 1984 showed that the percentage of

currently married women who agreed that a wife should “keep quiet” if she disagrees with her husband was nearly 70% in Upper Egypt, compared to 55% in Lower Egypt and 42% in Cairo and Alexandria. Only 38% of wives in Upper Egypt agreed that they would respect husbands more if the “wife is treated as an equal” to him. This compares to 57% of wives in Lower Egypt and 65% in Cairo and Alexandria (Sayed et al., 1985). The Egypt Demographic and Health Survey (EDHS) of 1992 showed that the percentage of husbands disapproving of the use of contraception was 16% in Upper Egypt, 6% in Lower Egypt, and 9% in the metropolitan governorates (El-Zanaty et al., 1993). The EDHS also showed that the percentage of husbands believing that religion forbids the practice of family planning varied from 17% in Lower Egypt to 23% in Upper Egypt. Other aspects of patriarchal relations are observed in the EDHS, notably that only 67% of Upper Egyptian husbands agreed that the “wife can go out alone” compared to 81 and 89% in Lower Egypt and metropolitan Egypt, respectively. Similarly, 56% of Upper Egyptian husbands agree that the “wife should express her opinion” compared to 69% in Lower Egypt and 81% in metropolitan Egypt. With reference to husband-wife attitudes, the EDHS showed that husbands and wives from Upper Egypt were more likely than husbands and wives from other regions to be wrong in their perceptions concerning their spouse’s attitudes about family planning. Among couples from rural Upper Egypt, for example, one-third of wives and nearly 30% of husbands inaccurately assessed their spouse’s attitudes.

A consistent finding in all of these sources is that husband-wife concurrence about reproductive preferences varies by region. In this analysis, couples in Region 3 were significantly less likely to concur. When they did concur, they were more likely to do so with more traditional, or pronatalist and somewhat fatalistic attitudes relative to the other regions. Why would husbands and wives from Region 3 show such a lack of concurrence about fertility and family planning? There is ample evidence, for example, that households in Cairo are filled with discord and substantial husband-wife conflict and disagreement (e.g., Wikan, 1980; Hoodfar, 1990; Singerman, 1990). In fact Singerman debunks the “new home economics” idea of the household as an undifferentiated “black-box” where altruism works to maximize a joint husband-wife utility function. Inter-spousal arguing and bickering emerged as a major theme from her series of participant observation encounters among *sha’bi* households situated in a popular quarter of Cairo. She hypothesized that

“conflict within families would not be so common if strict kinship, gender or age hierarchies were observed” (Singerman, 1990: 9). In other words, where patriarchy is more salient, inter-spousal conflict disappears. The data presented here, however, support a characterization of metropolitan couples as having coincidental, if not truly shared ideas and beliefs about fertility and family planning. Why do we not see far higher “conflict” among Region 1 couples? Furthermore, if we accept that kinship, gender and age hierarchies are stricter in Region 3 than in Regions 1 and 2, we would then expect less husband-wife conflict in that region, while the data show the opposite is true. The problem may be in the definition of conflict.

In the nucleated and urbanized settings of Region 1 couples, we can interpret “conflict” as measured by participant observation to reflect a more open and permissive set of allowable husband-wife exchanges. In these settings, Singerman’s point about the relative weakness of patriarchy in controlling familial behavior implies that the wife is free to engage her husband and other family members in open argument, or conflict. This would not be the case in Region 3. At the same time, however, wives and husbands in metropolitan Egypt would be likely to share what Stycos called a fertility belief system. Life in Cairo would in and of itself demand a serious re-evaluation of pronatalist norms among even the most recent rural immigrants. Constant scarcity, high prices, the value of a child’s education in the urban employment market and the unavailability of ample living space are concrete factors in this evaluation, and most urban couples are forced to accept smaller family size norms. In the more traditional agrarian dominated settings of Egypt, the level of development and women’s status and family organization contribute to a much more complex fertility equation, and one that is far more likely to be differentiated by gender. Thus it is reasonable to predict that in Regions 2 and 3 husbands and wives may have divergent fertility belief systems, reflected in their divergent answers to survey questions about reproductive preferences.

The significance of region is to suggest a dependable set of statistical associations with indicators of patriarchy and gender inequality. The descriptive analysis allows us to tentatively conclude that respondents living in Upper Egypt are significantly more under the influence of systems of patriarchy and gender inequality than respondents living in the other two regions. The multivariate analysis suggests that these underlying relationships persist even while likely confounding

factors are controlled, including region itself. Couples residing in Upper Egypt, especially in rural areas of this region, have lower prevalence of husband-wife concurrence on important reproductive preference indicators, lower prevalence of husband-wife communication about family planning, and lower rates of contraceptive use. The theoretical significance of these findings relates to the effect of patriarchy on husband-wife decision-making in the household, or the lack thereof. The extent of spousal discordance appears strongly related to patriarchal living arrangements, and provides partial support to the notion that dual or competing fertility belief systems coexist under the same roof, along lines of gender.

The cultural distinctiveness of Upper Egypt is well known, and is routinely featured in jokes and good-natured references to the region's relative backwardness. More specifically, the sounds and idioms of the *Sa'idi* dialect stereotype the simple nature of Upper Egyptian farmers. One anecdotally hears of newly trained medical doctors, pharmacists, military officers or other officials who come from outside the region complaining about having to serve mandatory duty in Upper Egypt. They are familiar with the heavy accent changes in the language but feel out of place, in a cultural backwater. It is possible that such attitudes contribute to a generally less motivated and respectful system of family planning service delivery.

The practical significance of these findings is that family planning programs should address gender inequality in regions such as rural Upper Egypt, paying particular attention to greater access and exposure to media among men, high levels of son preference, and low levels of contraceptive knowledge. More specifically, targeting husbands in such regions is reasonable, as they appear more accessible, and more favorable to family planning than their wives. The significant husband-wife differences in education, literacy, and exposure to media should not be ignored by policymakers, however, and reducing them should be part of a long-term goal of assuring more equality in the household. These findings do suggest that mutual, rather than disparate background characteristics and attitudes are associated with increased communication about family planning and contraceptive use. In traditional parts of Egypt where various elements of gender inequality and of female seclusion persist, affecting these variables is more difficult. Under these conditions it perhaps makes more sense to design husband-oriented interventions, as they are more accessible, at least in terms of non-clinical approaches. On

the other hand, ensuring that girls stay in school at least as long as boys, and increasing women's exposure to media such as radio and television constitute feasible steps, though with great potential for positive social change. Together with more holistic public health programs, such approaches could eventually lead to the development of common fertility belief systems among husbands and wives.

Notes

- 1 Basu's point is that by comparing the status of women with other women we may lose a measurable sense of gender inequality, but unless absolute levels of women's status are increased there will be little hope for desirable changes in demographic behavior. She does, however, relate low levels of female autonomy in decision-making to greater inequality with males (Basu, 1992:54).
- 2 John Scanzoni (1979), in a detailed review of how power is conceptualized within the family, related power to decision-making as follows: "It was argued that power cannot be analyzed in isolation - apart from intrinsically related social processes. Though it is risky to use the much maligned term 'decision making,' that label was nonetheless chosen as shorthand *construct* to subsume these ongoing inherently linked processes, which include attraction, exchange, exchange rules, distributive justice, negotiation, maximum joint profit, power (nonlegitimate power versus authority), trust, communication, conflict, hostility, and violence" (Scanzoni, 1979: 313).
- 3 The KAP-gap is conventionally measured as the proportion of married women who want no more children but are not using contraception. It thus refers to this discrepancy between practice of contraception and stated reproductive intentions. It is called "KAP" gap because it was first demonstrated with data collected from the number of demographic and family planning surveys conducted during the 1960s and 1970s which included sections on Knowledge of, Attitudes toward, and Practice of contraception.
- 4 Raush, Greif, and Nugent (1979) refer to over 50 studies of communication theory and its applications to the family. Their level of analysis, however, goes far deeper into the meanings and complex

codes of communication used by family members than could be measured at the level of a typical demographic survey.

- 5 Though these scholars critique the "Western" view that communication signifies a more "modern" or egalitarian household, they offer no alternative method of measurement.

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GOVERNMENT HEALTH POLICIES IN THE MIDDLE EAST: THE MODEL OF THE UNITED ARAB EMIRATES

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Introduction

The topic of “Government health policies in the Middle East” requires that certain definitions be established. By “government” I mean not only the main agency for health care, namely the Ministry of Health, but a large constituency of other health care agencies. These would generally include ministries such as the Ministries of Defense, Interior, Education, Higher Education, Labor and Social Affairs; governmental agencies such as the municipalities; parastatal organizations such as the social security schemes; professional organizations such as those of physicians, nurses, pharmacists, and paramedicals; professional societies such as the Societies of Pediatrics, Cardiology, etc; syndicates such as the syndicate of the owners of private hospitals; academia such as medical schools, nursing schools, universities; regional organizations such as the AGFUND, the Arab Board for Medical Specialization; international organizations such as the World Health Organization, UNICEF, and the World Bank; and bilateral agencies such as the USAID, CIDA, SIDA, etc.

There are different definitions of the Middle East. Various international and regional organizations have various countries as members, although a core group remains in all divisions. In all instances, the countries of the Middle East have witnessed a somewhat similar development and transformation in their health care systems, not unlike

the changes that have taken place elsewhere in the last several decades.

In general, most of the Middle Eastern countries had adopted at the end of the First World War the health care system of the colonial power that stepped in to replace Ottoman rule. Government policies were restricted then to preserving society against infectious diseases, epidemics and the perceived hazards of mental patients; the concern of the government and its agencies was essentially non-personal health services and the isolation of patients, in view of their threat to society. Medical care was then assumed by the philanthropic, mostly religious, associations that saw in health care an entry to the population groups and a service to the community. Medical services were relatively inexpensive and could be financed through donations, fees for services rendered and government subsidies. Physicians were educated mostly abroad, until the establishment of national medical schools. Nurses were primarily nuns and auxiliaries that had received on-the-job training in hospital-based institutes.

Between the two World Wars, small clinics and hospitals started to burgeon, either in independent buildings or in apartments, to cater for the private patients of physicians who had returned from specialty training back to their country of origin. Fee-for-service was the predominant method of payment.

The Second World War transformed the health care scene. While in most of the Western countries, health became an undeniably human right, supported through taxation, employers' schemes, insurance companies, social security schemes, or other third party payers, the transformation in the Middle East was slower to come; instead, a more "paternalistic" philosophy prevailed in most of the countries that had achieved independence at that time. Governments became the primary providers and payers of medical services—thus adding on to their more traditional role, the provision of personal health services. Government hospitals, clinics, dispensaries, sanatoria, and laboratories were established across the various states; the services were essentially geared to the medically indigent population, since the more affluent strata of the population could avail themselves of the private sector. This orientation encouraged indirectly the development of the private sector for the wealthier groups; decreased the pressure to change and improve; burdened the public purse, as the costs of medical care escalated as in all countries; and led to the present impasse in the health services, namely, variable and generally sub-optimal quality of care, slow improvements

due to stifling government regulations and red tape, a general lagging-behind in advances in medical care, discontent with the public services, and an increasing shift to private care, either in-country or abroad.

Against the background of these systemic changes, there has been a mixed epidemiologic or morbidity transition, whereby infectious diseases, diseases of developing countries, are co-existing with the morbidity and mortality patterns of developed societies, including chronic disorders. This transformation is evolving rapidly, with the easier accessibility of communications, travel, television, etc. HIV, STD, drug abuse, alcoholism, and addiction have become serious public health concerns, albeit of a far smaller prevalence than in the West due to a number of cultural, religious and societal differences. Traditional medicine is deeply anchored and has gained renewed interest and support, often as an integral aspect of the common heritage of a society.

In view of the diversity of the health care systems of the Middle East, most of this chapter discusses, in some depth, the transformation that is currently occurring in only one country, namely the United Arab Emirates. This model serves to highlight the changes that are taking place, their direction and their impact on the future of health care in the region. Whenever appropriate, additional measures taken in other Arab countries will be highlighted briefly. The health situation in the United Arab Emirates is much like the situation in the five other Gulf Cooperation Council (GCC) countries, namely Saudi Arabia, Bahrain, Kuwait, Qatar and Oman. Moreover, the changes in governmental policies in many other Middle Eastern countries resemble and are somewhat influenced by changes initiated by GCC countries. Finally, additional private investment in health care, in some countries, is being driven by investors from the GCC states.

After the in-depth discussion of the Emirates, I offer in closing some generalizations about health policy in the Middle East as a whole.

Case Study: The United Arab Emirates as a Prototype

The purpose of this case study is to examine some of the available basic indicators of the health care system of the United Arab Emirates (UAE), to relate these indicators to the likely future developments in this sector, and to suggest some effective interventions to support the further development of the health services.

Background

Demographic indicators. The 1995 population of the UAE has been estimated officially at 2.378 million residents. It has also been indicated that the national population represents some 25-30% of this number; thus 70-75% are expatriates living in the UAE for variable lengths of stay.

The population of the UAE was reported to have been only 180,000 people in 1968. By 1975, the population numbered 557,000; it doubled by 1980 to about 1 million to 1.67 million by 1985. The overall increase is 13-fold in 27 years or about 10% per year over that period.

The population has increased about 29% between 1990 and 1995. This increase is predominantly due to the continuing inflow of expatriates, a tide that does not seem to have changed appreciably since 1968. The percent of annual natural population increase has been noted as 1.86% for the period 1990 to 1995; however, this veils the fact that the close to 50,000 annual live births should be related to a far smaller population base than the total population of some 2.4 million, since many of the expatriate population have single status in the UAE; the births of their children are usually noted elsewhere, in the country of origin.

If we consider only the total born to nationals, over their relative representation in the population, we would obtain an annual increase for the national population of some 3.5%, a number far more likely to represent the true state and at par with the population increase in neighboring states.

Conversely, if indeed we assume that most of the segments of the expatriate population have the same annual rate of natural increase (most coming from neighboring countries), then the expatriate population would be overall 55% single, as regards its civil status in the UAE. This is an important determinant for the planning of maternity and pediatric services, as well as an indicator for some other diseases, in the UAE.

The crude birth rate fell from 31.7 to 20.6 per 1000 in the ten year interval 1986-95; the infant mortality rate fell from 11.2 to 10.0 per 1000 in the same period, while the crude death rate has been stable at around 2/1000. These indicators point to the improvement of the health services, particularly in causes of death that can be prevented by immunization or treatment. The neonatal mortality rate has not varied much (7.9 vs. 7.0), indicating the difficult medical conditions faced in the neonatal period (namely, congenital anomalies and deformities). Also, an improvement in maternal services has caused a major drop in maternal mortality. This

may be attributable to the very high percentage of deliveries now occurring in-hospital (some 98.9% of deliveries) under medical supervision.

The total number of births born to the overall population was 49,064 in 1995, 20,733 to nationals and 28,331 to expatriates. Of this number, only 61% were delivered in MOH facilities. Other governmental and private facilities must have delivered the balance.

The population pyramid of the UAE has the characteristic of the migrant nature. While the male/female ratio remains close to one in the age groups 0-24 years and in the age group 65 years and above, it diverges distinctly in the age group 25-64 years, yielding an overall male/female distribution of 2/1, i.e. the male population represents 66.5% of the total population rather than the 1:1 or 50-50 distribution expected in non-migrant societies. This has distinct implications for health planning, in the following ways.

The pediatric population (0-15 years) represents 33.9% of the population. The proportion of children between 0-15 years and women in the child bearing group of 15-45 represent 65% of the total population, reflecting a high dependency ratio, and highlighting the importance of maternal and child health services.

The proportion of those aged above 65 years is only 1.3% of the total population; this geriatric population is likely to be mainly nationals. This is understandable since the majority of expatriates do return to their country of origin upon retirement (60 years in the Civil Service) or when they become incapacitated with disease. For planning purposes, the health care system of the UAE is not over-burdened with the chronic illnesses that usually predominate in the elderly population (that may reach up to 20% in Western societies), and hence the cost of medical care is relieved of this high-cost element of the population.

On the other hand, the fact that a large proportion of the expatriate population has single civil status may present the health care system with different problems, such as sexually transmitted diseases (that are usually not fully documented) and psychosomatic illnesses (equally under-reported). One has to note as well that since the expatriates are in the UAE because they are employed and have a secure job in the country, health problems associated with unemployment are expected to be far less than in other societies.

Mortality indicators. The mortality picture resembles that of developed countries, with a predominance of cardiovascular deaths (20.2%). However, the category of accidents and poisoning ranks second with 16% of the deaths, while tumors account for only 6.3%.

This mortality picture highlights the growing importance of road traffic accidents as a major cause of death, despite the availability of an excellent infrastructure of roads, the insignificant amount of alcoholism in the country, the excellent weather year round, with no snow, rain, sleet or freezing conditions, and the presence of well-maintained vehicles.

The mortality due to cancer may be masked by the return to the country of origin of expatriates afflicted with the disease.

The mortality attributed to infectious diseases has been much reduced due to the excellent provision of preventive and promotive health services, such as immunization, good water supply, good sewer systems, etc. Mortality is now dominated with diseases and conditions related to unhealthy lifestyles such as obesity, smoking, stress, lack of exercise, drugs, etc., much as in Western societies.

Mortality attributed to perinatal diseases stands at 0.26% of the total number of deaths, with a rate of 0.03/1000, down from 1.2/1000 in 1986. One may wonder whether the high prevalence of consanguinity may be partly responsible for these deaths, which are essentially due to congenital anomalies.

The UAE has taken firm action against the spread of AIDS. The UAE has made testing for AIDS mandatory for residents of 18 and over. Over two million screening tests have now been carried out, usually when foreign residents apply for or renew their residence visas. At those times, they are also screened for tuberculosis and intestinal infections. Close monitoring is also carried out at the country's twenty blood banks, both to check the health of donors, and to ensure that no cases of the disease are transmitted through blood transfusions. The UAE has also mounted a drive to maintain self-sufficiency in blood as part of measures to prevent the spread of AIDS.

The outbreak of plague in India in 1994 caused the UAE health authorities to place temporary restrictions on the movement of people and goods between India and the Emirates. The action taken against air and sea traffic was in accordance with international guidelines. The UAE also took effective measures to prevent the spread of the Ebola virus to the UAE from Zaire.

Health care facilities. The Ministry of Health (MOH) operates 29 hospitals, with a total number of 4,346 beds, thus yielding a ratio of 545 persons per bed or a ratio of 1.8 beds per 1000 people. The number of hospitals and hospital beds have not increased appreciably in the last decade, as shown below, in Table 10.1..

Table 10.1
UAE Government Hospital Data, 1986-95

	1986	1990	1995
No. of hospitals	26	29	29
No. of beds	3,952	4,341	4,346
Population/bed	366	425	545
Bed/1000 population	2.7	2.4	1.8
Occupancy (%)	51.9	52.6	56.7
ALOS in days	4.9	5.5	5.3
Admissions as % of population	9.1	8.2	7.1

The infrastructure of hospitals had been essentially completed in the early 1980s. With the increase in the size of the population, some indicators of utilization have increased; still, the average hospital tends to run at around 55% of capacity. However, most of the major hospitals have indeed an optimal occupancy at around 70-80%. The average occupancy of all MOH hospitals is lowered by the low occupancy in the smaller rural hospitals and some of the larger hospitals in the Northern Emirates. The average length of stay (ALOS) is tending to move upward, which may signal a sicker mix of patients admitted to hospitals.

In addition to the Ministry of Health, a number of health institutions operate hospitals, namely, the Department of Health and Medical Services of the Emirate of Dubai, the Military Medical Services, and the oil companies, in addition to the private sector. The total number of non-MOH hospitals is 20, excluding the hospitals of the Military Medical Services. The total number of non-MOH beds is 2,011 (half as many as MOH beds). Non-MOH hospitals employ 957 physicians, 2,665 nursing personnel, and 733 technical personnel. It is reported that together

they cater to 86,575 hospital admissions and close to 200,000 consultations (Table 10.2).

Table 10.2
UAE Hospital Data by Sector, 1995

	MOH Hospitals	Non-MOH Hospitals	Non-MOH as % of Total	Total
No. of hospitals	29	20	41	49
No. of hospital beds	4,346	2,011	32	6,357
Hospital admissions	168,290	86,575	34	254,865
No. of physicians	1,405	957	41	2,362
No. of nurses	4,194	2,665	39	6,859
No. of technicians	1,182	733	38	1,915

Recent developments indicate that the size of the private sector is likely to expand, especially in hospital facilities. In the summer of 1996, the new 100-bed American Hospital started operations in Dubai; in December 1996, it was announced that a new 200-bed hospital was being commissioned in Abu Dhabi, due to be operational at the end of 1998.

The Gulf Diagnostic Center opened in July, 1996. The GDC has brought to the UAE the latest in medical technology and diagnostic procedures, accompanied by a team of highly skilled specialists such as radiologists, pathologists, urologists, technicians, and a nursing staff. The GDC has access to the medical expertise of major medical institutions such as the Mayo Clinic (through the use of telemedicine) and the Cleveland Clinic, thus providing patients with the best consultations.

There is a tendency for nationals to have a higher rate of hospital utilization than expected; if one were to use international norms, the number of admissions of nationals ought to have been around 60,000 per year. Instead, it is 74,250 or 24% higher than anticipated. These numbers exclude admissions outside the UAE, such as for treatment abroad.

One of the Ministry of Health's projects is the Zayed Foundation for Research and Traditional Medicine. The center is the first of its kind in the Gulf, combining scientific research on natural medication, such as the analysis of plants and herbs to study their active treatment components, along with medical treatment using natural medication, and the production of natural herb- and plant-based pharmaceuticals. Popular medicine or medication using natural drug-free methods has always been an important form of treatment amongst UAE nationals and is part of Arabian culture. This center not only provides a new dimension to medical and biological research, but also helps preserve important ancestral customs.

Not only does the UAE take a strong interest in the development of health facilities for its people within the country, but it has also made investments overseas. Among these, the HCI International Medical Centre in Glasgow, UK, is of particular importance. The 260-bed Grand Hospital, which forms part of the center, serves patients from different parts of the world and particularly the UAE.

The Ministry of Health's outpatient facilities include the primary health care centers, the maternal and child health centers (MCH), the school health system, and the dental clinics. There were 98 major MOH PHC centers in the UAE in 1995. All in all, some 3.6 million visits took place in these PHC centers in 1995, generating 77,000 referrals for further care and medical opinion (a rate of about 2%).

Of significance is the fact that these 98 PHC centers, which are spread all over the UAE, had only 137,000 persons registered, or only 6% of the total population. Nationals and expatriates had similar rates of registration. These rates are indeed low, particularly since the PHC center is expected to be the first entry point into the health care system of the UAE. Registration is also required for all health services; recently new legislation has been enacted to require the registration of all expatriates. This may increase dramatically the number of persons registered, but not necessarily their utilization of the services.

Health manpower. The Ministry of Health employs 1,937 physicians. Physicians constitute 20% of the health professionals. Two-thirds of the physicians are males and only 10% are nationals. All specialties are represented. There are 1,227 persons per physician, and 2.24 beds per physician. One needs to remember that these are only MOH physicians,

while the denominator is the totality of the population, inclusive of Dubai.

Nursing staff number 5,235, of whom 75% are professional nurses. They represent 54% of the health manpower employed by the MOH. Of the nursing personnel, 84% are females and only 2% are nationals (mainly assistant nurses).

Paramedical technical staff number 1,499. Together they constitute 16% of the health team; 56% are males, and 6% are nationals. The majority of the paramedical personnel is employed in MOH hospitals. There are 694 medical laboratory technicians, who analyze some 10 million tests, a rate of 4.2 tests per person. Radiology/imaging technicians number 345; they process 750,000 radiological examinations on 626,000 patients, an annual rate of 0.32 exams per person. The radiological examinations are mainly routine X-rays. The Ministry of Health employs also 69 physiotherapists, 22 optometrists, 51 respiratory therapists and 51 nutritionists/dieticians.

Pharmacy manpower consists of 197 pharmacists and 465 assistant pharmacists. Together they form 7% of the health professionals; 68% are males, 4% are nationals. Some 5 million prescriptions are dispensed yearly, or about 2 per person per year.

The private sector employs an additional 847 pharmacists and 391 assistant pharmacists, working in 458 private pharmacies and 86 pharmaceutical stores.

Financing the medical services. The 1995 Ministry of Health Federal budget amounted to 1.26 billion dirhams (1 US dollar = 3.68 dirhams). About 71% of this budget pays the salaries and benefits of Ministry staff. About 25% is spent on general services, including pharmaceuticals (13% of the total budget), and treatment abroad of some 190 referrals (3%). Some 4-5% is left for equipment. The federal health budget is actually spent to the tune of 92% of the budgeted figures.

The Federal health institutions are supported by contributions from the local governments, primarily the local government of the Abu Dhabi Emirate. Additional resources are spent on the health services of the military forces from the Ministry of Defense budget. The oil companies have their own medical services for their staff and dependents. The Emirate of Dubai manages and operates its own hospitals and health centers. The Crown Prince Courts of Abu Dhabi and Dubai cover costs of treatment abroad of several thousand nationals. The private sector is

financed by payments from national and expatriate clients. Health insurance companies have made their entry in the last two years. Some of these companies are national companies, others are branches of international concerns.

The Abu Dhabi authorities in the late 1980's instituted an offset program. Under it, defense sales contractors are required to invest an amount equal to 60% of their contract in the UAE. The terms of investment and amount are subject to negotiation with the UAE offset office, which must approve each investment project. The projects must show a profit after seven years. The contractor may not own more than 49 percent of the project. The remaining 51% must be held by UAE nationals. By July 1995, the program had resulted in 22 projects.

Problems

An observer reviewing these data might conclude that the United Arab Emirates enjoys an enviable health care system, for the following reasons:

- The United Arab Emirates has a relatively small population, and only 1.3% are above the age of 65 years. Most of the chronic cases amongst expatriates return home for treatment and retirement.
- All families, whether nationals or expatriates, have at the very least an acceptable income and a dwelling. The diseases associated with poverty are thus minimal. Health care is free to all, nationals and expatriates, except for minor charges that all can afford and that can even be waived in case of financial need.
- The country has a modern infrastructure in all its sectors. Thus diseases associated with poor water systems or poor sewage disposals are minimized.
- The prevention of illnesses, whether by public health measures (such as food control, inspection of imports, etc.), immunization programs, health education, school health, etc. is advanced by any standard and is in most cases free. There is no financial toll to the care seeker.

- The health institutions (hospitals, health centers, dental clinics, etc.) have all been built relatively recently, are clean and well equipped generally. The UAE has one of the highest ratios of beds per person.
- Health manpower is available in all facilities, and generally in good ratios, whether physicians (all specialties), nursing staff or paramedical workers. Ratios of manpower to population for the MOH alone and for the country as a whole are indeed very favorable.
- The expenditures on health care are sizable if one considers the relevant contributions of all departments, ministries and agencies.

In view of the above, and of many other similar arguments and points in favor of the current health care system, why does the perception remain that the health care system is not what it should be, that the quality of care in its facilities leaves much to be desired, that it needs major overhauling, etc? Why is it that patients prefer to be treated abroad, despite the pain and cost associated with it? Why is it that patients seek in increasing numbers the private health care sector of the UAE?

I shall attempt to respond to some of these queries by reviewing first the macro-level of the health care system of the UAE:

1. Health care in the UAE is first and foremost the responsibility of the Federal Ministry of Health. Thus it is essentially a public and a governmental responsibility. Being so, it is regulated by mandates issued by supra-ministerial bodies such the Civil Service Commission, the Budget Bureau, etc. The supra-ministerial regulations affect all ministries and all sectors, since these agencies are indeed created to do just that, namely, to streamline governmental roles and regulations, policies, procedures, and systems.

However, the Ministry of Health has distinct features that differentiate it from other ministries and governmental agencies, namely:

- a. A very large proportion of the Ministry of Health employees is technical (9,611 out of a total of 14,000-15,000 employees, or some 65-70%).
- b. Disease and sickness require continuous monitoring and the availability of care around the clock, in health care facilities. Although skeletal staff and on-duty personnel assure continuity of care, it is difficult to provide optimal care when the hospital is on a 6-hour shift per day, 5 days per week. Medical professionals cannot

provide an adequate service if the official schedule is 7:00-13:30 or even less. Illnesses are unpredictable, and care is highly inelastic.

c. Flexibility is essential in the management of health care facilities. These facilities may run short of medical supplies, pharmaceuticals, office supplies, or reagents, even with careful planning. Decentralization and devolution of authority are required for the management of health care facilities.

d. Health care is labor-intensive and labor-sensitive. The quality of the staff is essentially what differentiates the service provided and the quality received. The process of change in a health care system is the basic client-provider relationship. It is this relationship that determines the outcome, and transforms the input to become the output. This "one-to-one" relationship cannot be replaced by facilities or technology.

Nonetheless, under the current system, the emoluments paid to physicians and nurses in line with Civil Service Commission standards are generally not high enough to attract Western-trained professionals in large numbers, or in numbers large enough to maintain a "critical mass" of professionals capable of inducing and sustaining improvement.

However, the selection committees are flooded with candidates seeking employment in the UAE. Many of the candidates are even willing to accept grades and positions inferior to those they are entitled to by law. Thus there is a large supply available, and the Civil Service and the Ministry of Finance see no reason to revise the current salary structure. This structure has not been revised since 1979, despite the yearly increase in the cost of living since then.

With time, health professionals, who may have been full of zest initially, become disillusioned because no incentives have been offered. Their professional growth may also have been stemmed because they have not had the opportunity to work in Western health facilities (due to licensure restrictions). The programs of continuing education have been episodic and often unplanned and ineffective. The quality of care offered by the physicians, nurses, and technicians is thus bound to deteriorate over time. The morale sags as well. This climate does not encourage the recruitment of new and highly qualified professionals, who are concerned to maintain their professional growth and update their skills and knowledge. These merely agree to come for short visits and consultations.

2. Financing the health services presents its own set of problems. Like all countries that have essentially a publicly-financed health care system, the Ministry of Health has to compete with any and all other sectors for federal monies. With the increase in public spending, the decrease in the state revenues, the rapid escalation in the cost of health care, and the increase in the number of people it serves, etc., the monies allocated by the federal budget are always going to remain less-than-what-is-expected-and-wished. Health care has almost no ceiling, because the mere availability of the supply generates the demand for medical services. Furthermore, there are currently few if any barriers to health care: there is no financial toll, little queuing, no problems with accessibility, few social inconveniences, etc.

Health officials have to date relied on additional monies being disbursed from the local government and complementing the federal budget. The sums have grown to be quite substantial. But even with that additional source, more is needed. One new source is co-payment through some basic forms of cost sharing, which yielded 0.5 million dirhams to the Ministry of Health in 1995. Clearly more will need to be done in that field, particularly with the advent of third party payers into the health care scene. The writing is on the wall nevertheless; few things are likely to remain free, even in rich countries.

3. The "political" pressure that could assist in the further development of the health services has been reduced by the overseas treatment of large numbers of nationals, estimated variously at some 5,000-6,000 per year. The referral of nationals for treatment abroad generates benefits for many parties: the patient himself and his escorts (family), the medical centers abroad that compete for referrals, and the hotels, car rental companies, interpreters, private physicians, and laboratories benefiting from the presence of sponsored patients from the UAE, at a time of financial duress for health care facilities in the West.

Overseas treatment releases any pressure that may build up to further improve the quality of service in the UAE; it also saps the confidence of the nationals in the health care system in its totality. Hence the circle is completed, with more and more patients going abroad, and less and less pressure to improve the national system. Moreover, it is rather difficult to support the further expansion of a health care system that caters essentially to expatriates, without any contribution from either employers or clients.

4. The "professionalization" of the management of the health care system, although already initiated, is still far from being complete. Professional systems in procurement and materials management should assist in the provision, distribution, and monitoring of pharmaceuticals and medical supplies. Useful and timely information systems are urgently needed to provide decision-makers with well-analyzed options and recommendations. Financial systems and cost analysis have lagged behind because of the public nature of the health care system and the minimal urgency to contain cost. Quality control, medical and nursing audit, and other evaluation systems need to be established at the core of medical services.

5. The "nationalization" of the health professionals has also lagged behind, despite the efforts made. As noted above, only 10% of the physicians, 2% of the nurses, 7% of the dentists, 4% of the pharmacists and 6% of the paramedical staff are nationals. Nationalization contributes to continuity, to pressure for improvement, and to outreach within the community of nationals, all yielding power and inducing change. Persons who are well known to the decision-makers and who are permanent in the land have greater credibility.

6. The development of a professional environment within the health care system needs to be accelerated. Health professionals need to be assured of their tenure, of their immunity should medical malpractice occur. Likewise, since these professionals serve all segments of the population, their skills and knowledge have to be updated and maintained. Re-licensure must be required of all health professionals who deal with clients and patients.

7. The "registration" of clients, whether nationals or expatriates, must be encouraged and indeed required. As noted above, only 6% of the total population had registered in PHC centers. Unless the registration process becomes effective, it will be difficult to rationalize the process of patient care, referral and follow up.

Possible Solutions

Some of the health system problems noted above might be solved in the following ways:

1. Some groups favor the contracting out of some or most of the major MOH hospitals to private management companies of proved competence. Such an interest is fueled by the concern to maintain quality of care, contain costs and obtain value-for-money services.

Interest has also been expressed in the establishment of a private national company for the management and delivery of health services and health related programs. This interest is to be seen against a background favoring a degree of privatization in the health care sector of the United Arab Emirates as well as in many other Gulf countries.

Management companies for health care facilities have yet to be established in the United Arab Emirates, and to a large extent, in the rest of the Arab World. Perhaps the primary reason for this is that in most Arab states, the public sector is overdominant. Private entries in health had to be, by necessity, modest and limited, for it remains hard to compete with a government-sponsored service which is free at the point of delivery. On the other hand, some governments have been relatively insensitive to the cost of medical care, or insensitive to the low quality of care provided to their citizens.

In some countries, notably the Kingdom of Saudi Arabia, national management companies for health care have been established, often as joint ventures with well-known Western companies. These national companies have developed primarily by winning government-financed contracts for the management of hospitals. What remains unclear is the size of the national expertise and manpower involved in the actual management and operation of contracted facilities.

It is anticipated that the national management company would submit its bid supported by the credibility and expertise of the international management company. The national company remains however the primary contractor should the bid be successful. With proper planning, after a few years the capacity and expertise of the national company, along with its network, would have been developed adequately. By being the primary contractor, the national company oversees the performance of staff and has inside information that insures control and builds up for the future.

The primary advantage of the national company lies indeed in what the international company prefers not to be, namely to be the primary contractor. International companies, particularly in the Arab World and the GCC countries, opt against entering into bids and placing money up front. In this aspect, the national company has a definite edge

in the negotiations and indeed is better placed to secure its payments and advances on time. In view of the delays that are usually associated with reimbursement, a mezzanine facility of payment would be required to settle payments on time.

The national company, while under the mother agreement with the international company, may bid for smaller projects and contracts, given the entry it already has established in conjunction with the international company. By so doing, the national company acquires additional expertise of its own, in preparation for future contracts. The national management company may develop its own subsidiaries or may subcontract certain services such as catering, laundry, or staff accommodation. At the same time, the national company could second some of its junior national staff to the contracts with the international management company, in order to prepare these health professionals to assume responsibilities in the next round of negotiations. Such national expertise may also become a resource for national subsidiaries in information systems, materials management, quality control, and manpower recruitment as they learn the trade from the major international company.

2. While the contracting of one or more hospitals (or of any other facilities) to the private sector or to a voluntary group is possible, and may well be envisaged, the overall responsibility for the health sector cannot but remain the purview and *raison d'être* of the Ministry of Health. The Ministry cannot relinquish its constitutional authority in promulgating legislation, planning, monitoring, provision of non-personal health services, quality control, emergency services, etc. The Ministry could only relinquish, if it wishes to, the managerial and operational levels, not the strategic and control layers of authority and responsibility

3. Management companies will be relatively free of control by public bureaucracies. Private management also provides for flexibility, instant action, immediate response with no strings attached. Administrative and financial systems have usually been well tested and are usually efficient.

4. Another option consists in twinning hospitals, in their entirety, or some of their departments, with centers of medical excellence internationally reputed for the excellence of their medical care and their educational capabilities. To illustrate: the cardiovascular program in

Hospital X in the UAE enters into an agreement with academic center Y in the USA. The US-based center supports the department through the secondment of a senior professional to the department, for a limited period of time. This senior professional assists the department in the hospital, as well as other officials, in defining up-to-date professional systems for patient care, education, and training. The housestaff training program is strengthened. Visiting staff contribute to the continuing education of the other members of the department. Quality control is assured by a monitoring team set up with the academic medical center.

The seconded professional is willing to spend perhaps two years in the UAE, returning after that assignment to the home institution. Professional growth has not been risked, but has been strengthened through the assignment in the UAE. Contacts have not been lost with peers in the USA, because the seconded professional did return home on annual leave, reestablishing contact with the academic medical center where office, staff, and peers are located. The professional kept abreast with new knowledge through these trips and through the visits of consultants in the UAE.

The hospital or department in the UAE has by this means defined a preferred relationship with the academic medical center in the USA. The public's perception of the quality of care in that hospital or department has been enhanced. The original staff have benefited from the exposure. Medical students and housestaff now have a far better chance to join that academic medical center in the USA to continue their graduate education.

The academic medical center in the USA succeeds through this twinning program in accessing the health sector of the United Arab Emirates. The center becomes better known. More patients may now be referred for treatment there. More of its staff may be invited for consultations and conferences. It could encourage the initiation of joint international projects and research. It is a win-win situation for all.

5. Private sector facilities and manpower ought to be carefully monitored. As it stands currently, the perception of the medical services they provide is not complimentary, for most of the practitioners and facilities. Efforts are needed to monitor quality of care and encourage the formation of group practices, outpatient facilities, mono-specialty hospitals, and larger general hospitals.

6. Health insurance companies are likely to increase and widen the scope of their operations. HMO-like arrangements are imminent, with some association and affiliation with medical centers abroad (regional and international) as well. This vehicle may well serve to promote cost sharing, particularly if the employers and employees were to contribute to the premium.

Health Policies in the Middle East

Common Features

1. Government policies in the Middle East have supported in full the international acceptance of primary health care as the gateway to health. The Alma Ata declaration of 1978 and the Health for All resolution of the World Health Assembly of 1979 have both been endorsed by ministries of health in Middle Eastern states. In many countries, the commitment of the State to provide comprehensive, longitudinal, and accessible care has been promulgated in constitutions, declarations, and decrees. The support given to these policies by regional and international organizations has been of paramount importance.
2. In parallel to primary care, government policies have also supported the establishment of environmental regulations; safety standards for industry; waste water and sewage treatment facilities; assurance of clean and safe drinking water; and food inspection. These measures have also been supported by special programs endorsed by the international medical and health community. The United Arab Emirates established in 1993 the Federal Environmental Agency; other countries chose the Ministry of the Environment as their vehicle to safeguard the environment.
3. Within the medical specialties, Family Medicine has been the subject of government support, either alone or alongside Community Health. Family Medicine and Community Health was the domain of one of the first five scientific councils established by the Arab Board of Medical Specializations, an institution created by the Council of the Arab Ministers of Health.

4. The education and training of health professionals in general, and of physicians in particular, have been the subject of numerous government policies and regulations in the Middle East. Beginning with the early 1970s, the formation, both in-country and abroad, of physicians accelerated, so much so that in the early 1990s, a surplus of physicians has become a common denominator in the Middle East. With the ever-present concerns about cost, this oversupply of physicians has been causing alarm in Government agencies, professional associations, and orders of physicians. There are related concerns with the quality of the education provided and the placement of these physicians upon their return from overseas training. Of concern to government has been the shortage of nursing manpower, as well as other paramedical and administrative health professionals, so acutely needed by the various government and private institutions.

5. The provision of quality care has been an important stated goal of governments all over the Middle East. Unfortunately, public perception has identified this as the major flaw in government-managed health facilities; this has led to the blossoming of the private sector in medical care. The quality of care is directly related to the quality of health manpower. Government legislation has been a main hurdle in assuring the recruitment of superior staff, in view of the constraints imposed by Civil Service regulations and Ministries of Finance.

6. The cost of medical care has been the primary focus of government policies in health care in the past several years, in the Middle East as much as elsewhere. Even wealthy countries, such as the Gulf Cooperation Council member states, have realized that the spiraling cost of medical care had to be checked; the need for private sector partnership has been significantly accentuated. It has become evident that there is no ceiling to the demand for medical care. Paternalistic attitudes, prevalent in former times, were no longer satisfactory. Governments are encouraging the private sector to share some of the burden of health care, primarily in curative medicine.

In view of this explicit or implicit encouragement, the private sector has seen a window of opportunity. Unlike the situation a generation ago, the private sector is now predominantly for-profit, proprietary and investor-led, as distinct from the voluntary, community-led, or charitable organizations that provided medical care in the fifties and sixties.

However, one should note that the impetus for the development of the private sector has been the payments by government for patients treated at the private facilities.

7. Opportunities for private investment in health care have not been limited to the provision of medical services. The pharmaceutical industry has long been handled by the private sector, with governmental agencies as their primary clients. Slow to develop, the in-country production of medical supplies, vaccines, and sera has gathered momentum of late, particularly with the call to national or regional self-sufficiency in these sectors. Likewise, in the past few years, the introduction of modern technologies in health care has been entirely in private hands, such as the opportunities in telemedicine, video-conferencing, and optical scanners. Currently interest is gradually building for the leasing of medical equipment. Medical leasing has the advantage of transforming a capital cost into an operational cost as well as ensuring state-of-the-art medical equipment.

8. A role of national ministries of health in private health services systems has been the establishment of guidelines and licensing for private hospitals and diagnostic centers. Private health care organizations have centered on outpatient curative services, in most Middle Eastern countries.

9. In some countries of the regions, particularly Jordan and Lebanon, there is a growing group of visitors who come mainly or solely for the excellent health care facilities. Private medical treatment in Jordan for non-Jordanians is a growing business and an increasingly important revenue earner for the country. The combination of highly qualified Jordanian physicians and other medical personnel, first-rate facilities, and costs which are much lower than in other countries makes Jordan highly competitive in the health care business. This success has meant that cases are coming in from all over the Middle East. Private hospitals in Jordan now constitute 29% of the total number of beds in the country; this is greater than the share of the military medical services (24%). The ministry facilities constitute 40% of the total hospital beds.

Forthcoming Trends

Government policies in health care are expected to transform the roles of various state agencies. The role of the state in non-personal health services will continue as it has always been. It is likely, however, that the state will increasingly assume important functions in monitoring the health scene, in financing medical care either directly or through third-party payers, and in manpower planning and licensure. In addition, various incentives are likely to be introduced to encourage the private sector to address national priorities and respond to needs.

These functions are likely to require a different set of organizations and staffing in the central, regional, and district health agencies; the indirect costs of the provision of health care will devolve on the health facilities that provide care directly to the population. Appropriate regulations and systems will need to be introduced as this metamorphosis is undertaken.

The cost of medical services will need to be borne by the state as well as by clients and perhaps by employers. Cost containment measures such as copayment and deductibles will be introduced to support the transformation. Competition by various private providers of medical services will assist in cost control. Government agencies will continue to monitor the quality of care provided, as well as assure accessibility to medical services, particularly in life-threatening situations. It is also likely that catastrophic illnesses of all types will continue to be supported by the public purse, as well as halfway therapies, such as renal dialysis, chronic long-term illnesses, and rehabilitation.

Health insurance and third-party payers are also expected to continue their rapid expansion. Employers and the corporate world are likely to provide part of the premiums for health care to their staff.

The role of the state should be based on a social compact between the state and the private sector. This is because, more than ever before, the private sector is now expected to carry much of the burden of future development in many of the countries of the Middle East. The government is expected to ease regulations to make this process possible. However, the private sector must lend a hand in solving problems of human development. The compact should be voluntary and open to continued discussion between the two sides.

Figures from Egypt (below) highlight the fact that while public expenditure on health in Egypt is quite comparable with the group of

newly industrialized countries, private expenditure on health is quite low. Again, this implies that the government must devise ways to bring in the private sector to provide health services, both in the form of health insurance schemes and in the ownership and operation of health care units. The government could then reduce investment in curative health care and encourage private investment in that area, while increasing investment in preventive medicine and primary health care.

Table 10.3
Life Expectancy and Health Expenditure in Selected Countries

	Life Expectancy at Birth (years)		Expenditure on Health (as % of GDP)			
			Public		Private	Total
	1960	1992	1960	1990	1990	1990
Japan	67.9	78.6	5.3	...	...	9.9
Hong Kong	66.2	77.4	1.0	1.1	4.6	5.7
Singapore	64.5	74.2	0.2	1.1	0.8	1.9
Korea	53.9	70.4	...	2.7	3.9	6.6
Taiwan	...	...	...	0.3	...	...
Indonesia	41.2	62.0	1.1	0.7	1.3	2.0
Malaysia	53.9	70.4	0.4	1.3	1.7	3.0
Thailand	52.3	68.7	0.6	1.1	3.9	5.0
Egypt	49.0	65.0	...	1.0	1.6	2.6

Functions of the Private Sector

Government sees in the private sector the following functions and responsibilities:

1. Job creation: the health sector remains a major employer. Moreover, being in a state of continuous change and development, the training and education of staff members in the health sector are better carried out by the private sector.

2. Government sees that the private sector is capable of creating small businesses that could respond rapidly to market needs in health services. The diverse activities that characterize medical services, as well as technological advances, encourage the formation of small business. Tax credits, easy loans, and access to credit are institutional tools that the government can use in encouraging the private sector in this sphere.

3. The private sector's main advantages are perhaps its capability in raising capital and ensuring efficiency and flexibility in management. To invest in the social infrastructure requires, however, access to information and a partnership with the public sector so that both sectors work together in complementary fashion. Price liberalization is critical in certain countries of the Middle East, to encourage the private sector to invest in the provision of medical services.

4. Efficiency and flexibility are difficult, if not impossible, to provide in government-led medical services. Government, in the Middle East as elsewhere, has to work through legislation and decrees. These require ample discussion in representative bodies, causing delays. Furthermore, political representatives are often affected by ulterior motives in deciding on legislation.

The private sector can also capitalize more readily on technological advances, research and new ventures. It seeks profits, and if these can be assured and controlled, investors can readily move in, unlike government.

5. The partnerships between public and private sectors could be promoted if the government could assist the private sector in the promotion of its exports and could remove trade barriers that may exist between countries. This is a trump card that could be used by the government as an incentive to the private sector in exchange for which the private sector could respond more readily to the goals and objectives set by the public sector in health care.

6. The professional associations, such as the orders of physicians, nurses, or pharmacists, should adopt codes of ethics. This could assist in the elimination of gender bias, and lead the professionals to police their own ranks more actively.

7. The government may legislate to protect the environment, and create incentives for the private sector to take active steps in that respect. Technology transfer, education, training, and research are functions that can be ascribed by government to the private sector, particularly academic institutions. Subsidies and grants are beneficial in this respect.

Conclusion

This chapter has attempted to portray the changes that are facing the health care systems in many of the countries of the Middle East. The United Arab Emirates has been used as a prototype to delineate the reasons for these changes and some of the solutions that have been proposed to address emerging problems. The private sector is seen as a partner to governmental agencies in providing quality medical services that are accessible to the public. The government's roles are proposed to be primarily in strategic planning, programming, assurance of quality, financing, creating incentives, and regulating services. The government has by mandate the responsibility to provide the non-personal health services through its police power and its ability to legislate.

The Middle East has been described as an area awaiting major transformation in the provision of medical care. The role of international and regional organizations, as well as of bilateral assistance agencies, is portrayed as assisting the governments to define the functions that they wish to delegate to other players in the health scene, and to restructure the health sector in an optimal manner, through the enactment of enabling legislation, the use of administrative policies, and support in the provision of professional advice and technology transfer.