

**THE BURDEN OF DISEASE IN
THE WEST BANK AND GAZA
AN ASSESSMENT REPORT**

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Submitted by:

LTG Associates, Inc.
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Submitted to:

The United States Agency for International Development
in the West Bank and Gaza
Under Contract No. HRN-I-00-99-00002-00

February 2000



The Burden of Disease in the West Bank and Gaza: An Assessment Report, was prepared under the auspices of the U.S. Agency for International Development (USAID)/West Bank and Gaza under the terms of the Monitoring, Evaluation, and Design Support (MEDS) project, Contract No. HRN-I-00-99-00002-00. The opinions expressed herein are those of the authors and do not necessarily reflect the views of LTG Associates, TvT Associates, or USAID.

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ACKNOWLEDGMENTS

The assessment team would like to express its appreciation and gratitude to the Palestinian Ministry of Health officials, their staffs, and the experts and professionals (who are listed in annex H) who graciously shared their valuable time, effort and expertise in assisting the team in undertaking this assessment. The team would like to thank the following:

- Mr. Jack Thomas and Dr. Taroub Faramand of the United States Agency for International Development (USAID), who invited the team to the West Bank and Gaza (WB/G) and supported the team throughout its visit;
- Ministry of Health staffs in Ramallah, Nablus, and Gaza, who shared their valuable time meeting with the team, providing expert information and their perspective on the state of Palestinian health;
- Palestinian professionals in the medical, university, and research communities and in the health nongovernmental organizations;
- Donor community representatives in the West Bank and Gaza, who shared their expertise, views, reports, and data; and,
- Dr. Kai Spratt and Ms. Mellen Tanamly, for data on the status of HIV/AIDS and nutrition in the West Bank and Gaza, respectively, from their individual studies, which greatly informed the assessment.

The assessment team hopes that the report contributes in some measure to understanding the factors and issues pertaining to the profile and burden of disease in the West Bank and Gaza.

ACRONYMS AND FOREIGN TERMS

ANC	Antenatal care
ANE/SEA	Asia Near East Bureau/Southeast Asia
ARI	Acute respiratory infection
BCC	Behavior change communication
BCG	Bacillus Calmette-Guérin; tuberculosis vaccine
BMI	Body mass index
DALYs	Disability-adjusted life years
DTP	Diphtheria, tetanus, pertussis
EHP	Expanded Health Project
EMR	Eastern Mediterranean Region
EPI	Expanded Programme on Immunization
FETP	Field Epidemiology Training Program
GDP	Gross domestic product
Hib	Haemophilus influenza type b
HIV/AIDS	Human immunodeficiency virus/acquired immune deficiency syndrome
MCH	Maternal and child health
MDR	Multidrug resistant
MIS	Management information system
MMR	Measles, mumps, rubella
MOH	Ministry of Health
NGO	Nongovernmental organization
NIS	New Israeli shekel
ORS	Oral rehydration solution
PCBS	Palestinian Central Bureau of Statistics
PHC	Primary health care
PHP	Pilot Health Project
SO	Strategic Objective
TB	Tuberculosis
STI	Sexually transmitted infection
UNICEF	United Nations Children's Fund
UNRWA	United Nations Relief and Works Agency
USAID	United States Agency for International Development
WB/G	West Bank/Gaza
WHO	World Health Organization

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EXECUTIVE SUMMARY

The demographic and health situation of the West Bank and Gaza (WB/G) is unique. National health indicators mirror those of a developed country, yet WB/G retains many of the characteristics of an underdeveloped country in its economic development status. A health team commissioned by the United States Agency for International Development (USAID) Mission in WB/G conducted a burden of disease analysis in February 2000 to gather information on the current disease profile. Because of limited epidemiological data, as well as limited information on health expenditures for each disease, the health team was not able to conduct a rigorous burden of disease analysis. However, the team was able to use the limited information to produce findings and recommendations for informing the conceptualization and design of the USAID Expanded Health Project (EHP).

Based on the available information, an epidemiological transition appears to be well underway in WB/G. The leading cause of death among Palestinians is noninfectious diseases (50 percent of all deaths), with the balance caused by infectious diseases (13 percent), neonatal and infant conditions (8 percent), injuries and accidents (5 percent), and other causes (24 percent). The incidence of deaths due to noninfectious diseases is higher in the West Bank (57 percent versus 40 percent in Gaza), while the incidence of deaths due to infectious diseases is higher in Gaza (18 percent versus 10 percent in the West Bank).

Deaths due to neonatal and infant conditions in Gaza are more than twice those in the West Bank (12 percent versus 5 percent). The primary causes of morbidity in infants less than one year old are neonatal/infant conditions and infectious diseases. At particular risk are infants less than 28 days old; this cohort accounted for more than 50 percent of deaths in the younger than one-year age group. One third of all infant deaths occur at home. Respiratory infections and diarrheal diseases remain important causes of child morbidity and mortality. To a large extent, the latter conditions are due to poor sanitary and environmental conditions (only 35 percent of households are connected to sewage networks although, reportedly, most homes have access to some form of sewage disposal). An effective immunization program and other child survival interventions have resulted in infant and child morbidity and mortality rates that are among the lowest in the region, if not the world. In order to protect the health of future children, investments in immunization and other child survival interventions need to be continued.

Preventable injuries from traffic accidents, burns and poisoning are prominent causes of childhood mortality and account for more than one fourth of the deaths in children between the ages of one and five. Preventable accidents and injuries are also responsible for almost one third of all deaths among the 5–39 year age group. Cardiovascular disease and cancer are responsible for 58 percent of all deaths in middle-aged adults (40–59 years); for older adults (over 60), these conditions cause 49 percent of deaths.

Beyond typical diseases and health conditions, other factors affect the health of Palestinians. The sociopolitical situation, restricted social mobility, low status of women, and limited economic and recreational opportunities contribute to high stress levels among the adolescent and adult populations. Women are also exposed to various degrees of domestic violence and this constant threat affects women's mental health.¹ The combination of stress, dietary habits and sedentary lifestyle is most likely contributing to hypertension, heart disease, stroke, cancer and other noninfectious diseases, such as diabetes mellitus.

As the epidemiological transition is taking place in WB/G, exponential population growth and population momentum are taking place at the same time. The overlap of these phenomena presents a major public health and development problem for Palestinians. Policymakers, political leaders, and program planners need to be aware of the implications of this problem and the need to respond with nontraditional and innovative ways in national development planning and in changing social norms.

¹*West Bank and Gaza Medium-Term Development Strategy for the Health Sector: A World Bank Country Study*, World Bank, Washington, D.C., August 1998.

I. INTRODUCTION

The Palestinian economy is small and poorly endowed with natural resources, especially in light of the separation of the economies of the Palestinian Territories. In 1997, the gross domestic product (GDP) per capita was \$1,304, a decline of 3.5 percent from 1992. There is severe economic hardship among the Palestinian population living near or below the poverty line. At the lower income levels in Palestine, nutritional problems are related more to the balance and quality of food in the diet than to dietary energy intake. Many nutritional disorders result from an inadequate dietary balance because the poor often cannot afford the variety of food that promotes good health.

According to the 1997 census, the Palestinian population is 3,105,892, with 1,873,476 in the West Bank (60 percent), 1,022,207 in Gaza (33 percent), and 210,209 (7 percent) in East Jerusalem. Refugees make up 41.4 percent of the national population (65 percent in Gaza and 27 percent in the West Bank). Many of these people have been displaced for over 50 years and have access to a wide range of free health services provided by the United Nations Relief and Works Agency (UNRWA). As of 1997, according to the Palestinian Central Bureau of Statistics (PCBS), the population was growing at a natural rate of increase of 3.97 percent, or at 5.8 percent, with net migration included. The total fertility rate for the West Bank and Gaza (WB/G) was estimated at 6.1 children per woman (5.6 in the West Bank and 6.9 in Gaza). The population density in the Gaza Strip is 2,700 people per square kilometer; in the West Bank, it is 300.² The population is young, with 47 percent under age 15. Fifty-eight percent of the population are younger than 19, and 21 percent are of reproductive age. The average age of marriage is 18 for females and 23 for males. About 5.2 percent of the population are elderly (age 60 and over), and 1.8 percent of Palestinians (46,063) have moving, seeing, hearing, or mental disabilities.

The health infrastructure is predominantly public sector. The Ministry of Health (MOH) runs 178 primary health care (PHC) centers in the West Bank and 29 in Gaza. Nongovernmental organizations (NGOs) operate 210 PHC facilities and one third of the total number (1,959) of hospital beds.³ UNRWA supervises 22 medical clinics in the West Bank and 11 in Gaza, providing free health care to refugees, especially primary health care. About 61 percent of the population has health insurance coverage, 39 percent from the government and 18 percent from UNRWA, with the remaining 4 percent covered by private insurance. The West Bank and Gaza's health expenditures make up about 9 percent of the GDP, which is one of the highest in the Asia and Near East region. Part of the reason may be the orientation towards curative treatment and recent large investments made on building the health infrastructure. The Palestinian Authority's budget for health is the second largest among social services (education is the largest).

² Palestinian Central Bureau of Statistics, 1997.

³ M. Barghouthi and J. Lennox, *Health in Palestine: Potential and Challenges*, March 1997, Palestine Economic Policy Research Institute (MAS), Discussion Papers.

In the health sector, the Palestinian Authority faces a number of major challenges in building an effective and integrated health system. Health services are fragmented, with the various service providers (MOH, UNRWA, NGOs, and private sector) needing to streamline their own policies, goals, and areas of interest. Health facilities are not well equipped and, in many areas, are in need of urgent upgrading and repairs. Many health care personnel lack up-to-date technical skills and management training. The system is curative based, and complementary preventive and promotive health strategies are largely inadequate.⁴ However, there are some existing MOH programs that focus on prevention and public health, including maternal and child health; family planning; immunization; health for school children (medical, dental, psychological, and health education); environmental care; laboratories and blood banks; physical medicine and medical rehabilitation; oral health; mental health; and, prevention and control of endemic diseases.

Another significant challenge facing the Palestinian Authority is the epidemiological transition currently taking place. This shift from infectious to noninfectious diseases as the leading cause of mortality and morbidity is also being seen in other developing and mid-income countries. In the words of health experts following this global trend, noninfectious diseases are becoming the “emerging epidemics.” Conditions such as cardiovascular disease (heart disease, stroke, and hypertension) and cancer are not only expensive to treat, but they also affect the most economically productive segment of society.

⁴ UNICEF Master Plan of Operations for the West Bank and Gaza, 1998–2000.

II. PURPOSE OF THE ASSESSMENT

It is anticipated that this assessment will provide data for informing the development of two planned United States Agency for International Development (USAID) Mission activities: scaling up the Pilot Project on Maternal and Child Health, and formulating a Strategic Objective on a broad and long-term health sector program, “Healthy Palestinian Families.” The product of the assessment, a technical report defining the most important and most prevalent diseases in WB/G, could be used by the Mission in developing interventions to improve the health of Palestinians, especially those who are most vulnerable and disadvantaged. The technical report can also be used as a tool in dialogues with the Palestinian Authority, influential Palestinians, and international donors on health priorities and resource allocation for health.

III. METHODOLOGY FOR ESTIMATING THE BURDEN OF DISEASE IN THE WEST BANK AND GAZA

~~In assessing the health status of populations, the classic “global burden of disease” methodology factors in the outcomes of nonfatal conditions, or morbidity, with traditional mortality data. This methodology allows researchers to calculate the burden of disease and injury using one measure, disability-adjusted life years (DALYs), which can also be used to assess the cost-effectiveness of interventions in terms of the cost per unit of disease burden averted.~~

In order to estimate the burden of disease in the West Bank and Gaza (WB/G), the assessment team collected and analyzed information on morbidity, disability, and mortality from the Ministry of Health (MOH), the Palestinian Central Bureau of Statistics (PCBS), and special assessments and reports. The information collected included:

- Mortality data for WB/G sorted by geographic area and age group (*The Status of Health in Palestine*, Annual Report 1997, Ministry of Health, Palestinian National Authority);
- Morbidity data from hospitals in Gaza (same as above) and government primary health care clinics in the West Bank (M. Barghouthi and J. Lennox, 1997);
- Morbidity data for infectious diseases in WB/G (*Annual Communicable Disease Report, 1998*, Primary Health Care, Preventative Medicine Department, Ministry of Health, Palestine National Authority);
- Disability data from the PCBS 1997 census;
- Mortality and DALYs’ statistics for the Eastern Mediterranean region (*1999 World Health Report*, World Health Organization [WHO]);
- Human immunodeficiency virus and acquired immune deficiency syndrome (HIV/AIDS) and sexually transmitted infection (STI) assessment for WB/G (USAID, February 2000); and,
- Nutrition assessment for WB/G (USAID, February 2000).

It should be noted that surveillance data for mortality, morbidity and disability associated with disease in WB/G are somewhat limited. In general, infectious disease data are easier to obtain than those associated with noninfectious diseases. The availability of additional data differs depending on geographic location. The quality of the data also varies, since some diagnoses—such as for polio, HIV/AIDS, and hepatitis B and C—are based on laboratory tests, while others use clinical symptoms that are less precise. Part of the problem in obtaining disease data lies in the reporting of diseases and the sources of the

information. A higher priority is placed on the reporting of infectious diseases because of their potential to spread. And while all health facilities (MOH, UNRWA, NGOs, and private) are supposed to report disease data to the Ministry of Health, underreporting is probably not uncommon, especially for NGO facilities. Overall strengthening of health information systems in the West Bank and Gaza is needed to improve the quality and quantity of disease data. Some efforts are already underway to address these problems.

IV. FINDINGS FROM THE BURDEN OF DISEASE STUDY

A. THE REGIONAL PICTURE

The West Bank and Gaza have already made significant progress in improving the health status of their citizens. As shown in table 1, the health indicators for Palestinians are generally better than those for people in other Arab nations, despite the lower GDP per capita in WB/G. Palestinians have also succeeded in decreasing the total fertility rate, but at 6.1, it is still considerably higher than the average of 4.4 for Eastern Mediterranean countries.

Table 1: Health and Demographic Indicators for West Bank/Gaza and the Region

Country	Population (000)	Total Fertility Rate	GDP per Capita	Health Expenditures		Maternal Mortality Rate per 100,000 Women	Infant Mortality Rate per 1,000 Births	Percent of Children Immunized vs. Measles
				Total percent of GDP	Total Public Sector percent of GDP			
Eastern Mediterranean Countries	473,644 (1998)	4.4 (1998)	\$2,139 (1998)	3.6 (1998)	1.6 (1998)	440 (1998)	69 (1998)	83 (1998)
Egypt	52,442 (1997)	3.2 (1997)	\$3,050 (1997)	3.7 (1995)	1.6 (1997)	170 (1990)	51 (1998)	92 (1997)
Israel	4,660 (1997)	2.7 (1997)	\$18,150 (1997)	4.1 (1993)	0.3 (1990)	7 (1990)	8 (1998)	94 (1997)
Jordan	3,170 (1997)	4.2 (1997)	\$3,450 (1997)	7.9 (1994)	3.7 (1994)	150 (1990)	26 (1998)	95 (1997)
Lebanon	3,635 (1997)	2.5 (1997)	\$5,940 (1997)	10 (1997)	3.0 (1997)	300 (1990)	29 (1998)	89 (1997)
Morocco	24,043 (1997)	3.1 (1997)	\$ 3,310 (1997)	3.6 (1996)	1.2 (1996)	610 (1990)	51 (1998)	92 (1997)
Syria	12,116 (1997)	4.0 (1997)	\$3,250 (1997)	NA [@]	NA	180 (1990)	33 (1998)	93 (1997)
West Bank and Gaza	3,106 (1997)	6.1 (1997)	\$1,480 (1996)⁺	8.4 (1996)	4.7 (1996)	70-80 (1995)*	25 (1998)	96 (1997)
Yemen	11,876 (1997)	6.4 (1997)	\$ 810 (1997)	5.9 (1997)	1.3 (1997)	1400 (1990)	80 (1998)	51 (1997)

Sources: 1999 *World Development Indicators*, World Bank.

[#] 1999 *World Health Report*, World Health Organization.

[@] Not available.

⁺ 1996 UNESCO Quarterly Report, *Economic and Social Conditions in the West Bank and Gaza Strip*.

^{*} 1995 *Demographic Survey in the West Bank and Gaza Strip*, Palestinian Central Bureau of Statistics.

According to the World Health Organization (WHO), the greatest health problems in the Eastern Mediterranean region in 1998 included noninfectious diseases, such as cardiovascular disease and neuropsychiatric disorders; infectious diseases, including acute respiratory infections and diarrheal disease; perinatal conditions; injuries; and, nutritional deficiencies (see table 2). However, the unique circumstances in WB/G

related to population, the environment, nutrition, and social and political pressures are likely to make the health profile for Palestinians somewhat different from that of its neighbors in the region. For example, although other countries (e.g., Jordan, Syria and Lebanon) also have refugee populations, in WB/G, large segments of the population live in refugee camps (65 percent in Gaza, 27 percent in the West Bank). In addition, population growth and overcrowding are more pronounced in WB/G (especially in Gaza) than in neighboring countries.

Table 2: Summary of Disability-Adjusted Life Years (DALYs) and Deaths in the Eastern Mediterranean Region

Disease Category	DALYs, 000 (Percent of Total)	Deaths, 000 (Percent of Total)	Mortality Rate (per 100,000)
Noninfectious Diseases	43,312 (35%)	1,759 (47%)	371
Infectious Diseases	38,805 (32%)	1,102 (29%)	233
Injuries	19,156 (16%)	463 (12%)	98
Maternal/Neonatal Conditions	16,859 (14%)	383 (10%)	81
Nutritional Deficiencies	4,851 (4%)	61 (2%)	13
Total	122,983 (100%)	3,768 (100%)	796

Source: 1999 World Health Report, World Health Organization. See annex A for more detailed information.

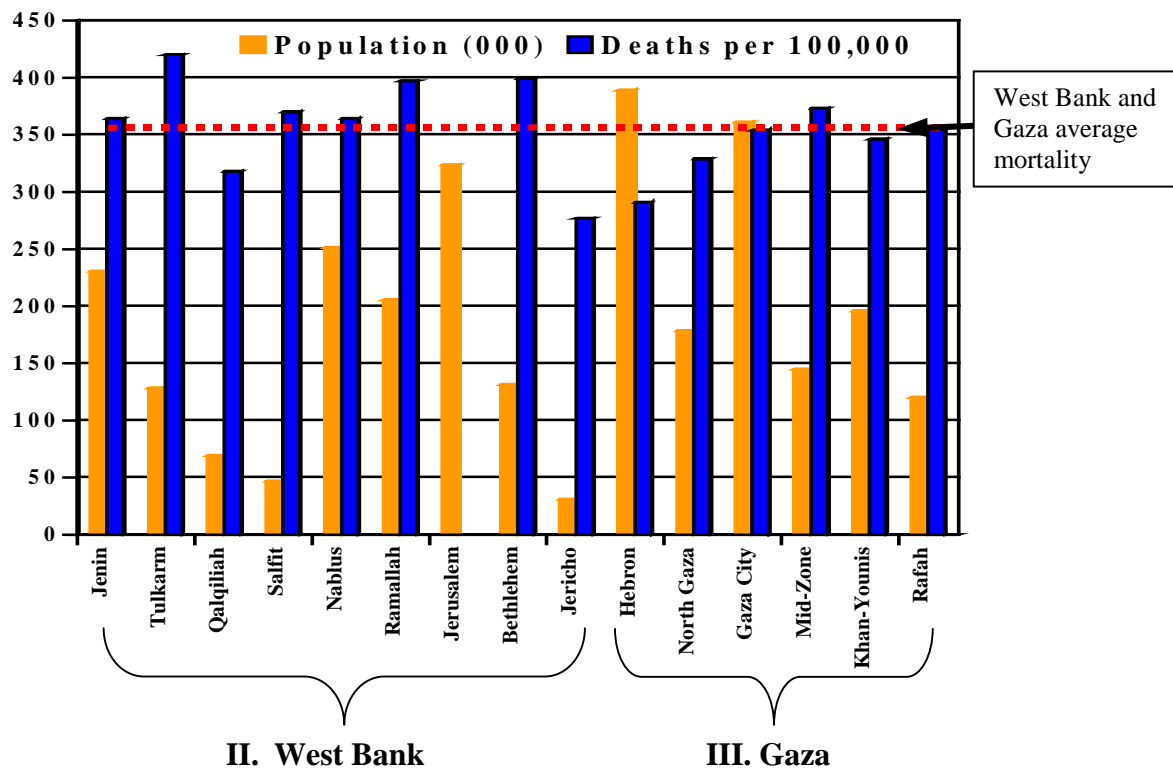
B. MORTALITY IN THE WEST BANK AND GAZA

There were 8,818 deaths reported in 1997 in WB/G (excluding Jerusalem). Due to problems in the reporting system, the MOH acknowledges that this is probably an underestimate. Based on a population of about 2.8 million, the average death rate was 352 per 100,000 population (353 for the West Bank, 351 for Gaza); other sources report that the number was 465–70 per 100,000. The 1998 average mortality rate for the Eastern Mediterranean region (see annex A), which includes many low-income countries, was 796 per 100,000. The MOH data for WB/G indicate that the overall mortality rates ranged from 277 to 420 deaths per 100,000⁵ population, depending on geographic location (figure 1).

Deaths due to noninfectious diseases were nearly double the number caused by infectious diseases (mostly pneumonia and respiratory diseases), maternal/neonatal conditions, and injuries/accidents combined (table 3). The remaining deaths were grouped together by the Ministry of Health under the category “other causes.” In WB/G, the ratio of deaths in the various disease categories was similar to that of Eastern Mediterranean countries. The pattern of disease—when compared with both developing and developed countries—indicates that WB/G is indeed in the midst of an epidemiological transition.

Figure 1: Geographic Distribution of Deaths in the West Bank and Gaza, 1997

⁵ The mortality rate cited in the 1999 edition of the World Bank’s *World Development Indicators* is 470 per 100,000. According to the *Population in Palestinian Territories in 1997–2025* report (Palestinian Central Bureau of Statistics, September 1999), the value for 1998 was 465 per 100,000 (473 in the West Bank, 451 in Gaza).



Source: *The Status of Health in Palestine, Annual Report 1997*, Ministry of Health, Palestinian Authority.
 Note: Jerusalem does not have a mortality rate because of the presence of both Palestinian and Israeli health providers and the difficulties in tracking people and cases.

Table 3: Deaths in the West Bank and Gaza and Other Countries

Disease Category	West Bank (1997)	Gaza (1997)	West Bank and Gaza (1997)	Eastern Med. Countries (1998)*	Developing Countries (1997)*	Developed Countries (1997)*
Noninfectious Diseases	57%	40%	50%	48%	38%	75%
Infectious Diseases	10%	18%	13%	29%	43%	1%
Maternal/Neonatal Conditions	5%	12%	8%	10%	10%	1%
Other Causes	28%	30%	29%	12%	9%	23%
Total Deaths	5,236	3,582	8,818	3.8 million	40 million	12 million

Source: *The Status of Health in Palestine, Annual Report 1997*, Ministry of Health.
 * = 1998 and 1999 *World Health Report*, World Health Organization.

Analysis of deaths by disease category revealed that noninfectious diseases were more problematic in the West Bank than in Gaza. In contrast, deaths due to maternal/neonatal causes and infectious diseases were higher in Gaza than the West Bank (tables 3 and 4). These differences may reflect true variations in risk of contracting certain diseases, may be the result of reporting problems, or may be a combination of the two. The neonatal/infant death disparity may simply be a reporting problem since there were no

reported deaths due to prematurity in the under one-year-old age group from the West Bank; otherwise, deaths due to other neonatal/infant causes were similar. The higher population density in Gaza (2,700 people per square kilometer versus 300 for the West Bank) may be responsible for higher levels of infectious diseases, such as pneumonia and diarrhea, while differences in nutrition habits and/or lifestyle between Gaza and the West Bank may be influencing the number of deaths due to noninfectious diseases.

Table 4: Leading Reported Causes of Death in the West Bank and Gaza, 1997

Rank	West Bank (Percent of Total)	Gaza (Percent of Total)	West Bank and Gaza (Percent of Total)
1	Ischemic heart disease 15.2	Cerebrovascular disease 12.9	Cerebrovascular disease 12.1
2	Senility 11.7	Pneumonia/resp. conditions 11.7	Ischemic heart disease 12.0
3	Cerebrovascular disease 11.6	Malignancies/neoplasms 9.3	Malignancies/neoplasms 9.5
4	Malignancies/neoplasms 9.7	Ischemic heart disease 7.3	Pneumonia/resp. conditions 8.6
5	Pneumonia/resp. conditions 6.4	Infant prematurity 5.3	Senility 8.1
6	Hypertension 4.1	Hypertension 4.7	Hypertension 4.4
7	Accidents/injuries/poisonings 3.4	Congenital anomalies 4.5	Congenital anomalies 3.5
8	Diabetes mellitus 2.8	Accidents/injuries/poisonings 3.5	Accidents/injuries/poisonings 3.5
9	Congenital anomalies 2.8	Senility 2.8	Infant prematurity 2.2
10	Road/transport accidents 2.0	Digestive/liver diseases 2.4	Diabetes mellitus 2.1
11	Digestive/liver diseases 1.6	Road/transport accidents 1.9	Road/transport accidents 2.0
12	Infant septicemia 1.4	Sudden infant death 1.2	Digestive/liver diseases 1.9
13	Sudden infant death 0.8	Diabetes mellitus 1.0	Infant septicemia 1.3
14	Gastroenteritis/dehydration 0.5	Infant septicemia 1.0	Sudden infant death 1.0
15	Meningitis 0.3	Gastroenteritis/dehydration 1.0	Gastroenteritis/dehydration 0.7

Sources: *The Status of Health in Palestine*, Annual Report 1997, Ministry of Health; *Population, Housing, and Establishment Census, 1997*, Palestine Central Bureau of Statistics. See annex B for more detailed information.

Mortality in the Palestinian population varied by age group, with the greatest death rates among the youngest and the oldest (see annex B). The primary causes of morbidity in infants less than one year were neonatal/infant conditions (45 percent) and infectious diseases (35 percent). At particular risk were infants less than 28 days old; this group accounted for more than 50 percent of deaths under one year, with males being more at risk than females. The leading causes of death for children between 1 and 5 years old included infectious diseases (28 percent); injuries, such as falls, burns, and poisonings in the home (18 percent); and, neoplasms (6 percent). The overall mortality rate for preschool-aged children (less than 5 years old) was 379 per 100,000, with males accounting for more than 60 percent of these deaths.⁶ According to a Demographic Survey of the West Bank and Gaza Strip (April–July 1995), the infant and under 5 mortality rates were greater for boys than girls, lower in cities than in villages or refugee camps, lower when parents had at least a secondary education, and lower for the West Bank, compared with Gaza.

However, while biological factors may have a strong effect on neonatal deaths, postneonatal mortality may be influenced more by environmental and socioeconomic

⁶ *The Situation of Palestinian Children and Women in the West Bank and Gaza Strip*, UNICEF, 1997.

factors, including treatment and care. For example, a recent report suggested that the low social status of females might result in differential treatment and care of young girls, contributing to a postneonatal death rate that is 20 percent higher than that of boys.⁷ Preventable accidents and injuries were responsible for almost one third of the deaths among school-aged children and adolescents (5–19 years). While pneumonia and respiratory infections were still significant (12 percent) in this age group, cancers and other noninfectious diseases were also a significant cause of death (about 17 percent). The overall mortality rate for this age group was 40 per 100,000.

Noninfectious diseases, such as cancers and heart disease, were responsible for about 35 percent of deaths among young adults (20–39 years), including most women of reproductive age. Accidents and injuries were also leading causes of death (31 percent), perhaps due to occupational hazards. The overall mortality rate was 72 per 100,000. The maternal mortality rate (Gaza only) for women 15–45 years of age was reported to be 37 per 100,000. Almost 60 percent of deaths in middle-aged adults (40–59 years) were caused by cardiovascular disease and cancer. Despite this age group being part of the work force, deaths due to accidents and injuries (5 percent) were considerably lower than in the 20–39 age group, perhaps as a result of decreased manual labor. The overall mortality rate was 390 per 100,000. The disease patterns for older adults (60 years and older) were similar to that of the 40–59 age group, with 49 percent of deaths resulting from cardiovascular disease or cancer. The mortality rate, however, was significantly higher (3,952 per 100,000) in the over 60 age group, with most of the deaths occurring in the 65 and older subset.

The total number of deaths in all age groups due to cardiovascular disease was 2,509 (cerebrovascular disease, 12.1 percent; ischemic heart disease, 12.0 percent; and, hypertension, 4.4 percent), resulting in a mortality rate of 89 per 100,000. This rate is significantly lower than the rates reported for other countries in the *1998 World Health Statistics Annual Report* (WHO). For example, among men and women aged 35–74, the mortality rates (per 100,000) were about 1,150 for men and 750 for women in China, Colombia, and Mexico; in Israel, the rates were 821 for men and 532 for women. These differences may indicate that cardiovascular diseases are not as serious in WB/G as they are in other countries, that there is underreporting, or perhaps both.

C. MORBIDITY IN THE WEST BANK AND GAZA

In 1995, Palestinians visited the West Bank government primary health care (PHC) centers for ailments that included the following: respiratory diseases, including acute respiratory infections (ARI) (36 percent); cardiovascular diseases (8 percent); digestive diseases (7 percent); and, many other noninfectious diseases (table 5). Other infectious diseases accounted for 4 percent of visits, accidents/injuries for 1 percent, and neonatal/infant conditions for 1 percent. In contrast, disease morbidity from three hospitals in Gaza during 1997 showed that most hospital admissions were for noninfectious diseases (44 percent), followed by maternal and pregnancy-related conditions (30 percent), neonatal/infant conditions (11 percent), accidents/injuries (8

⁷ *Gender and Health in Palestine*, Palestinian Central Bureau of Statistics, March 1998.

percent), and infectious diseases (5 percent). Although the number of hospital visits and length of stay have decreased between 1985 and 1996, the hospitalization rate for noninfectious diseases increased 46 percent over the same time period.⁸

Table 5: Summary of Reported Morbidity in the West Bank and Gaza

Disease/Condition	West Bank Clinics (1995)		Gaza Hospitals (1997)	
	Total Cases	Percent of Total	Total Cases	Percent of Total
Respiratory Disease (includes ARI)	317,101	36%	9,460	14%
Cardiovascular Disease and Blood Disorders	82,732	10%	6,139	9%
Digestive and Liver Diseases	64,924	7%	3,550	5%
Musculoskeletal Disorders	64,127	7%	769	1%
Skin Disease	61,651	7%	846	1%
Nutritional/Endocrine Disorders	50,333	6%	322	<1%
Sense Organ Disorders	49,312	6%	245	<1%
Genitourinary Disorders	35,929	4%	3,005	4%
Neurological Disorders	32,391	4%	3,024	4%
Other Infectious Diseases	31,232	4%	420	1%
Oral Disease	18,796	2%	77	<1%
Injuries/Accidents	7,344	1%	5,535	8%
Congenital Anomalies	5,318	1%	1,336	2%
Perinatal Conditions	4,462	<1%	6,145	9%
Cancer	1,178	<1%	1,708	3%
Maternal/Pregnancy-Related Conditions	1,122	<1%	20,667	30%
Diarrheal Diseases	NA	NA	2,902	4%
Diabetes Mellitus	NA	NA	1,464	2%
Other Causes	40,932	5%	1,190	2%
TOTAL CASES	868,884	100%	68,804	99%

Sources: M. Barghouti and J. Lennox, *Health in Palestine: Potential and Challenges*, March 1997, and the *Status of Health in Palestine*, Annual Report 1997, Ministry of Health. See annexes C and D for more detailed information.

NA= specific data not available. Percentages may not total 100 percent because of rounding.

Noninfectious Diseases

Cardiovascular Disease

The principal forms of cardiovascular disease are ischemic heart disease, cerebrovascular disease, and hypertension. Contributing factors include dietary habits (eating processed foods with high sugar and fat content and low fiber), tobacco use, and lack of exercise. Other factors cited by Palestinian doctors are obesity, stress from unemployment and lack of freedom of self-expression. Heart disease is developing in younger age cohorts, often striking men in their forties. The incidence of heart disease is estimated at 1,200 per 100,000 population; 80 percent of these patients will ultimately need surgery.⁹

⁸ Z. Abdeen, *Palestinian Health Strategy: The Challenges Ahead*, Monograph Series on Human Development, Sustainable Human Development Project in Palestine, 1997.

⁹ Dr. Shawki Harb, Ramallah General Hospital.

Ramallah General Hospital is the only facility in the West Bank/Gaza performing heart surgery, and this service may end soon because of the retirement of its only heart surgeon.

Cancer

According to the National Cancer Registry, the incidence of cancer in 1998 was about 32 per 100,000 (999 cases diagnosed in the West Bank, but no data available from Gaza; see annex E for additional details). Of these, 22 percent had died and the status of 28 percent of the cases was unknown. More than 36 percent of the total number of cases was caused by four types: breast cancer (129 cases), lymphomas/cancer of the lymph node (84), lung cancer (78), and colon cancer (76). Of the 516 total cases in men, the five most common cancers were lung (64 cases), prostate (50), bladder (48), colon and rectum (37), and non-Hodgkin's lymphoma (31). A total of 483 cases were reported for women: breast (126 cases), colon and rectum (37), and non-Hodgkin's lymphoma (24) were the most common types. Sixty-five percent of the cases occurred in Hebron, Nablus, Ramallah, and Bethlehem. There are three in-country locations for cancer patients needing chemotherapy or surgery: Beit-jala Hospital (Bethlehem), Al-Watani Hospital (Nablus), and Al-Shifa Hospital (Gaza). Patients requiring radiation therapy are referred for treatment abroad.

Diabetes Mellitus

According to the WHO *1998 World Health Statistics Annual Report*, the estimated prevalence of diabetes mellitus in Egypt, Jordan, and Syria is 2,000–12,000 per 100,000. The situation in the West Bank and Gaza is probably similar since many of the same risk factors (unhealthy diet, obesity, and sedentary lifestyle) are present. Preliminary results from an ongoing study by Al-Quds University on diabetes mellitus (sample of 4,000) indicate that the prevalence is 7,000–10,000 per 100,000 among Palestinians 15–68 years of age. People living with diabetes are also at higher risk for other conditions, such as blindness, kidney disease, nerve disease, and cardiovascular disease. If WB/G follows worldwide trends, 10–15 percent of these cases would be Type I, or insulin-injecting patients. The MOH provides free insulin to Type I patients who will need to use insulin their entire lives. Type I diabetes usually begins in childhood, due to the inability of the pancreas to produce insulin. Type II diabetes usually develops in adults, due to the body's ineffective use of insulin (usually secondary to obesity). Adults with this condition will require insulin injections to keep their glucose regulated. Insulin levels among Type II diabetics can also be managed with weight loss and/or oral medication. There are nine MOH diabetes centers in the West Bank, with a medical coordinator based in Ramallah.¹⁰

Mental Illness

¹⁰ M. M. Elayyan, Ramallah Diabetes Center.

Due to the difficult socioeconomic situation and restricted social mobility, many women are reported to be suffering from mental disorders, such as depression.¹¹ A survey of 364 randomly selected people conducted by the Guidance and Training Center for the Child and Family in Bethlehem found that 75 percent of female children in the sample population suffered from at least one of the three most common mental illnesses: depression, developmental delay, and posttraumatic stress disorder. Reportedly, there are 1,500 new cases a year of children with developmental delay in the West Bank refugee camps. The only psychiatric hospital in the West Bank/Gaza is the 320-bed facility in Bethlehem, although there are affiliated mental health centers in Ramallah, Jenin, Hebron, and Nablus. The Bethlehem Psychiatric Hospital houses about 200 patients, with an outpatient department serving about 100 referrals a year. Although the Guidance and Training Center for the Child and Family in Bethlehem does provide some services to children and the family, there is no inpatient mental health facility for children in WB/G.

Infectious Diseases

The incidence of all reported infectious diseases in 1998 was about 1,500 per 100,000 (see annex F for specific information).

Respiratory Infections and Meningitis

A 1996 survey in the West Bank and Gaza indicated that 25 percent of children under the age of 5 (27 percent, West Bank; 20 percent, Gaza) in the 3,722 surveyed households had a cough or cold in the two weeks before the survey.¹² The incidence was highest (38 percent) among infants 6–11 months old. Of those children with a cough or a cold, 42 percent suffered from breathing difficulties (a symptom of ARI) and 63 percent from fever. Over half of the ill children received medical care from health centers (46 percent) and private clinics (38 percent). The most common treatments received were antipyretics (64 percent of children), herbal solutions (51 percent), antibiotics (50 percent), and expectorant solutions (48 percent). The MOH 1997 annual report indicated that 8.6 percent of all deaths in the West Bank and Gaza were due to pneumonia and other respiratory conditions. The incidence of meningitis and tuberculosis (TB) per 100,000 in 1998 were 38 and 3, respectively.

HIV/AIDS

The burden of disease regarding HIV/AIDS is low in WB/G. A total of 50 cases of HIV/AIDS have been detected in WB/G between 1988 and 1999; reportedly, all the cases have been among Palestinians returning from other Arab and Western countries. The overall prevalence is approximately 1.6 per 100,000. As of February 1, 2000, 33 AIDS

¹¹ *West Bank and Gaza Medium-Term Development Strategy for the Health Sector: A World Bank Country Study*, World Bank, Washington, D.C., August 1998.

¹² *Child Health: The Health Survey in the West Bank and Gaza Strip, 1996*, Analytical Reports Series, No. 1, Palestinian Central Bureau of Statistics (PCBS), September 1999.

and 11 HIV-positive cases are registered in WB/G. Of the 33 AIDS cases, 92 percent are male. Limited data indicate that the factors usually associated with the rapid spread of HIV (e.g., brothel-based sex work, multiple partners, high prevalence of STIs) are not present in WB/G. The MOH reports that no new cases have been detected from testing 27 high-risk individuals, as well as from 33,142 from low-risk groups (e.g., blood donors, pregnant women, outmigrants). Since 1994, because of the large percentage of HIV cases contracted through blood transfusion, the MOH has been screening all donated blood for HIV, as well as for hepatitis B and C. The MOH provides free or low-cost treatment to all patients with STIs and antiretroviral therapy to HIV-positive persons.¹³

Food and Water-Borne Diseases

Together with ARI, diarrheal diseases are significant causes of child mortality and morbidity. The combined incidence of reported cases of salmonella, shigella, food poisoning, intestinal worms, other intestinal parasites, and hepatitis A was 607 per 100,000 in 1998. To a large extent, the incidence of diarrheal diseases was associated with poor sanitary and environmental conditions (only 34 percent of households are connected to public sewage systems, although reportedly, most have access to some form of waste disposal).¹⁴ The same PCBS survey showed that 14 percent of children under 5 years of age had an episode of diarrhea in the 2 weeks prior to the survey. The highest incidence (32 percent) was in the 6–11 month old group. Sixty-one percent of ill children received medical care (70 percent Gaza, 58 percent West Bank) which included either oral rehydration solution (ORS) or increased fluids. Most of the other cases were perceived as being mild. Even though girls had lower rates of diarrheal disease, they were more likely than boys to become dehydrated, suggesting that either the home management of the disease was inappropriate or there was a delay in care seeking.¹⁵ In addition, it is more common for girls to receive less or no breastfeeding during a diarrheal disease episode than for boys.

There were about 2,900 reported cases of intestinal worms each of the past two years (1998 and 1999). During the same time period, there were also about 6,000 cases of amoebiasis and 3,500 cases of giardiasis each year. A United Nations Children's Fund (UNICEF) study reported that 71 percent of UNRWA schoolchildren in Gaza had a parasitic infection and 14 percent had more than one type of parasite.¹⁶ A 1986 study¹⁷ of elementary schoolchildren in Bir Zeit found that 23 percent had one or more of the following intestinal parasites: Giardia, Entamoeba, Trichomonas, Trichuris, and Hymenolepis. The authors also reported that there were no significant differences in mean hemoglobin levels between children who had parasites and those that did not.

Brucellosis

¹³ K. Spratt, *An Assessment of HIV/AIDS in the West Bank and Gaza*, Draft, February 2000.

¹⁴ *Population, Housing, and Establishment Census of 1997*, Palestinian Central Bureau of Statistics.

¹⁵ *Gender and Health in Palestine*, Palestinian Central Bureau of Statistics, March 1998.

¹⁶ *The Situation of Palestinian Children and Women in the West Bank and Gaza Strip*, Master Plan of Operations, 1998–2000, UNICEF, 1997.

¹⁷ A. Condie and S. Kaspari, Bir Zeit University, 1986.

The incidence of this sheep and goat disease in humans was 32 per 100,000 in 1998, one of the highest rates in Mediterranean countries.¹⁸ Incidences were highest in Hebron (140 per 100,000) and Jericho (124 per 100,000), and lowest in Gaza (2.5 per 100,000). Of the cases investigated, two thirds were in people from rural areas and 40 percent were in children less than 15 years of age. Forty percent of the cases had contact with animals, three quarters had consumed contaminated milk, and 86 percent had consumed dairy products. Most of the cases (60 percent) occurred between April and September, when consumption of sheep and goat milk and cheese was the highest. Hebron, which had 63 percent of the cases, also had the highest incidence of animal infection and the largest population of animals.

Other Infectious Diseases

In 1998, the incidence of blood-borne and sexually transmitted infections was 300–400 per 100,000. The combined incidence of childhood diseases, such as chicken pox, measles, rubella (i.e., German measles), mumps, poliomyelitis, diphtheria, and tetanus was about 320 per 100,000; the vast majority of these cases were chicken pox. The combined incidence of tropical diseases (malaria and leishmaniasis) was about 4 per 100,000.

Accidents/Injuries

A 1996 survey showed that 4 percent of children under 5 years of age had been involved in some type of accident in the previous year.¹⁹ Wounds were the most common injury (43 percent), followed by burns (23 percent), fractures (22 percent), and poisonings (12 percent). Boys and girls equally suffered from wounds and burns. However, boys had more fractures than girls (28 percent versus 16 percent) and there were more poisoning incidents in girls than boys (20 percent versus 5 percent). The majority of accidents took place in the home (69 percent), accounting for 98 percent of burns, 73 percent of poisonings, 56 percent of wounds, and 54 percent of fractures. The remaining accidents occurred near the home (24 percent) or in the street (7 percent). It was estimated that 13 percent of accidents would have a long-term health impact. The MOH's Department of Preventative Medicine reported that nationally, there were 385 instances of chemical poisoning in 1998, and 333 cases in 1999. The greatest numbers of cases were in Jenin, Tulkarm, and Jericho.

According to the Ramallah General Hospital emergency admission records, there are 10–15 cases of injured children per month. Poisoning from sodium hydroxide (used by many households for making soap) and ingestion of foreign bodies are the most common cases.

D. DISABILITY IN THE WEST BANK AND GAZA

¹⁸ 1998 *Brucellosis Prevention and Control Program Annual Report*, Ministry of Health.

¹⁹ *Child Health: The Health Survey in the West Bank and Gaza Strip*, 1996 Analytical Reports Series, No. 1, Palestinian Central Bureau of Statistics (PCBS), September 1999.

In 1997, there were a total of 46,063 people (1.8 percent of the population) living with disabilities in both the West Bank and Gaza.²⁰ Thirty percent of the cases are categorized as “moving” disabilities, 15 percent as “seeing,” and 15 percent as “mental.” These types of disabilities can be caused by any number of conditions, including infectious and noninfectious diseases, injuries/accidents, and nutritional deficiencies. UNICEF estimates that the number of disabled children under the age of 15 is 36,500, with many of these disabilities being preventable.²¹

E. COST OF HEALTH SERVICES IN THE WEST BANK AND GAZA

The 1996 expenditures on health services in WB/G totaled US \$230 million (13 percent of the national budget, or about \$100 per capita).²² The distribution of health expenditures by provider is private, 41 percent; government, 32 percent; NGOs, 16 percent; and, UNRWA, 11 percent.²³ Sixty-seven percent of the MOH health budget for the West Bank was spent on secondary care, while the rest went to primary health care and public health activities.

For people with government health insurance, there is no charge for primary and secondary care services. For those with no insurance, antenatal care, vaccinations, and treatment for children less than 3 years are free; for other services, PHC centers charge \$3.00–6.50 for consultation, plus any additional charges for tests, medications, and dressings.²¹ At hospitals, the uninsured have to pay \$100 a day along with \$1.50–10.00 per test and \$65–200 for surgery; maternity or pediatric beds cost \$65.00 per day, while intensive care beds cost \$200 a day. In 1996, the cost to the MOH for each hospital bed was \$26,836 per year, including all overhead, staff, and treatment costs.

At UNRWA facilities, all services are free for refugees and there is no charge for maternal/child health services for nonrefugees. UNRWA covers most of the cost (70–90 percent) for referrals to other secondary or tertiary facilities. Anyone can access primary health care services at NGO facilities for a nominal fee. At NGO hospitals, clients pay directly for services. For example, at the Palestinian Red Crescent Society Maternity Hospital in Ramallah, a normal delivery costs \$115 and a cesarean section costs \$330. St. Luke’s Hospital in Nablus charges \$25 a day per bed (\$106 in intensive care), \$99 for minor surgery, \$190 for major surgery, \$7 for a simple blood test, and \$50 for a more complex blood test. The private sector also offers primary and secondary health services, which are covered by private insurance. A normal delivery in this setting typically costs \$150–350. UNRWA health workers are reported to see more patients and have shorter consultations with each than health workers in non-UNRWA facilities.²³

²⁰ *Population, Housing and Establishment Census of 1997*, Palestinian Central Bureau of Statistics.

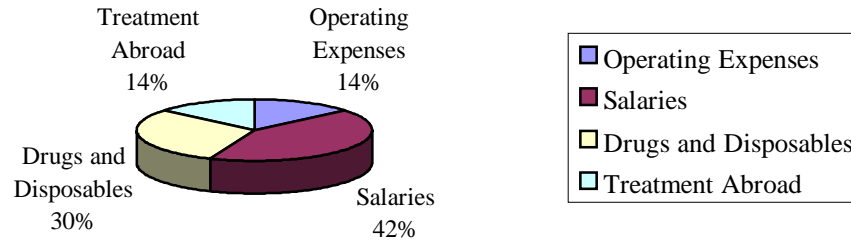
²¹ *Progress of Nations: the West Bank and Gaza*, UNICEF, 1999.

²² Z. Abdeen, *Palestinian Health Strategy: The Challenges Ahead*, Monograph Series on Human Development. Sustainable Human Development Project in Palestine, 1997.

²³ M. Barghouthi and J. Lennox, *Health in Palestine: Potential and Challenges*, March 1997. Palestine Economic Policy Research Institute (MAS), Discussion Papers.

Of the nearly US \$98 million spent by the Ministry of Health in 1997, about \$14 million was spent treating patients in other countries (figure 2). In 1995, a total of 5,804 cases were referred to non-MOH facilities, including Al Makassed Hospital (Jerusalem), Palestinian Red Crescent Hospital (Cairo), Arab Heart Surgical Center (Amman), and Hadassah Hospital (Israel); 71 percent of expenditures (\$10.1 million) for treatment abroad went to Hadassah Hospital.²⁴

Figure 2: Ministry of Health Expenditures, 1997



Health insurance finances 27 percent of all health expenditures; 12 percent are paid by households and the rest is paid by tax revenues. Government health insurance premiums range from about \$8–22 a month.²⁰ For private insurance, the cost is about \$61 a month for a family consisting of two parents and four children. The premium covers up to \$4,930 per person in a one-year period for primary and secondary care, but excludes the following: pre-existing conditions, such as diabetes, hypertension, and heart disease; congenital conditions; cancers; AIDS-related diseases; psychiatry; optometry; and, dentistry. Pregnancy costs extra and there is a discount for prescriptions.

In 1998, the average amount of money spent on health per household per month ranged from 14 to 43 new Israeli shekels (NIS), depending on geographic location.²⁵ For PHC centers, the cost varied from 0 to about 40 NIS, depending on the type of clinic (i.e., government, UNRWA, private, or NGO/charity) and the degree of specialization of the person consulted. However, many people bypass PHC centers and proceed directly to secondary care facilities. Half of the people who visit hospitals do not have referrals, citing “emergencies” (29 percent), “better service from hospital” (24 percent), and “nearest service available” (20 percent) as their main reasons for doing so.²⁶ In addition to being a less efficient use of personnel and facilities, the costs associated with going directly to hospitals are higher. For example, 50 percent of people paid for the consultation (average of 466 NIS), 64 percent purchased medicines (average 165 NIS), 41 percent had costs associated with investigations (average 214 NIS), and nearly everyone (87 percent) paid for transport (average 75 NIS).

²⁴ Ibid.

²⁵ *Expenditure and Consumption Level Survey*, Palestinian Central Bureau of Statistics, March 1999.

²⁶ A. Cockcroft, *West Bank and Gaza Service Delivery Survey: Health and Basic Education Services*, CIET International, Palestine Central Bureau of Statistics and the World Bank, 1998.

F. COSTS ASSOCIATED WITH SPECIFIC DISEASES

The U.S. Experience

According to the American Heart Association, the total cost of cardiovascular disease in the United States during 1999 was \$326.6 billion (57 percent direct costs and 43 percent indirect costs, including lost productivity due to illness and death), or about \$5,500 per patient. In 1997, the annual cost of diabetes in the United States was estimated by the American Diabetes Association to be \$98 billion (\$44 billion in direct medical and treatment costs, \$54 billion for indirect costs attributed to disability and mortality). For the 15.7 million people living with diabetes in the United States (prevalence of 5,900 per 100,000), the annual cost per person is about \$6,000. The U.S. National Institutes of Health estimates that the annual cost of cancer in the United States is \$107 billion (\$37 billion for direct medical costs, \$11 billion for indirect morbidity costs, and \$59 billion for indirect mortality costs). Using an estimate of 10 million cancer patients (based on the number of new cases each year, the number of annual deaths, and the number of people who have ever had cancer), the yearly cost per patient is about \$10,700. The International Agency for Research on Cancer estimates that infectious agents (such as hepatitis B and C, human papilloma virus, *H. pylori*) and tobacco use each account for about 15 percent of cancer cases in the world; in developing countries, the share due to infectious agents is even higher (23 percent). Compared with the high cost of diagnosis and treatment, cancer prevention programs aimed at improving healthy behaviors are relatively inexpensive. It is assumed that other noninfectious diseases are also quite costly to treat because they generally require long, inpatient treatment with specialized equipment and health staff with highly specialized training.

Costs associated with infectious diseases, however, are likely to be relatively inexpensive (less than \$100 per patient for direct medical costs), since these conditions can generally be treated over the course of a few days on an outpatient basis. Exceptions include HIV/AIDS and tuberculosis (TB). For HIV/AIDS, the cost of antiretroviral therapy is high (\$4,000 per patient in Brazil, \$10,000 in the United States). Treatment for TB is estimated to cost about \$200 per patient because of the required 6 months for multidrug therapy (with direct observation for at least the first 2 months) and follow-up testing. Costs will be higher when treating drug-resistant infections because of longer periods of illness and the need for alternative drugs (often in combination) that tend to be more expensive; for multidrug resistant (MDR) tuberculosis, the treatment costs are estimated to be 10–100 times higher.

Costs associated with injuries, on average, are assumed to fall between those associated with infectious and noninfectious diseases.

Cost Estimates for Treating and Managing Heart Disease and Diabetes Mellitus in the West Bank and Gaza

Cost data on the treatment and management of chronic diseases in WB/G are not readily available. Based on limited interviews with Palestinian medical specialists in cardiovascular disease and diabetes mellitus, the assessment team arrived at some cost

estimates for treating and managing these conditions. In 1997, a study²⁷ estimated that 1,750 operations related to heart disease needed to be performed in WB/G each year (500 open heart surgeries, 1,000 catheterizations, and 250 balloon angioplasty operations). For open heart surgery alone, at an estimate of \$5,000–6,000 per patient, \$2.75 million would be needed. Because the number of heart surgeons and surgical facilities is very limited in WB/G (Ramallah General Hospital currently has one surgeon and surgical facilities; however, this service may end soon as the heart surgeon is retiring), scores of cases are referred abroad for treatment (for example, to Jordan, which has seven hospitals where open heart surgery is performed). A more recent estimate placed the incidence of heart disease at 1,200 per 100,000 population, of which 80 percent will ultimately need surgery.²⁸ The total cost for managing the resultant 28,800 estimated cases would cost about \$15.84 million dollars, if the need for surgery by all patients were met. Regarding diabetes mellitus, it was previously estimated that 10–15 percent of the cases in WB/G would be Type I, or insulin-injecting cases. One insulin injection reportedly costs 120 NIS. Type II patients take a daily regimen of tablets that cost about 10 NIS per day; these patients will need to take these tablets for the rest of their lives, assuming their condition does not worsen.²⁹

G. BURDEN OF DISEASE IN THE WEST BANK AND GAZA

Using data collected in this study, diseases and conditions were ranked high, medium, or low according to mortality, morbidity, and associated costs. A ranking of high was given to those diseases that accounted for more than 10 percent of the morbidity or mortality, medium to those between 1 and 10 percent, and low to those less than 1 percent. In addition, “–” and “+” were used to indicate that a disease/condition was near the lower end or upper end, respectively, of the ranking. The burden of each disease in the West Bank/Gaza (see table 6, which also shows the populations most at risk) was classified as high, medium, or low, based on the combined mortality and morbidity. For comparison, the regional rankings of each condition (by DALYs) for the Eastern Mediterranean are also shown.

The top 10 conditions which are responsible for the majority of deaths and illnesses in the West Bank and Gaza include cardiovascular disease, ARI/respiratory disease, mental disorders, cancer, injuries/accidents, perinatal conditions, congenital anomalies, digestive liver diseases, diabetes, and maternal conditions. In general, the disease burden in WB/G is similar to that of the region with the following exceptions: infectious diseases, other than ARIs, and injuries/accidents are ranked lower in WB/G than in the rest of the region; and, noninfectious diseases, such as cancer, congenital anomalies, and diabetes mellitus, are higher in WB/G than elsewhere in the Eastern Mediterranean region.

Table 6: Estimated Burden of Disease for the West Bank and Gaza

Disease/Condition	WB/G	WB/G	WB/G	Age Group at	EMR*	WB/G
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²⁷ Dr. Nidal H. Harb, Harb Heart Center, Ramallah.

²⁸ Dr. Shawki Harb, Ramallah General Hospital.

²⁹ M. M. Elayyan, Ramallah Diabetes Center.

	Mortality	Morbidity	Cost	Greatest Risk	Rank	Burden
Cardiovascular Disease	High +	Medium +	High	>20 years	2	High
Acute Respiratory Infections	Medium+	High	Low	<20 years	4	Medium
Neuropsychiatric Disorders	Medium+	Medium	Medium	All ages	3	Medium
Cancers	Medium+	Medium –	High	>5 years	11	Medium
Injuries/accidents	Medium	Medium	Medium	1–40 years	1	Medium
Perinatal Conditions	Medium –	Medium	Medium	<1 year	5	Medium
Congenital Abnormalities	Medium	Medium –	High	<1 year	14	Medium
Digestive/Liver Diseases	Medium –	Medium	Medium	>5 years	10	Medium
Diabetes Mellitus	Medium –	Medium –	High	>20 years	20	Medium
Maternal Conditions	Low	High	Medium	Women 15–45 years	12	Medium
Diarrheal Disease	Low +	Medium	Low	<5 years	6	Low
Noninfectious Respiratory Diseases	Low	Medium	Medium	All ages	15	Low
Genitourinary Diseases	Low	Medium	Medium	Adults	16	Low
Musculoskeletal Disease	Low	Medium	Medium	>20 years	21	Low
Nutritional Deficiencies	Low	Medium	Low	<5 years and women 15–45 years	8	Low
Sense Organ Disorders	Low	Medium	Medium	All ages	19	Low
Skin Diseases	Low	Medium	Low	All ages	27	Low
Nutritional/Endocrine Disorders	Low	Medium	Medium	All ages	22	Low
Oral Disease	Low	Medium –	Low	>20 years	18	Low
Meningitis	Low	Low	Medium	<5 years	23	Low
Hepatitis	Low	Low	Medium	All ages	26	Low
Tuberculosis	Low	Low	Medium	>20 years	13	Low
Brucellosis	Low	Low	Low	<20 years, rural	–	Low
Malaria, Leishmaniasis, and Other Tropical Diseases	Low	Low	Low	<5 years and women 15–45 years	17	Low
EPI** Diseases (measles, pertussis, tetanus, diphtheria, polio)	Low	Low	Low	<5 years	7	Low
Intestinal Nematodes	Low	Low	Low	<20 years	25	Low
HIV/AIDS and STIs	Low	Low	Medium	>15 years	9	Low
Trachoma	Low	Low	Low	All ages	24	Low
Other Infectious Diseases	Low	Low	Low	All ages		Low

*EMR = Eastern Mediterranean Region

**EPI = Expanded Programme on Immunization

H. CURRENT AND FUTURE TRENDS

Listed below are several important trends that will likely have an impact on the health of Palestinians in the future.

Economic, Social, and Political Conditions

The sociopolitical situation, restricted population mobility, low status of women, and limited economic and recreational opportunities contribute to high stress levels among the adolescent and adult populations. Women are also exposed to various degrees of domestic violence (for example, the notion of “disgrace to the family honor” can cause death at the hands of male relatives), and this constant threat affects women’s mental

health.³⁰ The combination of stress, dietary habits and sedentary lifestyle is most likely contributing to hypertension, heart disease, stroke, cancer, and diabetes mellitus. Marriages between cousins (29 percent of all marriages) and within clans (49 percent) are also contributing to the perpetuation of genetic disorders, such as thalassemia.³¹

The PCBS has adopted the ratio of food expenditure to total expenditure as an indicator of poverty or standard of living. PCBS data reveal that 38.5 percent of West Bank families and 34 percent of Gaza families fall into the low standard of living group that spends over 53 percent of disposable income on food. Overall, Palestinian families spend 38.7 percent of their monthly family expenditures on food, the highest household expense. Poor households spend a larger proportion of their income on food and are therefore more vulnerable to economic and political pressures. Being disadvantaged, their general well-being and health are more at risk.

Population Dynamics

Currently, about 50 percent of the population in WB/G is under the age of 15. From 2.807 million in 1997, the population is projected to reach 3.15 million in 2000 and 6.580 million by 2020. With relatively low death rates and high fertility rates in the West Bank and Gaza, this population growth will have a significant effect on society because of the stress placed on health and other social services. In addition, increasing population density puts additional stress on the environment and resources (e.g., water, sewage and garbage disposal) and favors the transmission of infectious diseases.

Senior citizens (those 60 years old and over) currently make up 5.2 percent of the population. Only 44 percent of them have health insurance, and a large number are the “permanently poor.” There are 19 old-age homes, mostly in central West Bank, but most of them reportedly provide low-quality services. There is a growing concern among researchers that more attention should be paid to geriatric health care issues, as they relate strongly to social security and fertility issues. As the population of the West Bank and Gaza ages, and with a lengthening life span, the senior citizen cohort will be increasing and demand for geriatric health care and other services will also rise. As the elderly population grows, the cost of managing additional cases of cardiovascular disease, diabetes and other noninfectious diseases will be formidable.

Health Services

The availability and quality of health services, including essential medicines, is considered to be adequate in WB/G. A recent survey³² indicated that 49 percent of households rated health services as “good” or “very good” but 37 percent thought there was a lack of necessary medicines. This could reflect a true shortage or could be due to

³⁰ *West Bank and Gaza Medium-Term Development Strategy for the Health Sector: A World Bank Country Study*, World Bank, Washington, D.C., August 1998.

³¹ *Demographic Survey in the West Bank and Gaza Strip, April–July 1995*, Palestinian Central Bureau of Statistics, 1995.

³² A. Cockcroft, *West Bank and Gaza Service Delivery Survey: Health and Basic Education Services*, CIET International, Palestinian Central Bureau of Statistics and the World Bank, 1998.

unrealistic expectations by patients and caregivers. The same survey also observed that some government clinics lacked basic equipment and supplies: half did not have an ophthalmoscope that is needed for routine management of diabetes, hypertension and other conditions; about 38 percent did not have intravenous lines or oxygen. Hospitals also had the same problem, with only 67 percent having an X-ray machine; 71 percent, an ultrasound machine; 86 percent, a laboratory; 64 percent, central sterilization; and, 46 percent, a blood bank.

Only 15 percent of recurrent health expenditures are used for primary and preventative health care, while curative, secondary and tertiary services account for more than 80 percent. Considering the uncertainty of future resources for health and the rapidly expanding population, a shift towards more preventative and primary health care is advisable. In 1996, 70 percent of PHC clinics already had some sort of health education program, while 70 percent, 49 percent, and 43 percent offered prenatal, postnatal, and well-baby services, respectively.³³ There is also a need for increased public awareness of health rights, which would promote advocacy for improved health care.

Infectious Diseases

In general, infectious diseases are not a major problem in WB/G. However, although some food- and water-borne diseases (e.g. typhoid and hepatitis A) seem to be on the decline, others remain problematic. According to the 1997 Population, Housing, and Establishment Census,³⁴ only 4.2 percent of Palestinian households lack access to piped water (1.8 percent in Gaza and 5.5 percent in the West Bank) and just 2.6 percent of the population do not have access to some form of sewage disposal (1.7 percent in Gaza and 3.0 percent in the West Bank). However, other reports indicate that access to a sewage system can be as low as 35 percent.³⁵ Diarrheal diseases, especially in children, continue to be a problem. Mothers typically breastfeed their children for an average of 11 months, with supplementary foods added around 5 months of age.³⁶ However, breastfeeding is not exclusive, with infants under 4 months often receiving herbal drinks, powdered milk, or sugar water. A recent report on Palestinian maternal and child health³⁷ confirmed that mothers are not exclusively breastfeeding long enough and that water-borne pathogens are being transferred by mothers to their babies in sugar water. Two interventions may further reduce the number of cases and deaths due to diarrheal disease: promotion of exclusive breastfeeding up to 6 months, which not only provides immunological benefits, but also prevents ingestion of contaminated, complementary fluids; and, promotion of hand washing to limit fecal-oral transmission of infectious agents.

³³ *Infrastructure and Health Services in the West Bank*, Health Development Information and Policy Institute, 1996.

³⁴ *Population, Housing and Establishment Census of 1997*, Palestinian Central Bureau of Statistics.

³⁵ *West Bank and Gaza Medium-Term Development Strategy for the Health Sector: A World Bank Country Study*, World Bank, Washington, D.C., August 1998.

³⁶ *Child Health: The Health Survey in the West Bank and Gaza Strip*, 1996 Analytical Reports Series, No. 1, Palestinian Central Bureau of Statistics (PCBS), September 1999.

³⁷ E. Green et al., *Palestinian Maternal and Child Health: A Qualitative National Study*, Palestinian Central Bureau of Statistics, West Bank and Gaza, February 2000.

In addition, respiratory infections (not including tuberculosis) are problematic. The child immunization schedule in WB/G includes the standard EPI vaccines, along with hepatitis B and measles, mumps and rubella (MMR) vaccines. According to a 1997 MOH report, immunization coverage is about 95 percent, which has helped keep morbidity and mortality (and presumably disability) from these diseases low. However, another study reported that only 75 percent of children 12–23 months of age were fully vaccinated in the West Bank (coverage was 94 percent for Gaza).³⁸ Low coverage included the tuberculosis vaccine (BCG), measles, and MMR immunizations (22 percent, 29 percent, and 66 percent, respectively) in the West Bank as well as hepatitis B and MMR (48 percent and 61 percent, respectively) in Gaza.

The incidence of diseases transmitted by blood or sexual contact (e.g., HIV/AIDS, STIs, and hepatitis B and C) is also relatively low. However, risk factors for the spread of these diseases exist in WB/G so continued vigilance and disease-control measures—including public education—are needed. All donated blood is currently screened for HIV and hepatitis B and C prior to transfusion.

There is a perception that antimicrobial drug resistance may be a problem because drugs are often self-prescribed and overused, but the extent of the problem is unknown. One study conducted in Gaza between 1993 and 1996 examined drug resistance levels among *Streptococcus pneumoniae* isolated from children under 4 years of age with meningitis or middle ear infections.³⁹ Based on laboratory tests, 31 percent and 19 percent of the isolates exhibited intermediate-level resistance to penicillin and cotrimoxazole, respectively, two drugs commonly used for the management of infections in children. These results were similar to those found in other countries in the Middle East, including Israel. Efforts to decrease drug resistance—focusing on promoting the rational use of drugs by both prescribers and patients—should have economic benefits for both households and the health system. Israeli hospitals spend between US \$400,000 to \$5,000,000 per year on antibiotics.

Obesity

There is evidence that many Palestinians are overweight or obese and that the problem seems to be getting worse. A recent study on diabetes in two communities in Ramallah District⁴⁰ found that the mean body mass index (BMI) among urban women was 30.2, while that of men was 27.4. The mean BMI of rural women and men was slightly lower: 28.6 for women and 26.5 for men. (Normal or optimal BMI is between 20 and 24. Overweight is classified as 25–29 and obesity is defined as 30 or above.) Obesity is a significant risk factor for cardiovascular disease, hypertension, stroke, diabetes mellitus, and various forms of cancer, among other infections.

³⁸ *Child Health: The Health Survey in the West Bank and Gaza Strip*, 1996 Analytical Reports Series, No. 1, Palestinian Central Bureau of Statistics (PCBS), September 1999, figure 7.

³⁹ Zacharia El-Astal et al., “Antimicrobial Resistance and Typing of Pneumococci in Gaza Strip Children,” *Pediatric Infectious Disease Journal*, Vol. 16, No. 9, pp. 905–907.

⁴⁰ Husseini, A., Birzeit University, unpublished, “Study on Nutrition in West Bank and Gaza,” 2000.

Tobacco Use

If current trends persist, the World Health Organization (WHO) estimates that tobacco-related deaths will be the leading cause of worldwide mortality in 20–30 years, accounting for one out of every eight deaths. In addition to smokers who are at higher risk of respiratory infections, cancer, and cardiovascular disease, exposure to environmental tobacco smoke is also associated with adverse health effects in children, including a greater risk of respiratory problems, ear infections, low birth weight (which can affect susceptibility to infectious diseases and neurological development), and sudden infant death syndrome.⁴¹

According to a UNICEF report, 22 percent of the Palestinian population 14 years and older are smokers (40 percent among males and 3 percent among females).⁴² In addition to being a drain on the health system because of increased morbidity and mortality, tobacco also has an impact on household income. In most governorates of WB/G, the average monthly expenditure for tobacco (21–34 NIS) in 1998 exceeded the amount spent on education (12–24 NIS) or medical care (13–43 NIS).⁴³ A similar use of household resources has been observed in Egypt.

I. RECOMMENDATIONS FROM THE STUDY

To respond to the numerous burden of disease issues in WB/G identified by this assessment, the following recommendations are presented for USAID/West Bank and Gaza's consideration.

General Recommendations

1. Support the World Bank Health System Development Project's objective of strengthening MOH management and planning capacity and improving the quality of primary health care. Complement World Bank and Palestinian Authority objectives of developing an MOH Health Information Center/management information system (MIS) by strengthening the capacity of the Pilot Health Project (PHP)/prospective expanded health project (EHP) MIS in computerized data collection, analysis and utilization of data for decision-making, which can serve as exemplars for the MOH and, at the same time, enhance the MIS capacity to support information and monitoring and evaluation requirements of PHP/EHP.
2. Strengthen the improvement of quality of care and client satisfaction in NGO and private sector clinics participating in the PHP and prospective EHP, to offer model quality standards and practices for the public sector. USAID efforts to address quality-of-care issues would complement other donor health care objectives and offer lessons for the public sector.

⁴¹ *Report from the International Consultation of Environmental Tobacco Smoke and Child Health*, WHO Division of Noncommunicable Diseases, Tobacco-Free Initiatives, Geneva, January 11–14, 1999.

⁴² *The Situation of Palestinian Children and Women in the West Bank and Gaza Strip*, UNICEF, 1997.

⁴³ *Palestinian Expenditure and Consumption Level Survey*, Palestinian Central Bureau of Statistics, 1999.

3. Promote strengthening of the public health system and the capacity of the MOH to plan and manage, in cooperation with other donors, by supporting the training of professionals in fields of expertise that are critically limited or lacking in the West Bank and Gaza today, such as epidemiology, health economics, hospital administration, policy planning, quality assurance, formative research, and behavior change communication (BCC). Consider promoting with the MOH a national health accounts system for rationalizing health sector expenditures and resource allocation.
4. In the Expanded Health Project, consider expanding the PHP Basic Model (Intervention A) to include, as part of antenatal services, determining whether the pregnant mother suffers from chronic conditions, such as anemia, hypertension, iodine deficiency or diabetes, and which conditions can be exacerbated by pregnancy and carry deleterious and life-threatening risks for both the mother and baby. Identification and management of these conditions during pregnancy and after childbirth (postpartum) can be part of the basic PHP/EHP maternal and child health (MCH) services.
5. In the EHP, consider expanding the network of private sector service providers through facilitating the organization of a professional women's medical association, offering a wider range of for-fee or health insurance-covered reproductive/MCH services (birth spacing, STI prevention and management, maternal nutrition, management of parasitic infections, counseling, and essential obstetric care).
6. Consider advocating with the MOH a Palestinian version of the U.S. Healthy People 2000 and 2010 Initiative. Such an initiative would encourage the MOH to assume a leadership role in the health sector among partners, involving the NGOs, private sector and UNRWA health officials in an MOH-led initiative. A "Healthy Palestinian People" Initiative could include infectious and noninfectious disease objectives and targets, as well as MCH and reproductive health goals.
7. Strengthen the regulatory role of the MOH. To be able to be a regulatory body, MOH needs first to have the capacity to regulate itself. Together with the World Bank and other international donors, USAID/West Bank and Gaza could hold dialogues with the MOH regarding developing regulatory policy, setting standards for quality assurance and protocols, and helping the MOH make the transition from a free or almost free service provision policy for consumers who are able to pay NGO/private sector services (e.g., immunization) to a policy that concentrates on safety net health services for those who cannot afford to pay.
8. Support the further development of a disease surveillance (sentinel) epidemiological system for tracking and predicting the occurrence of disease and injury among the at-risk populations. An important facet of this system involves the training of epidemiologists to manage the system. In addition to playing a role in the prevention and treatment of disease and injury, epidemiologists have skills that can be used to develop and shape rational health policies and practices.

Specific Recommendations

There are several opportunities within the context of the existing Pilot Health Project (and its expansion) or the larger Strategic Objective 7 (SO 7) framework (“Healthier Palestinian Families”) to decrease the burden of certain diseases and improve the health of the Palestinian people:

1. Health System Strengthening. While the number of health facilities and staff is generally considered to be acceptable, the overall health system needs to be strengthened in the following specific areas:

- Strengthen laboratories and the health and management information system (including standardization of data collection and reporting methods). This would allow for improved quality and availability of health data as well as evidence-based allocation of resources for disease control, treatment, and prevention. Improvements in epidemiology and disease surveillance could be achieved through the Field Epidemiology Training Program (FETP), which is conducted in both Egypt and Jordan. Infectious diseases—including HIV/AIDS and STIs—and drug resistance can be addressed through regional programs in cooperation with the Asia Near East Bureau/Southeast Asia (USAID/ANE/SEA).
- Increase the number of preventative/primary health interventions. Shifting away from the more expensive secondary and tertiary curative health care services would most likely reduce health costs for individuals and the MOH. In order to be successful, this approach would require addressing the problem of clients bypassing the primary level and going straight to secondary care facilities. A greater emphasis should also be placed on community outreach. Decreasing the unnecessary use of drugs (and associated costs) could also be an important part of this type of effort along with the promotion of health rights, improvements in the quality of services, and a greater emphasis on cost recovery.
- Improve service delivery through the introduction/expansion of accreditation, licensing, and incentives for doctors, nurses, paramedics, technicians, and laboratories.

2. Reduce morbidity and mortality among children less than 5 years old. Emphasis should be placed on preventing infectious diseases and conditions that jeopardize the health of mothers and children. Intervention areas could be linked to UNICEF’s Health and Nutrition Program to include the following:

- Strengthen antenatal care (ANC) by training health providers to recognize and counsel the pregnant mother on existing malnutrition or infection conditions, and on apparent danger signs indicative of a possibly complicated birth.

- Train health workers in counseling married couples and families on child survival interventions. This could be accomplished using a BCC package on MCH nutrition, birth spacing, exclusive breastfeeding, hygiene and infectious-disease prevention (including proper food preparation and waste disposal), care-seeking behavior, and providing a safe environment for infants in the home. The package could also be expanded to include information on tobacco, home-safety precautions, exercise, and other issues related to improved health. (According to the 1997 PCBS Population, Housing, and Establishment Census, 85 percent of households surveyed had a television and the literacy rate for people 15 years of age and older was 92 percent for men and 79 percent for women. Tobacco advertising/promotion can be addressed within the context of regulation of the private sector, along with infant formula and pharmaceuticals.)

- Introduce new tools to reduce the incidence of bacterial pneumonia. The currently available vaccine against Haemophilus influenzae type b (Hib) can prevent some types of pneumonia and meningitis, but it is costly compared with other EPI vaccines (about US \$2.00–2.50 per dose, with 3 doses required). A pentavalent vaccine (Hib + DTP + hepatitis B) is also available for about US \$3.00–3.50, offering a small cost savings while also using fewer syringes and needles. A new vaccine for Streptococcus pneumoniae will also be available in 2000, but it, too, will be expensive. The costs associated with the reduction of ARI and meningitis burden in children as well as the decreased need (and cost) for antibiotics should be taken into consideration when deciding whether these vaccines are worth the expense appropriate for the West Bank and Gaza, especially since drug resistance is known to develop in these two respiratory pathogens. A patient cost-sharing mechanism could be employed to help offset the costs to the MOH if these vaccines are to be used.

- Address neonatal mortality by establishing basic neonatal care units in district hospitals to recognize and manage minor but prevalent problems among newborns. Similar units in Egypt have made it possible to achieve a 75 percent overall survival rate among sick neonates.⁴⁴

3. Reduce morbidity and mortality among children and adolescents 5–20 years old.

Expanding on a previous recommendation, EHP activities could be linked to UNICEF’s Basic Education Program to include the following:

- Train educators and development of health campaigns that could be conducted under a larger health agenda (for example, Healthy People 2000/2010).

- Educate children through schools to promote good health-seeking behavior and reduce risks related to noninfectious diseases. Health education could focus on nutrition, personal hygiene, accident prevention, exercise and sports,

⁴⁴ M. Tanamly, *An Assessment of the Status of Nutrition in the West Bank/Gaza*, February 2000.

managing stress, and tobacco use. With 88 percent of 6–18 year olds attending school, this type of health promotion can reach a large segment of the population, including young men and women before they get married.

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ANNEX A

**BURDEN OF DISEASE IN THE
EASTERN MEDITERRANEAN REGION (EMR)**

Burden of Disease in the Eastern Mediterranean Region (EMR)

EMR Rank	Disease/Condition	Eastern Mediterranean Region			
		DALYs, 000 (Percent of Total)		Deaths, 000 (Percent of Total)	
1	Injuries (intentional and unintentional)	19,156	15.6%	463	12.3%
2	Cardiovascular Disease	13,617	11.1%	1,097	29.1%
3	Neuropsychiatric Disorders	12,053	9.8%	48	1.3%
4	Acute Respiratory Infections	10,251	8.3%	348	9.2%
5	Perinatal Conditions	10,061	8.2%	274	7.3%
6	Diarrheal Disease	9,510	7.7%	278	7.4%
7	EPI Diseases (measles, pertussis, tetanus, diphtheria, polio)	6,927	5.6%	198	5.2%
8	Nutritional Deficiencies	4,851	3.9%	61	1.6%
9	HIV/AIDS and STIs	4,318	3.5%	28	0.7%
10	Digestive Diseases	3,900	3.2%	105	2.8%
11	Cancers	3,867	3.1%	240	6.4%
12	Maternal Conditions	3,664	3.0%	52	1.4%
13	Tuberculosis	3,189	2.6%	139	3.7%
14	Congenital Abnormalities	3,134	2.5%	57	1.5%
15	Non-Infectious Respiratory Diseases	2,745	2.2%	133	3.5%
16	Genitourinary Diseases	2,457	2.0%	74	2.0%
17	Malaria, Leishmaniasis, and Other Tropical Diseases	2,409	2.0%	59	1.6%
18	Oral Disease	1,222	1.0%	0	0.0%
19	Sense Organ Disorders	942	0.8%	0	0.0%
20	Diabetes Mellitus	887	0.7%	46	1.2%
21	Musculoskeletal Disease	843	0.7%	2	0.1%
22	Nutritional/Endocrine Disorders	779	0.6%	14	0.4%
23	Meningitis	452	0.4%	12	0.3%
24	Trachoma	239	0.2%	0	0.0%
25	Intestinal Nematodes	168	0.1%	1	0.0%
26	Hepatitis	167	0.1%	8	0.2%
27	Skin Diseases	105	0.1%	2	0.1%
	Other Infectious Diseases	1,070	0.9%	29	0.8%
	TOTAL	122,983	99.9%	3,768	100.1%

Source: 1999 World Health Report, World Health Organization.

Due to rounding, total percentages do not always equal 100.

ANNEX B

**LEADING CAUSES OF DEATH
IN THE WEST BANK AND GAZA
BY AGE GROUP, 1997**

Leading Causes of Death in the West Bank and Gaza by Age Group, 1997

Age Group	< 1 year	1 to < 5 years	5–19 years	20–39 years	40–59 years	60+ years
Deaths per 100,000 Population	379		40	72	390	3,952
Leading Causes of Death	1. Pneumonia and respiratory disease (22%)	1. Pneumonia and respiratory disease (19%)	1. Injuries and accidents (31%)	1. Injuries and accidents (31%)	1. Ischemic heart disease (22%)	1. Cerebrovascular disease (18%)
	2. Congenital anomalies (19%)	2. Injuries and accidents (18%)	2. Malignancy (14%)	2. Malignancy (16%)	2. Malignancy (21%)	2. Ischemic heart disease (15%)
	3. Prematurity (14%)	3. Neoplasms (6%)	3. Pneumonia and respiratory disease (12%)	3. Ischemic heart disease (8%)	3. Cerebrovascular disease (12%)	3. Senility (14%)
	4. Septicemia (8%)	4. Gastroenteritis and dehydration (4%)	4. Other infectious diseases (5%)	4. Other infectious diseases (6%)	4. Other infectious diseases (7%)	4. Malignancy (9%)
	5. Sudden death (6%)	5. Meningitis (3%)	5. Digestive diseases (3%)	5. Cerebrovascular disease (6%)	5. Injuries and accidents (5%)	5. Hypertension (7%)
	6. Gastroenteritis and dehydration (3%)	6. Signs, symptoms and ill-defined findings (3%)	6. Hypertension (< 1%)	6. Pneumonia and respiratory disease (4%)	6. Digestive diseases (3%)	6. Pneumonia and respiratory disease (5%)
	7. Signs, symptoms and ill-defined findings (3%)	7. Septicemia (2%)	7. Diabetes (< 1%)	7. Digestive diseases (3%)	7. Pneumonia and respiratory disease (3%)	7. Diabetes (3%)
	8. Cold injury and hypothermia (3%)			8. Diabetes (2%)	8. Diabetes (3%)	8. Digestive diseases (2%)
	9. Meningitis (2%)			9. Hypertension (<1%)	9. Hypertension (3%)	9. Other infectious diseases (2%)
	10. Injuries and accidents (2%)				10. Senility (< 1%)	10. Injuries and accidents (1%)

Source: *The Status of Health in Palestine*, Annual Report 1997, Ministry of Health.

ANNEX C

**PRIMARY HEALTH CARE REPORT FROM GOVERNMENT
CLINICS IN THE WEST BANK (1995)**

Primary Health Care Report from Government Clinics in the West Bank (1995)

Disease Category	Specific Disease or Condition	Jenin	Tulkarem	Qalqiliya	Salfit	Nablus	Ramallah	Bethlehem	Jericho	Hebron	Total
Infectious Diseases	Intestinal infectious diseases	438	659	39	117	1,214	853	336	1,005	5,568	10,229
	Tuberculosis	1	0	3	1	921	598	12	16	597	2,149
	Other bacterial diseases	13	4	1	7	25	115	18	21	301	505
	Viral diseases	329	210	88	58	754	874	528	278	738	3,857
	Rickettsia and other arthropod-borne diseases	1,072	14	1	0	144	70	8	97	41	1,447
	Venereal diseases	0	0	0	0	1	0	0	0	4	5
	Other infectious diseases and late effects of infectious diseases	2,288	2,279	656	611	1,757	1,419	897	296	2,837	13,040
	Total infectious diseases	4,141	3,166	788	794	4,816	3,929	1,799	1,713	10,086	31,232
Cancers and Other Neoplasms	Cancer of lip, oral cavity, and pharynx	2	0	8	0	4	45	1	0	1	61
	Cancer of digestive organs and peritoneum	11	11	0	5	22	38	4	0	11	102
	Cancer of respiratory and intrathoracic organs	32	6	0	0	19	53	2	6	0	118
	Cancer of bones, connective tissue, skin, and breast	102	22	2	9	74	180	11	1	10	411
	Cancer of genitourinary organs	21	8	0	1	24	14	3	0	13	84
	Other cancers	5	9	3	1	35	7	5	2	19	86
	Cancers of lymphatic and haemopoietic tissue	43	9	1	3	54	8	1	3	4	126
	Benign neoplasms	22	2	1	0	26	18	7	0	8	84
	Other and unspecified neoplasms	1	0	1	0	16	0	0	87	1	106
	Total cancers and neoplasms	239	67	16	19	274	363	34	99	67	1,178
Blood Disorders	Diseases of blood and blood-forming organs	2,206	1,298	542	140	1,042	837	411	167	3,041	9,684
	Total blood disorders	2,206	1,298	542	140	1,042	837	411	167	3,041	9,684

Disease Category	Specific Disease or Condition	Jenin	Tulkarem	Qalqiliya	Salfit	Nablus	Ramallah	Bethlehem	Jericho	Hebron	Total
Endocrine Disorders	Endocrine, metabolic, and immunity disorders	6,627	7,911	1,675	1,291	8,865	6,376	3,942	1,413	8,490	46,590
	Nutritional deficiency	161	120	426	14	30	75	2	201	2,714	3,743
	Total endocrine disorders	6,788	8,031	2,101	1,305	8,895	6,451	3,944	1,614	11,204	50,333
Neurological Disorders	Mental disorders	2,847	3,118	600	266	6,205	42	6	107	1,807	14,998
	Diseases of the nervous system	2,614	2,634	922	393	5,391	3,313	394	112	1,620	17,393
	Disorders of the eye and adnexa	5,681	4,516	1,365	1046	4,895	1,759	1,144	752	5,379	26,537
	Diseases of the ear and mastoid process	3,940	2,930	964	593	3,379	3,055	1,534	678	5,702	22,775
	Total neurological disorders	15,082	13,198	3,851	2,298	19,870	8,169	3,078	1,649	14,508	81,703
Heart Diseases and Circulatory System Disorders	Rheumatic fever and rheumatic heart disease	72	37	83	54	215	532	18	9	64	1,084
	Hypertensive diseases	5,611	5,890	853	780	8,875	5,135	4,556	1,424	7,797	40,921
	Ischemic heart disease	5,371	3,336	582	773	6,058	2,577	2,390	757	2,016	23,860
	Diseases of pulmonary circulation and other heart disease	730	85	24	40	830	1,098	152	20	1,959	4,938
	Cerebrovascular disease	20	76	40	12	166	23	23	6	8	374
	Other diseases of the circulatory system	535	164	27	41	460	216	62	43	323	1,871
	Total heart and circulatory system disorders	12,339	9,588	1,609	1,700	16,604	9,581	7,201	2,259	12,167	73,048
Respiratory Diseases	Diseases of upper respiratory tract	47,236	28,073	8,615	11,602	45,898	29,756	8,500	8,198	30,591	218,469
	Other respiratory diseases	8,427	21,783	5,838	1,381	8,913	10,100	4,886	5,688	31,616	98,632
	Total respiratory diseases	55,663	49,856	14,453	12,983	54,811	39,856	13,386	13,886	62,207	317,101

THE BURDEN OF DISEASE IN THE WEST BANK AND GAZA: AN ASSESSMENT REPORT

Disease Category	Specific Disease or Condition	Jenin	Tulkarem	Qalqiliya	Salfit	Nablus	Ramallah	Bethlehem	Jericho	Hebron	Total
Digestive and Liver Diseases	Diseases of jaws, oral cavity, salivary glands	3,608	3,297	1,233	596	3,213	1,625	894	311	4,019	18,796
	Diseases of other parts of the digestive system	12,941	9,288	4,251	2,706	11,484	6,128	3,999	2,461	11,666	64,924
	Total digestive and liver diseases	16,549	12,585	5,484	3,302	14,697	7,753	4,893	2,772	15,685	83,720
Skin Diseases	Diseases of the skin and subcutaneous tissue	12,597	9,614	2,624	1,843	8,883	7,046	4,289	2,044	12,711	61,651
	Total skin diseases	12,597	9,614	2,624	1,843	8,883	7,046	4,289	2,044	12,711	61,651
Musculo-skeletal Disorders	Diseases of the musculoskeletal system and connective tissue	10,468	9,664	1,849	2,482	10,090	8,724	5,146	3,566	12,138	64,127
	Total musculoskeletal disorders	10,468	9,664	1,849	2,482	10,090	8,724	5,146	3,566	12,138	64,127
Kidney Disease and Related Disorders	Diseases of the urinary system	5,660	3,354	700	899	5,138	2,665	1,800	1,421	5,378	27,015
	Diseases of male genital organs	351	264	214	239	1,312	531	272	190	750	4,123
	Diseases of female genital organs	973	867	164	168	544	805	181	173	916	4,791
	Total kidney disease and related disorders	6,984	4,485	1,078	1,306	6,994	4,001	2,253	1,784	7,044	35,929
Pregnancy-Related Conditions	Abortion	68	8	8	35	142	115	21	27	135	559
	Direct obstetric causes	59	14	22	12	248	13	13	164	18	563
	Total pregnancy-related conditions	127	22	30	47	390	128	34	191	153	1,122
Neonatal/Infant Conditions	Congenital anomalies	50	12	276	425	1,329	1,060	563	263	1,340	5,318
	Certain conditions originating in the perinatal period	6	4	23	7	21	15	1	3	1	81
	Signs, symptoms, and ill-defined conditions	67	140	62	3	3,169	44	1	31	864	4,381
	Total neonatal/infant conditions	123	156	361	435	4,519	1,119	565	297	2,205	9,780

ANNEXES

Disease Category	Specific Disease or Condition	Jenin	Tulkarem	Qalqiliya	Salfit	Nablus	Ramallah	Bethlehem	Jericho	Hebron	Total
Injuries and Accidents	Fractures	148	29	46	12	445	24	3	13	167	887
	Dislocations, sprains, strains	223	70	10	30	57	209	1	51	6	657
	Intracranial and injuries including nerves	37	1	2	5	7	28	0	5	7	92
	Open wounds and injuries to blood vessels	290	58	194	64	86	100	8	20	36	856
	Burns	425	143	119	38	264	120	36	47	358	1,550
	Poisonings and toxic effects	50	6	43	2	49	12	4	4	25	195
	Complications of medical and surgical care	19	39	20	5	111	53	5	45	52	349
	Other injuries, early complications of trauma	147	213	85	186	744	337	15	54	253	2,034
	Transport accidents	43	18	43	20	110	30	1	13	40	318
	Accidental poisonings	9	9	12	8	4	9	1	1	8	61
	Misadventures during medical care, abnormal reactions, late complications	0	13	1	1	3	0	0	0	4	22
	Accidental falls	90	33	28	16	6	6	7	14	10	210
	Accidents caused by fire and flames	7	8	8	8	0	0	0	2	0	33
	Other accidents, including late effects	1	2	2	2	0	1	2	1	1	12
	Drugs, medicaments causing adverse effects in therapeutic use	2	4	0	1	1	0	0	0	0	8
	Suicide and self-inflicted injury	0	0	0	0	5	0	0	1	0	6
	Homicide and injury purposely inflicted by other persons	2	14	20	0	1	7	0	2	2	48
	Effects of foreign body entering through orifice	0	0	0	0	6	0	0	0	0	6
	Total injuries and accidents	1,493	660	633	398	1,899	936	83	273	969	7,344
	Other Causes	Other reasons for contacting health services	2,801	6,832	1,897	588	2,244	11,790	6,094	1,605	7,081
Total other causes		2,801	6,832	1,897	588	2,244	11,790	6,094	1,605	7,081	40,932
All Causes	Total all causes	147,600	129,222	37,316	29,640	156,028	110,683	53,210	33,919	171,266	868,884

Source: M. Barghouti and J. Lennox, *Health in Palestine: Potential and Challenges*, March 1997.

ANNEX D

MORBIDITY OF INPATIENTS IN THREE GAZA HOSPITALS
(JANUARY 1–DECEMBER 31, 1997)

**Morbidity of Inpatients in Three Gaza Hospitals
(January 1–December 31, 1997)**

Disease Category	Specific Disease or Condition	Shifa Hospital	Naser Hospital	Naser Pediatric Hospital	Total
Infectious Diseases	Typhoid and paratyphoid fevers	42	0	3	45
	Shigellosis	0	0	7	7
	Amoebiasis	0	0	7	7
	Diarrhea and gastroenteritis	368	1,259	1,216	2,843
	Other intestinal infectious diseases	6	59	1	66
	Pulmonary tuberculosis	16	3	0	19
	Other tuberculosis	1	0	0	1
	Brucellosis	4	1	0	5
	Neonatal tetanus	0	3	0	3
	Other tetanus	3	1	0	4
	Meningococcal meningitis	0	0	34	34
	Septicemia	14	11	26	51
	Other bacterial diseases	6	5	7	18
	Syphilis and other sexually transmitted infections	6	3	0	9
	Relapsing fevers	0	0	0	0
	Trachoma	0	0	0	0
	Typhus fever	8	0	0	8
	Viral encephalitis	0	2	0	2
	Acute hepatitis A	7	5	10	22
	Acute hepatitis B	9	5	0	14
Other viral hepatitis	4	3	0	7	
Other infectious and parasitic diseases	88	41	28	157	
	Total infectious diseases	582	1,401	1,339	3,322
Cancers and Other Neoplasms	Lip, oral cavity, and pharynx cancer	4	0	0	4
	Stomach cancer	27	0	0	27
	Colon cancer	52	0	0	52
	Liver and bile duct cancer	26	32	0	58
	Pancreatic cancer	13	3	0	16
	Other digestive organ cancer	12	8	0	20
	Lung and bronchial cancer	56	2	0	58
	Other respiratory and intrathoracic organ cancer	8	1	0	9
	Bone and cartilage cancer	22	2	0	24
	Skin cancer	17	1	0	18
	Mesothelial and soft tissue cancer	18	0	0	18
	Breast cancer	72	9	0	81
	Female genital organ cancer	29	3	0	32
	Prostate cancer	10	1	0	11
	Other male genital organ cancers	6	0	0	6
	Bladder cancer	59	3	0	62
	Other urinary tract cancers	8	2	27	37
	Brain cancer	5	2	12	19
	Eye and other central nervous system cancer	3	0	5	8
	Thyroid and other endocrine gland cancer	12	6	49	67
	Ill-defined, secondary, or unspecified cancer	13	0	123	136
	Hodgkin's disease	12	3	75	90
	Non-Hodgkin's lymphoma	38	0	189	227
	Leukemia	101	5	241	347
	Other and unspecified lymphoid cancer	12	1	31	44
	Carcinoma in situ and uncertain neoplasms	1	2	0	3
	Benign neoplasms	195	19	20	234
	Total cancers and neoplasms	831	105	772	1,708

Disease Category	Specific Disease or Condition	Shifa	Naser	Naser	Total
Blood Disorders	Nutritional anemias	43	5	17	65
	Thalassemia	0	0	874	874
	Other haemolytic anemias	51	135	115	301
	Aplastic and other anemias	89	73	224	386
	Other diseases of blood and blood-forming organs	81	9	172	262
	Total blood disorders	264	222	1,402	1,888
Endocrine Disorders	Thyroid gland disorders	42	5	133	180
	Diabetes mellitus	1,119	345	0	1,464
	Other endocrine disorders	40	13	0	53
	Malnutrition	0	15	0	15
	Other nutritional deficiencies	5	0	0	5
	Other metabolic, immunity disorders	52	17	0	69
	Total endocrine disorders	1,258	395	133	1,786
Neurological Disorders	Mental and behavioral disorders	109	29	7	145
	Meningitis and encephalitis	26	614	1,611	2,251
	Epilepsy	55	66	42	163
	Other diseases of the nervous system	228	150	87	465
	Diseases of the eye and adnexa	11	5	0	16
	Diseases of the ear and mastoid process	152	59	18	229
	Total neurological disorders	581	923	1,765	3,269
Heart Disease and Disorders of the Circulatory System	Acute rheumatic fever	1	3	0	4
	Noninfectious rheumatic heart disease	35	21	0	56
	Primary hypertension	781	241	0	1,022
	Other hypertensive disease	15	97	0	112
	Acute myocardial infarction	229	24	0	253
	Other ischemic heart disease	377	152	0	529
	Pulmonary embolism	6	1	0	7
	Condition disorders and cardiac arrhythmias	284	167	0	451
	Heart failure	237	115	0	352
	Other heart diseases	134	208	0	342
	Stroke, not specified as hemorrhage or infarction	369	158	0	527
	Other cerebrovascular disease	19	17	0	36
	Other diseases of the circulatory system	432	88	40	560
	Total heart and circulatory system disorders	2,919	1,292	40	4,251
Respiratory Diseases	Acute upper respiratory infections	160	494	903	1,557
	Influenza	24	2	1	27
	Pneumonia	269	490	2,294	3,053
	Acute bronchitis and acute bronchiolitis	49	234	363	646
	Bronchitis and other lower respiratory disease	572	560	27	1,159
	Asthma	659	730	364	1,753
	Bronchiectasis	81	102	3	186
	Other diseases of the respiratory system	741	307	31	1,079
	Total respiratory diseases	2,555	2,919	3,986	9,460
Digestive and Liver Diseases	Diseases of oral cavity, salivary glands, and jaw	62	15	0	77
	Gastric and duodenal ulcers	116	26	0	142
	Gastritis and duodenitis	255	91	0	346
	Other diseases of esophagus, stomach, duodenum	50	24	0	74
	Diseases of appendix	385	145	0	530
	Inguinal hernia	701	95	0	796
	Other hernia	173	25	0	198
	Other diseases of the intestines	345	149	0	494
	Diseases of the liver	192	89	0	281
	Cholelithiasis	308	88	0	396
	Other diseases of the digestive system	145	34	114	293
Total digestive and liver diseases	2,732	781	114	3,627	
Skin Diseases	Skin and subcutaneous infections	467	210	23	700
	Total skin diseases	584	227	35	846

Disease Category	Specific Disease or Condition	Shifa	Naser	Naser	Total
Musculoskeletal Disorders	Musculoskeletal disease	549	196	24	769
	Total musculoskeletal disorders	549	196	24	769
Kidney Disease and Related Disorders	Renal tubulo-interstitial disease	65	13	0	78
	Renal failure	278	123	0	401
	Other diseases of the urinary system	338	148	127	613
	Diseases of male genital organs	184	98	0	282
	Diseases of female genital organs	792	85	0	877
	Other diseases of the genitourinary system	391	273	90	754
	Total kidney disease and related disorders	2,048	740	217	3,005
Pregnancy-Related Conditions	Missed abortion	241	79	0	320
	Other abortion unspecified	1,043	568	0	1,611
	Other pregnancies with abortive outcome	107	58	0	165
	Other complications of pregnancy and delivery	2,263	566	0	2,829
	Single and multiple delivery	8,457	5,120	0	13,577
	Single and multiple delivery by cesarean	1,708	457	0	2,165
	Total pregnancy-related conditions	13,819	6,848	0	20,667
Neonatal/Infant Conditions	Fetus and newborn affected by maternal....	8	0	12	20
	Slow fetal growth and immaturity	373	17	80	470
	Birth trauma	7	2	6	15
	Intrauterine hypoxia and birth asphyxia	0	0	4	4
	Respiratory distress of newborn	0	0	91	91
	Neonatal aspiration syndromes	0	0	92	92
	Bacterial sepsis of newborn	0	0	56	56
	Other perinatal infections	0	0	10	10
	Neonatal jaundice from other/unspecified causes	0	0	388	388
	Other perinatal hematological disorders	0	0	24	24
	Hypothermia of newborn	0	0	83	83
	Other perinatal conditions	330	400	104	834
	Other congenital malformations of heart....	0	0	125	125
	Down's syndrome	0	0	36	36
	Other congenital anomalies	756	263	156	1,175
	Abnormalities of breathing (wheezing)	0	0	184	184
	Convulsions, not elsewhere classified	0	0	51	51
	Symptoms, signs, and ill-defined findings	874	2,949	0	3,823
Total neonatal/infant conditions	2,348	3,631	1,502	7,481	
Injuries and Accidents	Fracture of skull and facial bones	47	6	0	53
	Fracture of neck, thorax or pelvis	31	9	0	40
	Fracture of femur	362	107	0	469
	Other injuries of specified, unspecified....	1,119	458	0	1,577
	Effects of foreign body entering through orifice	294	25	0	319
	Burns and corrosions	330	84	0	414
	Poisoning by drugs and biological substances	96	34	0	130
	Toxic effects of external causes	0	0	0	0
	Other and unspecified effects of external causes	210	145	0	355
	Other complications of medical and surgical care	112	27	0	139
	Other injury, complications from external causes	1	1	0	2
	Transport accidents	639	329	0	968
	Accidental falls	536	384	0	920
	Accidental drowning and submersion	7	6	0	13
	Other injuries, poisonings....	0	0	136	136
	Total injuries and accidents	3,784	1,615	136	5,535
Other Causes	Other reasons to contact health services	46	7	0	53
	Others	764	162	211	1,137
	Total other causes	810	169	211	1,190
All Causes	Total all causes	35,664	21,464	11,676	68,804

Source: *The Status of Health in Palestine*, Annual Report 1997, Ministry of Health, Palestinian National Authority.

ANNEX E

**GEOGRAPHIC DISTRIBUTION OF CANCER CASES IN THE
WEST BANK, 1998**

Geographic Distribution of Cancer Cases in the West Bank, 1998

Location	All Cancers	Breast	Lung	Stomach	Colon	Leukemia	Testis	Bladder
Hebron	222 (22%)	25 (19%)	6 (8%)	9 (26%)	9 (15%)	28 (42%)	1 (6%)	5 (9%)
Nablus	187 (19%)	21 (16%)	11 (14%)	6 (17%)	12 (20%)	3 (5%)	10 (59%)	18 (31%)
Ramallah	125 (13%)	22 (17%)	10 (13%)	4 (11%)	7 (12%)	9 (14%)	2 (12%)	9 (16%)
Bethlehem	107 (11%)	23 (18%)	11 (14%)	0 (0%)	7 (12%)	7 (11%)	1 (6%)	6 (10%)
Jenin	94 (9%)	5 (4%)	18 (23%)	5 (14%)	10 (17%)	7 (11%)	2 (12%)	5 (9%)
Tulkarem	66 (7%)	11 (8%)	8 (10%)	3 (9%)	7 (12%)	0 (0%)	1 (6%)	2 (3%)
Qalqilya	26 (3%)	3 (2%)	4 (5%)	2 (6%)	3 (5%)	1 (2%)	0 (0%)	2 (3%)
Jerusalem	25 (3%)	2 (2%)	1 (1%)	1 (3%)	3 (5%)	3 (5%)	0 (0%)	2 (3%)
Jericho	18 (2%)	5 (4%)	1 (1%)	0 (0%)	0 (0%)	3 (5%)	0 (0%)	0 (0%)
Salfeet	14 (1%)	2 (2%)	3 (4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)
Unknown	108 (11%)	11 (8%)	5 (6%)	5 (14%)	1 (2%)	5 (8%)	0 (0%)	8 (14%)
Total	992 (100%)	130 (100%)	78 (101%)	35 (100%)	59 (100%)	66 (103%)	17 (101%)	58 (100%)

Source: *Palestine National Cancer Registry*, Annual Report 1998, Ministry of Health, Palestine National Authority.

Due to rounding, total percentages do not always equal 100.

ANNEX F

REPORTED CASES OF INFECTIOUS DISEASES

Reported Cases of Infectious Diseases*

1998 Disease Incidence	Hebron	Bethlehem	Ramallah	Nablus	Jenin	Tulkarm	Jericho	Qalqilia	Salfeet	Gaza	1998 Total	1999 Total	Incidence 1998
Food poisoning	114	45	9	78	<u>160</u>	<u>59</u>	<u>25</u>	0	<u>26</u>	20	536	506	21
Typhoid and paratyphoid	17	0	0	8	0	4	1	3	0	66	99	81	4
Shigellosis											980	24	37
Intestinal worms											2,806	3,011	112
Amoebiasis											5,590	6,468	217
Giardiasis											3,303	3,707	128
Hepatitis A	460	88	230	382	85	<u>187</u>	35	55	36	712	2,270	2,422	88
Hepatitis B	36	<u>23</u>	2	1	25	4	3	2	3	61	160	89	6
Hepatitis B carriers	418	103	194	257	62	70	11	9	0	705	1,829	1,762	71
Hepatitis C and carriers	10	2	28	<u>62</u>	6	1	0	0	2	134	245	119	10
HIV/AIDS **	5	3	8	3	3	1	2	0	1	14	40	44	2
Gonorrhoea											11	8	<1
Other STIs											7,759	4,104	301
Herpes											62	93	2
Meningococcal meningitis	0	1	1	0	0	0	0	0	0	<u>47</u>	49	80	2
H. influenzae meningitis											13	14	<1
Other bacterial meningitis	32	13	10	21	13	<u>26</u>	2	8	6	26	144	219	6
Other meningitis	58	21	17	26	4	7	2	9	4	<u>618</u>	766	546	30
Pulmonary TB	10	6	5	3	16	3	0	1	0	11	55	24	2
Other TB	4	5	4	1	3	2	0	0	0	8	27	14	1
Brucellosis	546	75	77	22	22	18	39	11	2	25	837	747	32
Toxoplasmosis											0	1	<1
Cutaneous leishmaniasis	5	4	0	2	<u>51</u>	0	<u>30</u>	1	0	0	93	53	4
Visceral leishmaniasis	<u>7</u>	2	4	0	<u>4</u>	0	0	0	0	0	17	19	<1
Malaria	1	0	0	0	0	0	0	0	0	4	5	2	<1
Rheumatic fever											216	63	8
Scarlet fever											4	2	<1
Measles	2	2	0	2	0	<u>29</u>	1	0	<u>2</u>	2	40	138	2
Chicken pox	244	178	92	535	196	136	56	207	263	<u>5,876</u>	7,783	5,064	302
Rubella	1	2	5	7	3	<u>20</u>	1	<u>28</u>	<u>13</u>	4	84	59	3
Mumps	19	21	21	29	8	23	2	18	15	109	265	391	10
Tetanus	2	0	1	0	0	0	0	0	0	2	5	4	<1
Pertussis											3	2	<1
Scabies	33	17	13	51	3	5	1	16	23	3,994	4,156	2,183	161
Leprosy **											26	26	1
Typhus											226	94	9
Q fever											0	170	0
Septicemia											457	547	19

*Sources: *Annual Communicable Diseases Report in Palestine*, Ministry of Health/Preventative Medicine Department, 1998; *Monthly Epidemiological Record*, Ministry of Health/Preventative Medicine Department, December 1999.

**Empty cells indicate that no data were available. Underlined numbers indicate locations where certain diseases have been more common in recent years than in other locations.

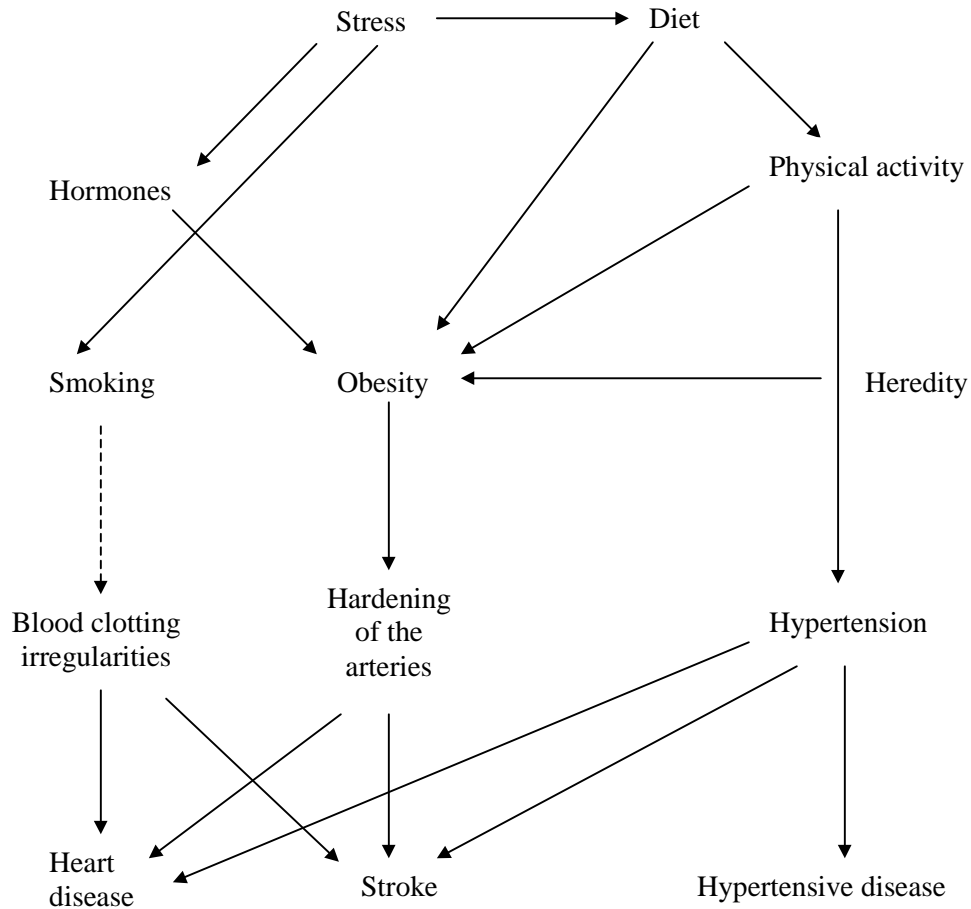
***Prevalence data (i.e., the cumulative number of cases) are shown for HIV/AIDS and leprosy instead of incidence (new cases).

ANNEX G

**A SIMPLIFIED WEB OF CAUSATION APPLIED TO
CARDIOVASCULAR DISEASE**

A Simplified Web of Causation Applied to Cardiovascular Disease

The process that actually generates disease or leads to injury is complex. The web of causation model was developed to enhance understanding of noninfectious disease, such as cardiovascular disease. It can also be applied to the study of injury and infectious diseases. The model de-emphasizes the role of the agent of the disease and highlights other factors, such as stress, diet, heredity, and physical activity that encourage the onset of the three vascular diseases (coronary heart disease, stroke, and hypertension).



Note: Some intermediate links were omitted in this example.

Source: Adapted from R.A. Stallones, Public Health Monograph 76 (Washington, DC: U.S. GPO, 1966), 53.

ANNEX H
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ANNEX I
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