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EPIDEMIOLOGICAL REVIEW OF SELECTED DISEASES, INJURIES, AND RISK FACTORS IN LEBANON:

BACKGROUND INFORMATION FOR THE NATIONAL BURDEN OF DISEASE STUDY

الجمهورية اللبنانية

مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام

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FOREWORD

The preparation of this report faced many challenges. However, the support and understanding of Dr. Walid Ammar, Director General of the Ministry of Public Health, and Dr. Habib Latiri, WHO representative in Beirut, enabled the project success.

The initial challenge lay in defining the real purpose of the report. Of course, this report is part of the overall National Burden of Disease Study (NBDS). Its main objective is to provide information on the prevalence, incidence, and prognosis of selected diseases, injuries and risk factors in Lebanon. However, such information can also be integrated with other data such as disease valuation and a Lebanese life table. Thus, morbidity and mortality associated with each health condition will be translated into the composite measure of Disability Adjusted Life Years (DALYs). DALYs present a standardized comparable measurement unit and a tool for more informed decision-making.

Another challenge lay in the timing of this activity. In the July 9-11, 2001, "Regional consultation on the conceptual framework on health systems" meetings held in Lebanon, Dr. Alan Lopez summarized the steps of a National Burden of Disease Study as follows:

- Preparing the building blocks:

- An age-sex population pyramid that estimates the overall number of the Lebanese population in both sexes and in 5-year age groups.
- A national life table that estimates the death rate by age and sex.

- Collecting data on mortality:

- An estimate of the overall number of deaths in Lebanon
- Distribution of deaths by age (5-year age groups) and sex along the three major groups of diseases as classified by WHO (Group I: Communicable, maternal, perinatal and nutritional conditions/ Group II: Non-communicable conditions/ Group III: Injuries)
- A re-evaluation of the above death distribution as the study progresses but always within the 'fixed' framework determined by the number of deaths within a specific age group.

- Gathering disease-specific data on mortality:

- Data on mortality from all diseases.
- The collected data are assessed and adjusted according to the framework set earlier and by comparing findings to that of countries at a similar stage of development.

- Assembling disease-specific data on morbidity:

Morbidity data are collected from within the country and borrowed from other countries and populations, assuming that differences in the natural history of diseases are mostly contextual rather than biological.

Lopez added that the country has to agree on one calendar year for which the burden of disease study should be conducted. We suggest either 1999 (last year of last decade) or 1996 (when many national household studies were conducted).

In Lebanon, the National Burden of Disease Study did not follow the above steps. Although a lot of work has been done to lay the ground for the first two steps (they will be launched very soon). The preparation of this report started a year earlier. Thus, its real use

and benefit cannot be appreciated until the “earlier steps” are completed. This was realized early on, but still, we are convinced of and excited about the process of collecting and documenting available information. In addition to being an integral part of the Burden of Disease Study, this report provides health professionals and researchers in Lebanon with a summary of all that is known, up to our knowledge and accessibility, about 40 diseases, injuries, and risk factors. Those reviews are extremely useful to identify research gaps that are needed for better health policy decisions. Such reviews, however, should never be viewed as complete and final. Instead, the experts in different fields should look at these reviews as drafts that are worth improving and updating regularly. In this vein, we encourage the MOPH and WHO to endorse such efforts.

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LIST OF ABBREVIATIONS

AUB	American University of Beirut
AUBMC	AUB Medical Center
BAU	Beirut Arab University
CAS	Central Administration for Statistics
CCC	Chronic Care Center
DALY	Disability Adjusted Life Year
FHS	Faculty of Health Sciences
GBD	Global Burden of Disease
GBDS	Global Burden of Disease Study
HDF	Hotel Dieu de France
HFR	Health Financing Reform
LAU	Lebanese American University
LU	Lebanese University
MOI	Ministry of Interior
MOPH	Ministry of Public Health
MOSA	Ministry of Social Affairs
NBDS	National Burden of Disease Study
NGO	Non-Governmental Organization
NHHEUS	National Household Health Expenditures and Utilization Survey
PHS	Population and Housing Survey
SD	Standard Deviation
SGH	St. Georges Hospital
UNICEF	United Nations Funds for Children
USJ	University of Saint Joseph
WB	World Bank
WHO	World Health Organization

CHAPTER 1: INTRODUCTION

Iman Nuwayhid, Abba-Mehio Sibai

1.1 Burden of Disease Studies

Collective knowledge on the totality of health remains fragmentary, in spite of occasionally extensive data available on specific health conditions. This is more extenuated in low-to-middle income countries where surveillance systems are incomplete, inaccurate, and heavily biased towards mortality statistics. The lack of reliable and comprehensive health statistics in most countries has prompted public health workers to search for a measure that would account for morbidity, disability, as well as mortality. Such a measure could provide a way of comparing disease problems in a quantitative way and address the worldwide tendency for rational evaluation of policies for health improvement.

Efforts along this line started in the late 1980's and culminated in The Global Burden of Disease and Injuries Study (GBDS). The study provided, on a global, regional, and even country level, a detailed and consistent measure of diseases and injuries. The GBDS used an aggregate assessment of disease burden (Disability-Adjusted Life Year or DALYs), which combined the burden from premature mortality with that from living with disability.

In Lebanon, there are considerable gaps in our current knowledge of the relative magnitude of major health problems and the proportion of these attributable to major risk factors. Epidemiological measures such as incidence, prevalence, and mortality statistics for most diseases are lacking. This is aggravated by the insufficiency of reliable estimates on population denominators. The most recent census was conducted in 1932 when Lebanon was still a French mandate. In addition, vital registration is unreliable and government statistical surveys and health statistics were, until very recently, non-existent. Existing data derive from relatively small-scale studies and individual reports. There is a need for a comprehensive, detailed, and reliable epidemiological assessment of the major health conditions in the country. Such information is indispensable for a variety of purposes, including the identification of major health problems and their relative magnitude, the recognition of patterns and the search for explanations of these patterns, the prioritization of health investments, and the proper allocation of resources.

This is of utmost urgency after the long years of devastating civil war in Lebanon and the major challenges for reform and rehabilitation. In view of the epidemiological transition we are passing through, and the limited financial and manpower resources in the country, health system reform became a national priority. In this respect, a Health Financing Reform (HFR) project was developed for the Ministry of Public Health (MOPH), in collaboration with the World Health Organization (WHO), and supported by the World Bank (WB). It essentially aimed at achieving financial sustainability and assuring quality of care and equitable access to services all over the country. The HFR project included several components, some of which are currently underway or are almost completed: National Household Health Expenditures and Utilization Survey (NHHEUS), National Health Accounts Study (NHAS), National Health Care Providers Study, and an analysis of policy options for the development of health insurance.

1.2 Why This Report?

This report is part of and provides background information on selected diseases, injuries, and risk factors for the National Burden of Disease Study (NBDS) in Lebanon.

The NBDS consists of several activities:

- Reviewing published and unpublished documents to assess the mortality and morbidity data on selected health conditions
 - Identifying the major causes of death in the country and preparing a Lebanese life table
 - Assessing the value of health, disease, and disability for the Lebanese population
 - Integrating the above data into the composite measure of DALYs
 - Utilizing the collected and aggregate data in setting health priorities
-
- The objectives of the current report were limited to the following:
 - To review published and un-published epidemiological material and existing data sources available for around 40 different diseases and injuries
 - To provide measures of incidence, prevalence, and mortality for the different disease entities, whenever available
 - To assess the prevalence of selected risk factors and the relative contribution of these factors to the burden of disease in the country, and finally
 - To critique and synthesize the different sources of data

CHAPTER 2: SELECTION OF DISEASES, INJURIES AND RISK FACTORS TO BE REVIEWED

Iman Nuwayhid, Arabia Mohamed Ali-Osseiran, Abla-Mehio Sibai

A preliminary decision was made at the level of the WHO in Lebanon to limit the number of diseases, injuries, and risk factors to be reviewed to less than 45. A workshop was organized in the AUB Alumni Association Club in Beirut, on July 14, 2000, with the objective of reaching consensus on the top 40 main diseases in Lebanon. Twenty-nine participants from a wide spectrum of governmental, international, academic, medical, insurance, and non-governmental institutions were invited (Appendix A).

All participating individuals and institutions received an official invitation stating the objective of the workshop and explaining the process. In addition, participants were asked to review the following documents:

- Hospital Discharges: Four out of seven contacted hospitals (AUB Medical Center, Hotel Dieu de France, Makassed General, and St. Georges) provided the frequency of admitted diseases based on discharge diagnoses over a one-year period (1999). This is further described in Chapter Five.
- Insurance Claims: MedNet, a third party administrator of more than 30 insurance companies, provided the number of claims processed for different diseases and injuries over the same time period. Details are also presented in Chapter Five.
- Medical Societies: In a survey during the month of June 2000, the presidents of 24 out of 32 contacted medical societies, registered under the Lebanese Order of Physicians, marked the top 30 diseases (out of a provided WHO list of 107 conditions) with the highest burden on the Lebanese population. Appendix B lists the frequency received by each disease.
- Data from selected surveys and studies.

At the start of the workshop, the concept of the burden of disease and indicators used in setting health priorities were discussed. The National Burden of Disease project and its relation to the Health Reform Plan in Lebanon were described. The participants debated the criteria used for priority setting and underlined the significance of curability, ethical consideration, and vulnerability to intervention and externalities of health care. The participants were also hesitant about prioritizing diseases for the NBDS, which is supposed to provide this output.

The participants were divided into four working groups. Each group was provided with a different set of information and asked to identify the top 20 diseases using the provided documents and their experiences (Appendix C). The four lists prepared by the four groups were compared. Diseases received a score of 1 to 4 out of a maximum of 4, depending on the number of groups that listed them. The following table summarizes the results of this exercise, and represents the final list adopted by the groups as the top health conditions to be reviewed.

Table 2-1 Diseases and injuries by the number of groups that listed them as a priority

4 out of 4	3 out of 4	2 out of 4	1 out of 4
* Traffic accidents * Diabetes * Cerebrovascular * Ischemic heart * Lung cancer * Breast cancer * Asthma * Depression * Tuberculosis * Hypertension	* Colorectal cancer * Prostate cancer * COPD * Peptic ulcer * Diarrhea	- Leukemia - Lower respiratory infections & pneumonia - Renal failure & nephritis and nephrosis - Cervical cancer & cancer of reproductive organs - Hepatitis B and C - Birth trauma (labor & delivery) - Low birth weight - Maternal and pregnancy with abortive outcomes - HIV - Back pain - Dental caries - Schizophrenia	- Obesity - Falls - Genetic blood disorders - Osteoporosis - Adverse drug reactions - Illicit drug use - Pancreatic cancer - Congenital anomalies - Epilepsy - Violence (children & women) - Osteoarthritis - Renal stones/ calculi - Sexually transmitted diseases - Trauma

COPD: Chronic Obstructive Pulmonary Diseases

CHAPTER 3: METHODOLOGY

Iman Nuwayhid, Abla-Mehio Sibai, Arabia Mohamed Ali-Osseiran

3.1 What to Review?

The list of diseases agreed upon in the July 2000 workshop was adopted after introducing the following modifications:

- Labor and delivery problems were grouped with pregnancy and abortive outcomes under the heading 'Reproductive Health Problems'
- Thalassemia was selected for review under genetic blood disorders
- Lower respiratory infections were limited to 'Pneumonia'
- Violence was excluded and traffic accidents, falls, and trauma were combined under the heading of 'Unintentional Injuries'
- Cancer of the cervix and other reproductive organs were limited to 'Cancer of the cervix'
- Osteoarthritis was reviewed under the general heading of 'Arthritis'
- Hypertension and obesity were classified as risk factors rather than diseases
- Smoking was added to the list of risk factors
- Cerebrovascular Diseases, Epilepsy, Nephritis and Nephrosis were later excluded for failure to identify relevant studies or information. Congenital anomalies and low birth weight were not reviewed, mainly for lack of time.

The final list of conditions that were reviewed included the following, listed as per the WHO classification of diseases for the GBDS:

Table 3-1 List of selected diseases included in Lebanon BDS

Group I: Communicable, maternal, perinatal & nutritional conditions		
Tuberculosis STDs (excluding HIV) HIV Diarrhea	Hepatitis Pneumonia Reproductive Health Outcomes	
Group II: Non-communicable diseases		
Cancer: Colo-rectal Pancreatic Lung Breast Cervix Prostate Leukemia Diabetes Mellitus Neuro-psychiatric: Depression Schizophrenia Drug Abuse	Cardiovascular: Ischemic Heart Disease Respiratory Diseases: COPD Asthma Digestive Diseases: Peptic Ulcer	Genito-urinary Diseases: Renal Failure Musculo-skeletal Diseases: Arthritis Back Pain Osteoporosis Oral Conditions: Dental Caries Genetic Blood Disorders: Thalassemia Adverse Drug Reactions
Group III: Injuries		
Unintentional Injuries		
Risk Factors		
Hypertension Obesity Smoking		

3.2 Resources

The following resources were tapped to identify all published and unpublished documents on the above listed conditions:

- Medline, an international database of all articles published in more than 3000 medical and health journals since 1966, was searched (1966-2000) to identify all published articles relevant to Lebanon.
- The Lebanese Corner at the AUB-Saab Medical Library was searched to identify all relevant papers and reports. This resource keeps published and unpublished reports.
- The health and medical libraries of the University of Saint Joseph (USJ) and the Lebanese University (LU) were searched.
- The MOPH Epidemiological Surveillance Unit (ESU) and the directors of different health programs (e.g., AIDS, Tuberculosis, and Smoking) were contacted for any reports or documents.
- Centers in private institutions and hospitals (e.g., Chronic Care Center, AUBMC Tumor registry) were contacted.
- Associations (e.g., Family Planning) and health experts were consulted.
- Proceedings or abstract books of medical and health conferences were reviewed.

In addition to scientific papers and unpublished documents, information was extracted from selected national and regional health surveys:

- National Household Health Expenditure and Utilization Survey (NHHEUS) 1999
- Population and Household Survey (PHS) 1996
- PAP-Child Survey 1996
- Beirut Health Profile (Beirut 92) 1992-1993

3.3 Process

References were grouped by topics. A summary of each reference, including those written in French, was prepared. One individual reviewed the original references and/or summaries for each topic. In addition, this person reviewed one or more textbooks of medicine or a recent review article to understand the topic under review, and to recommend a flowchart reflecting the natural history of the disease. A concise review paper was written on each topic, adhering (but not rigidly) to the following sections: background (international literature), flowchart (if possible), list and short description of identified relevant references, and summary information on age and sex distributions of prevalence, morbidity, and mortality (whenever available).

Relevant references were defined as those providing information on incidence, prevalence, morbidity, mortality and survival. Clinical and review studies were excluded after careful reading to identify any data of relevance to this study.

As most of the background section in each chapter is derived almost entirely from the international literature referenced as a footnote at the bottom of each section, authors were not specifically cited in the text itself.

3.4 Assumptions

One of the major obstacles we faced was the lack of a national census, and consequently the absence of valid denominators. The two main national household surveys (Population and Household Survey of the Ministry of Social Affairs in 1996 and the Survey of Living Conditions of the Central Administration for Statistics (CAS)) reported different estimates of the population of Lebanon and its distribution in the regions. To ensure consistency within the report and comparability to the household-based disease valuation sample, the data reported by CAS were adopted in most of the cases.

CHAPTER 4: OVERALL MORTALITY IN LEBANON

Abba-Mehio Sibai, Iman Nuwayhid, Arabia Mohamed Ali-Osseiran

4.1 Background

Lebanon lacks a reliable and valid vital registration system that reports the number and causes of death by age, sex, and region on a periodic basis. Instead, the number of deaths and death rates are estimated through national or local household surveys and review of selected death certificates. This chapter will be limited to what has been published or reported.

4.2 Relevant References

Several references were consulted in examining mortality for Lebanon.

Author (year)	Study Population/ Methodology
Abou-Daoud KT (1967)	The 1966 death certificates of the city of Beirut were reviewed and analyzed.
Zurayk H, Faour M & Awn S (1984)	A cross-sectional survey of 2752 households in the city of Beirut in 1983. Respondents were asked about the number and causes of deaths that occurred in the 2 years prior to the study.
MOSA (1995)	The Population and Household Survey (PHS) conducted by the Ministry of Social Affairs: A total of around 70,000 households representative of all districts and geographical areas of the country were included. The respondent, usually the mother, was asked about the deaths that had occurred in the household within the two years prior to the survey. Age and causes of deaths were elicited.
Nuwayhid I, Sibai A, Adib S. & Shaar KH (1997)	A follow-up study conducted in 1992-1993, of 2752 households in the city of Beirut originally interviewed in 1982-1983. A total of 1641 households were visited with 376 replacements (i.e., another family living in same house was interviewed). Respondents were asked about the number of and causes of deaths over the last 10 years.
MOPH (1999)	National Household Health Expenditures and Utilization Survey (NHHEUS) conducted by the Ministry of Public Health: A total of 6544 households representative of the whole of Lebanon were included in this survey. The sampling frame included all household residents, as well as those living outside the lodging temporarily. The 1996-1997 Census of buildings, lodgings, and establishments conducted by the Central Administration of Statistics (CAS) constituted the sampling frame. The questionnaire inquired about the number and causes of deaths in the household over the last 12 months. Data were collected between May 17 and July 17, 1999 and covered 32,648 individuals.
Sibai A, Fletcher A, Hills M, Campbell O (2001)	A follow-up mortality study conducted in 1993 of individuals who were aged 50 years and over in the Beirut-1983 survey. Utilizing a verbal autopsy interview schedule, the next-of-kin of the deceased was interviewed regarding the circumstances and cause of death.
Sibai A, Nuwayhid I, Beydoun M & Chaaya M (2002)	A 20% sample of death certificates registered in the Vital Registration System of the city of Beirut covering the years 1974, 1984, 1994, 1997 and 1998 were reviewed and analyzed. The years were selected to represent pre- during and post-war period.

A more recent effort on the part of the MOPH and WHO in coordination with the Ministry of Interior has been the computerization of all death certificates in Lebanon filed over 3 years (1998-2000). In spite of the limitations and inadequacies of death certification in Lebanon, The analysis of this data set when ready will provide valuable information on age and sex distribution of deaths occurring in the country.

4.3 Findings

Perhaps, the most comprehensive of all surveys and studies reporting on mortality in Lebanon is the Population and Housing Survey (PHS) conducted by the Ministry of Social Affairs in 1995. This remains the largest nationally representative study conducted. Other studies were either smaller in size or limited to certain age groups and covered only small geographical areas, mostly the city of Beirut. The mortality data in the PHS revealed a total of around 1450 deaths which when weighted to the total population, gave a total of 15,584 deaths occurring in the *two years prior* to the study. Assuming the total population of the country is around 3.1 million (as is estimated from the same survey), this would yield a crude mortality rate of less than 3 per 1000. Crude death rates were earlier estimated from the Beirut-1983 survey at 6.3 per 1000 as compared to 6.9 being reported by Abu-Daoud in 1966 based on death certification records. On the other hand, international statistical books report a crude mortality for all of Lebanon in the range of 5 to 7 per thousand. Factors such as the variability in source of data, population covered and measurements made, contribute to the differentials in the estimates obtained and add to the uncertainty in such a vital and basic summary measure.

In this report, the relative frequencies of various causes of mortality according to the 1996 Population and Housing Survey are compared with those of other small-scale surveys that were conducted over the past three decades (table 4-1). In Abou Daoud's study (1966), information on mortality was obtained by examining all available deaths certificates of Beirut residents in that year. In 1983-84 and 1992-93, the Population Laboratory at the American University of Beirut conducted two small-scale population-based surveys to assess the health status of Beirut residents, during and after the war period. Deaths that occurred during the two years prior to the surveys are presented.

In 2002, Sibai et al. published the results obtained for a sample of death certificates selected from the city of Beirut for the years 1974, 1984, 1994 and 1997-98. The results obtained, based on secondary analysis for the causes of deaths occurring only for the year 1998, are presented and compared with the other earlier studies also in table 4-1. During the past three decades, the leading causes of death remained cardiovascular diseases. The high proportion of accidents and injuries (30%) as reported in 1983-84 is mainly attributed to war events that were prevalent in the country during that time. This argument is reinforced by the fact that injuries were no longer important causes of death during the post-war period (10.0% in 1992-93).

The high percentage of deaths grouped under 'Old-age and ill-defined' may be attributed to several factors. Firstly, multiple morbidities among the elderly is a common feature and hence, it becomes difficult to assign one cause of death among elderly with several co-morbid conditions. Secondly, when death is sudden, with no direct specific

causes, it is common to attribute it to 'God's will', 'aging' or to an 'ill-defined' cause. Also, reporting biases may limit data collection on causes of death for the very old.

Table 4-1 Trends in causes of deaths among the Lebanese population, over three decades: 1966-1996

Cause of death	Beirut 1966-67 ¹	Beirut 1983-84 ²	Beirut 1992-93 ³	Beirut 1998 ⁴	Beirut 1996 ⁵	Lebanon 1996 ⁵
Communicable disease*	7.1	1.1	0.0	0.2	1.2	1.8
Non-communicable diseases	86.4	68.9	89.6	98.1	89.1	89.0
Cardiovascular diseases	48.4	17.2	42.4	32.0	39.4	34.9
Neoplasms	11.1	15.0	12.9	8.5	9.7	11.2
Other NCDs**	21.2	14.9	12.9	13.5	7.9	7.7
Old age & ill-defined	5.7	21.8	21.4	44.1	32.1	35.2
Accidents and Injuries	6.5	30.0	10.0	1.7	9.7	9.1
Total number of deaths	2,748	87	70	481	2,092	15,585

Sources:

1 Abou Daoud, 1967

2 Zurayk H, Faour M & Awn S. 1984

3 Nuwayhid I, Sibai AM, Adib S & Shaar KH. 1997

4 Sibai A, Nuwayhid I, Beydoun M & Chaaya M. 2002

5 PHS, 1996

* Includes maternal and perinatal causes of death.

** Other NCDs included endocrine, mental, nervous, eye and ear diseases, respiratory, digestive and skin disorders, as well as musculoskeletal and genitourinary causes.

In fact, it is quite uncommon to find, in internationally reported statistics on causes of death such a high percentage of deaths attributed to 'old-age and ill-defined causes' or such a low percentage attributed to 'communicable disease'. The quality of data on causes of death is often evaluated by proportion of death attributed to 'old-age and ill-defined causes'. The smaller the percentage (<5%), the better is the quality of the data. This re-enforces the need for more reliable and valid sources of data on causes of death in the country.

While the Beirut-1992 survey (Nuwahid et al., 1997) reported a total of 386 deaths over a period of 10 years of follow-up for all age-groups, the Sibai-1993 (Sibai et al., 2001) reported, for those who were 50 years and over in 1983, a total of 416 deaths over the same follow-up period. The inconsistency in total number of deaths reflects different strategies of follow-up in the field as well as differentials in follow-up rates between the two studies. The distribution of causes of death by age and sex as presented in both published studies is shown in tables 4-2 and 4-3. In both studies, deaths due to Group I (communicable, maternal, perinatal, and nutritional conditions) were the least common, followed by Group III (Injuries). Group II conditions (non-communicable diseases) were by far the most common causes of death, whereby cardiovascular diseases, accidents, and cancer topped the list of causes of death.

Table 4-2 Distribution of underlying causes of death according to major categories of diseases (ICD-9) by sex and age at death among individuals aged 50 years and above at start of follow-up, Beirut 1983-1993/4

Cause of death	Men						Women						Total	
	Age Groups						Age Groups							
	50 - 64		65 - 79		80 +		50 - 64		65 - 79		80 +			
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
I. Communicable diseases	0	0.0	5	4.6	3	4.7	0	0.0	0	0.0	1	1.4	9	2.2
II. Non-communicable diseases														
Cancer	15	23.8	20	18.3	2	3.1	10	28.6	11	15.5	4	5.5	62	14.9
Diabetes	1	1.6	9	8.2	1	1.6	1	2.9	2	2.8	1	1.4	15	3.6
Circulatory diseases (sub-total)	38	60.3	63	57.2	46	71.9	19	54.3	43	60.6	40	54.8	249	59.8
Ischaemic heart disease	30	47.6	55	50.0	29	45.3	9	25.7	21	29.6	24	32.9	168	40.4
Cerebrovascular diseases	8	12.7	4	3.6	8	12.5	9	25.7	13	18.3	11	15.1	53	12.7
Other heart/circulatory diseases	0	0.0	4	3.6	9	14.1	1	2.9	9	12.7	5	6.8	28	6.7
Respiratory diseases	1	1.6	3	2.7	2	3.1	1	2.9	2	2.8	0	0.0	9	2.2
Digestive diseases	1	1.6	3	2.7	0	0.0	0	0.0	0	0.0	0	0.0	4	1.0
Renal problems	2	3.2	1	0.9	1	1.6	3	8.6	4	5.6	2	2.7	13	3.1
Senile and ill-defined	0	0.0	1	0.9	4	6.3	0	0.0	8	11.3	16	21.9	29	7.0
III. Injuries														
Motor vehicle accidents	1	1.6	2	1.8	0	0.0	1	2.9	0	0.0	0	0.0	4	1.0
Falls and fractures	0	0.0	1	0.9	4	6.3	0	0.0	0	0.0	9	12.3	14	3.4
War-related injuries	4	6.3	2	1.8	1	1.6	0	0.0	1	1.4	0	0.0	8	1.9
Total	63	100	110	100	64	100	35	100	71	100	73	100	416	100

Source: Sibai et al. 2001. Pp 10

Table 4-3: Distribution (%) of causes of death, by age at death and sex, Beirut 1992-93.

Cause of death	Age group (years)						No.	Total
	<20	20-29	30-39	40-49	50-59	>=60		
Males								
Communicable diseases	0.0	5.3	0.0	0.0	0.0	1.3	3	1.3
Cancer	0.0	10.5	14.3	14.3	17.5	11.4	28	12.1
Cardiovascular diseases	0.0	10.5	0.0	71.0	60.0	55.7	114	49.4
Liver diseases	0.0	0.0	0.0	0.0	2.5	2	4	1.7
Renal disease	0.0	0.0	0.0	14.3	2.5	0.0	2	0.9
Other causes*	0.0	0.0	14.3	0.0	2.5	6.7	12	5.2
Accidents and injuries	100	73.7	71.4	0.0	10.0	5.4	40	17.3
Old age and ill-defined causes	0.0	0.0	0.0	0.0	5.0	17.5	28	12.1
Total no. of deaths	9	19	7	7	40	149	231	100
Females								
Communicable diseases	0.0	0.0	0.0	0.0	6.7	0.8	2	1.3
Cancer	16.7	14.3	20.0	0.0	13.3	10.1	17	11.0
Cardiovascular diseases	16.7	14.3	40.0	0.0	33.3	39.5	56	36.1
Liver diseases	0.0	0.0	0.0	0.0	6.7	1.3	2	1.3
Renal disease	0.0	0.0	0.0	33.3	20.0	1.7	6	3.9
Other causes*	0.0	0.0	0.0	0.0	0.0	4.2	5	3.2
Accidents and injuries	66.6	71.4	20.0	66.7	13.3	9.3	25	16.1
Old age and ill-defined causes	0.0	0.0	20.0	0.0	6.7	33.6	42	27.1
Total no. of deaths	6	7	5	3	15	119	155	100
Total no. of all deaths	15	26	12	10	55	268	386	386

Source: Nuwayhid et al., 1997

* Includes diabetes, respiratory diseases, peptic ulcer, Parkinson's disease, obstetrical death and congenital malformations

In addition to the above, the following table (4-4) compares the results obtained from the secondary analysis of the Vital Registration data collected for the most recent two years (1997 and 1998 combined) as well as for the Population and Housing Survey (1995) by age and sex. Findings show that while the male-to-female sex ratio is higher than one from both sources, there is a wide variation between the two, with the measure estimated from the Population-based survey farther away from a value of one than that of the Vital Registration (1.50 vs. 1.29). Proportionate mortality ratios from both sources were more comparable in the older age groups than in the younger ones. Furthermore, the number of deaths under-5 years of age may have been subject to under-registration in the Vital Registration system.

The NHHEUS yielded a total of 142 (weighted) deaths in 1999. The age distribution was as follows: 7 (<5 years), 6 (5-14 years), 39 (15-59 years), and 90 (60 years and above). The numbers, however, were deemed too small to analyze or even report (Dr. Chogig Kasparian, personal communication, MOPH, 2001).

Table 4-4 Proportionate morbidity ratios for both males and females by age groups utilizing two different sources of data: Vital registration system and population-based data.

Age at death	Vital Registration System Beirut, 1997-98			Population and Housing Survey Lebanon, 1995		
	Males	Females	Total	Males	Females	Total
0-4	1.0	2.2	1.5	5.1	6.4	5.6
5-9	1.2	1.1	1.2	1.1	0.5	0.8
10-19	5.0	2.7	4.0	2.6	2.8	2.7
20-29	3.9	1.6	2.9	4.7	2.2	3.7
30-39	3.5	4.0	3.7	4.9	2.3	3.9
40-49	6.0	3.7	5.0	6.2	5.7	6.0
50-59	11.8	8.8	10.5	12.3	7.8	10.5
60-69	19.2	15.7	17.7	20.9	17.4	19.5
70-79	26.2	24.8	25.6	17.1	18.0	17.5
80+	22.1	35.5	27.9	25.1	36.9	29.9
Total number of deaths	484	375	859	872	580	1,452

4.4 Comments

The above findings clearly indicate the need for a valid and reliable source of information on mortality in Lebanon. Within the field of public health, death certification remains the most valuable source of information at the national and local level. Cause-of-death statistics from death certificates offer a multitude of benefits to the health care field, including monitoring health of populations, setting priorities and targeting health intervention activities. While efforts are underway to improve Lebanon vital registration system, many challenges remain.

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CHAPTER 5: OVERALL MORBIDITY IN LEBANON

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5.1 Background

During the long years of war in Lebanon (1975-1990) the Ministry of Public Health (MOPH) played a limited role for in the direct provision of health services. Such services were mainly delivered through the private sector and non-governmental organizations (NGOs), albeit financed by the MOPH. In 1991, it was evident that the Lebanese health care system was faced with a sharp increase in health care expenditures, a changing epidemiological and demographic profile, a weakened primary health care system (PHC), and unregulated growth of the private sector.

In a recent report, the World Bank (1999) noted that Lebanon's expenditures on health services represent 10-11% of its GDP, which is the highest in the region and higher than many upper to middle income countries in the world. In contrast, Lebanon's health status indicators are considered to be below average when compared to other countries in the region or upper to middle income countries with comparable levels of health expenditures. The World Bank reported a life expectancy at birth of 71.3 years, an infant mortality rate of 28 per 1000 live births, and a total fertility rate of 2.8. This is most likely the result of inequities in the distribution of health services in the country and one of the main challenges the MOPH is addressing.

Health services in Lebanon are financed by a combination of public and private insurance schemes. The three sources of public health insurance are the National Social Security Fund (NSSF), Security Sector Insurance Schemes (SSIS), and the Cooperative of Public Sector Employees (CPSE). In addition, the MOPH reimburses private hospitals for the hospitalization of patients who are not covered by any of the 3 public insurance schemes (40-52% of the population). The MOPH also provides 100% coverage for heart surgery, kidney dialysis, and cancer treatment for all the population. In parallel, there are around 80 private insurers and mutuels in the country. Private insurance plans are occasionally purchased to complement public insurance schemes. More than 50% of those with private insurances live in Greater Beirut and Mount Lebanon. Private insurance in Lebanon covers 23% of the total health bill in the country, as compared to 28% by the public sector and 47% as out-of-pocket expense.

More than 90% of the population is covered for hospitalization, with 40% through the MOPH hospital reimbursement scheme. Private hospitals constitute 90-95% of the total number of hospitals in Lebanon (155<n<185). The majority of hospital beds are located in Beirut and Mount Lebanon. The regions of the South, North, and Beqaa are under-provided.

In short, the emphasis in the Lebanese health care system is on curative rather than on preventive health care. Further, the current financing system is providing incentives for excess hospital-based services at the expense of ambulatory and primary care. Ambulatory and primary care are provided by hospital outpatient clinics, doctors in private practice, or health centers (that provide a less expensive alternative). However, the current Lebanese health care financing system favors and covers in-patient services. Consequently, access to ambulatory care by the uninsured (typically poor, old, or vulnerable) is limited. The

MOPH currently contracts with thirty NGO, MOPH, and Ministry of Social Affairs (MOSA) health centers under the World Bank Health rehabilitation project to provide defined services, which are supplied to patients at minimal charge.

This introduction provides a background for a better understanding of the frequency of morbid conditions in Lebanon. The remaining sections of this chapter report the frequency of morbid conditions on a continuum, i.e., from reported symptoms and health conditions, to visits to outpatient health care facilities, to insurance claims, to hospitalization.

Thus, it is important to note that representativeness was not our major concern. The main intention of this process was to gather data that were accessible or already published.

5.2 Reported Health Problems

Reported health problems were extracted from two household surveys. The first is the one conducted by FHS-AUB in 1992-93, thereafter referred to as the Beirut-1992 Survey (Nuwayhid et al., 1997) where more than 2000 households were visited in administrative Beirut. The second is the NHHEUS that covered more than 6500 households all over Lebanon in 1999. Individuals were asked about their acute and chronic health conditions.

The Beirut 1992-93 survey revealed that the most often reported chronic conditions among 8906 Beirut residents (Appendix 4) were: hypertension (5.8%); back pain (5.6%); arthritis (4.8%); heart conditions (4.1%); dyslipidemia (4%); diabetes (3.6%); migraine (2.6%); anemia (2.5%); renal conditions (2.2%); asthma (2.1%); peptic ulcer (1.8%); and thyroid problems (1.8%). These conditions were more prevalent among older age groups. Except for peptic ulcer, asthma, cerebrovascular accidents, and heart conditions, chronic health problems were more prevalent among females.

The same study also showed that the most common injuries among both males and females were fractures and dislocations (almost 50%) followed by wounds and burns. However females experienced more burns and fewer wounds than males (Table 5.1). As for the distribution of injuries by age, males over 44 years experienced the highest proportion of fractures and dislocations (60%), followed by males aged between 15 and 44 (51.8%) and those less than 15 (30%). The 'increasing with age' trend was not shown among females who appeared to experience a U-shaped relationship between age and this type of injury; females aged over 44 experienced the highest percentage of fractures and dislocations (60%) followed by those under 15 (56%) and those between 15 and 44 (30.4%). Wounds were the most common injuries among boys under 15 and their occurrence decreased with age.

Table 5-1 Distribution of injuries experienced in the previous 6 months

Type of Injury	Age (years) at Injury				Total
	0 - 14	15 - 44	≥ 45		
	Males				
	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	
Fractures/ Dislocation	9	29	18	56	48.3
Wound	15	16	4	35	30.2
Burn	2	5	1	8	6.9
Other	4	6	7	17	14.7
Total	30	56	30	116	100
Population at Risk	1037	2027	1233	4297	--
	Females				
	<i>n</i>	<i>n</i>	<i>n</i>	<i>n</i>	%
Fractures/ Dislocation	9	7	24	40	50.6
Wound	3	6	4	13	16.5
Burn	3	8	2	13	16.5
Other	1	2	10	13	16.5
Total	16	23	40	79	100
Population at Risk	959	2275	1376	4610	--

Source: Nuwayhid et al., 1997.

On the other hand, the NHHEUS 1999 reported that 'diseases of the musculoskeletal system and connective tissue' were the most prevalent chronic conditions (11.5%) among males and females (8.3% and 14.6%, respectively). This was followed by 'diseases of the circulatory system' (8.4%; 7.7% M, 9.1% F), 'endocrine, nutritional, and metabolic diseases' (7.9%; 6.2% M, 9.5% F), 'diseases of the respiratory system' (4.0%; 4.4% M, 3.7% F), and 'diseases of the digestive system' (3.9%; 3.6% M, 4.1% F).

Table 5-2 Prevalence of major diseases by sex in Lebanon (in weighted %)

Diseases (by major categories)	Sex		Total
	Males	Females	
Certain infectious and parasitic diseases	0.2	0.3	0.3
Neoplasms	0.2	0.3	0.3
Diseases of the blood, blood-forming organs and disorders of the immune system	1.1	3.4	2.3
Endocrine, nutritional and metabolic diseases	6.2	9.5	7.9
Mental and behavioral disorders	0.7	0.8	0.8
Diseases of the nervous system	2.0	3.7	2.9
Diseases of the eye and adnexa	2.1	2.1	2.1
Diseases of the ear and mastoid process	0.3	0.4	0.3
Diseases of the circulatory system	7.7	9.1	8.4
Diseases of the respiratory system	4.4	3.7	4.0
Diseases of the digestive system	3.6	4.1	3.9
Diseases of the skin and subcutaneous tissue	1.4	1.7	1.6
Diseases of the musculoskeletal system and connective tissue	8.3	14.6	11.5
Diseases of the genitourinary system	3.2	3.0	3.1
Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified	0.7	0.9	0.8
Others	0.2	0.2	0.2

Source: NHHEUS, 1999.

The most prevalent specific conditions were: back pain (6.9%), hypertension (5.5%), rheumatoid arthritis (5.3%), abnormal levels of lipoproteins (3.6%), cardiac problems (3.5%), diabetes (3.1%), and digestive ulcers (3.1%).

Table 5-3 Most prevalent diseases by sex in Lebanon (in weighted %).

Disease*	Sex		Total
	Males	Females	
Thyroid problems	0.5	3.9	2.2
Diabetes	2.9	3.3	3.1
Abnormal levels of lipoproteins	3.6	3.6	3.6
Migraine	1.3	3.2	2.3
Cataract/Glaucoma	1.3	1.6	1.4
Hypertension	4.5	6.6	5.5
Cardiac problems	3.8	3.3	3.5
Asthma	1.9	1.6	1.7
Digestive ulcers	3.0	3.1	3.1
Rheumatoid arthritis	3.3	7.2	5.3
Back pain	5.3	8.6	6.9
Kidney problems	1.4	2.2	1.8

*Only diseases that exceed 450 cases are listed.

Source: NHHEUS, 1999.

The most frequently reported acute health problems (NHHEUS 1999) were: headaches (34.7%), colds (25.7%), back pain (20.0%), toothache (19.8%), cough (16.4%), and dizziness (15.9%).

Table 5-4 Prevalence of most frequently reported health problems by sex (in weighted %)

Health Problems*	Sex		Total
	Males	Females	
Depression	7.6	12.2	9.9
Anxiety	9.8	13.2	11.5
Insomnia	6.6	9.0	7.8
Eye problems	11.3	13.1	12.2
Dizziness	11.5	20.3	15.9
Ear problems	7.1	7.9	7.5
Cold	25.7	25.7	25.7
Allergy	11.4	13.1	12.3
Toothache	18.5	21.1	19.8
Constipation	4.6	6.3	5.5
Joints problems	7.4	13.3	10.4
Back pain	15.2	24.7	20.0
Cough	16.9	15.8	16.4
Shortness of breath	8.9	12.3	10.6
Stomach ache	9.1	12.2	10.6
Problems in urination	5.2	5.6	5.4
Headaches	30.4	28.9	34.7
Loss of appetite	6.1	8.6	7.4

*Only diseases that exceed 1700 cases are listed.

Source: NHHEUS, 1999

5.3 Visits to Health Care Centers

The previous section focused on what people reported, while this section aims at reporting the most common medical conditions received at the primary or ambulatory level. As mentioned in section 5.1, these include hospital outpatient clinics, doctors in private practice, and the less expensive health centers.

In order to examine data at the ambulatory level, the literature was reviewed and a paper written by Adib et al. (1995) was identified that reported on the medical conditions seen at health care centers. Private clinics and hospital outpatient clinics were excluded for lack of published data and logistical and financial infeasibility. The other sources used included:

- NHHEUS 1999, in which individuals were asked to report on medical conditions for which they had to seek outpatient care during the past 12 months
- The AUB-University Health Services (UHS), which is a health center that provides primary medical services only to the AUB population (faculty, staff, and students). The center acts as the primary gatekeeper for AUB's health insurance plan (HIP). UHS uses the ICHPPC-2 classification system, which is based on the International Code of Disease system (ICD), but modified to suit the needs of NGOs and health care centers. UHS provided data on all visits to their center between July 1999 and July 2000.
- A sample of primary health care centers: Originally, and based on a recommendation of Dr. Bahij Arbid from MOPH, a number of health care centers were identified that served a large segment of the population, provided general medical services, and had a manageable medical record system. The directors of selected centers were contacted. Unfortunately, all criteria were not satisfied, mainly due to lack of a usable record system. A few centers were not cooperative or provided data that were not useful. Only two health care centers in Nabatiyeh and Kobayat, both run by Malta organization, were included¹. Data were provided for 1999.
- Adib S et al. (1995): This paper presents the results of an assessment report of the major health problems seen in primary health care centers requested by the Ministry of Public Health. Data were gathered from a sample 23 primary health care centers from various regions in Lebanon in addition to an 8-year review of the experience of the Department of Family Medicine at the AUBMC.

NHHEUS 1999 reported a total of 10,357 outpatient visits with the following most common medical reasons: diseases of respiratory system (22.1%), general exams and check-ups (17.4%), non classifiable symptoms, signs, or lab findings (16.0%), and diseases of the musculoskeletal system and connective tissue (11.9%).

The most common diseases treated between 1980 and 1988 at the outpatient clinic of the Department of Family Medicine in AUBMC (n= 31569 outpatient visits) were in descending order (Adib et al. 1995) as follows: obesity (5.5%), acute and upper respiratory tract infections (4.1%), diabetes (3.1%), hypertension (2.3%), anxiety disorders (2.1%),

¹ Some centers, like the MOPH - Borj Al Barajneh Center do not use ICD-9 coding for the reported diseases. Other centers, like the Islamic Health Association, had their own classification system. The majority of these centers didn't have an automated system to record patient diagnosis and care.

depressive disorders (2.1%), anemia (1.6%), acute otitis media (1.6%), abdominal pain (1.3%), and urogenital moniliasis (1.2%).

Adib et al. (1995) reported that hypertension was the most common type of disease in internal medicine, seen in selected primary health care centers in Lebanon in 1993 (30%). Hypertension was followed by cardiology (22.5%), diabetes (12.4%), dermatology (9.6%), ear nose and throat diseases (6%), ophthalmology (5.7%), neurology-psychiatry (3.8%), asthma (2.9%) and endocrinology-metabolism (2.5%).

The following summary table presents the findings from AUB-UHS and the two health centers in Nabatiyeh and Kobayat (see Appendix 5 for more detailed information). The two community health centers provided a list of individual patient cases with other related information, such as age (or date of birth) and sex. Data was heavily processed to allow comparison.

Table 5-5 Reported frequencies of diseases in some health care centers in Lebanon

CATEGORY	AUB-UHS		Malta-Kobyat		Malta-Nabatiyeh	
	N	%	N	%	N	%
Accidents	919	4.23	84	3.10	5	0.34
Blood disorders	460	2.12	52	1.92	9	0.61
Cardiovascular	1297	5.97	315	11.62	69	4.70
Congenital	13	0.06		0.00		0.00
Dermatology	2362	10.88	100	3.69	46	3.13
Ear Nose Throat	1037	4.77	63	2.32	39	2.66
Digestive system diseases	1253	5.77	194	7.16	80	5.45
Gynecology	613	2.82	41	1.51	16	1.09
Infectious diseases	1059	4.88	471	17.37	80	5.45
Male Genito-Urinary	192	0.88	2	0.07		0.00
Metabolic disorders	1933	8.90	203	7.49	84	5.72
Musculoskeletal	4091	18.84	137	5.05	44	3.00
Neoplasm (Benign)	106	0.49		0.00		0.00
Neoplasm (Malignant)	76	0.35	8	0.30	1	0.07
Neurology	408	1.88	28	1.03	9	0.61
Not specified	12	0.06		0.00	6	0.41
Obstetrics	104	0.48	6	0.22	9	0.61
Ophthalmology	334	1.54	89	3.28	3	0.20
Psychiatric/Behavioral	591	2.72	8	0.30		0.00
Renal diseases	540	2.49	24	0.89	43	2.93
Respiratory diseases	4318	19.88	565	20.84	925	63.01
Total	21718	100.0	2711	100.0	1468	100.0

Sources: AUB-UHS: American University of Beirut- University Health Services (July 1999 - July 2000); Kobayat: Malta Organization- Kobayat Health Center (January 1999 - December 2000); Nabatiyeh: Malta Organization- Nabatiyeh Health Center (July 1999 - July 2000)

The leading medical conditions in the confined, yet diverse, community of AUB seen over one year in the UHS were: respiratory diseases (20%), musculoskeletal diseases (19%), dermatological diseases (11%), and metabolic disorders (9%). In the Kobayat center, north of Lebanon, the most common conditions were: respiratory (21%), infectious diseases (17%), cardiovascular diseases (12%), metabolic disorders (7%) and digestive

system diseases (7%). In the Nabatiyeh center, south of Lebanon, 63% of patients presented because of respiratory diseases followed by metabolic disorders, digestive system diseases, and infectious diseases (each 5-6%).

5.4 Medical Insurance Claims

Medical insurance claims present a mixed bag of outpatient and inpatient medical conditions. Being limited to private insurance plans, they might not represent all socioeconomic groups. Moreover, the majority of these plans cover only the young and healthy population excluding the high-risk groups. Further, a few conditions, such as heart surgery and kidney dialysis, are not covered since care is provided almost free by the MOPH to all patients regardless of socioeconomic status.

Data were compiled from MedNet, which is one of the largest third party administrators in the country. MedNet manages the inpatient and outpatient claims for more than 30 private insurance companies in Lebanon. All claims processed in one year (January 1998- December 1999) were provided following the recommended Global Burden of Disease WHO classification of diseases.

While Appendix 6 presents a detailed list of all conditions, the following is a summary table. Claims for "Injuries and poisoning" ranked first accounting for 25% of all claims. If ill-defined conditions are excluded, pregnancy, childbirth complications, diseases of the digestive system, and diseases of the respiratory system would rank second, third, and fourth, respectively. As mentioned before, ischemic heart diseases did not rank high.

Table 5-6 Medical conditions as reported by MedNet in 1999

Diseases	Frequency
Infectious and parasitic	1,781
Neoplasms	2,551
Endocrine, nutritional, metabolic	298
Blood and blood-forming organs	172
Mental disorders	21
Nervous system & sense organs	1,592
Circulatory system	2,295
Respiratory system	3,368
Digestive system	3,501
Genitourinary system	2,623
Complications of pregnancy, childbirth and puerperium	3,386
Skin and subcutaneous tissue	967
Musculoskeletal system and the connective tissue	1,129
Congenital Anomalies	166
Certain conditions originating in the Perinatal period	60
Symptoms, signs, and ill-defined conditions	5,676
Injury and poisoning	10,699
Death	18
Emergency	12
Organ or tissue replacement	1
Any disease	625
TOTAL	40,941

Source: MedNet, 1999

5.5 Hospital Admissions

This section reports the most common medical conditions that led to hospitalization in 1999, using data from the NHHEUS 1999, and hospital discharge diagnoses from four hospitals.

The NHHEUS 1999 reported that 3981 cases (weighted) were hospitalized within the past year (Table 5.7). The leading reasons for hospitalization were reported as: conditions originating in the perinatal period & congenital malformations (14.9%), diseases of the circulatory system (13.2%), diseases of the respiratory system (12.4%), diseases of the digestive system (10.9%), pregnancy, childbirth, and the puerperium (10.7%), diseases of the genitourinary system (10%), and injury/poisoning (8.1%).

Table 5-7 Distribution of hospitalized cases by reason

Reason*	Distribution in %
Certain infectious and parasitic diseases	5.5
Neoplasms	2.7
Diseases of blood and disorders involving immunity mechanisms	1.1
Endocrine, nutritional and metabolic diseases	2.4
Mental and behavioral disorders	2.0
Diseases of the nervous system	1.2
Diseases of the eye and adnexa	3.2
Diseases of the ear and mastoid process	1.3
Diseases of the circulatory system	13.2
Diseases of the respiratory system	12.4
Diseases of the digestive system	10.9
Diseases of the skin and subcutaneous tissue	0.8
Diseases of the musculoskeletal system and connective tissue	5.5
Diseases of the genitourinary system	10.0
Pregnancy, childbirth and the puerperium	10.7
Symptoms, signs, and abnormal clinical lab findings (not elsewhere classified)	0.3
Certain conditions originating in the perinatal period and congenital malformations	14.9
Injury, poisoning and certain other external causes of morbidity and mortality	8.1
Factors influencing health status+ contact w. health services	3.9
Number of cases of hospitalization= 100% (non-weighted)	3959
Number of cases of hospitalization= 100% (weighted)	3981

Source: NHHEUS, 1999

Hospital discharge diagnoses were provided by 3 hospitals. Seven hospitals were contacted, 4 in Beirut, 1 in Saida, 1 in Triploi, and 1 in Zahleh. Only the three large teaching hospitals in Beirut (AUBMC, Makassed General, St. Georges, and Hotel-Dieu de

France) provided the requested data using the WHO classification. Hospitals outside the capital Beirut did not have computerized data systems, or refused to participate. The four participating hospitals represent the largest referral hospitals in Beirut, or the country, and serve populations that live outside Beirut.

The data provided lacked age and sex distribution and presented medical diagnoses upon discharge and not patients. In other words, patients with multiple diagnoses contributed more than once to the list.

Cardiovascular diseases and other non-communicable diseases constituted the bulk of admissions to the 3 hospitals, Table 5.8. This was not surprising in a country passing through an epidemiological and demographic transition.

Appendix 7 presents the detailed findings, the following table is a concise overview.

Table 5-8 Hospitals discharge diagnoses 1999-2000

Disease Classification	Frequency
Group 1-Communicable, maternal, perinatal and nutritional conditions	
Maternal conditions	9991
Respiratory infections	2685
Conditions arising during the perinatal period	2453
Infectious and parasitic diseases	2294
Nutritional deficiencies	662
	18085
Group 2 -Noncommunicable diseases	
Cardiovascular diseases	10487
Genitourinary diseases	5465
Digestive diseases	5148
Musculoskeletal diseases	3480
Malignant neoplasms	3075
Endocrine disorders	2604
Respiratory diseases	2295
Sense organ diseases	1878
Diabetes mellitus	1579
Congenital anomalies	1518
Other neoplasms	992
Skin diseases	774
Oral conditions	69
	41419
Group 3-Injuries	
Unintentional injuries	643
Intentional injuries	93
	744

Group 2 conditions (non-communicable diseases) topped the medical reasons for hospital admission. Cardiovascular, genitourinary, and digestive diseases ranked first in

this group. Group 1 accounted for less than one-third of all admissions with maternal conditions (including pregnancy and delivery) ranking highest. Group 3 (injuries) accounted for a small percentage of hospital admissions.

5.6 Comments

The proportion of those who are 65 and above is continuously increasing. Thus a process of ageing of the Lebanese population has been taking place. This ageing process has created a shift in the epidemiological profile of the country with more emphasis on degenerative diseases and diseases that more typically affect the older population. This was true across the spectrum of self-reported health problems through visits to health centers or hospitals ending with mortality.

Recently, the World Bank Human Development Group of Middle East and North Africa (January 2000) reported that the major causes of morbidity in specific age groups in the country are:

- Infants: Low birth weight and high perinatal mortality
- Children: Upper respiratory tract infections, diarrhea, accidental injury, and behavioral problems
- Adolescents: Accidental injury, drug and alcohol abuse, and mental health problems
- Adults (including elderly): Cardiovascular diseases and diabetes

The concise reviews of chapters 4 and 5 and the more extensive reviews that will follow attest in great part to the above statement.

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CHAPTER 6: EPIDEMIOLOGICAL REVIEWS OF COMMUNICABLE DISEASES

6.1 TUBERCULOSIS

Omar Fattal & Iman Nuwayhid

Background¹

Tuberculosis (TB) is a disease caused by bacteria belonging to the *Mycobacterium tuberculosis* complex. The disease usually affects the lungs, although in up to one-third of the cases other organs are involved. *Mycobacterium tuberculosis* is the most frequent and most important agent causing TB. *Mycobacterium bovis* infrequently causes TB and that is mostly through ingestion of unpasteurized milk. *Mycobacterium africanum* is a causative agent in a minority of cases.

In 1995 an estimated 8.8 million cases of TB occurred worldwide, 95% of them from developing countries. The distribution among different areas of the world was as follow: Asia 5.5 million cases; Africa 1.5 million cases; Middle East 745,000 cases; Latin America 600,000 cases. In the Global Burden of TB study, it was estimated that 7.96 million new cases of TB occurred worldwide in 1997, most of which, 44%, were infectious. Eighty percent of all incident TB cases were found in 22 countries, with more than half of the cases occurring in five Southeast Asian countries. Global prevalence of *Mycobacterium* infection was 32% (1.86 billion people). Among infected individuals, the incidence of TB is highest during late adolescence and early adulthood. The incidence among women peaks at 25-34 years. Between 25 and 34 years of age, the rate in females is higher than in males.

The most common mode of transmission is from a patient with infectious pulmonary TB to other persons by droplet nuclei which are aerosolized by coughing, sneezing or speaking. Another minor mode of transmission is through raw milk with *M. bovis*. It is estimated that 2-3 contacts will usually be infected by each Acid Fast Bacilli (AFB) positive case before detection.

Primary TB is the clinical illness that directly follows infection. It is common among children up to 4 years of age. It is often severe, disseminated, and usually not transmissible. When infection is acquired later in life, the chance is greater that the immune system will contain it. Two patterns might follow after being infected with TB: the majority will ultimately develop TB within the first year or two after infection; others will harbor dormant bacilli for years before being reactivated to produce secondary TB which is often infectious. In all cases, it is estimated that about 5-10% of infected persons

¹ References:

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2. Seita A. Surveillance for tuberculosis in the Eastern Mediterranean Region. *La Revue de Sante de la Mediteranee Orientale*, 1996; 2: 129-134.
3. Araj GF. Tuberculosis: Resurging disease with new dimensions. Current status and new trends in laboratory diagnosis. *LMJ*, 1994; 42: 126-133.
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will eventually develop active TB.

Tuberculosis may be present as a pulmonary (affecting the lungs) or extrapulmonary (affecting organs other than the lungs) disease.

- Pulmonary TB disease is broken down into primary and postprimary (reactivation/secondary) disease based on its onset. Primary disease, often seen in children, usually involves the middle and lower lungs. In the majority of cases, the outcome is spontaneous healing of the lesion into a small calcified nodule. However, in children with impaired immunity (e.g., HIV, malnutrition), the outcome is a clinical disease which may lead to hematogenous dissemination. The majority of cases heal and the remainder develop miliary TB.
- Postprimary disease is also called adult type or reactivation TB or secondary TB. It is the result of endogenous reactivation of a latent infection. In 1/3 of untreated patients, the outcome is severe pulmonary TB within weeks or months. The remaining 2/3 may have a spontaneous remission or a chronic progressively debilitating course (also called consumption).
- Extrapulmonary TB invades virtually all organ systems in the following order of decreasing frequency: lymph nodes (> 25%); pleura, genito-urinary tract (15%); bones and joints (8-9%); meninges, peritoneum, central nervous system (5 %).

If untreated, the 1 year mortality is 33% and the 5 year mortality is 50%. However, for sputum smear positive cases, the 5 year mortality is 65%; of the remaining 35%, 60% will go into spontaneous remission and 40% will continue excreting Tubercle Bacilli. If properly treated, patients have a good chance of being cured. The improper use of antibiotics usually leads to chronic cases.

Before the HIV era, 80% of cases were pulmonary and 20% extrapulmonary. However, up to 2/3 of HIV infected patients may have both pulmonary and extrapulmonary disease or extrapulmonary disease alone. Patients with AIDS have an accelerated death time which ranges from 4 to 16 weeks from TB diagnosis. Patients with multidrug resistance also have higher mortality rates. In patients resistant to 2 or more drugs (without AIDS), the case fatality rate is 40-60%. However, in patients resistant to 2 or more drugs, with AIDS, the case fatality rate reaches 80%.

The initial suspicion of pulmonary TB is often based on an abnormal chest radiograph in a patient with respiratory symptoms. The typical picture is that of upper lobes infiltrates and cavitation. However, any radiologic pattern may be seen. A presumptive diagnosis is commonly based on the finding of AFB (Acid Fast Bacilli) upon microscopic examination of a diagnostic specimen such as a smear of expectorated sputum or of tissue. Definitive diagnosis is dependent on the isolation of *Mycobacterium tuberculosis* from a diagnostic specimen (mostly sputum). Usually, 4-8 weeks may be required before growth is detected.

PPD skin test is of limited value in diagnosis because of its low sensitivity and specificity. However, in the absence of a history of BCG vaccination, a positive skin test may provide additional support for diagnosis of TB in culture negative cases. PPD skin test is used for screening, however it has a high false positive rate.

Tuberculosis in the Region

According to WHO (Seita 1996- ref 755), 30% of the population in the Eastern Mediterranean region is infected with TB. In 1995, TB incidence was estimated at 166/100,000.

Lebanon is usually grouped within low prevalence countries with an estimated level of risk of infection at 0.1-0.2%, as shown below (WHO, 1998):

Table 6.1-1: Statistics regarding incidence in low prevalence countries

	Estimated risk of infection (%)	Population at risk (millions)	Estimated Incidence (per 100,000)	Estimated number of new cases per year
Low prevalence countries (including Lebanon)	0.1-0.2	13	15	2,000

Source: WHO. 1998

However, WHO warns about, the discrepancy between the number of reported TB cases in the EMR (40,000 positive smear per year and 350,000 cases under treatment) and the expected numbers estimated at 250,000 and 1,000,000 respectively (WHO, 1998):

Table 6.1-2: Reported expected prevalence of TB in EMR

	Reported	Expected	Reported/Expected
Number of smear positive/ year	40,000	250,000	1: 6
Number of cases under treatment	350,000	1,000,000	1: 3

Source: WHO. 1998

Available Relevant References in Lebanon

Table 6.1-3 Selected studies regarding Tuberculosis in children in Lebanon

Author	Year/Population/Methodology	Positive reaction (%)
Yazigi and Najjar (1985)	- June 1983 - 2412 school children (4-14 years) from southern suburbs of Beirut (17 different schools)—low socioeconomic status - Students were tested using the tine test first and those who tested positive 48-72 hours later were tested with PPD - Cut point for positivity not stated	1.82%
Rabay-Chacar and Asmar (1993)	- 1988-1992 (interrupted by war) - 1962 children (7 months-18 years) from different socioeconomic status. - Used monotest with old tuberculin on 300 subjects and Intradermis injection of 5 u of standard purified tuberculin on the rest - No information on sample selection.	0.5%
Misljenovic (1995)	- 1994 - 4704 school children (6-10 yrs) from 53 primary schools randomly selected from all Lebanon - Unpublished letter - Testing method: WHO standard mantoux test - Cut point for positivity was $\geq 10\text{mm}$ or $\geq 14\text{mm}$	1.9%
Saab et al. (1998)	- 1992-1993 - 1236 students (5-14 years) from 25 schools in Beirut who tested negative I 1992 were re-tested in 1993 - Sample mostly from low socioeconomic class - Testing method: 5 Tuberculin units (TU) of PPD - $\geq 10\text{mm}$ was used as a cut point for positivity	1.4% (converters)

Summary Findings

- i) Prevalence of reported TB in general population:
 NHHEUS 1999: TB is not reported in any of the tables provided by Dr. Choghig Kasparian.
 Beirut 1992-1993: TB was one of the least reported conditions with a prevalence of 0.1%.
- ii) Prevalence of positive reaction to TB antigens (infection rate):
 The previous table summarizes the different studies which tested the reaction of school children to tuberculin tests:

Yazigi and Najjar (1985) reported an overall positive reaction of 1.82% with the following age-sex distribution.

Table 6.1-4: TB reaction rates by age and sex

	Number Tested	Number read	Positive Reaction	% positive
Age (years)				
<4	18	18	0	0
4-6	1030	958	5	0.52
7-12	1353	1315	37	2.81
>12	11	11	0	0
Sex				
Male	1177	1123	17	1.51
Female	1235	1179	25	2.12
TOTAL	2412	2302	42	1.82

Source: Yazigi and Najjar. 1985

In Misljenovic's study (1995) for the WHO, 5008 children aged 6 to 10 years were approached in a national survey on 53 primary schools randomly selected from different regions in Lebanon. The test used was WHO standard mantoux test: 2 tuberculin units PPD. The results were read after 72 hours. The children were then divided into 2 major groups: BCG vaccinated and non-BCG vaccinated. Three cut-off points were used to estimate the prevalence of infection with Tuberculosis:

1. 10mm cut-off point that is suitable for an area with little infection with Mycobacteria other than Tuberculosis
2. 14mm*1.22 cut-off point, which is appropriate for an area with some infection with Mycobacteria other than Tuberculosis
3. 17mm*2 cut-off point that is suitable for an area with much infection with Mycobacteria other than Tuberculosis

The following tables present the reactivity results by vaccination status and by region.

Table 6.1-5: TB reactivity in BCG vaccinated vs. nonvaccinated children

Non- BCG vaccinated children (average age = 7.4years)									
	Total Number	>=6mm		>=10mm		>=14mm *1.22		>=17mm *2	
		N	%	N	%	N	%	N	%
Male	2266	61	2.7	47	2.1	48	2.1	44	1.9
Female	2015	44	2.2	34	1.7	33	1.6	35	1.7
TOTAL	4281	105	2.5	81	1.9	81	1.9	79	1.8
BCG vaccinated children (average age=7.4 years)									
Male	237	74	31.2	45	18.9	16	6.7	4	1.7
Female	186	39	21.0	18	9.7	9	4.8	2	1.1
TOTAL	423	113	26.7	63	14.9	25	5.9	6	1.4

Source: Misljenovic. 1995

Table 6.1-6: Comparison of TB reactivity rates by region in Lebanon

	Number with no BCG scar	≥10mm		≥14mm*1.22		≥17mm *2		Average age (years)
		N	%	N	%	N	%	
Beirut	1184	41	3.5	38	3.2	39	3.3	7.5
South Beirut Suburb	322	2	0.6	2	0.6	4	1.2	7.4
North Lebanon	613	6	1.0	7	1.1	3	0.5	7.5
Bekaa	501	4	0.8	5	1.0	7	1.4	7.8
South Lebanon	530	4	0.7	2	0.4	2	0.4	7.7
Mount Lebanon	648	8	1.2	9	1.4	12	1.9	7.8
Akkar and Hirmel	483	16	3.3	17	3.5	12	2.5	7.6

Source: Misljenovic . 1995

No significant differences were noted between males and females. However, positive reaction (infection rate) was highest in Beirut and Akkar/ Hirmel and lowest in Southern suburbs of Beirut and South Lebanon.

Saab et al. (1998) assessed the one-year conversion rate of a cohort of 1236 negative-testing children in 1992. The conversion rate was 1.4%.

Adib et al. (1995) reported their findings on prisoners, an adult special group who have been shown to be at higher risk of TB infection due to several factors like over crowding and poor sanitary conditions. The study, done in collaboration with the MOPH, tested 3931 inmates in all 21 jails in Lebanon. The test used was Mantoux PPD test and the results were read 72 hours later (≥ 8mm in diameter was considered positive, 5-8 mm in diameter was considered borderline, and < 5mm was considered negative). The results showed that 45% of the inmates tested positive, 12 % were borderline and 43% negative.

Among the 1776 individuals who tested positive, 1056 received a CXR and among them 78 (7%) showed radiologic signs suggestive of TB infection. The risk of a positive PPD test increased with the duration of incarceration.

Incident and Hospitalized TB Cases

Reported Cases

The following table presents the number of TB cases reported by physicians and hospitals to the Epidemiology Surveillance Unit (ESU) at the MOPH

Table 6.1-7: Number of new cases reported to ESU-MOPH by age, sex, and year

	1992*	1993*	1994*	1995*	1996		1997		1998	
<i>Age (years):</i>	N	N	N	N	N	%	N	%	N	%
<1					1	0.10	1	0.12	0	0.00
1-4					27	2.80	20	2.40	20	4.77
5-14					85	8.83	52	6.24	22	5.27
15-24					192	19.94	158	18.94	91	21.72
25-34					244	25.34	196	23.50	112	26.73
35-44					130	13.50	100	11.99	45	10.74
45-54					73	7.58	97	11.63	31	7.40
>55					185	19.21	188	22.54	88	21.00
Not specified					23	2.39	22	2.64	10	2.39
<i>Sex:</i>										
Male					532	52.24	489	58.63	242	57.76
Female					428	44.44	345	41.37	177	42.24
<i>Location:</i>										
Beirut					399	41.43	310	37.17	163	38.90
Mt Lebanon					38	3.95	48	5.76	26	6.21
North					265	27.52	201	24.10	98	23.39
South					112	11.63	113	13.55	57	13.60
Bekaa					137	14.23	144	17.27	57	13.60
Not specified					9	0.93	18	2.16	18	4.30
TOTAL	884	885	886	887	963	100.0	834	100.0	419	100.0

Source: MOPH

*Only the total number of cases were reported for 1992-1995

The TB Program in Lebanon², which gathers data from all TB centers in Lebanon, reports a different number of new cases over seven years by age, sex, and type of disease.

Table 6.1-8: Number of cases followed by all the TB centers in Lebanon each year by age, sex, and type of disease

	1993		1994		1995		1996		1997		1998		1999	
Age(years)	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0-4	52	5.23	53	5.64	31	3.15	18	2.15	12	1.71	34	4.97	17	2.50
5-14	136	13.67	112	11.91	102	10.38	75	8.97	48	6.85	45	6.58	41	6.04
15-24	227	22.81	214	22.77	236	24.01	182	21.77	136	19.40	154	22.51	134	19.73
25-34	217	21.81	190	20.21	229	23.30	209	25.00	170	24.25	169	24.71	177	26.07
35-44	138	13.87	115	12.23	134	13.63	119	14.23	86	12.27	94	13.74	114	16.79
45-54	103	10.35	76	8.09	91	9.26	69	8.25	82	11.70	71	10.38	53	7.81
55-64	69	6.93	88	9.36	78	7.93	78	9.33	75	10.70	53	7.75	68	10.01
65+	49	4.92	91	9.68	79	8.04	72	8.61	87	12.41	64	9.36	56	8.25
Sex														
Male	565	56.78	514	54.68	570	57.99	453	54.19	404	57.63	369	53.95	365	53.76
Female	426	42.81	425	45.21	410	41.71	369	44.14	292	41.65	315	46.05	295	43.45
Total														
New	991	100.0	939	100.0	980	100.0	822	100.0	696	100.0	684	100.0	660	100.0
Relapse	4	--	1	--	3	--	14	--	5	--	6	--	19	--
TOTAL CASES	995	100.0	940	100.0	983	100.0	836	100.0	701	100.0	690	100.0	679	100.0

Source: National TB Program in Lebanon

Note: the Total of sex/ age distributions is equal to total new and not overall total

² The work of the National anti-TB Program in Lebanon started in 1991. In 1998 there were 8 centers: *Quarantina* (Beirut:Main Center), *Manasfi* (Beirut), *El-Qoubba* Hospital (Tripoli), *Ein El Hilwa* Hospital (Saida), *Tyr* Governmental Hospital (Tyr), *Beit El Dine* (Mount Lebanon), and *Maalaka* Hospital (Zahle). These centers provide free anti-TB treatment for all Lebanese and non-Lebanese patients for free. In addition they provide free CXR and sputum culture and free admission to *Bhannis* and *Azurieh* sanatoria for cases that need admission. The program started implementing the DOTS (Directly Observed Treatment Short Course) strategy in 1998.

[*Directory of Prevention of TB In Lebanon-The Lebanese Republic, MOPH, Jan 1998*]

Clinical Manifestations

The National TB program reports the distribution of TB cases according to site of infection as follows

Table 6.1-9: Distribution of TB cases as pulmonary vs extra pulmonary

	1993 N (%)	1994 N(%)	1995 N(%)	1996 N(%)	1997 N(%)	1998 N(%)	1999 N(%)
Pulmonary	807 (81)	718 (76)	725 (74)	582 (71)	508 (73)	457 (67)	417 (63)
(no. & % of sputum positive)	235 (-)	148 (-)	197 (27)	198(34)	205(40)	----	----
Extra Pulmonary	184 (19)	221 (24)	255 (26)	240 (29)	188 (27)	227 (33)	243 (37)

Source: National TB Program in Lebanon

The above table shows a clear decrease in the proportion of the pulmonary TB cases and an increase in the extrapulmonary cases. In 1986, Peltekian et al. reported on the distribution of the, 324 TB cases admitted to Bhannis Hospital between January 1980 and June 1983, which showed a preponderance of pulmonary TB cases:

Table 6.1-10: Distribution of TB cases as pulmonary vs extra pulmonary in Bhannis Hospital, 1980 and 1983.

Site of Infection	Number of cases	
	N	%
Pulmonary		
Primary	75	23
Postprimary	236	73
Miliary TB	4	1
Extrapulmonary		
Intestinal	3	
Genitourinary	2	
Meningeal	4	
TOTAL	324	100

Source: National TB Program in Lebanon

Another case series study by Shikhani et al. (1989) reviewed 545 patients with TB admitted to AUBMC between 1970 and 1985. Of these patients, 363 had pulmonary TB (67%) and 182 (33%) had extrapulmonary disease. Of these, 29 (4.5%) had cervical lymphadenitis.

In a much earlier study in 1963-1964, Abou-Daoud and Al-Shahrustai (1966) reviewed a total number of 1071 patients admitted to the four Sanatoria in Lebanon. Of these, 94% had pulmonary TB and the remainder presented extra-pulmonary disease (bone and joint 2.1%; glandular 1.3%; meningeal 1.0%).

Several papers were published about case series or case reports of extra-pulmonary TB cases

- Gehshan et al. (1975) reviewed 18 cases of miliary TB admitted to AUBMC between 1964 and 1973. Age ranged from 14 months to 56 years (6 between 14 months and 12 years/ 10 between 19 and 31 years). The male:female ratio was 0.5. The most common presenting symptoms were fever, gastrointestinal disturbances, weight loss, anorexia, cough, and headache. The most common physical signs were hepatomegaly, lymphadenopathy, fever and splenomegaly. The mortality rate was 16.7% (3/18).
- Ramadan et al. (1993) reviewed 16 cases with laryngeal TB admitted to AUBMC between 1954 and 1984. Age ranged from 3 to 58 years. The male:female ratio was 7. The most common presenting symptom was hoarseness (100%) and 25% of the patients were previously treated for TB.
- A case of cutaneous tuberculosis was reported by Makhoul E. et al. (1997).
- Tabbara and Khalidy (1969) reported 23 female patients with genital TB in two hospitals in Beirut (Khalidy Hospital and Hotel Dieu de France). Most of the subjects registered were young women, with 74% of the patients being between 20 and 30 years of age. The authors reported that 43% of the infections occurred in the ovaries and fallopian tubes.
- A case of TB of the thyroid in a 68 year old female admitted to AUBMC was reported by Hajjar and Salti (1973).

Treatment and Drug Resistance

Sarru et al. (1995) reviewed the of CXR of 113 asymptomatic young adults with positive PPD tests. Only 4 had a positive CXR

Hamze and Araj (1998) reviewed the drug resistance of 96 TB samples from AUBMC and Islamic Hospital in 1994-1995. A total of 26% of the samples were resistant to 1 or more drugs as follows:

- 44% resistant to 1 drug
- 40% resistant to 2 drugs
- 8% resistant to 3 drugs
- 8% resistant to 4 drugs

Looking at specific drugs:

- 23.9% were resistant to Isoniazid
- 12.5% were resistant to Rifampicine
- 7.3% were resistant to Streptomycin
- 3.1% were resistant to Ethanbutol

It was noted that the percentage was higher for all drugs in isolates from previously treated patients compared to new cases of TB.

Hatem (1969) found that resistance to anti-TB drugs in 389 sputum samples from patients at Dahr el Bacheck sanatorium ranged from 13 % to Pyrazinamide to 73.3% to Isoniazid.

Quoted in an article by Araj (1999) and according to a circular by Dr Hallak, also quoted in the directory of the anti TB program (1998), the resistance to various drugs in Bhanis Hospital from 1989 to 1993 were as follow:

	1989	1993
Isoniazid	5%	24%
Streptomycin	16%	28%
Ethambutol	8%	13%
Rifampicine	24%	21%

Regarding completion and efficacy of treatment, Seita (1996) reported for the WHO that in 1993, that 98.3 % of cases completed treatment. The cure rate was unknown [it was 47.7% in Syria in 1993]. However, the annual WHO report (1995) reported that the cure rate in 1995 was less than 50 %.

According to the Director of TB program in a WHO-sponsored workshop, 70-75% of patients in 1994-1996 completed treatment.

Comments

* In evaluating the global burden of TB, Dye et al (1999) estimated the incidence (I), prevalence (P), deaths, CFR (case fatality rate), CDR (case detection rate), and TB/HIV (coinfection of TB and HIV) in Lebanon (population estimated at 3,144,000) as follows.

Table 6.1-11: Statistics regarding TB in Lebanon

I*	Incidence of sputum Smear pos.	P*	Sputum Smear P*	Deaths*	CFR (%)	HIV+ (%)	CDR (%)	CDR For sputum smear positive (%)
27	12	43	19	3	12	0	82	53

Source: Dye et al. 1999

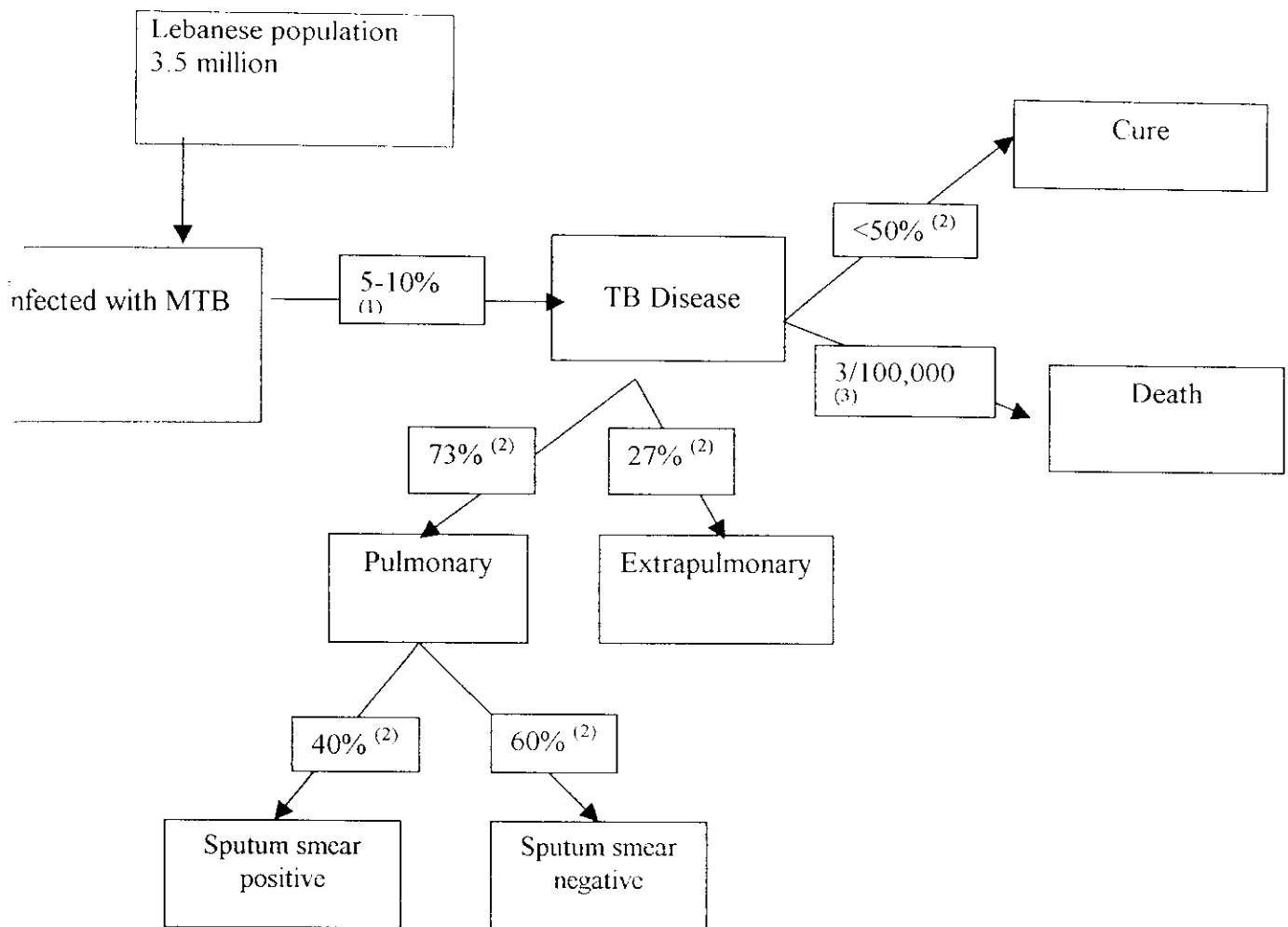
* per 100,000

* Based on the data from ESU and the National TB program, the number of new TB cases in Lebanon range between 700 and 1000, including non-Lebanese cases. Assuming a 3.5 million population, the incidence rate is around 26-28 per 100,000. This is comparable to the estimates of the Global Burden of TB project (Christopher Dye et al for WHO, 1997).

- If the incidence of a disease is stable through time (with change of <10% per year), then prevalence can be calculated by multiplying incidence by duration of illness. As the incidence of TB in Lebanon was fairly similar throughout the years (around 900), we can use the estimated duration of TB which is 2 years (Dye et al., 1999). Hence, the prevalence per 100,000 across the years was 56 (1993), 54 (1994), 53 (1995), 55 (1996), and 48 (1997).

- The estimation of the Global Burden of TB project was 43/100,000.
- Reviewing the studies done on school children in Lebanon, the percent positivity to skin testing generally ranged between 1.8% and 4.6%. The one-year conversion rate was 1.4%.
- It is clear that the proportion of extrapulmonary TB cases is increasing. It occurs in one-third in the more recent case series. The international literature estimated the distribution by 20% extra-pulmonary and 80% pulmonary for patients who are HIV negative. The results in 1993 and 1994 are very close to the international literature. However as of 1995, the percentage of pulmonary cases is decreasing and that of extra-pulmonary cases is increasing. This poses an important question: are we having an increase in the HIV and TB coinfection in Lebanon? It is worth noting though, that the criteria for classifying patients into pulmonary versus extra-pulmonary disease was not standard.
- According to the TB program, 70-75% of the patients have completed treatment and the cure rate is estimated by WHO to be less than 50%.
- No national estimates of mortality exist. The Global Burden of TB Study estimated the annual death rate from TB Lebanon at 3/100,000 and the case fatality rate at 12%.
- Resistance to anti-TB antibiotics in Lebanon is on the rise. The study done in Bhannis Hospital showed that resistance to Isoniazid rose from 5% in 1989 to 24% in 1993, and resistance to Ethanbutol increased from 8% in 1989 to 13% in 1993.

Natural History of Tuberculosis (adapted to the Lebanese data)



- (1) Harrison 14th edition
- (2) National TB program data for the year 1997
- (3) Global Burden of TB study (Dye et al, 1999)

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6.2 SEXUALLY TRANSMITTED DISEASES (STD; excluding HIV)

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Background¹

Sexually transmitted diseases (STDs and their accompanying syndromes) include more than 22 organisms that can be transmitted through sexual activity. STDs are completely dependant on behavioral factors for transmission. Thus, their epidemiology is influenced by socio-cultural factors, population composition, host susceptibility, efficiency of transmission, changing characteristics of the pathogens, and efforts in primary prevention and disease control.

STDs are not only an important cause of morbidity in the world but they also enhance HIV transmission. Thus, they constitute important markers of behavior associated with a high risk of HIV transmission. STDs burden is difficult to assess throughout the world because of the absence of effective control and notification systems in most countries, especially in the developing countries.

The following table estimates the annual incidence of STDs in the world and in North Africa and the Middle East Region:

Table 6.2-1 Incidence of STDs globally and in the region

STDs (Excluding HIV)	North Africa and Middle East	Global Total
Trichomoniasis	4.6 million cases	170 million cases
Chlamydial infections	2.9 million cases	89 million case
Gonococcal Infections	1.5 million cases	62 million cases
Syphilis	620,000 cases	12 million cases
Total	9.62 million cases	333 million cases

Source: WHO, Fact Sheet N 110, March 1996

Source: WHO, " Overview of Selected Curable STDs"

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The annual incidence and prevalence of STDs in the US are as follows:
Table 6.2-2 Incidence and prevalence of STDs in the U.S.

STD	Incidence (Estimated number of new cases every year)	Prevalence* (Estimated number of people currently infected)
Chlamydia	3 million	2 million
Gonorrhea	650,000	Not Available
Syphilis	70,000	Not Available
Herpes	1 million	45 million
Human Papillomavirus (HPV)	5.5 million	20 million
Hepatitis B	120,000	417,000
Trichomoniasis	5 million	Not Available
Bacterial Vaginosis*	Not Available	Not available

Source: Center for Disease Control (Cates, 1999)

* No recent surveys on national prevalence for gonorrhea, syphilis, trichomoniasis or bacterial vaginosis have been conducted

** Bacterial vaginosis is a genital infection that is not sexually transmitted but is associated with sexual intercourse

The remaining of the background section reviews selected sexually transmitted diseases.

Gonorrhea

Gonorrhea is caused by *Neisseria gonorrhea*, a fastidious non-motile gram-negative diplococcus transmitted through vaginal or oral sex. The incubation period is 1 to 14 days but most of the symptoms develop within 2 to 5 days.

About 95% of males will develop symptoms (urethral discharge and/or dysuria) usually 2 to 5 days after infection. Males with untreated infection may develop urethritis (the most common syndrome in men), epididymitis, stricture and prostatitis. The symptoms observed in women for Gonorrhea are non-specific such as increased vaginal discharge, dysuria, abnormal menses, spotting after sexual intercourse, and/or lower abdominal pain. Up to 30% of women are asymptomatic. In women, gonorrhea typically causes cervical disease (cervicitis). Urethritis and bartholinitis are also observed. Untreated women may develop pelvic inflammatory disease (PID) and its associated complications including infertility, ectopic pregnancy, chronic pelvic pain, tubo-ovarian abscesses. In males and females, the infection may develop symptoms such as proctitis (10-20% of anal gonorrhoea) and gonococcal pharyngitis (tend to be asymptomatic). If not treated, infection may spread (unusual) to the bloodstream and infect the joints, heart valves and the brain. In the US, Gonorrhea remains a major cause of pelvic inflammatory disease (PID) and subsequent infertility and tubal pregnancies in women.

In infants, gonococcal disease is transmitted by perinatal transmission, and may develop gonococcal ophthalmia, which is a severe public health problem in the developing world.

Gonorrhea has usually been diagnosed through culture. However, in the past few years, amplification techniques such as polymerase chain reaction and ligase chain reaction have been shown to be as sensitive as the culture and have the advantage to be used in urine. Gonorrhea infection can be cured with antibiotics but can develop resistance to antibiotics. Finally, according to CDC guidelines, all patients treated for gonorrhea should also be treated for chlamydia.

Chlamydia

Chlamydia is caused by the bacteria, *Chlamydia trachomatis*, transmitted mainly through vaginal or anal intercourse and also through oral sex. The incubation period is from 7 to 21 days before symptoms appear. The syndromes for chlamydia are similar to those seen in gonorrhea, but in generally are less severe.

In men, the symptoms are urethritis (mucoid discharge associated often with dysuria), and/or epididymitis. About 20-to 30% of infections are asymptomatic. If infection is untreated, it can lead to infertility. Most of the women are asymptomatic. However, when symptoms occur, they may manifest as vaginal discharge, dysuria, spotting after sexual intercourse, lower abdominal pain and/or pain during intercourse. In women, chlamydia can cause cervical infection (the most commonly reported syndrome), urethritis, and bartholinitis. If untreated, chlamydia infection leads in about 30% of the cases to PID and further on to ectopic pregnancy, infertility, and chronic pelvic pain. Symptomatic rectal infection may occur in men and women. However, they occur predominantly in homosexual men who have had receptive rectal intercourse.

According to a CDC report, up to 40 percent of women with untreated chlamydia will develop PID and one in five women with PID becomes infertile. People infected with chlamydia can be cured easily if the disease is recognized. However, millions of cases are unrecognized.

Syphilis

Syphilis is caused by the bacteria *Treponema pallidum* and it has several stages: primary, secondary and late syphilis. The incubation period is, on average, 21 days, during which the patient is not infectious. The first symptom that develops is a genital ulcerative lesion or chancre. If untreated, the chancre will heal within 3-6 weeks. Two to 8 weeks after, secondary syphilis will develop with a rash covering the entire body or only a few areas. Other symptoms may develop such as malaise, fever, general lymph node enlargement, hepatitis, arthritis and/or hearing loss. About 30% of untreated individuals will develop late syphilis with possible destruction of the central nervous and cardiovascular systems or gummas (large soft lesions in other organs). Finally, congenital syphilis may appear in infants. If untreated, the infants may suffer heart, brain or eye damage.

The incidence rate of primary and secondary syphilis in the US is at its lowest with no reported cases in 1999, in 79% of the 3,115 counties. However, in 1999, 556 cases of congenital syphilis were reported.

Vaginal Infections

These include:

- Trichomoniasis which present as discharge (42%), odor (5%), edema, erythema (22-37%), or vaginal pruritus. Intermenstrual or postcoital spotting are also noted because the ectocervix is involved. However, up to 50% of infected women are asymptomatic.
- Bacterial vaginosis (BV), which is not an STD, but is commonly seen in sexually active women and often coexists with STD infections. It is related to the loss of normal hydrogen peroxide-producing organisms and the appearance of mycoplasmas, Gardnerella, and anaerobic bacteria. Symptoms include vaginal discharge (90%) and unpleasant odor (90%).
- Vulvovaginal Candidiasis or “Yeast Infections” which represent 20 to 30% of all infections. It is not an STD, but an overgrowth of vaginal yeasts with the development of symptoms such as thick, white discharge (cottage cheese like), pruritus, erythema, excoriations, and often extensive inflammation which may involve the vulva.
- Cervicitis, which is often associated with vaginal, and STD infections.

Pelvic Inflammatory Diseases (PID) is the most important consequence of sexually transmitted bacterial infections. It is a serious complication caused essentially (50% of cases) by *Chlamydia trachomatis* and *Neisseria gonorrhea*. Symptoms and signs include lower abdominal tenderness, adnexal tenderness, and pain on manipulation of the cervix. Long-term complications, such as chronic pelvic pain, ectopic pregnancy and infertility, are noted in about 25% of PID cases.

Sexually Transmitted Diseases in Lebanon

Available Relevant References in Lebanon

The review of the Lebanese data on STDs was difficult and limited because of several factors (National AIDS Program 2001):

- The absence of STD clinics in Lebanon
- STDs patients often prefer self-treatment
- Limited studies on STDs in Lebanon
- Substantial underreporting of STDs
- STDs are considered a taboo
- An assumption that STD prevalence is low

The following table summarizes the relevant references from Lebanon:

Table 6.2-3 Selected references regarding STDs in Lebanon

Author	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Deeb M, Ghorayeb F, Kabakian T, Kanj M., Jabbour J. (1997)	Stratified random household survey (2,017 households and 8,940 individuals in Beirut 1992-93). 1,120 households (56%) had at least one woman eligible for the Reproductive Child Health survey, constituting 1,169 women. Of these, 1032 ever-married women were interviewed. Women were asked about complaints or symptoms that triggered their last visit to the physician and whether the woman was currently experiencing symptoms indicative of prolapse. Physician diagnoses (as reported by women) were considered a proxy for the prevalence of reproductive morbidity. Reported complaints are more a reflection of women's perceptions of their illnesses. Clinical and laboratory testing were not carried.
Deeb M et al. (1995)	6,058 admission records from 7 hospitals in Beirut, between January 1992 and December 1993. Hospitals included the two largest ones (AUBMC and HDF), the next two largest ones, two of midsize, and two of the smaller ones. Records of admissions were reviewed and causes of admission and discharge were recorded.
MOPH (1998-2000)	MOPH Epidemiologic Surveillance Unit: 1998, 1999, 2000
National AIDS Program (2001)	August 1999-September 2000 462 non-pregnant women (15-55 years) presenting for routine gynaecological exams or for a first visit in relation to vaginal discharge, dyspareunia, genital itching or genital lesion were selected from 4 different sites [Armenian Relief Cross (175); a private clinic at Arz hospital (146); AUBMC (96); Trad Hospital outpatient clinics (45)]. Women were examined and interviewed. Specimens were collected and examined for STDs (chlamydia, candida, gardenella, trichonomas, HBV, gonorrhoea, H. ducreyi, syphilis and HIV).
Deeb M, Awad J, Kaspar H., Yeretjian J. (1998)	Rural community (Nabi Sheet, Bekaa). Random sample from households. 530 women were questioned: all ever-married (94.3% married, 5.7% widowed and divorced) and aged between 15-60 years. 506 women were screened for trichomoniasis, candidiasis, bacteria vaginosis, gonorrhea, and C. trachomatis. Gynaecological signs and symptoms were obtained by questioning the women.
Kurban A. (1973)	Reviewed reports from the Department of Clinical Pathology at AUBMC (1969-1972) for syphilis. Inquired in a pilot study about urethritides among AUB students (few months period). Numbers of screening tests are compared with reactive non-treponemal (VDRL and Kolmer) and treponemal (Reiter's complement fixation) tests.

Zabanch H et al. (1980)	250 patients presenting with urethral discharge, of whom 100 were positive for N. gonorrhoea (18-56 years old, with a mean age of 28 years). The study aimed at comparing the effectiveness of several antibiotics.
Chaglassian HT, Azar JE (1954)	8561 patients from the outpatient department at AUBMC from January 1, 1953 till March 31, 1954. Tested for Chediack-V.D.R.L. Reactive or partially reactive patients were tested by routine serological tests for syphilis (S.T.S). Positives referred to the venereal disease clinic for diagnosis and treatment. Contact investigation was also done (household members and others).

Summary Findings

This section will cover overall STD complaints, then addresses specific types of STDs.

Overall

Following the health to disease spectrum, self-reported STDs and its complications will first be reported, followed by complaints of women presenting to clinics, then hospital admissions.

The NHHEUS (1999) did not inquire specifically about STDs. However in the Beirut Survey 1992-1993 (Deeb et al. 1997), 174 of the 1032 women interviewed (16.9%) reported having a gynaecological complaint. Discharge was the most frequent reported symptom, followed by irregularity in the menstrual cycle and irritation/itching. Pelvic inflammatory disease/hormonal disorders were reported by 5.4% of the women, followed by lower reproductive tract infections (4.6%), prolapse (0.4%), and infertility (0.3%).

Less than 45% of the women consulted a gynaecologist within one year before the interview. Those recalled the physicians' diagnoses as follows: negative (33.7%), gynaecological morbidity (3.5%), related morbidity (1.8%), other (1.4%), unspecified diagnosis (3.9%), and not related to gynaecology (0.3%). Among the reported gynaecological morbidity, 2.3% were lower reproductive tract infections, 0.6% pelvic inflammatory diseases (PID)/hormonal disorders, 0.5% gross pathology, and 0.1% prolapse. More than one-third of the 174 women who reported having symptoms were diagnosed by the physician as negative.

Realizing that "secondary infertility is related to untreated upper reproductive tract infections due to chlamydia or gonorrhea, or to unhygienic procedures during obstetrical care and/or abortion" (Deeb et al. 1997), secondary infertility defined as women aged 40-49 years or married for at least 5 years with no children and not currently pregnant was measured among ever married women with the following findings:

Table 6.2-4 Rate of secondary infertility in Lebanese women by age

Age (years)	Number and rate of secondary infertility	
	Number	(%)
15-19	1	3.2
20-24	6	19.4
25-29	7	22.6
30-34	5	16.1
35-39	8	25.8
40-44	2	6.5
45-49	2	6.5
Total	31	100.0
Rate (%)		3.1

Source: Deeb et al. 1997.

In the survey of the 462 women attending Ob/Gyn clinics in 1999-2000 (National AIDS program, 2001), 76% came for a routine exam and 24% for different reasons or complaints. Among the latter group, infertility was the most frequent reason for the visit (n= 26, 6.7%), followed by pain or itching (n= 18, 4.7%), discharge (n= 17, 4.4%), other reproductive organ disease (n= 13, 3.4%), cervical diseases (n= 3, 0.8%), urinary symptoms (n= 2, 0.5%), and contraception (n= 2, 0.5%).

A total of 169 (37%) of the women attending these clinics reported having symptoms, such as vaginal discharge (n= 84, 18.2%), low pelvic pain (n=29, 6.3%), burning upon urination (n=27, 5.8%), dyspareunia (n=22, 4.8%), swelling in the groin (n=5, 1.1%), and genital ulcers (n=2, 0.4%). Upon clinical examination, 85 women (18.4%) were diagnosed with vaginal discharge, 51 (11.0%) with cervical tenderness, 33 (7.1%) with cervical discharge, 10 (2.2%) with large uterus, 8 (1.7%) with pelvic tenderness, 7 (1.5%) with skin rash, 1 (0.2%) with inguinal bubo, 1 (0.2%) with vesicles on the genitals, and 1 (0.2%) with genital ulcers.

A total of 448 (97%) were tested with a Pap smear. Of those, 67.3% revealed a normal result and 20.4% showed cervicitis.

As for hospital admissions because of an STD or an STD-related health condition, 207 out of the 140,245 discharge diagnoses reported by the 3 hospitals in Beirut in 1999 (0.15%) were sexually transmitted diseases (Refer to chapter 5). Deeb (1995) reviewed all 6,058 admission records from 7 hospitals between January 1992 and December 1993, and reported the following STD or STD-related diagnoses:

Table 6.2-5 Hospitalization by type of STD

ICD code	Description	Number (%) of admissions*	
054	Herpes simplex	0	0
078	Other diseases due to viruses and chlamydia	11	0.2
091	Early syphilis, symptomatic	2	0
614	Inflammatory disease of ovary, fallopian tube, pelvic cellular tissue and peritoneum	27	0.4
615	Inflammatory diseases of uterus, except cervix	485	8.0
616	Inflammatory disease of cervix, vagina and vulva	232	3.8
617	Endometriosis	512	8.5
619	Fistula involving female genital tract	113	1.9
628	Infertility, female	378	6.2
633	Ectopic pregnancy	29	0.5

Source: Deeb, 1995

* Total number of admissions= 6,058

Finally, in a National KABP study conducted in 1996 by the MOPH and the NAP, 5.6% of the men in the sample population (42/760) self-reported symptoms suggestive of STD's during the last 12 months. About 50% (20) of these 42 men self-reported recurrent episodes of symptoms suggestive of STD's during the same year.

Gonorrhoea

The following table summarizes the number of cases of Gonorrhoea reported to the MOPH surveillance system over 5 years (1995-2000) by sex, age, and region of residency:

Table 6.2-6 Gonorrhea cases by sex, age and region of Lebanon

Year	1995	1996	1997	1998	1999	2000
Total	3	0	1	2	2	1
Sex						
Male			1	2	2	0
Female			0	0	0	1
Age (years)						
< 5						1
5-19						
20-64				2	1	
>= 65					1	
Region						
N. Lebanon				1		1
Bekaa						
Nabatieh						
S. Lebanon					1	
Mt. Lebanon					1	
Beirut						
Unknown				1		

Source: MOPH

The low numbers reported to the MOPH surveillance system obviously reflect under-reporting. However, the more recent studies in which women were screened in 4 Obs/Gyn clinics in Beirut and in the village of Nabi Sheet (National AIDS program 2001, Deeb et al.

1998), no cases of Gonorrhoea were found by microbiological testing and supported a low prevalence.

Earlier studies in which individuals with specific complaints were investigated reported different findings. In a pilot study conducted among AUB students in 1972 (Kurban 1973), 41 students reported urethritides, of whom 17 (41.5%) were gonococic and 24 (58.5%) were non-specific. In another study to examine the susceptibility of local *N. gonorrhoea* strains to antibiotics (Zabaneh et al. 1980), 250 patients presenting with urethral discharge were investigated of whom 100 (40%) had positive cultures of *N. gonorrhoea*. The patients diagnosed with gonorrhoea were 18 to 56 years old (mean 28 years) and they all presented with urethral discharge 1-30 days after sexual intercourse.

Chlamydia

No cases of chlamydia were detected by laboratory test in the community-based survey, conducted on 506 women in Nabi Sheet-Bekaa in 1998 (Deeb et al. 1998).

However, a total of 66 out of the 462 women (14.3%) attending Ob/Gyn clinics in Greater Beirut in 1999- 2000 tested positive (microbiologically) for chlamydia (National AIDS program, 2001). Those were distributed by age (if known) as follows:

Table 6.2-7 Percentage of women testing positive for chlamydia in selected Beirut clinics

Age group (years)	Number of women visiting clinics	Number (%) of women with Chlamydia	
15-19	3	1	33.3
20-24	29	5	17.2
25-29	69	6	8.7
30-34	100	20	20.0
35-39	81	6	7.4
40-44	73	11	15.1
45-49	55	4	7.3
>= 50	41	9	22.0
TOTAL	451	62	13.7

Source: National AIDS Program, 2001.

The 66 women diagnosed with chlamydia reported vaginal discharge (n= 20, 30.3%), burning upon urination (n= 8, 12.1%), low pelvic pain (n= 8, 12.1%), dyspareunia (n= 7, 10.6%), and swelling in the groin (n= 1, 1.5%). No symptom of genital ulcer was reported.

Upon clinical examination, the following gynaecological problems were seen: cervical tenderness (n= 23, 34.8%), cervical discharge (n= 16, 24.2%), vaginal discharge (n= 15, 22.7%), pelvic tenderness (n= 5, 7.6%), skin rash (n= 3, 4.5%), large uterus (n= 3, 4.5%), and inguinal bubo (n= 1, 1.5%). Again no genital ulcers were diagnosed.

Out of 140,245 discharge diagnoses reported by the 3 hospitals in Beirut in 1999 (Refer to Chapter 5), none was due to chlamydia.

Syphilis

The following table summarizes the number of cases of Syphilis reported to the MOPH surveillance system over 5 years (1995-2000) by sex, age, and region of residency:

Table 6.2-8 Reported cases of syphilis in Lebanon

Year	1995	1996	1997	1998	1999	2000
Total	9	9	38	57	19	7
Sex						
Male			5	4	7	4
Female			33	53	12	3
Age (years)						
< 5						
5-19					1	
20-64				11	8	5
>= 65				46	10	2
Region						
N. Lebanon					1	2
Bekaa						1
Nabatieh				1	2	
S. Lebanon				4	2	1
Mt. Lebanon				3	4	
Beirut				19	5	3
Unknown				30	5	

Source: MOPH

In spite of a positive microbiological diagnosis of STD in 30% of the 462 women attending Ob/Gyn clinics in four sentinel sites in 1999-2000 (National AIDS Program 2001), no cases of syphilis were diagnosed by VDRL test. Similarly, no cases were found in the community based survey conducted in the Bekaa region (Nabi Sheet) in 1998, although 1.2% of the women tested were microbiologically diagnosed with other STDs (Deeb et al. 1998).

In a review of the serologic tests for syphilis conducted on new admissions to the outpatient department and the hospital at AUBMC over a 3-year period (1969-1972), Kurban (1973) reported an increase in the number of reactive tests:

Table 6.2-9 Number of syphilis reactive tests at AUBMC 1969-1972

Year	S.T.S. Screening Tests	Reactive	
		S.T.S.	Reiter's
1969-1970	6615	117 (1.8%)	49 (0.74%)
1970-1971	5254	181 (3.4%)	91 (1.7%)
1971-1972	5163	199 (3.8%)	103 (2.0%)

Source: Kurban. 1973

Much earlier in 1954, Chaglassian and Azar reported that 8561 outpatients and some of their contacts were tested for syphilis between January 1, 1953 and March 31, 1954 using Chediack-VDRL tests and found that 279 (3.26%) were reactive.

Only one of the 140,245 hospital discharge diagnoses from the 3 hospitals in Beirut in 1999 was due to syphilis (Refer to Chapter 5).

Vaginitis and Vaginosis

The community-based survey conducted in Nabi Sheet, Bekaa in 1998 (Deeb et al. 1998) reported that 12 women (1.2%) screened positively for Trichomoniasis, 4 (0.8%) for bacterial vaginosis, and 44 (8.7%) for Candidiasis.

A total of 71 (15.3%) out of the 462 women who visited Obs/Gyn clinics in four sites in Greater Beirut in 1999-2000 (National AIDS Program 2001) were diagnosed with a vaginal infection distributed as follows: candida (n= 63, 13.6%), gardenella (n= 5, 1.1%), and trichomonas (n= 3, 0.6%).

The distribution of the candida cases by age (if known) was as follows:

Table 6.2-10 Distribution of candida cases by age in selected clinics in Beirut

Age group (years)	Number of women visiting clinics	Number (%) of women with Chlamydia
15-19	3	1 (33.3)
20-24	29	8 (27.6)
25-29	69	15 (21.7)
30-34	100	14 (14.0)
35-39	81	10 (12.3)
40-44	73	3 (4.1)
45-49	55	8 (14.5)
>= 50	41	3 (7.3)
TOTAL	451	62 (13.7)

Source: National Aids Program. 2001

The 63 women diagnosed with Candida reported the following symptoms: vaginal discharge (n= 26, 41.3%), burning upon urination (n= 11, 17.5%), dyspareunia (n= 5, 7.9%), low pelvic pain (n= 3, 4.8%), and genital ulcer (n= 1, 1.6%). Upon clinical examination, the following were observed: vaginal discharge (n= 32, 50.8%), skin rash (n= 5, 7.9%), cervical discharge (n= 3, 4.8%), cervical tenderness (n= 2, 3.2%), pelvic tenderness (n= 1, 1.6%), and large uterus (n= 1, 1.6%). No inguinal bubo or vesicles on the genitals were found.

Comments

Available data is limited especially in view of the underreporting of STD cases and other reportable diseases to the MOPH surveillance system. Of course, this could also mean that the prevalence of STDs is low in the country.

Only two studies investigated the prevalence of STDs among women in the general population, in Beirut in 1992-1993, and Nabi Sheet in 1998 (Deeb et al. 1997, Deeb et al. 1998). Men were not studied in the general population. Other studies focused on women visiting clinics or patients presenting to outpatient clinics or hospitals with complaints. Symptoms can be associated with a variety of the organisms. For instance, cervicitis has a differential diagnosis including chlamydial and gonococcal infection, herpes simplex, and vaginal infections such as trichomoniasis. Vaginitis may also be caused by gonorrhea or chlamydia but more often it is associated with trichomonas or candida.

The following remarks present the most striking findings/conclusions:

- The prevalence of gonorrhea seems to be very low.
- Gonorrhea presented a high proportion (40%) of individuals reporting urethral discharge in 1973 and 1980.
- Chlamydia is not a reportable disease in Lebanon.
- No cases of chlamydia were detected among the women of Nabi Sheet.
- Chlamydia was detected in 14.3% of the women attending clinics in 1999-2000.
- Clinical signs, such as cervical discharge, cervical tenderness, pelvic tenderness, and vaginal discharge, might reveal the presence of PID in these women attending clinics in 1999-2000.
- No cases of syphilis were detected in the 2 prevalence studies conducted among women.
- Candida was the primary cause of vaginal infection in the community-based and clinic-based surveys.

Drs. Seoud and Mroueh from AUBMC are currently conducting a study on STDs among women at AUBMC. No results have been disclosed yet.

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6.3 HIV/AIDS

Mylene Tewtel-Salem & Iman Nuwayhid

Background¹

Acquired immunodeficiency syndrome (AIDS) represents a growing public health problem with 36.1 million people living with HIV/AIDS, and 21.8 million deaths caused by AIDS worldwide since the beginning of the epidemic as estimated by the WHO in December 2000.

Table 6.3-1 AIDS statistics by region

	New Cases of Adults and Children Infected with HIV	Number of Adults and Children Living with HIV/AIDS	AIDS Deaths in 2000
North Africa & Middle East	80,000	400,000	24,000
North America	45,000	920,000	20,000
Caribbean	60,000	390,000	32,000
Latin America	150,000	1.4 million	50,000
Western Europe	30,000	540,000	7,000
Sub-Saharan Africa	3.8 million	25.3 million	2.4 million
Eastern Europe & Central Asia	250,000	700,000	14,000
East Asia & Pacific	130,000	640,000	25,000
South & South-East Asia	780,000	5.8 million	470,000
Australia & New Zealand	500	15,000	<500

Source: WHO. 2000

In North Africa and the Middle East, it is difficult to characterize the spread of HIV epidemic because of lack of data. The WHO reported the number of AIDS incident cases by year for selected Arab countries.

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Table 6.3-2 Number of AIDS incidence cases by year for selected Arab countries

Country	Up to 1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total	Up to
Lebanon	27	13	7	22	12	18	5	8	35	...	147	31.12.98
Bahrain	4	0	6	3	6	10	11	15	11	4	70	31.3.99
Egypt	27	12	23	29	22	16	14	25	33	14	215	30.6.99
Iran	19	25	16	32	19	16	27	40	21		215	31.12.98
Iraq	0	7	6	21	37	16	15	2	4	0	108	31.3.99
Jordan	12	8	7	8	6	2	4	12	11	1	71	30.6.99
Kuwait	3	3	2	2	5	4	5	2	19	1	46	31.3.99
Qatar	52	10	3	7	6	4	2	4	1	4	93	31.3.99
KSA	34	10	6	12	38	37	100	112	39	26	414	30.6.99
Syria	13	7	3	3	4	6	9	8	8	4	65	30.6.99

Source: EMR AIDS News, 5(3).September 1999

Human Immunodeficiency Virus (HIV) is the causative agent of AIDS and is transmitted through the blood and genital fluids. Two main types of HIV have been identified: HIV-1 and HIV-2. These two types show differences in incubation period and transmissibility (more attenuated for HIV-2), and also in their geographic distribution. HIV-1 is the source of the worldwide pandemic while HIV-2 is mainly restricted to West Africa and to migratory movements to or from these regions. Moreover, HIV-1 and HIV-2 display a high degree of genetic variation both in a single individual and through populations with different subtypes. It is essential to characterize the HIV genetic diversity in a region for monitoring the spread of HIV variants and for developing subtype-specific sub-unit vaccines.

The lag time between exposure and disease varies from one person to another, from a couple of years after seroconversion up to 10 years. It is estimated that 50-60% of HIV infected people will develop symptoms and signs of disease within 10 years of infection. The median time of progression to AIDS, in the absence of treatment, would be 7 to 10 years. Older age and some HLA haplotypes were associated with a more rapid progression.

HIV infection can be detected by serological tests since antibodies to HIV envelope protein are found in the serum of all individuals within 3 months of infection. During the asymptomatic period, many individuals will have abnormal laboratory tests, such as low CD4 lymphocytes counts, and hypergammaglobulinaemia.

Different staging systems have been proposed for classifying and standardizing the clinical course of the disease. The WHO proposed the following staging system:

Stage	Category	Physical Activity	Example of Symptoms/Diseases
I	Asymptomatic	Normal activity (asymptomatic)	None
II	Early disease	Normal activity (symptomatic)	Minor weight loss, minor skin conditions
III	Intermediate disease	Bed-bound <50% of the day	Weight loss >10% body weight, tuberculosis, thrush
IV	Late disease	Bed-Bound >50% of the day	AIDS defining illness

Source: Low-Beer D, Stoneburner R, Mertens T, Burton A, Berkley S. HIV and AIDS. In: Health Dimensions And Reproduction. Murray C and Lopez A. Geneva (eds). WHO, 1998.

Different case definitions used for AIDS by different countries will lead to under or overestimations of variations in reported AIDS cases between countries. WHO recommended in 1993 two case definitions for AIDS :

Table 6.3-3 WHO definition for AIDS

WHO Case Definition for AIDS Surveillance		Expanded WHO Case Definition for AIDS Surveillance
2 major and 1 minor sign from		HIV antibody test positive and one or more of the following
Major sign	Minor sign	
* Weight loss $\geq 10\%$ * Chronic diarrhea for more than 1 month * Prolonged fever for more than 1 month (intermittent or constant)	* Persistent cough for more than 1 month¹ * Generalized pruritic dermatitis * History of herpes zoster * Oropharyngeal candidiasis * Chronic progressive or disseminated herpes simplex * Generalized lymphadenopathy	* $\geq 10\%$ body weight loss of cachexia, with diarrhoea or fever, or both, intermittent or constant, for at least 1 month, not known to be due to condition unrelated to HIV. * Cryptococcal meningitis * Pulmonary or extra-pulmonary tuberculosis * Kaposi sarcoma * Neurological impairment sufficient to prevent independent daily activities, not known to be due to non-HIV condition * Candidiasis of the oesophagus (may be presumptively diagnosed on basis of oral candidiasis with dysphagia) * Clinically diagnosed life-threatening or recurrent episodes of pneumonia, with or without etiological confirmation * Invasive cervical cancer

¹ Not applicable to patients with tuberculosis.

Source: Low-Beer D, Stoneburner R, Mertens T, Burton A, Berkley S, HIV and AIDS. In: Health Dimensions And Reproduction. Murray C and Lopez A. Geneva (eds). WHO, 1998.

Different modes of transmission have been identified. These include sexual intercourse between heterosexuals and homosexuals males, exposure to blood (drug use or transfusion), and perinatal transmission (pregnancy, birth, breastfeeding). The risk of infection is related to the mode of transmission. For example, more than 90% of individuals will become infected if exposed through blood-to-blood contact with an HIV infected person.

Prognosis of HIV infection is directly related to the clinical stage of the disease. Several prognostic laboratory markers have been identified to predict the clinical course of the disease, such as B2 microglobulin, HIV p24 core antigen, CD4+ lymphocyte count, neopterin, cytokines and plasma virion-associated RNA load. Plasma viral load is directly related to the risk of acquiring immunodeficiency syndrome (AIDS) and death in individuals infected with HIV, including those with normal numbers of CD4+ T cells. The prognosis for individuals with AIDS in recent years has improved significantly because of new drugs and treatments, and preventive efforts. Different anti-HIV drugs have been developed and have been used in clinical trials.

Epidemiological studies have demonstrated an association between STDs and HIV and established a temporal relationship of exposure to STD prior to HIV infection. The increased risk of infection to HIV by ulcerative STDs such as chancroid, syphilis, and genital herpes, and inflammatory STDs such as gonorrhea, chlamydia, and trichomoniasis

ranges between 3.3 and 4.7. The temporal association between STDs with HIV infection can be due to the increase of the infectivity of HIV or susceptibility to HIV.

HIV/AIDS in Lebanon

Available Relevant References

In addition to reports and data from the MOPH surveillance system, the National AIDS Control program, and WHO/EMRO bulletins, the following references were identified:

Table 6.3-4 Selected references regarding HIV/AIDS in Lebanon

Author/ Year	Study Population/ Methodology
Fox E (1993)	<i>To describe HIV/AIDS surveillance in Lebanon:</i> Surveillance of AIDS in Lebanon is done through physicians, STD sentinel posts and active HIV surveys.
Mokhbat J et al. (1985)	A case report of a 34 year old Lebanese male presented at AUBMC in October 1984 with an anal mass.
Mokhbat J et al. (1989)	<i>To determine HIV seroepidemiology among multitransfused patients in Lebanon:</i> A total of 64 patients with hemophilia and thalassemia were tested for HIV (May 1985-October 1986). Of these, 35 were interviewed about their history of blood products transfusions.
Naman R et al. (1989)	<i>To determine HIV seroepidemiology in Lebanon:</i> ELISA test was performed on 11,384 Lebanese individuals (classical high risk groups and control populations) between October 1985 and December 1988. Positive sera were retested. Western Blot was used to retest consistently positive individuals. No information was given on the sampling method.
National AIDS Program (NAP) (2001)	<i>To determine the prevalence of sexually transmitted diseases in women:</i> A total of 462 non-pregnant women (15-55 years old) presenting for a routine gynecological exam or a gynecological complaint to 4 different sites [Armenian Relief Cross (175 women); a private clinic at Arz hospital (146 women); AUBMC (96 women); and Trad Hospital Outpatient Clinic (45 women)]. Women were interviewed and examined, with specimens tested for chlamydia, candida, gardenella, trichonomas, HBV, gonorrhoea, H. ducreyi, syphilis and HIV.
Nassar NT (1987)	<i>To determine HIV seroepidemiology among medical students:</i> Elisa test was performed on 458 individuals (333 men) belonging to four non high-risk groups (29% blood donors, 50% university students, 15% hospital inpatients and 6% hospital staff nurses) to determine the prevalence of anti-HIV (March 1986-June 1986).
Abdelnour GE et al. (1990)	<i>To determine HIV seroepidemiology among blood donors and patients on dialysis:</i> A total of 1528 healthy blood donors (18-68 years old; 91% males) and 37 patients on hemodialysis (7-81 years old; 23 males) at Hospital Notre Dame de Secours in Jbeil were screened for HIV and CMV (by ELISA) and HbsAg (by reverse hemagglutination test) (May 1986-April 1986). Those with a history of hepatitis and drug abuse were excluded.

Adib S, Tawila J (1995)	<i>To describe the epidemiological aspects of HIV/AIDS cases reported up till 1993:</i> Cases reported to the NACP are described in terms of year of report, age, gender, risk factor and clinical status at time of report.
Picnazek D et al. (1998)	<i>To determine HIV subtypes in Lebanon:</i> The subtypes of HIV in 26 seropositive Lebanese citizens.
Shrestha (1996a)	<i>To describe HIV/AIDS surveillance in the Eastern Mediterranean Region</i>

Summary Findings

In his report, Fox (1993) noted three sources for reported cases of AIDS/HIV in Lebanon:

- Physicians are required to report all cases of AIDS and HIV to the National AIDS Program (NAP) by filling anonymous notification sheets containing demographic, epidemiological, clinical, and laboratory information. Some laboratories report the number and results of HIV serological tests performed each month, with an individual data sheet for each positive serum.
- Patients with STDs are surveyed for HIV at two sentinel sites at AUBMC and HDF. The sentinel sites have not yet been functional. A sentinel site has also been established at the Military Medical Laboratory.
- High-risk patients are sero-surveyed.

AIDS arrived relatively late to Lebanon compared to developed countries. The first case of AIDS diagnosed in Lebanon was in 1984 in a heterosexual male who lived abroad and who had an intravenous drug abuser as a sexual partner (Mokhbat et al., 1985). Another case was diagnosed in 1985 in a homosexual who had an active sexual life in Lebanon and abroad (Abu-Shahine L, Personal communication 2001). A third case was diagnosed in a hemophiliac patient who was treated with factor VIII imported from the US (Mokhbat et al. 1989). The epidemiology of the virus in the 1980s seemed to reflect sexual activities (homosexual and heterosexual) abroad or exposure to transfusion of blood or blood products from outside Lebanon (Naman et al. 1989).

The reported prevalence of HIV/AIDS among the general population of patients were:

- No HIV seropositive cases were found among the 462 women who visited Obs/Gyn clinics for a routine visit or with a complaint in 1999-2000 (NAP 2001)
- No HIV seropositive cases were found among 458 AUB students in 1987 (Nassar 1987).
- 27 out of 11,384 individuals tested positive (0.24%) (Naman et al. 1989)
- 3 out of 9606 (0.03%) in healthy blood donors tested positive (Naman et al. 1989)
- 4 out of 64 hemophiliac and thalassemic patients (6.25%) tested positive (Mokhbat et al. 1989)
- 4 out of 1528 healthy blood donors (0.26%) (Abdelnour et al. 1990)

The National AIDS Program reported that, as of December 2000, 613 of AIDS/HIV cases have been reported in Lebanon (78.5% males/ M:F ratio= 3.76). Of these, 45% were

asymptomatic, 32.5% were AIDS symptomatic, and 22.5% lacked data on clinical status. The following table presents the distribution of AIDS/HIV cases by age and sex:

Table 6.3-5 Age and sex distribution of AIDS patient in Lebanon

Age (Years)	Sex			Total
	Males(%)	Females (%)	Not specified	
0-4		1 (0.78%)		1 (0.16%)
5-9	4 (0.83%)	5 (3.9%)		9 (1.5%)
10-14	10 (2%)	2 (1.56%)		12 (2%)
15-19	1 (0.2%)	2 (1.56%)		3 (0.5%)
20-24	6 (1.25%)	2 (1.56%)		8 (1.3%)
25-29	15 (3.1%)	5 (3.9%)		20 (3.26%)
30-34	34 (7%)	18 (14%)		52 (8.5%)
35-39	94 (19.5%)	24 (19%)		118 (19.3%)
40-44	102 (21.2%)	23 (18%)	1	126 (20.6%)
45-49	63 (13%)	10 (7.81%)		73 (11.9%)
50-54	38 (7.9%)	12 (9.38%)		50 (8.2%)
55-59	32 (6.7%)	3 (2.35%)		35 (5.7%)
60+	79 (16.5%)	19 (14.84%)	3	101 (16.5%)
NS	3 (0.62%)	2 (1.56%)		5 (0.81%)
Total	481 (78.5%)	128 (20.9%)	4 (0.65%)	613 (100%)

Source: NAP. 2000

Cases peaked in the age groups 35-45 and those older than 60 years, with no striking age differences between sexes. New reported cases were increasing every year with 20 HIV/AIDS cases in 1988 culminating with 89 HIV/AIDS cases in 1993 (22 AIDS). The observed trend then becomes irregular, peaking in years 1995 (86 HIV/AIDS cases) and 1998 (76 cases; 37 AIDS), and dropping to 31 cases (19 AIDS) in 2000 (See graph on "Number of New Cases Reported Every Year", NAP 2001).

The ratio of HIV new cases per year to AIDS new cases per year was greater than 1 for the period of 1985 to 1997, but it became less than one afterwards (0.54 in 1998, 0.44 in 1999, 0.63 in 2000) (see graph on "Number of New Cases Reported Every Year", NAP 2000). The estimated M/F sex ratio also decreased from 4.5 in 1988 to 2.7 in 1993 (Adib and Tawilah 1995) and to 2.44 in 2000 (NAP 2001).

The majority of reported cases were concentrated in Beirut (24%), followed by the South (14.5%) and Mount Lebanon (12.1%). This should be assessed with caution since the geographic location was missing for 36.2%, and because of the expected inaccuracy in reporting and mobility of people.

The NAP believes that HIV/AIDS cases are under-reported in Lebanon. Major referral hospitals have notified no AIDS cases to the NAP since 1990 and the number of estimated AIDS/HIV cases greatly exceeds the number of reported cases. NAP estimated that at least 2000 cases should have been reported by mid 1997, while the actual reported cases were 450 AIDS/HIV cases. Dr. Mustafa Nakeeb, current Director of NAP, also reports that the number of AIDS patients currently receiving medications from the MOPH Central Pharmacy is about 150.

The problems NAP faces are:

- Low compliance from physicians.
- The reporting form and methodology allows for a large number of “unspecified” cases.
- Submitted notification forms are incomplete.
- No standard AIDS case definition used by physicians.
- No follow-up on reported asymptomatic cases. The number of asymptomatic cases that progressed to AIDS is unknown. A follow-up notification sheet has been introduced but has not been used yet.
- Deaths attributed to AIDS are not reported.

On the other hand, the NAP director believes that double counting of cases is very rare.

NAP reported the most probable ways of transmission of HIV/AIDS in Lebanon as follows: sexual behavior 69.3%, transfusion 8.3%, intravenous drug use (IVDU) 8.5%, perinatal 4.1%, and unspecified 9.8%. The following table presents the distribution of different risk factors among all AIDS/HIV cases reported up to 2000 by sex:

Table 6.3-6 AIDS patients in Lebanon distributed by risk factors

Risk Factor	Males	Females	Total
Sexual behavior			
Homosexual	14 (6.8%)	0 (0.0%)	14 (5.1%)
Bisexual	18 (8.7%)	4 (5.8%)	22 (8.0%)
Heterosexual	123 (59.4%)	50 (72.5%)	173 (62.7%)
None	11 (5.3%)	4 (5.8%)	15 (5.4%)
Unknown	41 (19.8%)	11 (16%)	52 (18.8%)
IVDU			
Yes	24 (11.6%)	1 (1.5%)	25 (9.1%)
No	183 (88.4%)	68 (98.6%)	251 (90.9%)
Transfusion			
Yes	21 (10.1%)	3 (4.5%)	24 (8.7%)
No	186 (89.9%)	66 (96%)	252 (91.3%)
Perinatal transmission			
Yes	7 (3.4%)	4 (5.8%)	11 (4.0%)
No	200 (96.6%)	65 (94.2%)	265 (96.0%)

Note: More than one risk factor were reported for same individual.

Source: NAP. 2000

It is important to note that 63% of the cases were heterosexual (59% of males and 73% of females). The prevalence of each of the other risk factors/ modes of transmission was less than 10%. Of the 22 cases among children (< 15 years), 11 were attributed to perinatal transmission.

In the serosurvey study of 11,384 individuals in 1985-1988, Naaman et al. (1989) identified 27 HIV/AIDS positives of whom 9 (33.5%) were homosexual males, 4 (14.8%) drug addicts, 4 (14.8%) hemophiliacs, 2 (7.4%) heterosexual partners, 1 (3.7%) child of infected mother, 1 (3.7%) bisexual male, 1 (3.7%) female prostitute and intravenous drug user, and 1 (3.7%) homosexual male and intravenous drug user.

WHO-EMRO estimated, at the end of 1995, that 16.7% of reported cases are due to blood products contamination with HIV (Shrestha 1996b).

Migratory movements and traveling abroad has also been reported in many individuals infected with HIV. NAP reported that 258 out of 481 male cases (53.7%) had a history of traveling abroad, in comparison with 33 out of 128 female cases (25.8%). Africa (especially West Africa) constituted a major source of AIDS/HIV cases for Lebanon.

The study conducted by researchers from the Centers for Disease Control and Prevention in 1996 (Pienazek et al. 1998) found that 25 out of the 26 cases had HIV-1 falling into six envelope subtypes (B, A, C, D, G and unclassifiable), including 3 distinct HIV-1 mosaics. Only one case of HIV-2 subtype B was found, with no dual infection of HIV-1 and HIV-2. They noted that the "remarkable" variability of HIV types and subtypes, demonstrates a high heterogeneity and genetic diversity of HIV in Lebanon. They added that the distribution patterns of HIV subtypes resemble patterns in the Philippines and Cyprus. Finally, the HIV-1 and HIV-2 subtypes found in individuals' blood reflected that of the countries they visited.

Shrestha (1996a) reported that 1% of tested STDs patients were HIV seropositive in Lebanon in 1994, but most probably this is an underestimation because of several factors such as avoidance of public sector clinics.

NAP reported the following distribution of STDs among 12 HIV/AIDS patients:

Table 6.3-7 HIV patients presented with other STDs

	Male	Female	Total
Urethritis	3 (30.0%)		3 (25.0%)
Hepatitis	1 (0.0%)		1 (8.3%)
Condyloma	1 (10.0%)		1 (8.3%)
Herpes Simplex (Genital or Anal)	4 (40.0%)	1 (50.0%)	5 (41.7%)
Others	1 (10.0%)	1 (50.0%)	2 (16.7%)
Total	10 (83.3%)	2 (16.7%)	12 (100.0%)

Source: NAP. 2000

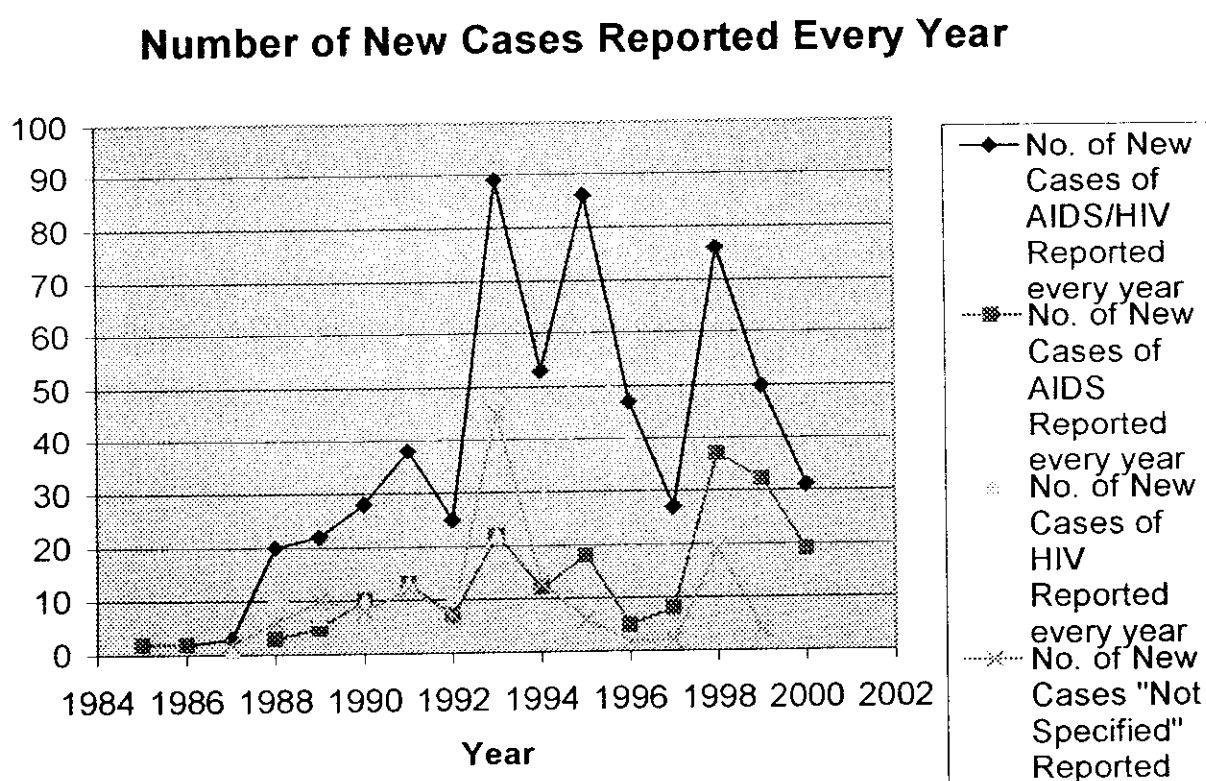
In the report document of the survey of 462 women attending Obs/Gyn clinics in 1999-2000 (National AIDS Program, 2001), it is reported that according to data on HIV patients "around 15% of the declared cases give history of previous or concomitant STD infection, most commonly non specific urethritis".

No follow-up studies of seropositive individuals in Lebanon were identified. The director of NAP informed us that the symptom most frequently reported to NAP by physicians are fever, weight loss, chronic diarrhea, pneumocystis carinii pneumonia, and fungal infection. Adib and Tawilah (1995) mentioned that interviewed physicians reported Pneumocystis carinii pneumonia, then Kaposi's sarcoma as the most frequent AIDS indicators seen by them in their AIDS patients. Mokhbat et al (1989) identified 4 seropositives among 64 patients with hemophilia and thalassemia (1985-1986) with the following symptoms: lymphadenopathy (3/4), sweats (3/4), weight loss (2/4), fever (2/4), diarrhea (2/4), and thrush (1/4).

Comments

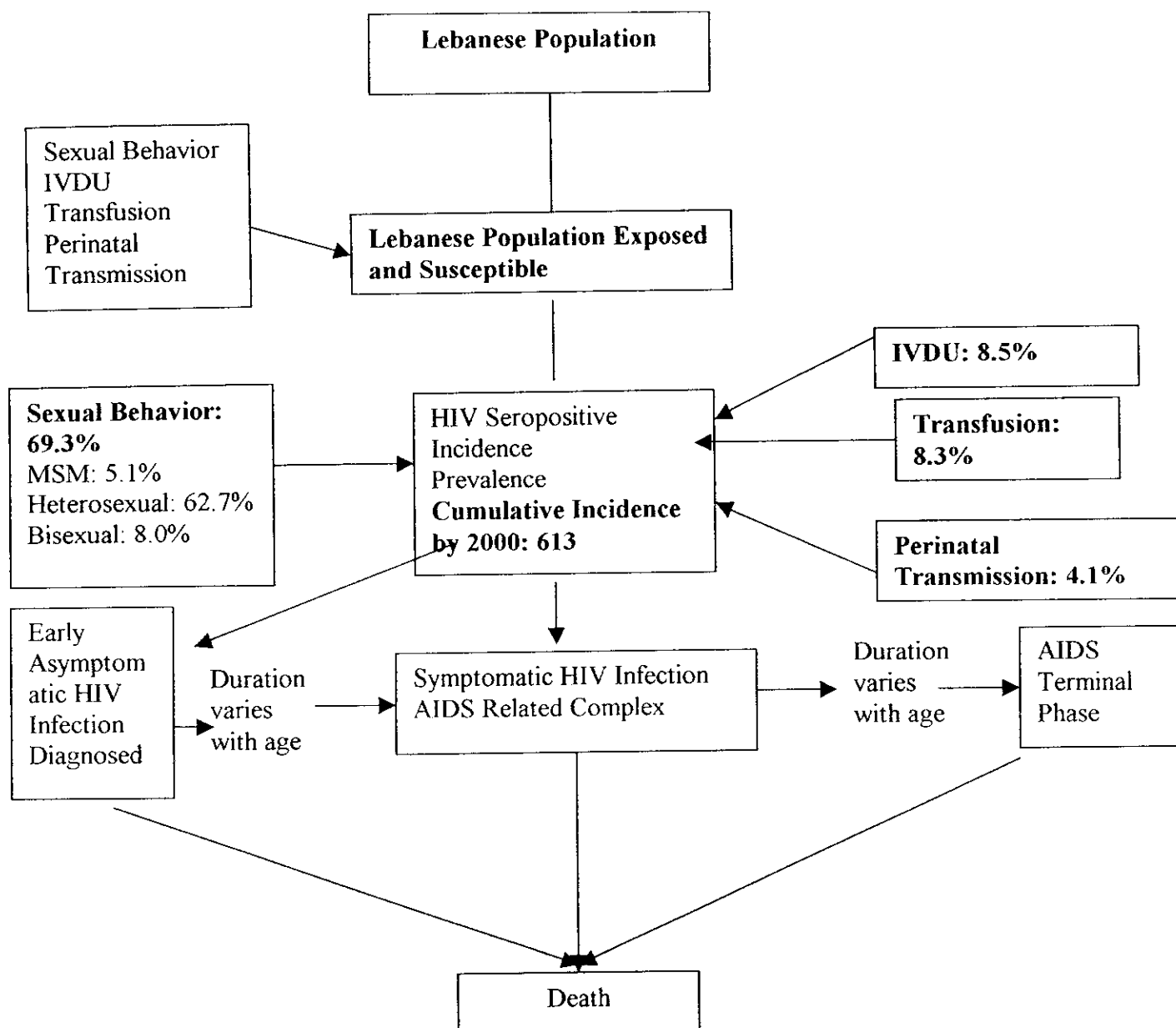
The main findings of the above review are:

- Reporting of HIV/AIDS has been decreasing over the last few years. A total of 31 cases have been reported in 2000 (12 HIV + 19 AIDS). This trend might be real or is just reflecting changes in reporting or migratory movements.
- There is a shift to higher age groups in the distribution of cases.
- Low prevalence of HIV in the general population (< 0.5%).
- Deaths from AIDS are not reported in Lebanon.
- 150 AIDS patients are receiving medications from the MOPH central pharmacy.
- The majority of AIDS/HIV cases are heterosexuals.
- The distribution patterns of HIV subtypes in Lebanon resemble patterns in the Philippines and Cyprus, and reflect the countries visited by the cases.



Source: NAP, 2000

A flowchart summarizing the natural history of HIV with numbers adapted to Lebanon is shown.



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6.4 DIARRHEAL DISEASES

Joseph Kakhaleh & Iman Nuwayhid

Background¹

Diarrhea is a complex of symptoms and signs, usually defined as an increased number of stools of liquid or semi-liquid consistency passed during a twenty-four-hour period. Recent studies have tended to consider more than three stools passed in twenty-four hours of observation as an indication of diarrhea after the age of three months. Diarrhea is defined clinically as frequent passage of loose stools leading to loss of water and electrolytes and acid-base imbalance resulting in severe dehydration, acidosis and circulatory collapse and ultimate death. In the public health context, "diarrhea" is also used to embrace dysentery which is characterized by the presence of blood in the stools, with or without excessive looseness or frequency. A threshold of normality is difficult to define, especially in infants, since breastfed infants have looser and more frequent stools, sometimes after every feed.

Diarrhea can be either acute or chronic. The most common causes of acute diarrhea are infectious agents. Most of these agents are acquired by oral ingestion of stool. Fecal-oral transmission can come by way of water, food or person-to-person contact. The specific pathogens of greatest importance to public health vary by age and geographical setting.

In 1995, acute infectious diarrhea caused more than 3 million deaths worldwide in children younger than 5 years of age. In its World Health Report 2000, the WHO estimated deaths by diarrheal diseases for 1999 at 2,213,000 with a world mortality rate in both sexes of 37 per 100,000, and a case fatality rate of 39.5 per 1000. Deaths from diarrheal diseases accounted for 4% of all deaths.

Most of these deaths occurred in developing nations, where two thirds of the world's population live in areas of extreme poverty, rapid urbanization, crowded housing with inadequate sewage disposal and water supplies, insufficient food with lack of refrigeration, poor personal hygiene, and a fundamental lack of access to health care. In underdeveloped countries, children have 100 to 1500 episodes of diarrhea per 100 child-years. Approximately 10% of the episodes result in dehydration requiring therapy.

In spite of the decline of the incidence of infant diarrheal deaths in the United States by 75% from 1968 to 1991, diarrhea is still listed as the principal cause of death for more than 500 children each year. About 50-100 of these deaths are due to rotavirus

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infection. The death rate for children and young adults in the US is 2-3 per 100,000 and is approximately 15 per 100,000 for those over age 74. However, certain populations, such as African Americans, are at a greater risk. The mortality for black infants is three times the national average. Moreover, the illness is frequent and severe enough to result in 250,000 hospital admissions, 7.9 million visits to physicians, and 48 million episodes with at least one full day of restricted activity every year.

Diarrheal Diseases in Lebanon

Available Relevant References in Lebanon

Information on diarrhea in Lebanon was collected from general household surveys and a few published and unpublished studies. A total of 16 studies were identified, but most of them were general reviews or case reports. The following documents provided relevant information:

Table 6.4-1 Selected references regarding diarrhea in Lebanon.

Author	Study Population/ Methodology
Ministry of Social Affairs (1996)	A household survey (PAP child survey) examined 4600 households (2156 children < 5 years). Information was gathered on type, place, and outcome of injury.
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Haddad R et al. (1996)	Descriptive study on 532 Dysentery cases reported from all Lebanon to the Epidemiological Surveillance Unit at MOPH in 1995
Bitar J (1974)	Review of acute diarrheal illness in childhood. No data
Eid B (1992)	Descriptive study on 112 pediatric cases admitted to HDF with diarrhea from 1980-1992
Karam P (1991)	A descriptive study on 75 adult patients admitted to HDF with diarrhea from 1981-1989.
Araj G et al. (1996)	Descriptive study on 44,864 stool specimens from AUBMC (1989-1993) and Islamic Hospital in Tripoli (1991-1993)

Summary Findings

None of the studies addressed a particular cause of diarrhea. Instead, all of them evaluated diarrhea as a whole, the definition of which, might have differed between studies and over time.

The PAP Child Survey, conducted by the Ministry of Social Affairs in 1996, reported a point prevalence of diarrhea (within 24 hours of the survey) in children less than 5 year of 5 % (boys 5.4% vs. girls 3.7%). The prevalence of diarrhea within 2 weeks prior to the survey in children less than 5 years was 12%, again more frequent in boys than girls.

The following table breaks down the findings by age and sex:

Table 6.4-2 Sex and age distribution of diarrheal cases

Age in months	Diarrhea (last 24 hours)	Diarrhea (last 2 weeks)	Mean duration of episode (days)	Total number of children
MALES				
<6	7.0	13.9	3.4	115
6-11	7.6	24.2	3.7	119
12-17	6.5	15.5	4.6	123
18-23	6.1	14.3	2.4	98
24-59	4.5	10.4	2.3	683
Total males	5.4	13.1	3.0	1137
FEMALES				
<6	4.3	10.8	3.8	95
6-11	11.5	20.8	2.1	87
12-17	8.3	26.7	2.9	97
18-23	2.9	13.7	3.6	103
24-59	2.0	5.4	2.7	637
Total females	3.7	10.1	2.9	1019
ALL				
<6	5.8	12.5	3.5	209
6-11	9.2	22.8	3.3	206
12-17	7.3	20.5	3.5	220
18-23	4.4	14.0	3.1	201
24-59	3.3	8.0	2.4	1320
Total children	4.6	11.7	3.0	2156

Source: MOSA. 1996

Diarrhea was not reported in Beirut 1992 because it was considered as an acute condition.

The NHHEUS (1999) reported a total of 10,357 outpatient visits among the interviewed weighted sample of 32,838. Of these, 5.2% were for infectious or parasitic health conditions. It might be justifiable to assume that most of the infectious/parasitic conditions are diarrheal in nature.

The data reported to the authors by three outpatient services for the year 1999 (Refer to Chapter 5) revealed the following: 110 out of the 2711 diagnoses (4%) reported by the Malta Organization Health Care Center in Kobayat were diarrhea, as compared to 44 out of 1468 (3%) in Malta Health Center in Nabatieh and 438 out of 21718 (2%) in AUB-UHS.

As for the medical insurance claims reported by MedNet for 1999 (Refer to chapter 5), a total of 1426 intestinal infectious diseases and 70 typhoid/paratyphoid cases were reported out of 41,000 claims (3.5%).

A total of 532 cases of dysentery were reported to the ESU-MOPH in 1995, with approximately equal cases of males and females (Haddad et al. 1995). The mean age was 17.4 [range: < 1 year to 86 years]. The majority of reported cases (84%) were from the South, with 31% of the South cases hospitalized. Dysentery showed a decreasing trend with age, similar for both males and females.

The three surveyed hospitals in Beirut reported 861 infectious diarrhea discharge diagnoses out of 60,248 (1.4%). The experience of AUBMC was reviewed by Bitar et al. (1994) and was found similar to that reported from western countries at that time. The known causative agents of infectious diarrhea identified at the AUBMC included *E. coli*, *Shigella*, *Salmonella* and certain parasites. Virological etiologies were not investigated. *E. coli* was reported to be the most common pathogen to produce diarrhea in the neonatal period and infancy.

The experience of HDF was reviewed in two theses from USJ. Eid (1992) reviewed 112 pediatric cases of diarrhea (45 % females) admitted to HDF between 1980 and 1992. Diarrhea was most frequent below 1 yr of age with a peak at 3 month-old. The frequency of diarrhea was at least of 4-5 stools/day. Stool characteristics varied between liquid in 44% of the cases, semiliquid in 32%, and unknown in 8%. The mean hospital stay was 15 days with an average cost of 92 US \$ (1992 value). Six percent of the cases experienced severe weight loss.

The other study (Karam, 1991) reviewed 75 adult cases (age > 15 years) hospitalized at HDF between the period of 1981 and 1989 for chronic diarrhea. The mean age was 39.7 yr [range 16-70] with 57% women. The frequency of diarrhea was reported at 3.5 stools/day; liquid in 61.3% of the cases and bloody with mucus in 30.6%. The mean weight loss was estimated at about 9.25 kg (+/- 5) and was found in 48% of the cases. Cachexia, as a complication of diarrhea, was found in 2.7% of the cases. In spite of the extensive work up, only 46% had a specific diagnosis, 44% had unspecific diagnosis, and 10% had colitis.

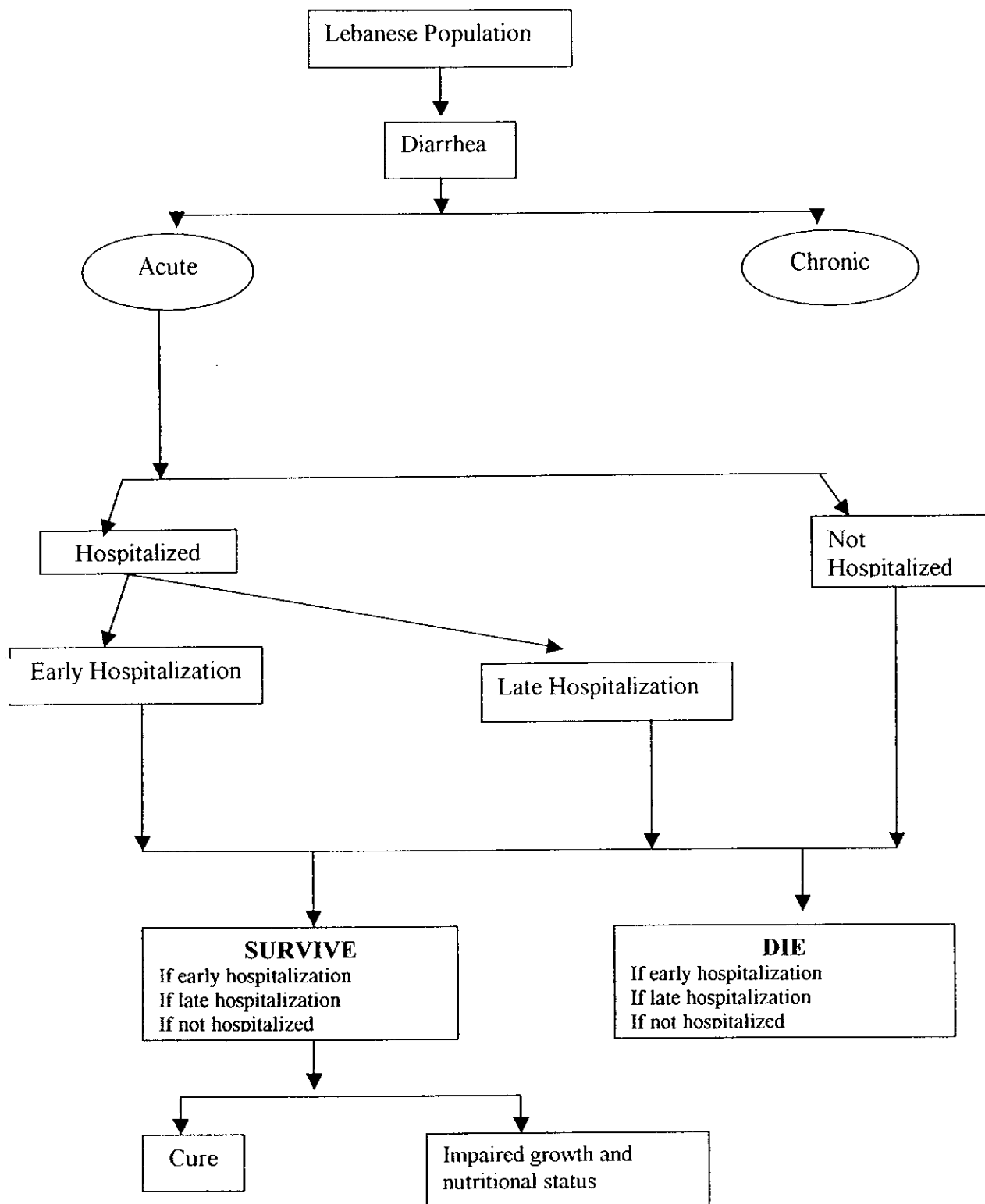
A retrospective study (Araj et al., 1996) to determine the prevalence and etiology of intestinal parasites in Lebanon reviewed the findings on 44,864 stool specimens examined at AUBMC (1989-1993: 33,253 samples) and Islamic Hospital in Tripoli (1991-1993: 11611 samples). The overall prevalence of positive findings was higher at the Islamic Hospital (45%) as compared to 8.5% at AUBMC. They noticed a decrease in prevalence in comparison with the only 2 earlier studies done in Lebanon, for most of the noted pathogenic parasites (prevalence rates: 58-85%), except for *Giardia lamblia* and *Ascaris lumbricoides*, which increased. However, the prevalence of positive findings did not show significant variation among years or sexes at either hospital.

Comments

A flowchart is provided for later estimation of the burden of diarrheal diseases. The current review suggests the following:

- About 5% of children less than 5 years of age have current diarrhea and 12% had it within the last two weeks.
- About 3-4% of all age groups visited a health care center because of diarrhea. The proportion increased in regions of lower SES.
- Less than 2% of patients are admitted to the hospital because of diarrhea.
- No information on case fatality or mortality rates due to diarrhea.

Flowchart for diarrhea



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6.5 HEPATITIS

Omar Fattal & Iman Nuwayhid

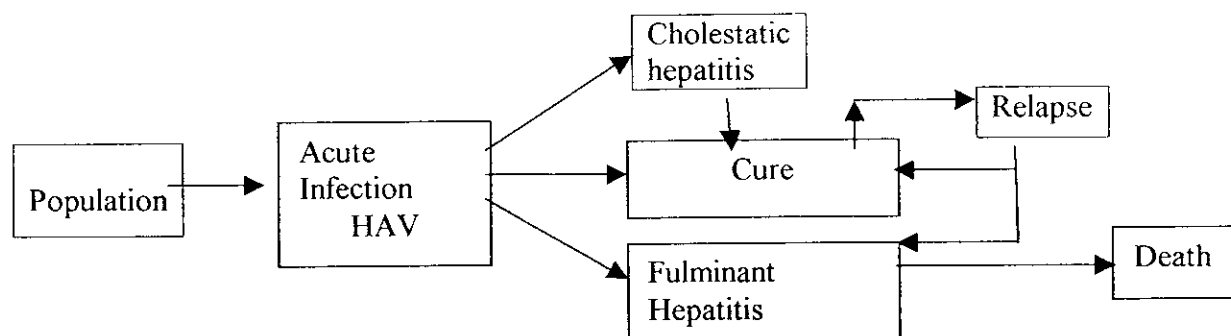
Background¹

Viral hepatitis is a systemic disease, caused by Hepatitis A, B, C, D and E viruses, and mainly affect the liver. This section will review each of them separately.

Hepatitis A Virus (HAV)

HAV is an RNA hepatovirus, which is transmitted mainly through the fecal-oral route. Poor personal hygiene, overcrowding, and contaminated food, water, milk, and shellfish enhance transmission. It has an incubation period of 15-45 days. The clinical disease is characterized by a prodromal phase followed by clinical jaundice and later by a recovery phase. Complete clinical and biochemical recovery usually occurs in 1-2 months. The complications and sequelae are many, including relapses in a small number of patients and cholestatic hepatitis, which is rare. In general, HAV is a limited disease and does not progress to chronic hepatitis. Fulminant hepatitis, which is the most feared complication, is a very rare complication (0.1% of cases), and it occurs mainly in adults and patients with underlying chronic liver disease. The diagnosis of an acute disease is established by demonstrating IgM anti HAV in the blood, while the diagnosis of a previous disease is done by demonstrating IgG anti HAV in the blood. There is no specific treatment. Immunoglobulins and killed vaccine are available for prophylaxis.

This diagram presents the natural history for the disease:



The prevalence of anti-HAV increases with increased age and lower socioeconomic status. It is low in developed countries, especially urban areas, while exposure and infection are almost universal in developing countries. The age preference of infection is among children and young adults.

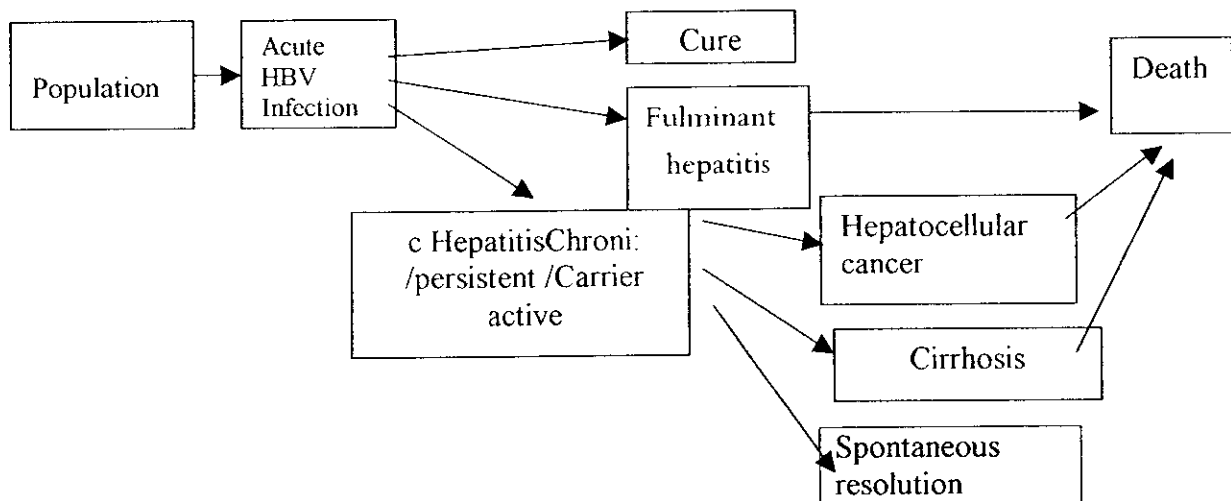
¹ References:

1. Toukan A. Strategy for the control of hepatitis B virus in the Middle East and North Africa. The Middle East Regional Study Group. *Vaccine*, 1990; **8**:117-121.
2. Harrison's Principles of Internal Medicine. 14th Ed. 1998.

Hepatitis B virus (HBV)

HBV is a DNA hepatovirus, which is transmitted percutaneously, sexually, and perinatally. The clinical disease, with an incubation period of 30-180 days, is characterized by a prodromal phase followed by clinical jaundice and later a recovery phase. Complete clinical and biochemical recovery usually occurs in 3-4 months after the onset of jaundice in 75% of uncomplicated cases; in the remainder, biochemical recovery may be delayed. The complications and sequelae are: fulminant hepatitis (0.1-1 % with an 80% mortality) and chronic hepatitis (1-10% in general and 90% of cases infected at birth). Chronic hepatitis can be further classified into asymptomatic carrier (0.1-30%), chronic persistent hepatitis (5 year survival 97%), and chronic active hepatitis (5 year survival 86%). Cirrhosis is another complication of HBV in addition to hepatocellular carcinoma, which occurs mainly in carriers of Hepatitis B surface antigen (HbsAg)- especially those infected in infancy or early childhood. The diagnosis of acute disease is established by identifying HBsAg and IgM anti-HBc in blood. The diagnosis of chronic disease is established by demonstrating HbsAg and IgG anti-HBc in blood. Available treatment is Interferon, which is only 40% effective. The case fatality rate of HBV is 0.1% (increases with advanced age and underlying medical disorders). Available modes of prophylaxis are HBIG (Hepatitis B Immunoglobulin) and Recombinant vaccine.

The following diagram presents the natural history for this HBV hepatitis:



There are more than 200 million HBsAg carriers in the world. Serum HBsAg is infrequent in the United States and Western Europe, however the prevalence of serum HBsAg reaches up to 5-20% in the Far East and in some tropical countries. High-risk groups include spouses of infected persons, sexually promiscuous persons, and health care workers. The age preference for infection is among babies, toddlers, and young adults.

The following tables summarize the estimated rates of clinical hepatitis, carrier state, and age-specific deaths attributable to HBV:

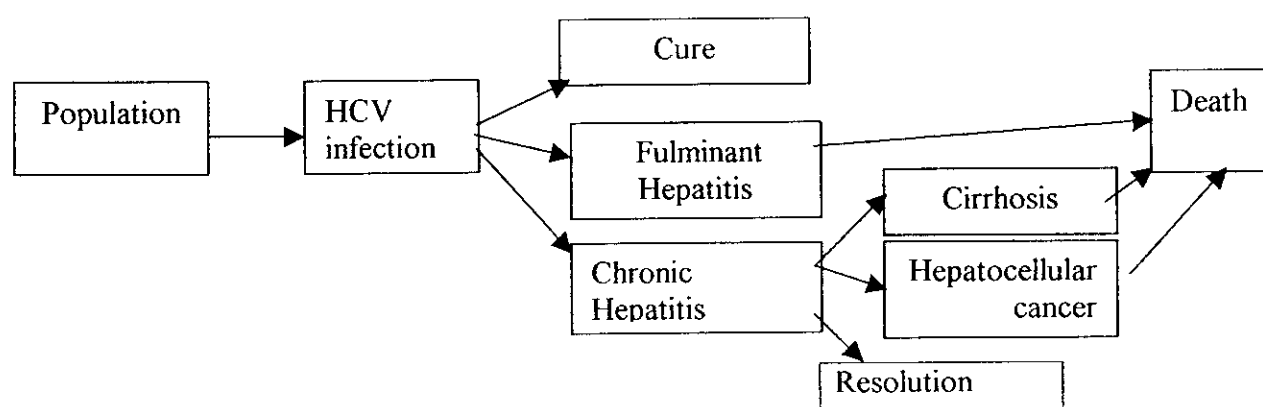
Table 6.5-1 Selected statistics regarding HBV by age

Age of infection (years)	Infection rate (%)	Clinical Hepatitis (%)	Carrier rate (%)	Deaths Attributable (%)
Perinatal	1	0	0.9	0.27
0-4	12	1.2	3.4	0.98
5-9	8	0.8	1.3	0.36
10-19	9	0.9	0.6	0.2
20-29	9	1.3	0.2	0.12
>=30	28	9.2	0.6	0.31
Total	67	13.4	6.9	2.24

Hepatitis C Virus (HCV)

HCV is an RNA favivirus-like, which was previously known as non-A non-B. It is transmitted mainly percutaneously. It is more common in adults and the risk of infection is increased in organ transplant and AIDS patients. It has an incubation period of 15-160 days, and the clinical disease is characterized by a prodromal phase, followed by clinical jaundice and later a recovery phase. Complete clinical and biochemical recovery usually occurs in 3-4 months of onset of jaundice in 75% of uncomplicated cases. Its complications and sequelae include fulminant hepatitis (0.1%), chronic hepatitis (50-70%), liver cirrhosis (20-50% of patients with chronic HCV), hepatocellular carcinoma, and carrier state (0.5-1% of patients).

This diagram presents the natural history for HCV hepatitis:



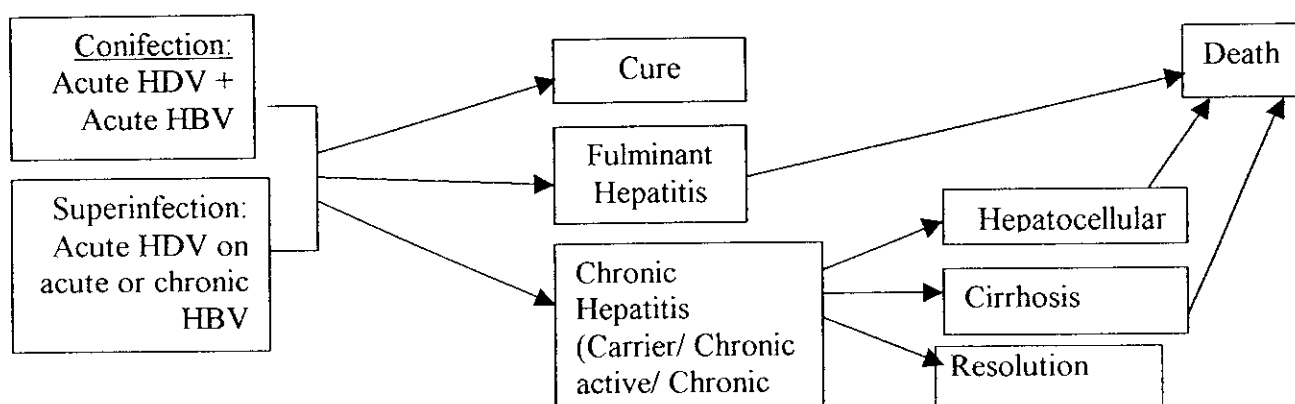
The diagnosis of acute and chronic disease is established by demonstrating anti-HCV and HCV-RNA in blood. Treatment is with Interferon, which has a 50% response. There is no known prophylaxis. Serologic evidence of HCV infection occurs in > 90% of patients with transfusion associated hepatitis, 0.5% of volunteer blood donors, and 1.5% of the general population.

Hepatitis D Virus (HDV)

HDV is an RNA virus, which resembles viroids and plant satellite viruses. It is a defective virus that requires the helper function of HBV. In Mediterranean countries, HDV is endemic among those with Hepatitis B. In United States and Northern Europe, HDV infection is confined to persons exposed frequently to blood and blood products. It can occur at any age, and is transmitted percutaneously, sexually, and perinatally.

HDV can either infect someone simultaneously with HBV (coinfection) or superinfect a person already infected with HBV (superinfection). When acute HDV and HBV infection occur simultaneously, clinical and biochemical features may be indistinguishable from those of HBV infection alone. Hepatitis D superinfection can transform asymptomatic or mild chronic hepatitis into severe progressive chronic hepatitis and cirrhosis. In some patients, HDV superinfection with chronic HBV may lead to fulminant hepatitis. Superinfection in acute HBV cases does not increase the likelihood of going into chronic HBV hepatitis. HDV has no specific treatment and HBV vaccine is used for prophylaxis.

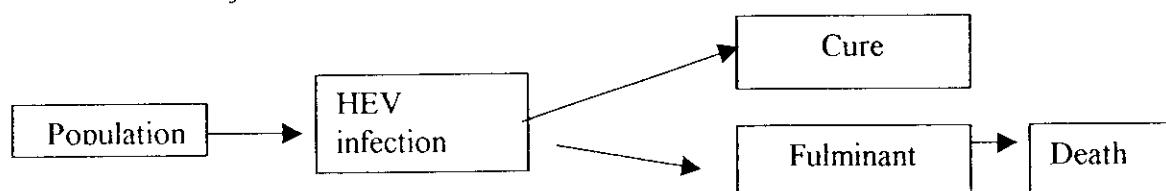
This represents the natural history of HDV coinfection:



Hepatitis E Virus (HEV)

HEV is an RNA alphavirus-like. It is endemic in India, Africa, and Central America, and transmitted mainly through the fecal-oral route (usually in young adults). It has an incubation period of 14 to 60 days, with the same clinical phases of other hepatitis: prodromal phase, clinical jaundice, and recovery phase. Complete clinical and biochemical recovery usually occurs in 1-2 months. The main complication is fulminant hepatitis (1-2%). HEV does not lead to chronic hepatitis or to a carrier state. It is diagnosed with IgM/IgG anti-HEVs, which are being developed. No specific treatment or prophylaxis is available. The overall case fatality rate = 0.5-3%.

Its natural history is as follows:



Hepatitis in Lebanon

Available Relevant References in Lebanon

Many published and unpublished documents were identified. The following studies were deemed most relevant for the purpose of this report.

Table 6.5-2 Selected references regarding hepatitis in Lebanon

Authors (year)	Study Population/ Methodology
General	
Bitar JG & Andonian K (1971)	Review of charts of 224 patients admitted to AUBMC with viral hepatitis (1961-1971)
Hepatitis A	
Shamma'a MH et al. (1982)	Three groups (total 772 subjects) were screened for HAV (using radio-immuno assay (RIA)): Group 1= 51 pregnant women at AUBMC + 344 'healthy' adults from blood donors and staff at AUBMC + 90 patients undergoing kidney dialysis in 5 centers in Beirut Group2= 171 children (1 day-12 years old) born at AUBMC or admitted for reasons different than liver disease Group 3= 116 foreigners (20-62 years old) living in Lebanon.
Bekdache N (1999)	200 subjects randomly selected from the general population in 1998-1999 were screened for HAV using enzymatic immunoassay. Selection of study population not stated.
Hepatitis B	
Shamma'a MH et al. (1982)	Same as above, but tested for HBV (using RIA)
Germanos M (1998)	The study assessed HBV seroprevalence. It included: (i) 139,000 blood donors from different hospitals in Lebanon [Islamic Hospital in Tripoli 1995-1996; AUBMC 1987-1992 & 1994-1996; HDF 1986-1996; Geitawi and SGH in Beirut 1994-1996; Notre Dame Hospital in Jbeil 1993-1996; Testing method not specified. Study interrupted because of the war. Charts of blood donors reviewed. (ii) 2431 pregnant women from HDF (1993-1996): Tested using EIA. (iii) 312 USJ students (medicine and dentistry: 1993-1995): Tested using EIA.
Nassar NT et al. (1976)	A total of 939 blood donors at AUBMC (1973-1974), 6153 blood donors at AUBMC (1974-1975), and 2359 AUB students (same years) were screened for hepatitis B [HbsAg] (using commercial counter electrophoresis)
Maalouf R (1997)	A total of 1922 pregnant women from HDF (1994-1997) screened for hepatitis B. Testing method not specified.
Nabulsi MM et al. (1997)	A total of 558 pregnant women from the obstetric outpatient clinic at AUBMC (1993-1995) were tested for HbsAg.

Hepatitis C	
Naman RE et al. (1996)	A total of 7771 blood donors (18-65 years old with a mean age of 30/ source not mentioned) and 317 patients (6-85 years old) on hemodialysis in 5 centers (4 of which were in Beirut) were screened for HCV in 1996 using EIA. Positive results were retested with same method.
Araj G et al. (1995)	A total of 3643 Lebanese blood donors (age not specified) from AUBMC (1992-1993). Tested for HCV using EIA. Positive tests checked with ELISA and immunoblot assays.
Hepatitis D	
Farci P et al. (1987)	63 consecutive patients at AUBMC (hospitalized or outpatients) with HbsAg. Sera tested with RIA for Delta hepatitis.
Hepatitis E	
Irani-Hakime N & Feghali-Haibeh R (1998)	100 Lebanese blood donors (not mentioned from where) screened for HEV IgG in 1995 using EIA.
Fakhoury F (1995)	150 patients (1 month- 83 years) at HDF admitted for non-Hepatitis reasons in 1995 tested for HEV using EIA.

Summary Findings

The following table presents the numbers of all cases of viral hepatitis- by age, sex, and geographical location- reported to MOPH, Epidemiological surveillance unit (ESU) between 1995 and mid-1998.

Table 6.5-3 Viral Hepatitis cases in Lebanon age, sex and geography

Age (years)	Number of reported cases					
	1995*	1996		1997		1998 (January-June)
	N	N	%	N	%	N %
<1		6	(1)	6	(1)	4 (1)
1-4		30	(5)	45	(6)	18 (5)
5-14		127	(22)	118	(16)	58 (17)
15-24		80	(14)	78	(11)	29 (9)
25-34		103	(18)	128	(18)	52 (15)
35-44		39	(7)	77	(11)	35 (10)
45-54		35	(6)	37	(5)	20 (6)
55+		61	(10)	76	(10)	25 (7)
Not specified		98	(17)	156	(22)	101 (30)
Sex						
Male		361	(62)	404	(56)	214 (63)
Female		218	(38)	317	(44)	128 (37)
Location						
Beirut		94	(16)	81	(11)	37 (11)
Mt Lebanon		99	(17)	95	(13)	49 (14)
North		111	(19)	99	(14)	40 (12)
South		188	(33)	279	(39)	131 (38)
Bekaa		29	(5)	26	(4)	19 (6)
Not specified		58	(10)	141	(19)	66 (19)
Total	323	579	(100)	721	(100)	342 (100)

Source: MPOH, ESU 1995 - 1998

* Breakdowns not available

The following table, also from ESU-MOPH, distributes viral hepatitis by type for the years 1998-2000:

Table 6.5-4 MOPH-ESU Unit

Cases reported for the years 1998-2000 by age, sex and region									
	1998			1999			2000		
	HAV	HBV	HCV	HAV	HBV	HCV	HAV	HBV	HCV
Age (years)									
<5	44	7	0	39	5	1	26	2	0
5-19	133	19	6	158	26	2	169	21	2
20-64	42	211	28	47	206	31	32	160	24
65+	35	252	38	21	153	32	8	52	13
Sex									
Male	129	333	46	133	269	47	125	177	31
Female	125	154	26	132	121	19	112	64	9
Region									
North	79	11	4	114	11	4	135	7	2
Bekaa	20	35	3	49	47	3	35	18	1
Nabatiye	15	44	10	1	26	6	1	14	5
South	43	99	12	31	74	15	17	70	13
Mt Leb	46	42	8	38	58	14	12	37	8
Beirut	27	70	7	24	55	4	20	27	1
N.S.	24	187	28	7	72	17	15	72	9
TOTAL	254	489	72	265	390	66	238	245	42

Source: MOPH – ESU 1995 - 98

N.S.=Not Specified (note: a few missing)

Bitar and Andonian (1971) reviewed the medical charts of 224 patients admitted with viral hepatitis to AUBMC between 1961 and 1971. The patients had the following age distribution:

Table 6-5-5: Age distribution of Viral Hepatitis cases at AUBMC

Age (years)	No.	%
0.5 - 3	5	2
4 - 13	25	11
14 - 20	35	15
20 - 30	80	36
30 - 67	79	35

Source: Bitar and Andonian. 1971

The male to female ratio was 2 and 66% of the patients were non-Lebanese. The most common presenting symptoms/signs were anorexia (89%), jaundice (92%), and enlarged liver (75%). The viral agents were not described.

Hepatitis A Virus

Shamma'a et al. (1982) reported the prevalence of anti-HAV antibodies on 772 subjects of different characteristics, as shown below:

Table 6.5-6 Prevalence of anti HAV antibodies among selected studies samples

	No. tested	Positive Anti-HAV	%	Comments
Lebanese adults (> 20 years): - 51 pregnant women delivering at AUBMC - 344 healthy adults (blood donors and staff) at AUBMC - 90 patients undergoing kidney dialysis in 5 centers in Beirut	485	474	97.7	No difference between sexes or across socioeconomic status.
Children (1 day through 12 years): - Newborns and children admitted for non-liver reasons (AUBMC): newborn (51), 1-120 days (27), 5-11 months (18), 1-5 years (35), and 6-12 years (40).	171	131	76.1	Prevalence by age: Cord blood: 100% 1-120 days: 100% 5-11 months: 55.6% 1-5 years: 40% 6-12 years: 85%
Non-Lebanese (20 – 62 years): - 100 Americans and 16 French (living in Lebanon for 3 months -20 years)	116	45	38.8	

Source: Shamma et al. 1982

In summary, the prevalence of HAV was 97.7% among the adult sample and 76% among the pediatric sample, highest in the 0-4 months age group (100%). In a study of 200 subjects selected in 1998-1999 (Bekdache 1999), the prevalence of anti-HAV by age was reported as follows:

Table 6.5-7 Prevalence of anti HAV in sample Lebanese population

Age group (years)	Prevalence of Anti-HAV
1-9	12.5%
10-19	29%
20-29	51.4%
30-39	93.3%
40-49	92%
>50	97.5%

Source: Bekache. 1999

The study reports “random selection” from the general population, but the methodology and population are not described.

Hepatitis B virus

Shamma'a et al. (1982) tested the same group tested for anti-HAV antibodies for the prevalence of Hepatitis B surface Antigen (HBsAg) and anti-HBs. The findings were as follows:

Table 6.5-8 Prevalence of HBs in selected study samples

	No. tested	HbsAg positive (%)	Anti-Hbs positive (%)
Health Lebanese adults (> 20 years): 51 women in delivery and 344 blood donors and staff	395	12 (3)	100 (25.3)
Kidney dialysis patients:	90	29 (32.2)	42 (46.7)
Children (1 day through 12 years): newborns and children admitted for non-liver reasons	171	2 (0.6)	28 (16.4)
Non-Lebanese (20 – 62 years): 100 Americans and 16 French	116	2 (1.7)	13 (11.2)

Source: Shamma et al. 1982

The following tables present the findings of similar cross-sectional studies in different groups and subgroups in the Lebanese population.:

Blood Donors

Table 6.5-9 Prevalence of HBsAg in selected studies in blood donors

Author (year)	Subjects	Prevalence of HBsAg
Germanos (1998)	139,000 blood donors (1986-1996)- interrupted by war: Islamic Hospital (Tripoli): Notre Dame (Jbeil): HDF+Geitawi+SGH (East Beirut): AUBMC (West Beirut):	 2.66% 0.44% 1.27% 3.3%
Nassar et al. (1976)	Two groups (both AUBMC): 939 blood donors (1973-1974): & 6153 blood donors (1974-1975)	 1.4% 1.7%

Lebanese pregnant women

Table 6.5-10 Prevalence of HBsAg selected studies regarding pregnant woman

Author (year)	Subjects	Prevalence of HBsAg
Germanos (1998)	2431 pregnant women HDF	0.12%
Maalouf (1997)	1922 pregnant women HDF	1.73%
Nabulsi et al. (1997)	558 pregnant women (obstetric out patient clinic at AUBMC)	2.9%

Lebanese students

Table 6.5-11 Prevalence of HBsAg selected studies regarding students

Author	Subjects	Prevalence of anti-HBsAg
Nassar et al. (1976)	2359 university students (AUB):	Overall: 1.7% By nationality: Arab Asians: 1.4%(26/1894) Non-Arab Asians: 6.4%(10/156) Africans: 13.3% (2/15) Europeans: 2.9%(2/70) Americans: 0.4%(1/224) By sex: Males: 2.4% Females: 0.6%
Germanos (1998)	312 university students(USJ: medicine & dentistry)	Overall: 0.62%

Hepatitis C Virus

The following table summarizes the findings of prevalence studies of HCV in Lebanon:

Table 6.5-12 Prevalence of HCV in selected studies in Lebanon

Author (year)	Subjects	Prevalence of HCV markers
Naman et al. (1996)	7771 blood donors in 1996 (18 – 65 years old) (source not mentioned)	0.45%
Naman et al. (1996)	317 patients on hemodialysis (age 6 to 85 years) from 5 centers, four of which are in Beirut	29%
Araj et al. (1995)	3643 Lebanese blood donors (AUBMC 1992-1993)	0.11%

Hepatitis D Virus

Only one study was identified regarding HDV in Lebanon:

Table 6.5-13 Prevalence of HDV in AUBMC sample population

Author	Subjects	Prevalence of Anti-HDV
Farci et al. (1987)	63 out- and in-patients at AUBMC divided into three groups: Asymptomatic HbsAG Active hepatitis Chronic active hepatitis	0% 0% 57%

Source: Farci et al. 1987

Hepatitis E Virus

The following studies investigated HEV in Lebanon:

Table 6.5-14 Prevalence of HEV in selected studies in Lebanon

Author (year)	Subjects	Prevalence of HEV
Irani-Hakim & Feghali-Haibeh (1998)	100 Lebanese blood donors (source not mentioned)	4% (Higher among low SES)
Fakhoury (1995)	150 patients (1 month – 83 years old) admitted to HDF for non-hepatitis reasons	12%

Comments

No studies regarding the prognosis of patients with hepatitis in Lebanon was identified. All studies were cross-sectional prevalence studies in different Lebanese subpopulations or non-Lebanese living in Lebanon.

The only source for incident cases is the MOPH-ESU. However, this surveillance system unfortunately still suffers from severe underreporting. One of the reasons for underreporting might be that the patients do not receive any medications from MOPH. Another limitation is the lack of nationality of the reported cases. The last three years (1998, 1999, 2000) gave a similar number of reported HAV cases (238-254), but showed a decrease in HBV cases (489 to 245) and HCV cases (72 to 42).

The prevalence of HAV in the adult general population was almost universal (97.7%) in Shamma'a et al. (1982) study with a gradual increase of positive cases among children with age. Of the children 6-12 years of age, 85% tested positive. Bekdache (1999) showed a similar trend and again a 97.5% for those older than 50 years. This is consistent with the international literature for developing countries (almost universal prevalence).

The prevalence of HBSAg (Hepatitis B surface Antigen), which indicates a carrier state, among the healthy Lebanese adults ranged from 0.12% to 3%. This figure is also consistent with the international literature.

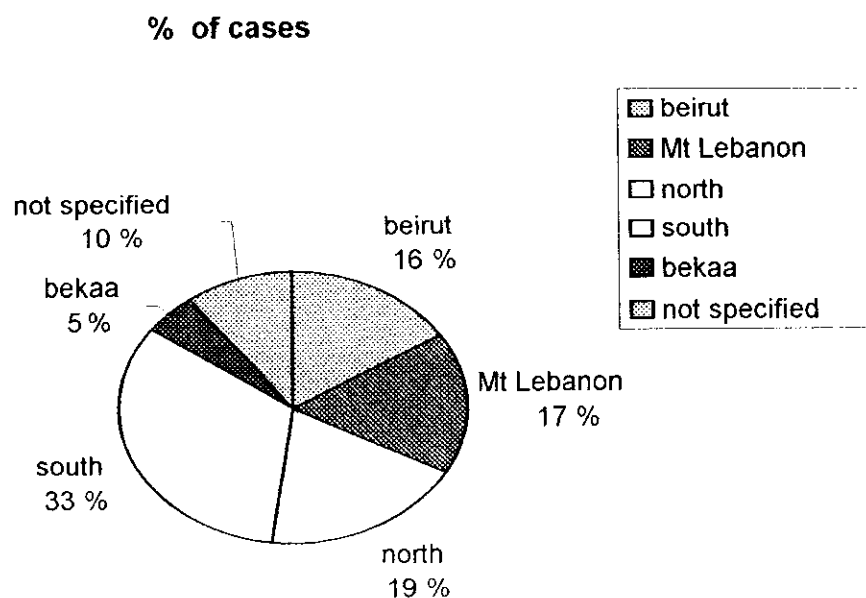
The prevalence of HCV markers in the blood of the Lebanese blood donors ranged from 0.11% to 0.45%. Naman et al. (1996) a more recent study with a larger sample size, revealed 0.45% prevalence, which is consistent with the international literature for blood donors (0.5%).

The prevalence of anti-HDV ranged from 0% in patients with asymptomatic HBsAg and acute hepatitis to 57% in patients with chronic active hepatitis (Farci et al. 1987). This is the only study on HDV in Lebanon and it is limited to 63 patients.

The prevalence of HEV ranged from 4% to 12%, which is consistent with the fact that HEV is common in the developing countries.

Overall, most studies showed a higher prevalence of the different hepatitis among males. This was also shown in the MOPH-ESU data. Variability by region was also noted especially for HBV. The hepatitis cases reported to MOPH in 1996, for example, were distributed as follows:

A higher percentage of cases were reported from the south and this is consistent



throughout the years 1997 and the first half of 1998. However, this might also be an indicator of better reporting.

References

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6.6 PNEUMONIA

Joseph Kahhaleh & Iman Nuwayhid

Background¹

Pneumonia refers to a syndrome caused by an acute bacterial or non-bacterial infection, characterized by clinical and/or radiographic signs of consolidation of the lung. It is broadly classified as community-acquired or hospital-acquired (nosocomial).

- **Community-acquired pneumonia:** Its incidence is usually unknown, since many episodes of pneumonia are treated by primary-care physicians as lower respiratory tract infection or bronchitis. In the UK, for example, the overall estimate of the annual incidence of community-acquired pneumonia varies between 2 and 12 cases per 1000, being highest in infants and in the elderly. In the USA, 4 million cases of pneumonia are estimated each year, with an attack rate of 12 per 1000 adults and 600,000 annual hospital admissions. Again, the annual incidence of community-acquired pneumonia in those aged over 65 years is estimated to be between 25 and 44 cases per 1000. This rate increases by 2 to 8 fold among institutionalized (residential or nursing homes) older people. The more recent decrease in incidence of pneumonia has been noted in the infant population. The parallel increase among the elderly may partly be a consequence of more people dying in hospitals or simply a more frequent use of 'pneumonia', rather than 'heart failure', as a cause of death.
- **Nosocomial pneumonia:** It is the most common hospital-acquired infection accounting for death. It occurs with an estimated frequency of 0.5-5% of admissions.

About 15 million children worldwide die each year as a consequence of acute respiratory infections; 1/3 of them from pneumonia. A total of 96% of these deaths occur in developing countries. Death rates from pneumonia may be influenced by seasonal factors (higher in cold winter months) and socio-economic status (higher in lower SES).

The following are a few examples of pneumonias:

Pneumococcal Pneumonia

It is responsible for 30-50% of all cases of community-acquired pneumonia in the UK. It is slightly more common in males than females throughout life, for reasons that are unclear. It is more common with increasing age, with an attack rate of about 46 cases per 1000 for those over 40 years of age, as compared to 1-5 per 1000 per year for the overall population.

Pneumococcal bacteremia shows a bimodal age distribution- one peak in patients over 65 and another in infants under one. The mortality from pneumococcal bacteremia is 18-40%.

¹ References:

1. Scaton A and Scaton D. Crofton and Douglas' Respiratory Diseases. 5th Ed. Blackwell Sciences. 2000.

The overall mortality from pneumococcal pneumonia in hospital is 5-19 %, having been 30% before the advent of antibiotic therapy.

Legionella Pneumonia

It is most likely caused by the inhalation of droplets of contaminated water. In the USA, the estimated incidence of *Legionella pneumonia*, serotype 1, was 12 cases per 100000 per year (excluding hospital acquired cases). Mortality is mainly influenced by the choice of antimicrobial therapy and previous health status of the patient. To illustrate, previously healthy patients who received erythromycin die less (about 5% mortality) than immunocompromised patients who did not receive erythromycin (about 80% mortality).

Mycoplasma Pneumoniae

It is found worldwide and may cause up to 20% of pneumonia. It is most common among children, adolescents, and young adults. Most patients recover in 10-14 days with proper antibiotics (erythromycin). The risk of relapse increases with improper treatment.

Pneumoniae in Lebanon

Available Relevant References in Lebanon

References on pneumonia were almost absent. A few national or local household surveys, which asked about respiratory infections in general or mostly upper respiratory infections, were identified. The few identified published articles were either review papers or case reports.

Table 6.6-1 Selected references regarding Pneumonia in Lebanon

Author (year)	Description
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
UNICEF (1993)	Household survey of 4 areas (Baalbeck-Hermel, Akkar, Tripoli, Batroun) each made of cluster of villages (more than 1000 children under five each). Survey on acute respiratory infections.

Summary Findings

The NHHEUS (1999) reported that of the 32838 individuals surveyed 10357 visited an outpatient clinic in the past year, with 22% of them due to diseases of the respiratory system.

In Beirut 92 survey, there is information about respiratory diseases and asthma and no information on Pneumonia per se.

The findings from the three outpatient health care centers contacted in 1999 show that overall respiratory accounted for 19% of all visits to AUB-UHS, 21% of those in Malta

organization-Kobayat, and 63% of those in Malta-Nabatiyeh. Earlier surveys have shown the following:

- AUB Family Practice (1980-1988): 4.4% upper respiratory tract infections/ 1.6% acute otitis media/ 0.8% tonsillitis/ No lower RTI
- Pneumonia did not show on the list of most common primary health problems (Adib et al. 1993). Tonsillitis and upper respiratory tract infections did.
- Out of 4636 school-aged children followed by Terre des Hommes in 1993, 3% had bronchitis/ pneumonia.

In 1999, 761 out of more than 40,000 insurance claims processed by MedNet were due to pneumonia and influenza.

NHHEUS 1999 reported that 12.4% of all 3981 hospital admissions by 32,838 individuals were due to diseases of the respiratory system and 22.1% of all 10,357 out-patients sought medical attention for respiratory problems.

However, the discharge diagnoses of three large hospitals in Beirut in 1999 (see chapter 5) showed that lower respiratory tract infections constituted a total of 1796 discharge diagnoses out of 60,000.

Findings from the "Preliminary Report on the Acute Respiratory Infections Survey Among Children Under Five" conducted in Baalbeck-Hermel, Akkar, Tripoli, and Batroun-Koura (UNICEF, 1993) are presented on the following page:

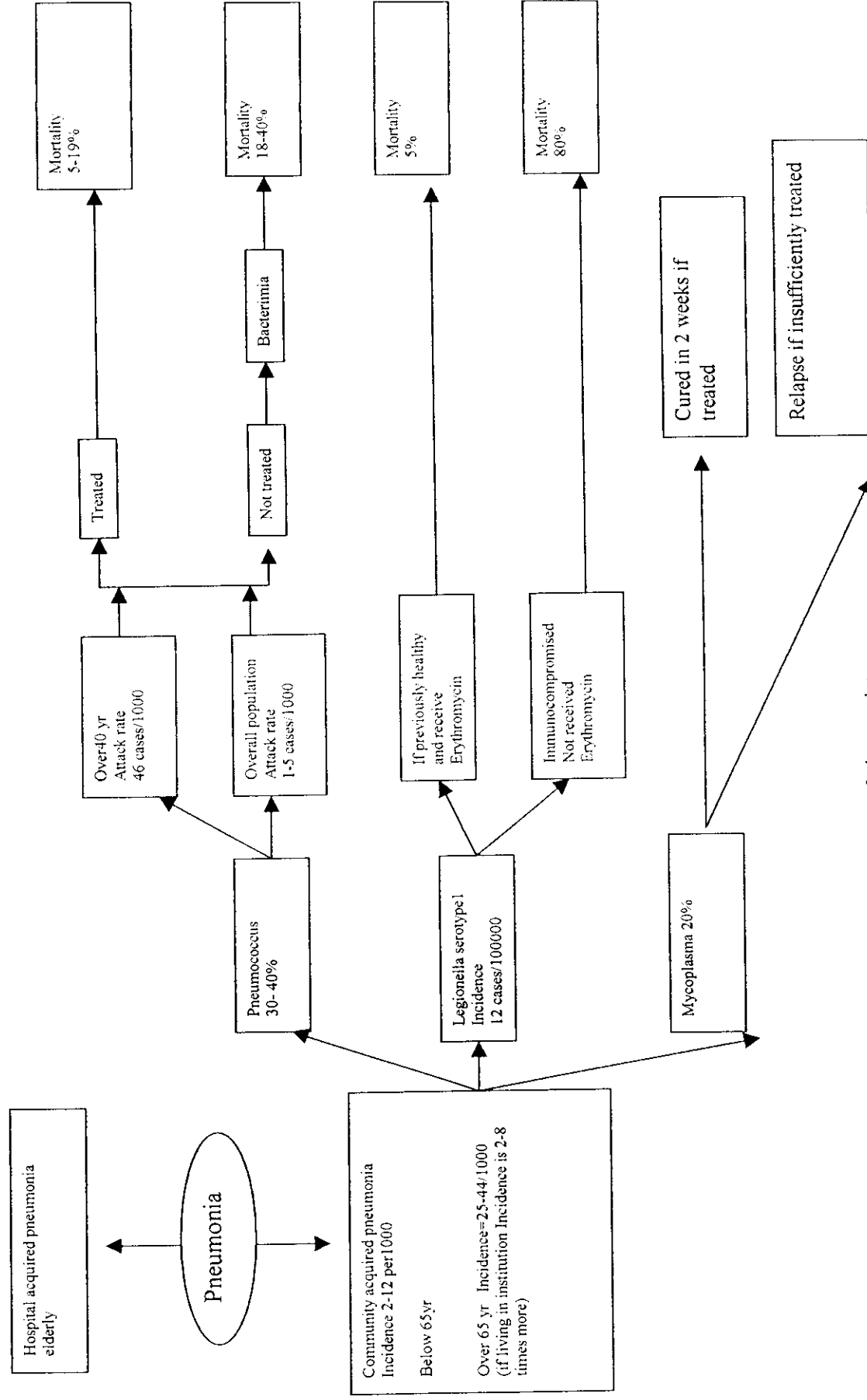
Table 6.6-2 Frequency and related samples of coughing in children by region in Lebanon

	AKKAR	TRIPOLI	BATROUN KOURA	BAALBECK HERMEL
Number of children under 5	1160	1136	*	1097
% females	47.7	49.2		47.1
Age distribution				
6 m.	10.5	11.2		8.1
6-12 m.	10.4	8.5		7.8
1-2 yr.	19.4	22.4		21.5
2-3 yr.	20.2	18.5		21.1
3-4 yr.	21.8	20.0		22.1
4-5 yr.	17.7	19.4		19.4
Cough in the past 2 weeks (%)	44.8	47		34.2
Average number of cough episodes per child per year	5.3	5.7		4.1
An episode of cough by age group				
0-5 m				5.3
6-11 m	9.4	9.3		9.3
1-2 yr	11.5	8.2		22.9
2-3 yr	21.5	22.8		20.3
3-4 yr	20.4	17.4		24.0
4-5 yr	20.4	23.2		18.1
Reported symptoms (%)				
Fever	53.7	54		67.7
Severe and continuous cough	29.4	32		34.4
Breathing difficulty	36.3	36.3		42.7
Other symptoms		4.5		4.3
An episode of cough and breathing difficulty (%)				
0-5 m	14.3	11.9		5.6
6-11 m	16.4	9.8		15.0
1-2 yr	21.7	24.7		23.8
2-3 yr	16.9	12.9		15.0
3-4 yr	19.0	25.3		20.0
4-5 yr	11.6	15.5		20.6

Source: UNICEF, 1993

* no information about Batroun and Koura was found.

Flow Chart of Pneumonia



* the numbers in this chart are from the literature and do not represent Lebanese data

References

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6.7 REPRODUCTIVE HEALTH: OBSTETRIC MORBIDITY AND MORTALITY

Omar Dewachi & Iman Nuwayhid

Background¹

Reproductive health is defined as a “state of complete physical, mental and social well-being and not merely the absence of disease and infirmity, in all matters relating to the reproductive system and its functions and processes” (WHO, 1999). This definition involves a wide spectrum of conditions that accompany males and females through their life, ranging from healthy sexual development, comfort, closeness and the joys of childbearing, to abuse, disease, disability and death.

In measuring morbidity and mortality associated with reproductive health, reproductive health conditions are classified according to the following categories (Murray and Lopez, 1998):

1. Major Sexually Transmitted Diseases (STD's), namely syphilis, gonorrhea, and chlamydia in adults and in children as a result of perinatal transmission;
2. HIV/AIDS infections in adults and children;
3. Cancers of the reproductive system, such as cervix, breast, ovarian, uterus, penis and testis;
4. Maternal mortality and morbidity that are an outcome of the five major obstetric complications (hemorrhage, sepsis, hypertensive disorders of pregnancy, obstructed labor, and abortion)

Measuring reproductive health morbidity of females in the Middle East is not easy, due to lack of information and studies. Most of the population-based surveys directed at women have concentrated on issues of fertility, contraception prevalence and child health (Zurayk et al. 1993).

This section is limited to the review of maternal obstetric morbidity and mortality in Lebanon. Reproductive tract infection not related to obstetrical causes, selected reproductive system cancers and HIV/AIDS are covered elsewhere in this report (sections 6.2, 6.3, 7.1-5, and 7.1-6, respectively).

¹ References:

1. World Health Organization. Interpreting reproductive health, Geneva: WHO, 1999.
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Classification of Obstetric Morbidity

Obstetric morbidity can be divided into conditions during pregnancy, delivery, and the postpartum period (Zurayk et al., 1993). A list of these conditions is shown in Table 6.7-1

Table 6.7-1 Conditions constituting obstetric morbidity

During pregnancy	a. Hemorrhage b. Discharge c. Fever d. Headache e. Edema in limbs f. Burning with urination g. High blood pressure h. Convulsions in third trimester
During delivery	a. Hemorrhage b. Episiotomy/ tear c. Delivery by instrument d. Cesarean section e. Malpresentation of fetus f. Long labor
After delivery	a. Hemorrhage b. Discharge or inflammation c. Fever d. Depression

Source: Zurayk et. al. 1993

We combined the above classification with the one mentioned earlier from Murray and Lopez burden of disease classification of obstetric complication (1998) into Table 6.7-2. This concise list (Table 6.7-2) will help in assessing the burden of each condition for each stage of gestation and delivery.

Table 6.7-2 Conditions constituting morbidity, modified

During pregnancy	- a- Hemorrhage - b- Hypertensive disorders (edema in limbs, high blood pressure, convulsions in third trimester) - c- Abortion
During delivery	- a- Hemorrhage - b- Obstructed Labor that include (episiotomy/ tear, delivery by instrument, malpresentation of fetus, long labor)
After delivery	- Hemorrhage - Sepsis (discharge or inflammation, fever) - Depression

Source: Zurayk et. al. 1993

The remainder of the background section will present a separate review for each condition, namely hemorrhage, hypertensive disorders of pregnancy (HDP), obstructed labor, sepsis, and abortion.

Hemorrhage²

Hemorrhage is mentioned in the three stages of pregnancy and will be divided into antepartum hemorrhage and postpartum hemorrhage. Antepartum hemorrhage is defined as bleeding from the genital tract before labor but after early pregnancy. Postpartum hemorrhage is usually defined as bleeding from the genital tract of 500 ml or more following delivery.

Antepartum Hemorrhage

Approximately half of the cases of antepartum hemorrhage are due to either placental abruption or placenta previa. The other half has no precise cause identified. The incidence of abruptio placentae was found to be 1 percent of pregnancies in the UK. While the etiology remains unclear, many studies relate it to factors such as trauma to the uterus and smoking during pregnancy.

The incidence of placenta previa in developed countries ranges between 0.29 to 1.24 percent of pregnancies (0.55 per 100). Mortality due to antepartum hemorrhage is not calculated due to rareness of these cases.

The incidence of antepartum hemorrhage in two community studies carried in the United States and the United Kingdom some 30 years ago reported an incidence of 3-4.8 percent.

Postpartum Hemorrhage

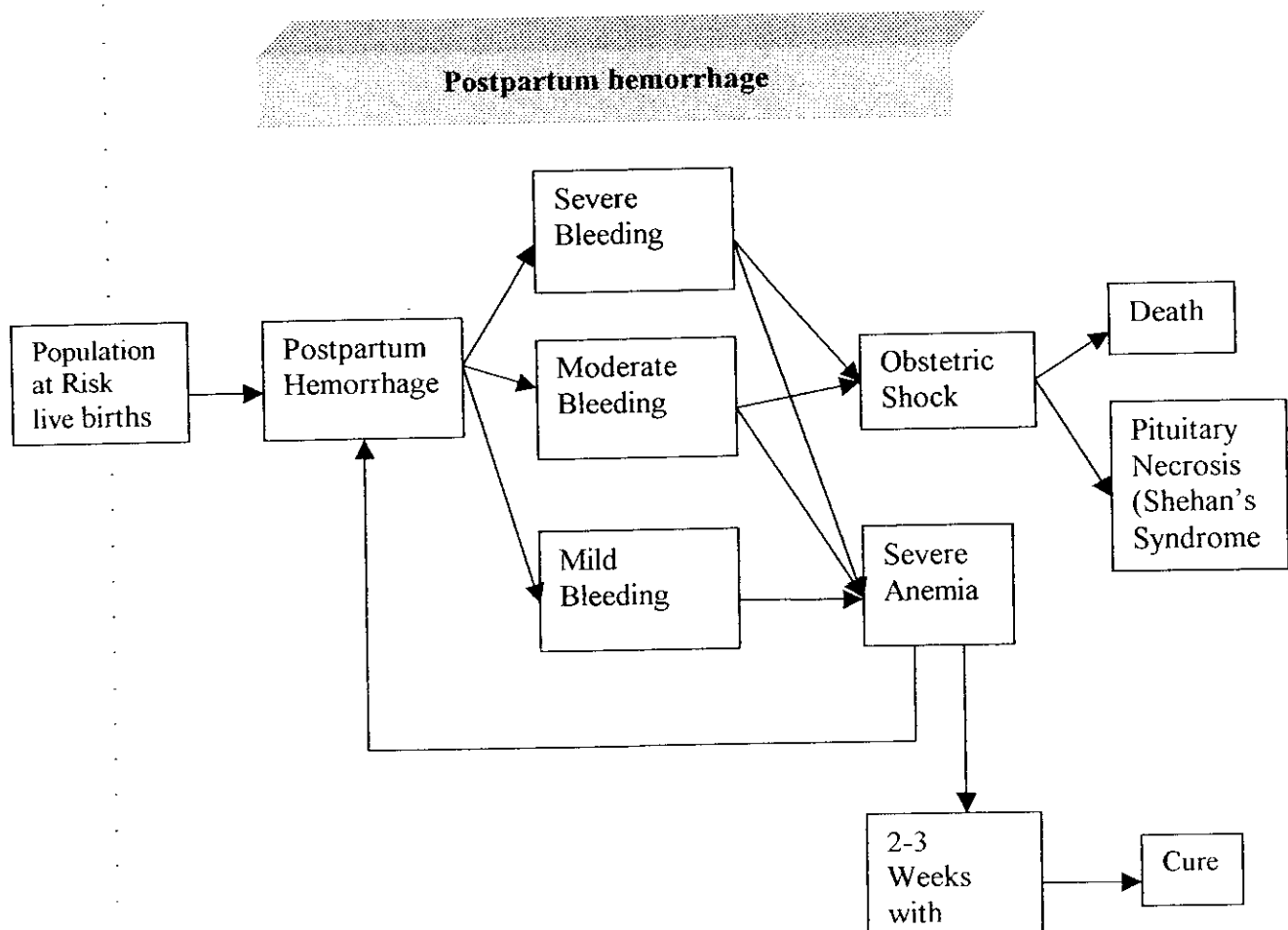
The incidence of postpartum hemorrhage is controversial due to factors related to the definitions of this condition and the cut line for the amount of blood loss. Abou Zahr, as part of the GBD study, used an estimate of 10 percent of all live births.

Hemorrhage is considered as the leading cause for maternal mortality. Mortality from postpartum hemorrhage has been estimated around 25 percent of maternal deaths-taken mainly from community-based studies. For example, maternal deaths due to hemorrhage (mainly postpartum) are estimated to be around 32% in Egypt and 9% in Turkey.

The two major complications of maternal hemorrhage are Shehan's syndrome and severe anemia. Shehan's syndrome, or postpartum pituitary necrosis following obstetric shock, is considered as the major disabling sequelae resulting from maternal hemorrhage. The GBD study calculated the incidence of Shehan's as 2 percent of severe postpartum hemorrhage.

² AbouZahr. Antepartum and Postpartum Hemorrhage. In: Health Dimensions of Sex and Reproduction. Murray and Lopez (eds), 1998. Chap 5.

Anemia is a very common complication of hemorrhage during pregnancy. It is estimated that 50 percent of the women who have postpartum hemorrhage will develop moderate to severe anemia every year. Since over half of the pregnant women are anemic, it is thought that hemorrhage will aggravate these conditions in a complex manner.



Hypertensive Disorders in Pregnancy and Eclampsia³

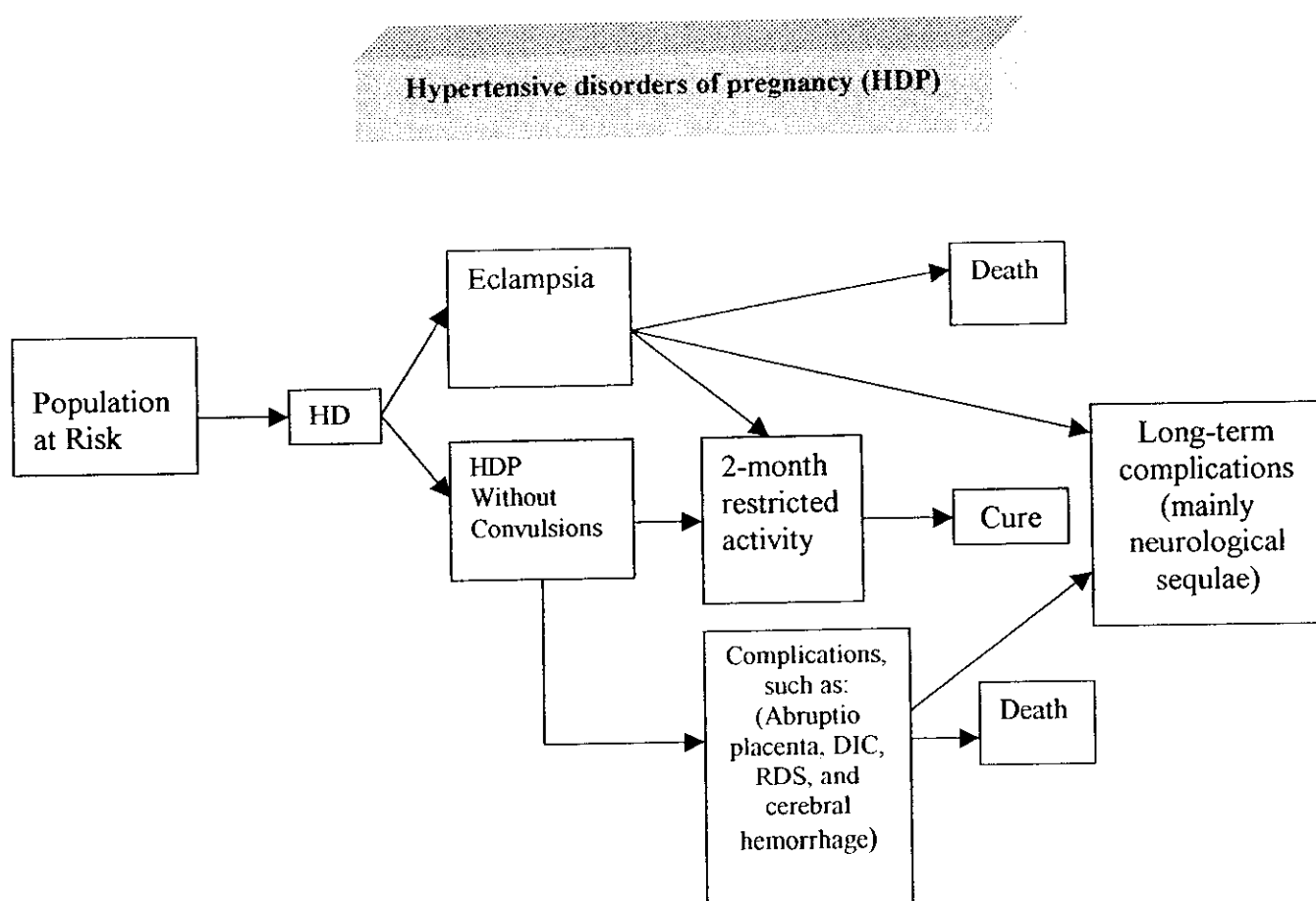
The diagnosis of hypertensive disorder during pregnancy depends on blood pressure measurement, urine testing for protein, and clinical observation of seizures and convulsions. The American College of Gynecologists and Obstetricians (ACGO) defines hypertension in pregnancy as a measurement greater or equal to 140/90 mm Hg on two occasions of at least 6 hours apart. Proteinuria is defined as positive test of ≥ 0.3 g/24 hours or ≥ 30 mg/dl (1+ dipstick) on two occasions ≥ 6 hours apart. Eclampsia is defined

³ AbouZahr and Guidotti. Hypertensive Disorders of Pregnancy. In Health Dimensions of Sex and Reproduction. Murray and Lopez (eds). 1998. Chap 6, pp: 219-241.

as hypertension in pregnancy associated with convulsions, in the absence of other neurological explanations.

The incidence of HDP ranges from 0.1 percent in developed countries up to 10-17 percent in the developing ones. Hypertensive disorders in pregnancy account for 10-15 percent of maternal deaths in the developed world. The major cause of death is eclampsia, yet death might occur as a complication of hypertensive disorders without convulsions. It may lead to placental abruption, disseminated intravascular coagulopathy, adult respiratory distress syndrome or cerebral hemorrhage, which all might lead to death. It has been assumed that two thirds of all deaths due to HDP are associated with eclampsia. In Egypt, a follow-up study on 124 cases of HDP admitted to Kasr-el-Aini Hospital in 1981-1982 found that the incidence of eclampsia was around 12 percent and case fatality was 13.7 percent.

Information about the complications of HDP in the literature is not very clear. Yet the data available verifies many complications due to pre-eclampsia, such as renal and liver damage, pulmonary edema, cerebral hemorrhage and retinal detachments. It is estimated that 10 percent of the eclamptic cases develop long-term complications, which are mentioned above. The GBD study limited its disability estimates of the global burden of HDP to neurological sequel, chronic hypertension and mild renal failure. It is estimated that 0.1 percent of eclamptic patients develop permanent neurological disability. As there is no effective treatment for conditions resulting from hypertensive disorders of pregnancy, the disability weights used for treated and non-treated were assumed similar.



Obstructed Labor⁴

Obstructed labor occurs when there is no advance of presenting part despite strong uterine contractions. Causes for obstructed labor include:

- Cephalopelvic disproportion
- Deep transverse arrest
- Fetal abnormalities
- Locked twins
- Malpresentations
- Pelvic Tumor
-

If obstruction cannot be overcome by manipulation or instrumental delivery, cesarean delivery is needed. If an obstructed labor is neglected, it might lead to major maternal and newborn morbidity and may result in death for one or both.

Maternal complications include the following:

- Intrauterine infections following prolonged rupture of membrane.
- Trauma to the bladder due to pressure of the fetal head or damage during delivery.
- Ruptured uterus with consequent bleeding, shock and even death.

Cephalopelvic disproportion (CPD) is the main cause of obstructed labor in areas of the world where malnutrition, disease, and early marriage are common. Other areas where CPD is not very prevalent, malpresentation and inefficient uterine contractions are primary causes for prolonged and obstructed labor. Women at risk for obstructed labor include those who are very young and those of short stature. Rupture of the uterus is a common complication of prolonged obstructed labor among women who have delivered many children rather than those in their first pregnancy.

The mortality from obstructed labor is difficult to estimate directly as to the fact that deaths are classified under the final cause of death, which may be sepsis, ruptured uterus or hemorrhage, rather than the underlying cause.

As most of obstructed or prolonged labor require instrumental or surgical delivery, it is possible to use operative delivery -cesarean, forceps, and vacuum extraction- as a proxy indicator of the incidence of obstructed labor. Lomas and Enkin (1989) verified the importance of breech presentation and cesarean section as indicators for difficult labor. The incidence of dystocia (difficult labor) is assumed to range from 3 percent in developed countries to 6 percent in Africa, the Middle East and South West Asia and India. As weighted by region, the incidence of obstructed labor is estimated to be 5.1 percent of all live births.

As we mentioned above, mortality from obstructed and prolonged labor is difficult to obtain because of the use of the final cause of death rather than the underlying cause. So, data on mortality should be handled with caution. It is estimated that maternal mortality due to obstructed labor ranges from less than 1 percent to 10 percent, with a global average of 7.5 percent of direct maternal death.

⁴ AbouZahr. Prolonged and Obstructed Labor. In Health Dimensions of Sex and Reproduction. Murray and Lopez (eds). 1998. Chap 7, pp: 243-266.

There are two main complications or disabilities following obstructed labor:

-Rectovaginal or vagino-vesical fistulae:

These are considered the most severe and distressing long term complications. They occur as a result of pressure necrosis resulting from the prolonged pressure of the fetal presenting part during difficult labor. Estimating the incidence and prevalence of fistulae resulting from prolonged labor is difficult. Most of the reported cases are ones that manage to reach a hospital setting. However, many cases are still not reaching the hospital, therefore are not being addressed by the researchers.

Uterine rupture:

Rupture of the uterus causes hemorrhage, shock and if proper management did not start rapidly, it will lead to death.

Other complications include:

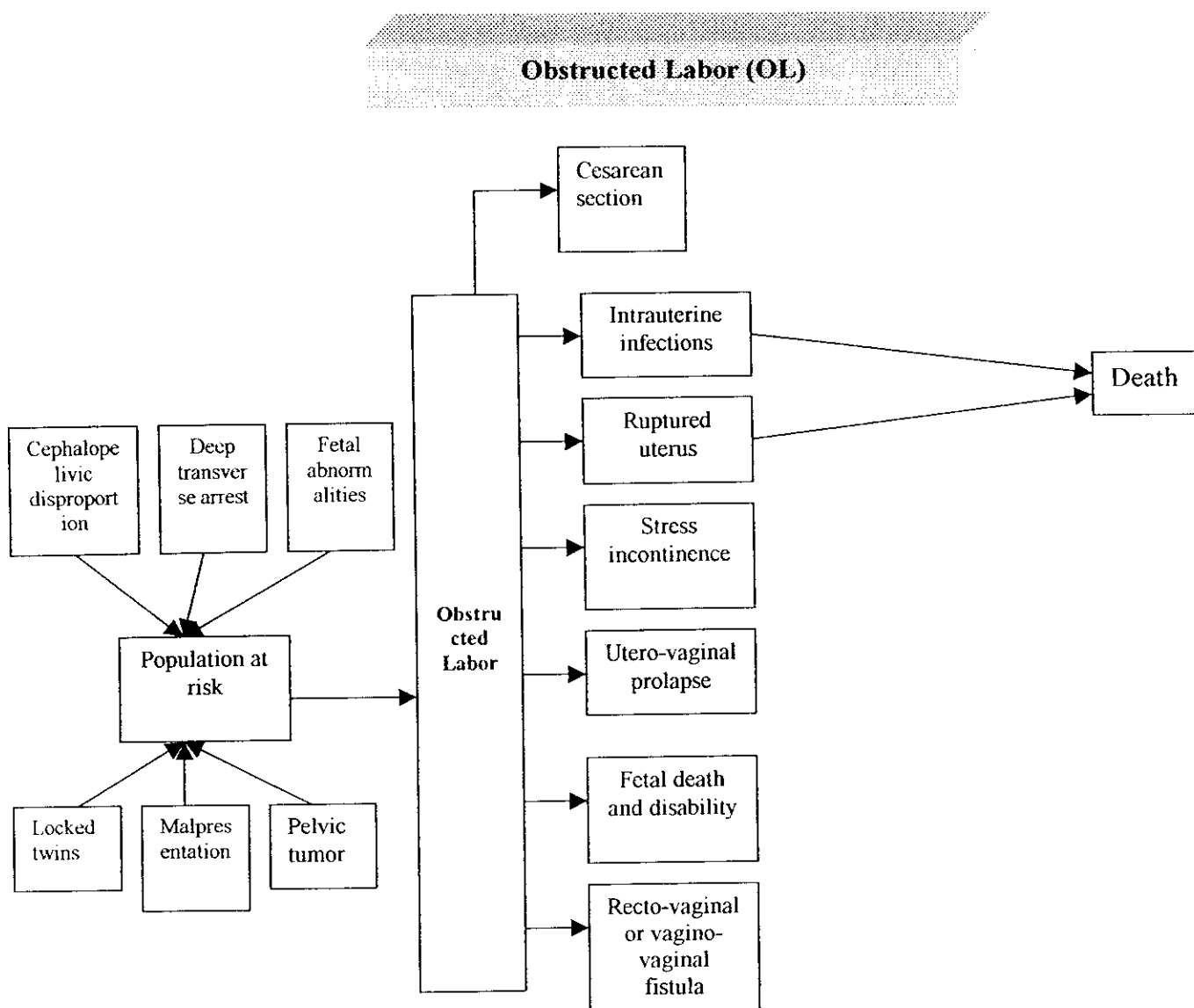
- Uterovaginal prolapse:

A survey in 9 countries revealed that the percentage of women with uterovaginal prolapse ranged from 2% to as high as 28%. This condition was higher among women with higher parity and who were older. On the other hand, a number of community-based studies in Lahore, Pakistan; Istanbul, Turkey; and Giza, Egypt, found that uterovaginal prolapse was prevalent in as high as one-third to two thirds of the women in these communities.

Stress incontinence:

- Fetal death and disability:

Treatment of obstructed labor is through operative intervention, such as cesarean section or delivery using instruments e.g. forceps, vacuum extractor, etc.



Puerperal Sepsis and Other Puerperal Infections⁵

These are infections due to puerperal sepsis, extra genital infections and incidental infections occurring during labor, delivery or puerperium. These conditions are mainly manifested clinically with fever, though not all cases necessarily present with fever. The definition of puerperal sepsis consists of the following elements:

1. Fever equal to or greater than 38.0° C
2. Fever must be present on any two of the first ten days of the postpartum period (exclusive of the first 24 hours)

The WHO Technical Working Group defined puerperal sepsis as:

- Fever, oral temperature 38.5° C or higher on any occasion.
- Pelvic pain
- Abnormal vaginal discharge, e.g. presence of pus
- Abnormal smell/ foul odor of discharge.
- Delay in the rate of reduction of the size of the uterus (<2 cm/day during first 8 days)

Etiology is mainly through nosocomial infection. Uterine infections and their complications are the major causes of death from puerperal sepsis.

Data on the incidence of puerperal infections mainly come from the industrialized world. In the United States, 1-7% of postpartum women develop a puerperal infection. Estimates of the incidence of puerperal sepsis range from a high 10% in Sub-Saharan Africa to a low of 5% in Established Market Economies. Difficulties arise in examining the full picture of this condition in the developing nations due to the following:

1. Women who are discharged from hospitals are never seen again until they present with the infant for immunization. In addition women whose infant has died will not show for postpartum check up nor for immunization.
2. Many deliveries take place at home where the risk of sepsis is much higher due to nosocomial infections.
3. At six weeks postpartum, signs and symptoms of sepsis are no longer likely to be clinically manifest with many infections rising to the upper genital tract.
4. Some women die following severe sepsis before reaching the hospital.

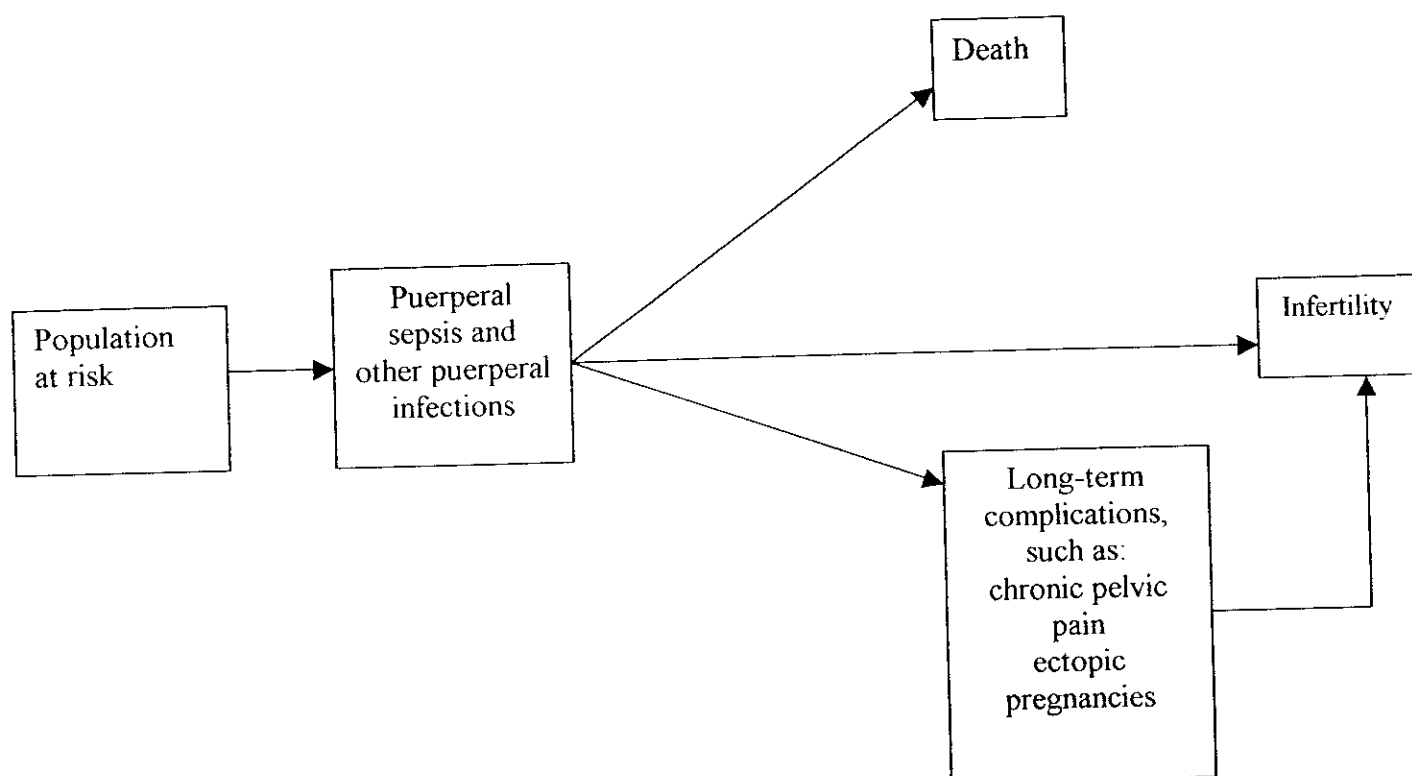
In the United States, postpartum sepsis accounts for 8 percent of the maternal deaths over the period 1979-86. Of those, 18 percent are due to genital tract infections, 15 percent to chorioamnionitis, and 32 percent to septicemia. According to the WHO report in 1991, maternal death due to sepsis in Egypt accounted for 13.3 percent.

It is known that complications related to puerperal infection include ectopic pregnancy, chronic pelvic pain, and infertility. Chronic and acute pelvic inflammatory disease (PID) cause pain and discomfort, and, in severe cases, pain during defecation, sexual intercourse, urination, and at or around menstruation. Chronic PID may also lead to

⁵ AbouZahr, Ahman, Guidotti. Antepartum and postpartum hemorrhage. In Health Dimensions of Sex and Reproduction, Murray and Lopez, (eds), 1998. Chap 5, pp: 191-218.

infertility due to the damage to the reproductive tract. In addition, the risk of infertility increases with the increase of the episodes of infection. In a community-based study in rural Egypt, it was found that 51 percent of the women had reproductive tract infections, and pelvic inflammatory disease was suspected in 20 percent. In the Middle East Crescent, it is estimated that the prevalence of long-term reproductive tract infection and secondary infertility caused by puerperal infection among women aged 15-49 years are 3% and 15%, respectively. It is also estimated that 41.2% of all cases of sepsis will result in long-term reproductive tract infections and 9.5% in infertility.

Puerperal Sepsis and Other Puerperal Infections



Unsafe abortion and ectopic pregnancy⁶

Abortion is classified according to the underlying cause, which include ectopic pregnancy, spontaneous abortion, and unsafe abortion.

1- Ectopic Pregnancy

Ectopic pregnancy occurs when the fertilized ovum implants outside the uterine cavity, usually in the fallopian tube, hence the term tubal pregnancy. Rarely, it might also implant in the abdomen cavity or the cervical canal. If it happens, the woman usually experiences the usual signs and symptoms of pregnancy in the early stages. Then as the growing fertilized ovum gets bigger, it causes pressure on the fallopian tubes and would eventually lead to tubal rupture and intraperitoneal hemorrhage. This condition is a very critical medical emergency that requires rapid intervention.

Diagnosis of ectopic pregnancy is by ultrasonography and hormonal assays. Etiology of ectopic pregnancy seems unclear.

The incidence of ectopic pregnancy varies between countries. It might reach to up to one ectopic pregnancy for every 28 births in Jamaica to as low as one for every 175 live and still birth in United Kingdom. However, there is some evidence suggesting that the incidence of ectopic pregnancy is rising in the industrialized world. In the United Kingdom, maternal death from ectopic pregnancy accounted for around 10% of all maternal deaths in 1986. Death from ectopic pregnancy is primarily due to hemorrhage. Other causes of death include pulmonary embolism, pregnancy induced hypertension, infection, and anesthesia complications.

2- Spontaneous Abortion

Around 15-20% of clinically diagnosed pregnancies end in spontaneous abortion. Spontaneous abortion in early pregnancy is almost always preceded by the death of the fetus, unlike those occurring at the end of pregnancy.

Fetal death occurring mainly in the first trimester might be associated with chromosomal abnormalities, abnormalities of the ovum, immunological factors, and abnormalities in the reproductive tract or systemic disease in the woman. Second trimester abortions are often associated with cervical incompetence, abnormalities of the uterine body, and infections, such as *Listeria monocytogenes*.

Factors that might be associated with spontaneous abortions include conditions such as high fever, diabetes, thyroid disease, renal disease, and hypertensive disorders. Other causes include environmental factors such as radiation, drugs, and severe stress. Spontaneous abortion is rarely associated with complications. However, it is believed that the main effect of spontaneous abortion is the psychological impact on the aborting mother that might lead to depression. The intensity of the reaction appears to be greater among women with no living children, women who had had abortions previously, and those whose abortion occurred in the second trimester, rather than early pregnancy.

⁶ AbouZahr, Ahman. Unsafe Abortion and Ectopic Pregnancy. In Health Dimensions of Sex and Reproduction. Murray and Lopez (eds). 1998. Chap 8, pp: 267-296.

3- Unsafe Abortion

The overwhelming majority of deaths and disabilities due to pregnancies with abortive outcome are caused by complications arising from unsafe abortion. Law in many countries restricts induced abortions. However, millions of abortions are performed outside the legal system every year, often by unskilled providers.

Unsafe abortion is defined by the WHO as a procedure for terminating an unwanted pregnancy either by a person lacking the necessary skills or in an environment lacking the minimal medical standards or both. In some developing countries, the risk of death following complications of unsafe abortion may be 100 to 500 times higher than that following an abortion performed under these conditions. In the United States where abortion is performed professionally under safe conditions, the death rate for induced abortion is now 0.6 per 100,000 procedures, making it safer than an injection of penicillin.

Most women seeking abortion are married or live in stable unions and already have several children. They seek abortion to limit the family size or to space birth. They may resort to abortion in the event of contraceptive failure or the lack of access to modern contraception. However, an increasing proportion of women living in urban areas who are seeking abortion are unmarried adolescents.

Abortion may be induced by the woman herself, by a non-medical person, or by health workers in unhygienic conditions. Such abortion procedures might be performed by introducing a solid object (usually root, twig or catheter) into the uterus, an improperly performed dilatation and curettage procedure, ingestion of harmful substance, or exertion of external forces. The risk of mortality and morbidity from unsafe abortion varies according to the facilities and skills of the provider, the method used, the age, parity, general health, presence of reproductive tract infections or sexually transmitted disease, and stage of pregnancy of the mother.

It is difficult to obtain information on unsafe abortion due to the moral/ethical constraints hindering data collection. There is also definitely underreporting in estimating the incidence of unsafe abortions. However, several methods are used to estimate the rate of unsafe abortion:

1. Hospital admissions for abortions: often used as an indicator of unsafe abortion. It is estimated that between 10 percent and 50 percent of unsafe abortions cases will need medical attention. However, not all women seek health care when complications arise. Therefore, admission data are representative of a small proportion of the total number.
2. Community surveys: interviewing a random sample of women in the community. Limitations include under-reporting of induced abortions and over-reporting of spontaneous abortions.
3. Abortion providers' surveys: may report higher numbers than the previous methods, but it might be the least biased one.
4. Mortality studies: case finding, through using a variety of sources of information, might be the most reliable mortality study in developing countries.

The estimates of incidence of, and mortality due to unsafe abortions are imprecise. Globally, it is estimated that some 20 million unsafe abortions take place every year.

Complications of unsafe abortion include sepsis, hemorrhage, genital and abdominal trauma, perforated uterus or poisoning from abortifacient medicines, which might lead to death if left untreated. A study of 840 women in Ibadan, Nigeria, in 1989 showed that complications from illegal abortion included the following: sepsis (86 percent), hemorrhage (35 percent), uterine perforation (16 percent), lower genital tract injury (10 percent), renal failure (0.4 percent), coma (0.4 percent), embolism (0.2 percent), and death (7 percent).

It is estimated that one in eight maternal deaths occur each year due to complications triggered by unsafe abortion and ectopic pregnancy. In Egypt, deaths from unsafe abortions for 1992-93 are estimated to be 7 per 100,000 live births, which constitute 4.1% of maternal deaths.

Sequels of unsafe abortion can lead to permanent disability. Laparotomy and hysterectomy are two of the main sequels of uncontrolled complications of unsafe abortion. Other long-term complications include chronic pelvic inflammatory disease, tubal occlusion, secondary infertility, high incidence of ectopic pregnancy and premature delivery, and increased risk of spontaneous abortion in subsequent pregnancies. It is estimated that 20-30% of unsafe abortions may lead to reproductive tract infections of which between 20% and 40% lead to pelvic inflammatory disease and infertility.

Obstetric Morbidity and Mortality in Lebanon

Available Relevant References in Lebanon

The following references were identified as relevant to the purpose of this report:

Table 6.7-3 Selected references regarding maternal morbidity and mortality in Lebanon

Author (year)	Study Population/ Methodology
Ministry of Social Affairs (1996)	A household survey (PAP child survey) examined 4600 households (2156 children < 5 years). Information was gathered on type, place, and outcome of injury.
Mashini I et al. (1984)	A retrospective review of maternal deaths following 35,058 live births (1971-1982) in AUBMC
Abou Zahr (1998)	
Decb, M et al. (1997)	Original sample: 2,017 households, consisting of 8,940 individuals in Beirut in 1992-1993. The Reproductive and Child Health Survey included married women aged 50 years or less. Of these, 251 women who had their last child during the past 3 years were interviewed.
Decb M et al (1996)	A two-stage follow up study (before delivery and after delivery) of 2936 maternity records in hospitals in Greater Beirut area
Chaaya et al. (2000)	Interviewed 398 women delivering in a hospital in Beirut and in Beka'a, 3 to 4 months after delivery.
Kassak et al.	600 women interviewed 24-48 hours after in one of 10 hospitals in Beirut

(2001)	
Murray c, Lopez A (1998)	The Global Burden of Disease (GBD). Incidence, prevalence, duration and case fatality of 107 major causes of death.

Summary Findings

In the absence of a national census in Lebanon since 1932, the Lebanese population is estimated at 3.26 million (Ministry of Social Affairs, 1996).

A-PAP Child Survey, 1996

The PAP Child survey in Lebanon (MOSA 1996) revealed that the average family size is 2.5 children/ family where it is highest in the north and lowest in Beirut. Average age for the first marriage was around 27.5 for females and 31 for males. Maternal mortality was estimated at 104 deaths per 100,000 live births, while the estimated infant mortality rate was 28 deaths per 1000 live births.

B- Mashini et al. 1984

In their retrospective review of 35,058 live births over a period of 11 years in AUBMC, Mashini et al. (1984) identified 45 maternal deaths for a maternal mortality rate of 128 per 100,000 live births. The main direct obstetric causes of death (n =25) were hemorrhage, sepsis, and toxemia (eclampsia). The main indirect causes (n= 20) were cerebrovascular accident, heart disease, TB, and tetanus. Findings are summarized in the following table:

Table 6.7-4 Causes of maternal mortality (AUBMC 1971-1982)

Direct			Indirect		
Causes of death	No.	Percent	Causes of death	No	Percent
Hemorrhage	11	44	Cerebrovascular hemorrhage	5	25
Postpartum	(10)				
Antepartum	(1)				
Sepsis	5	20	Heart disease	4	20
Septic abortion	(2)				
Puerperal sepsis	(3)				
Eclampsia	3	12	Malignant melanoma	3	15
Ruptured uterus	2	2	Iatrogenic hypoglycemia coma	1	5
Missed abortion	2	8	Pulmonary embolism	2	5
Anesthesia	1	4	Ruptured splenic embolism	1	5
Amniotic fluid embolism	1	4	Phenothiazine hepatitis	1	5
	25	100	Leukemia (AML)	1	5
			Mismatched transfusion	1	5

Source: Mashini et. al. 1984

AbuZahr (1998) relied on the above in estimating the proportion of maternal deaths associated with hypertensive disorders of pregnancy in 1990:

Table 6.7-5 Estimated maternal mortality rate due to HDP

Death due to maternal conditions per 100 000 live births	Percent of maternal death due to HDP	Death from HDP conditions per 100 000 live births
130	7	10

Source: Abu Zahr, 1998

C- Beirut 1994: A Health Profile (Deeb 1997)

Within the bigger household survey, the Reproductive and Child Health (RCH) Survey focused on married women aged 50 years or less (n=1,032). Of these, 251 women who had had their last child during the past 3 years were interviewed. The study showed that 53.2% of the women who had delivered during the past 3 years and 67% of those who were pregnant at the time of the study reported having had a morbid condition during their pregnancy. Regarding complications during delivery, 5.2% experienced hemorrhage during delivery, and 6.4 % had undergone a cesarean section.

Maternal mortality ratio was estimated at 63 maternal deaths per 100,000 live births using the sisterhood method⁷.

D- Deeb et al. (1996)

A hospital based-study that examined about 2936 maternity records in hospitals in Greater Beirut area, reported that the rate of cesarean section is around 15.62%.

E- Chaaya et al. (2000)

This is a two-stage follow up study (before and after delivery) that assessed 398 women delivering in a hospital in Beirut and in Beka'a, 3-5 months after delivery. It found that the prevalence of post-partum depression was 21.3% with significantly higher prevalence in Beka'a than in Beirut (26.3 vs. 16.4%). Complications during pregnancy and in the postpartum period were extracted from the raw data according to the adapted classification of conditions:

Table 6.7-6 Complications during pregnancy in two hospital samples

Complications During Pregnancy	Percentage (N=539)
Antepartum hemorrhage	7.6
HDP	
Uric Acid	11.7
Creatinine	4.6
Postpartum complications	Percentage (N=398)
Postpartum hemorrhage	8.3
Reproductive tract infections	14.1
Puerperal fever	4.8
Perineal cut infection	4.0
Urinary tract infection	12.8
Vaginal tear	0.3

Source: Chaaya et. al. 2000

⁷ The sisterhood method is an indirect approach to estimate maternal mortality that questions men and women about their sisters who have reached adulthood. The method also inquires about sisters who have died during pregnancy or during the 40 days after delivery or abortion.

F- Kassak et al. (2001)

A total of 600 women, who recently delivered in 10 hospitals in Beirut, were interviewed over a 4-month period in 2001. Women were interviewed 24 to 48 hours after delivery. Included hospitals were those with maternity wards. The incidence of cesarean delivery among all deliveries during the study period was 35%. The incidence of cesarean section was around 43% among primigravidas, 92% among those who have had a previous cesarean section, and 15% among women with previous vaginal delivery.

G- Data from Hospitals and NGOs

Hospital discharge data in 1999 were reviewed from three major hospitals in Beirut (see Chapter 5). Around 9991 maternal conditions were reported. Of these, 424 (4.2%) were abortion cases, 127 (1.3%) maternal hemorrhage, 93 (0.9%) obstructed labor, 80 (0.8%) hypertensive disorders of pregnancy, and 2 (0.02%) maternal sepsis.

Summary Findings

The following table summarizes the findings of the above studies:

Table 6.7-2 Statistics regarding obstetric morbidity and mortality from selected studies

Study	Sample	Ante-partum hemorrhage	Postpartum hemorrhage	HDP	Puerperal sepsis and infections	Cesarean section	Abortion	Postpartum Depression	Estimated MMR/IMR
Deeb (1997) <i>Family section</i>									MMR: 63 per 100,000 live births
Delivered during the last 3 years	251	-	5.2	15.0*	-	6.4	-	-	
PAP- Child, 1996	22660	-	-	-	-	-	-	-	104 deaths per 100,000 live births
Deeb et.al. (1996)	-	-	-	-	-	15.6	-	-	
Household survey 99	-	-	-	-	-	-	-	-	
Chaaya et. al., 2000 (Women delivering at a hospital) (Women interviewed in hospitals)	398 550	7.6	8.3	-	14.1	-	-	21.3	
Kassak et.al. (2001)	-	-	-	-	-	35.0	-	-	
Mashini et al. (1984)	Live births: 35,058 Maternal deaths: 45	-	-	-	-	-	-	-	

*extracted from raw data

Maternal Mortality

Maternal mortality rate varied between three sources. Although each source used different methodology in calculation, the most reliable number is the PAP Child rate, which is 104 per 100,000. The PAP child survey has the largest sample size and is a national based survey that reflects mortality rate on the country level.

Death from direct obstetric conditions could be inferred from the AUBMC study, which is 55.6% of those who died from maternal causes. Although this study has been conducted 20 years ago and only represents one referral hospital in Beirut, it is the only comprehensive study available.

Maternal Morbidity

Antepartum Hemorrhage

Chaaya et al. (2000) found that antepartum hemorrhage was as high as 7.6% (compared to 1 percent in the United States and UK 30 years ago). If we consider that half of these cases are due to placenta previa and abruptio placenta, the percentage of women having these conditions will be around 3.8 % compared to 0.29-1.24 percent in USA and UK). The reported figure from the UK and the USA is a community based finding, while Chaaya et al is a hospital-based study which could be biased toward a higher incidence because these centers are actually referral hospitals.

Postpartum Hemorrhage

From Chayya et al (2000), 8.3% incidence of postpartum hemorrhage was extracted. The global figure used in GBD study is around 10%.

Hypertensive Disorders of Pregnancy

Maternal death due to HDP is around 10 deaths per 100,000 live births, according to Mashini et al. study (1984). This number has also been used in the GBD study (1998). The incidence of HDP was extracted from the hospitals discharge data, estimated at 0.8% of maternal conditions admitted to these hospitals. The international data range between 0.1% in developed countries and 10-17% in developing countries.

Obstructed labor

As mentioned in the background section, CS and instrumental deliveries are used as proxies for obstructed labor. However, the number of CS in Lebanon is an over estimate of the real number of obstructed labor.

The study by Deeb et al. (1996) reported a rate of 15.6% in the Greater Beirut area. Kassak et al. (2001) reported that the rate of CS in major hospitals in Lebanon was 35%.

Puerperal Sepsis and Other Puerperal Infections

Chaaya et al. (2000) found that the proportion of women who complained from postpartum reproductive tract infections was 14%. Other infections such as UTI, Puerperal fever, and perineal cut infection constituted around 22 percent.

Abortion and Ectopic Pregnancy:

No information was available.

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CHAPTER 7: EPIDEMIOLOGICAL REVIEWS OF NON-COMMUNICABLE DISEASES

7.1 CANCER

Joseph Kahhaleh & Iman Nuwayhid

7.1.1 Overall

Background¹

Human cancer consists of multiple distinct diseases, each defined by its site of origin and cell type. Cancers differ in their clinical features. Some progress rapidly and are resistant to treatment, while others follow an indolent course and may persist for decades with little morbidity.

The pattern of cancer occurrence differs greatly between developing and developed countries. In developed countries, most cancer deaths are due to tumors of the lung, colorectum, breast, prostate, and pancreas. In developing countries, the main causes of cancer death are tumors of the stomach, esophagus, lung, liver, and cervix.

Determination of cancer mortality rates requires a reliable system of death registration and accurate demographic data that will also allow comparability to other causes of mortality. Determination of cancer incidence is best achieved through specialized tumor registries. The availability of cancer data, however, varies greatly between countries. This reflects the amount of resources devoted to vital statistics by a government, the quality and reliability of coding practices, the level of medical care, and the availability and quality of diagnostic procedures. Consequently, cancer incidence and mortality rates are likely to be underestimated in countries in which people have little access to advanced medical care and the health care system. Although some excellent tumor registries have been established in several low-income countries, they cover cancer incidence in only a minor fraction of the developing world. Information on cancer trends in these countries is scarce, and one must try to draw parallels from developed countries that have a longer history of collecting cancer incidence and mortality data.

The World Health Organization has recommended the development of national cancer strategies, based on surveillance and prevention programs, tailored to local needs. Such strategies would recognize local variations in cancer occurrence and risk factor prevalence, and consequently mobilize national resources to reduce cancer morbidity and mortality.

Efforts to establish a national hospital-based cancer registry in Lebanon are underway. At present, a few independent hospital-based registries exist. The following section will summarize the reports and papers that were published, reporting on the experience of those hospitals.

¹ *References:*

1. Jamison DT, Nosley WH, Measham AR, Bobadilla JL. Disease Control Priorities in Developing Countries. Oxford: Oxford University Press. 1993.

Cancer in Lebanon

Available Relevant References in Lebanon

In addition to national and local surveys and hospital and health care units data, the following references provided useful information:

Table 7.1-1 Selected references regarding cancer in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Taleb N (1994)	Review of publications between 1962 and 1993.
Abou Daoud K (1966)	Review of hospital files, hematology lab records, and hematologist private clinics In Beirut: 119 cases from 1963 to 1965.
Adib S et al. (1996)	Estimation of cancer incidence in Lebanon from fragmentary data from 1984.
Ghosn M et al. (1992)	HDF Pathology files in 1989. Description of 541 cases.
El Saghir NS et al. (1998)	AUBMC Cancer Registry 1983-1995. Description of 10220 cases
AUBMC Cancer Registry (1998-2000)	AUBMC Cancer Registry 1999-2000. Description of 2,378 cases.

The 1999 NHHEUS inquired about any chronic diseases in the household and found that 99 out of a weighted sample of 32,838 (0.3%) were reported to have a cancer that was diagnosed by a medical professional (0.2% of males and 0.3% of females). Distribution by age of individual and type of cancer was not provided.

The Beirut 1992-1993 survey (Nuwayhid et al. 1997) reported that 6 out of 4297 males (0.14%) and 8 out of 4609 females (0.17%) reported cancer (not necessarily diagnosed by a medical professional).

The total number of cancer cases in Lebanon is not known. In his review of all publications between 1962 and 1993, Taleb (1994) reported no significant increase in the number of cases in Lebanon. Taleb stated that the general incidence was evaluated only by Abou-Daoud in 1965 and it is about 103.5 cases for 100,000 which was comparable to the estimation made in other countries of the middle east. No other numbers were mentioned in his report, although there is a limitation in Abou-Daoud study in which the numbers were inflated. Adib (1996) added the cases of cancer at AUBMC in 1984 and reported 3500 incident (new) cases per year. No age distribution was available. A team of researchers at AUBMC is currently conducting a study to identify all cases of cancer in Lebanon.

A summary of the various studies included in this review are presented in table 7.1-

2.

Table 7.1-2 Distribution of the ten leading cancers by site and sex.

Ghosh et al. (1992); HDF 1989				Taleb (1994)				El-Saghir et al. (1998): AUBMC 1983-1995				AUBMC cancer registry 1998				AUBMC cancer registry 1999-2000			
Male (%)	Female (%)	Total (%)		Male (%)	Female (%)	Total (%)		Male (%)	Female (%)	Total (%)		Male (%)	Female (%)	Total (%)		Male (%)	Female (%)	Total (%)	
1 Lung (19)	Breast (36.1)	Breast (15.7)		Blad. (18.0)	Breast (30.0)	Breast (15.0)		Lung (18.0)	Breast (35.5)	—		Prost. (13.3)	Breast (32.3)	Breast (14.5)		Prost. (16.0)	Breast (33.1)	LMM* (11.8)	
2 Blad. (16.7)	Genital organs (18.7)	Lung (13.3)		Lung (14.0)	Uterus (12.0)	Blad. (11.0)		Blad. (9.9)	Cervix Uteri (10.4)	—		Lung (12.7)	Skin (6.68)	Lung (8.9)		Lung (12.5)	LMM* (13.1)	Lung (8.3)	
3 Prost. (11.6)	Dig. systems (12.1)	Blad. (11.4)		Prost. (11.0)	Colo-rectal (6.0)	Lung (8.0)		Larynx (8.6)	Colo-rectal 5.0	—		LMM* (9.2)	LMM* (6.47)	LMM* (8.3)		LMM* (0.5)	Brain (6.4)	Prost. (8.2)	
4 Dig. system (10.6)	Head and Neck (7.4)	Dig. System (11.4)		L** (7.0)	L** (5.0)	Prost. (6.0)		L** (7.7)	L**(4.5)	—		Skin (9.4)	Colo-rectal (6.5)	Skin (8.2)		Blad. (8.1)	Corpus uteri (3.7)	Brain (6.3)	
5 Skin (9.6)	Lung (5.6)	Head +neck (10.1)		Colo-rectal (5.5)	Ovary (4.0)	Colo-rectal (5.5)		Leuk*** (6.6)	Brain (4.1)	—		Blad. (7.63)	Brain (6.3)	Prostate (7.4)		Colo-rectal (6.3)	Corvix uteri (4.0)	Blad. (4.8)	
L** (7.4)	Skin (5.2)	Genital organs (8.9)		Oral (4.5)	Thyroid (3.2)	L** (5.5)		Colo-rectal (5.9)	Leuk*** (4.1)	—		Leuk*** (6.82)	Cervix (5.7)	Colo-rectal (5.7)		Brain (6.1)	Lung (3.7)	Leuk** (3.7)	
7 Head and Neck (7.4)	Blad. (4.3)	Skin (7.7)		—	Lung (3.2)	Uterus (5.0)		Prost. (5.7)	Corpus uteri (4.0)	—		Colo-rectal (5.03)	Ovary (4.6)	Brain (5.5)		Larynx (4.0)	Ovary (3.2)	Corpus uteri (1.8)	
8 Leuk*** (4.5)	L** (3.0)	Prost. (6.6)		—	—	Stomach (4.5)		Brain (54.6)	Ovary (3.5)	—		Brain (4.87)	Lung (4.2)	Leuk** (5.0)		Leuk** (4.1)	Colo-rectal (4.5)	Cervix (1.9)	
9 Kidney (2.2)	Leuk*** (2.6)	L** (5.5)		—	—	Oral (3.5)		Unk-prim ary (3.8)	Lung (3.2)	—		Larynx (3.73)	Uterus (3.4)	Bladder (4.5)		Unk (2.5)	Leuk** (3.4)	Ovary (1.6)	
10 Genital organs (1.6)	Adenocarcinoma of unk. Origin (1.3)	Leuk*** (3.7)		—	—	Larynx (2.5)		Stomach (3.5)	Stomach (2.5)	—		Stomach (3.08)	Leuk (2.8)	Larynx (2.6)		Pancreas (1.5)	Connect tissue (2.6)	—	

*Lymphoma and Multiple Myeloma, **Lymphoma, ***Leukemias

Ghosn et al. (1992) provided a breakdown of some systems:

-Digestive systems:

Male (% of total cancer): Colon 2.57%; Rectum 2.25%; Anus, Pancreas, Spleen, Esophagus, Stomach are less than 1% each.

Females (% of total cancer): Colon 2.17%; rectum 2.6%;, Anus, Pancreas, Spleen, Esophagus, Stomach are less than 1% each.

-Head and Neck:

Male (% of total cancer): Oral cavity and lips 5.14%; Larynx 3.21% ,Pharynx, Thyroid, Ear, Sinus, Parotid, Eye, Maxillary gland are less than 1% each (0.96% - 0%).

Females (% of total cancer): Thyroid 4.34%; Oral cavity and lips, Larynx, Pharynx, Ear, Sinus, Parotid, Eye, Maxillary gland are less than 1% each (0.87% - 0%).

-Genital organs:

Male (% of total cancer): Penis 1.28%; Testis 0.96%.

Females (% of total cancer): Uterus 15.2%; Ovaries 1.74%; Labia 1.74%.

-Skin:

Male (% of total cancer): Carcinoma 8.68%; Melanoma 0.96%.

Females (% of total cancer): Carcinoma 3.9% ; Melanoma 1.3%.

Taleb (1994) reported that the top 3 cancers among males were bladder, lung, then prostate, while the AUBMC registry (El-Saghir et al., 1998) reported lung, bladder, and larynx. In contrast, the two studies concurred that cancer of the breast topped the list of cancers among females followed by that of the cervix/ uterus and the colorectum. The most recent report from the AUBMC cancer registry (1999-2000) showed that prostate cancer topped the list among males (from rank 7 in 1983-1995).

Adib (1996) estimated the incidence of cancer in Lebanon at 106 per 100,000, which he assumed to remain the same since 1964, and not strikingly different from the cancer incidence in Alexandria Egypt and that of the Arabs in Israel in 1985 estimated at 82/100,000 and 90/100,000, respectively. Taleb (1994) also estimated the incidence of cancer in Lebanon at 103.5/100000.

The 1999 NHHEUS reported that 12.1% respondents (n= 3981) were hospitalized during the past 12 months. Cancer accounted for 2.7% (n= 107) of all hospitalizations and for 1.8% (n= 14) of all 785 one-day surgeries. Three hospitals, AUBMC, Makassed, and St. Georges, reported 4076 cancer diagnoses in 1999 out of a total of 60,248 discharge diagnoses (6.8%). Those were distributed as follows:

Table 7.1-3 Cancer cases in 1999 from three hospitals in Beirut

	N	%
Leukemia	350	8.6
Trachea, bronchus, lung	320	7.9
Lymphomas/ multiple myeloma	316	7.8
Breast	305	7.5
Bladder	174	4.3
Prostate	163	4.0
Colo-rectal	157	3.9
Mouth and oropharynx	64	1.6
Stomach	61	1.5
Cervix	59	1.5

Ovary	49	1.2
Pancreas	48	1.2
Corpus uteri	31	0.8
Melanoma & other skin	21	0.5
Liver	17	0.4
Esophagus	11	0.3
Other	992	24.4
Total	4067	100.0

Source: NHHEUS. 1999

At the level of outpatient care, cancer accounted for 2551(6.23%) of all insurance claims processed by MedNet in 1999 [AUB-UHS/ other NGOs]

Comments

If the total population in Lebanon is 4 million, and the 1999 NHHEUS is reporting 0.3% prevalent cases of cancer, then the overall number of cancer cases in 1999 was 12,000. Accounting for old surviving cases, the number of incident cases might be higher than the 3,500 estimated cases per year.

7.1.2 COLORECTAL CANCER

Background²

Colon and rectal carcinoma is the fourth most common cancer (excluding skin cancer) in the United States, where approximately 133,500 new cases are diagnosed annually; 71% are colon cancer and 29% are rectal cancer. It is also the second most common cause of cancer-related deaths in men and women. Lifetime risk of developing colon or rectal carcinoma is 1 in 16 for males and 1 in 17 for females.

Colorectal carcinoma affects predominantly the elderly. The incidence begins to rise in the sixth decade and peaks in the seventh and eighth decades, with an average age of 67 years. Approximately 6 to 8% of colorectal carcinomas are diagnosed in persons less than 40 years of age.

The overall 5-year survival rate for colorectal carcinoma is, 61%, for men and 58% for women. There has been a decrease in incidence and mortality rates due to colorectal cancer in the USA, with an overall increase in survival. This is credited to early detection of these cancers, since there has been no change in survivorship by stage of cancer.

Screening for colorectal cancer has been recommended by the American Cancer Society, National Cancer Institute, World Health Organization and American College of Physicians. The American Cancer Society Recommendations for Colorectal Cancer Screening are as follow:

Table 7.1.2-1 Recommendations for Colorectal Cancer Screening

Population	Age	Procedure	Frequency
Asymptomatic, no risk factors	40	Digital rectal examination	Yearly
	50	Fecal occult blood test	Yearly
	50	Sigmoidoscopy, preferably flexible	Every 3-5 years
First-degree relative of patient with colorectal cancer diagnosed at age <55	35-40	Colonoscopy or double-contrast barium enema	Every 5 years

Source: American Cancer Society

² References:

1. Rakel R, Conn's Current Therapy. Stanford University School of Medicine. WB Saunders, California, 1997.
2. Holland JF, Bast RC Jr, Morton DL, Frei E III, Kufe DW, Weichselbaum RR. Cancer Medecine. 4th Ed. Vol 1. Williams & Wilkins. Baltimore, 1997. Chap 126.

Colorectal cancer is staged using Dukes staging system, which is concisely summarized in the following:

<u>Stage</u>	<u>Extent of Disease</u>
A	Disease limited to the mucosa
B1	Disease extends into the muscularis mucosa
B2	Disease extends beyond the muscularis mucosa
C1	Stage B1 with positive draining lymph node
C2	Stage B2 with positive draining lymph node
D	Distant metastases

The survival rate decreases sharply with advanced stages as highlighted in the following table.

Table 7.1.2-2 Five year Survival Rate of Colorectal Cancer

Stage	5 yr. cancer related survival	Distribution of cases (%)
A	90-100%	10
B	65-75%	35
C	30-40%	30
D	<5	25

The only effective curative therapy for carcinoma of the colon is complete operative removal. However, patients who have had a resected colorectal cancer may or may not be cured. The majority of all recurrences occur within 3 years of the initial operation.

Colorectal Cancer in Lebanon

Available Relevant References in Lebanon

Table 7.1.2-3 Selected references regarding Colorectal cancer in Lebanon.

Author (year)	Study Population/ Methodology
Ibrahim NK and Abdul Karim FW (1986)	Pathology records of all 553 patients with colorectal cancer in AUBMC (1945-1985). Review of 132 younger patients (<30 years).
Kabbara N. (1999)	Retrospective file review of 174 cases from 1991 to 1998 at HDF
Nabbout G. (1992)	A description of 82 cases admitted to AUBMC over 10 years (1981-1990)

Summary Findings

Colorectal cancer in Lebanon ranks among the top 4-6 cancers in males and in females.

Table 7.1.2-3 Ranking of colorectal cancer by various studies

Author (yesr)	Period	Men		Women	
		Rank	%	Rank	%
Ghosn et al. (1992)	1989	6th	4.8	6th-7th	4.8
Taleb (1994)	1962-1993	5th	5.5	3rd	6.0
Saghir et al. (1998)	1983-1995	6th	5.9	3rd	5.0
AUBMC cancer registry	1998	7th	5.0	4th	6.5
AUBMC cancer registry	1999-2000	5th	6.3	8th	4.5

Ibrahim and Abdulkarim (1986) reviewed all 553 colorectal carcinoma cases that were admitted to AUBMC over a period of 40 year (1945-1985). The authors reported that colorectal cancer was the 6th most common cause of death from malignancy in Lebanon. They did not compute an incidence rate but adopted the one reported by Abou Daoud in 1966 at 10.6 per 100000, stating that Lebanon falls among the countries with low frequency (10-20/100000).

Male patients were dominant in Ibrahim and Abdulkarim study (1986) with a male to female ratio of 1.4, in contrast to 3 other studies with smaller sample sizes.

Table 7.1.2-4 Distribution of sample by sex, by study

Author	Sample size	Male	Female
Ibrahim & Abdulkarim (1986)	553	58.32%	41.7%
Sahyoun (1989)	36	--	--
Chaaya (1989)	34	44.1%	55.8%
Nabbout (1992)	82 rectal	43.9%	56.1%

In contrast to the Western world, where the average age of patients with colorectal cancer is 60-65 years, Ibrahim and Abdulkarim (1986) reported an average age of 53.7 years, similar to that reported from other low incidence and developing countries. Kabbara (1999) and Nabout (1992) reported an increase, with age, in the number of colorectal cases with a peak between 50-60 years, as shown here.

Table 7.1.2-5 Incidence of colorectal cancer by age

Author	19-30	31-40	41-50	51-60	61-70	71-80	81-90	Total
Kabbara (1999)	2.67%	9.82%	8.92%	26.78%	25%	18.75%	8%	174
Nabbout (1992)	3.5%	2.5%	6%	14.5%	9.5%	3.5%	1%	82

Sex distribution by age was not reported. However, Ibrahim and Abdulkarim (1986) observed an almost equal incidence of colorectal cancer among males and females younger than 30 years. This finding concurred with some studies and contradicted others.

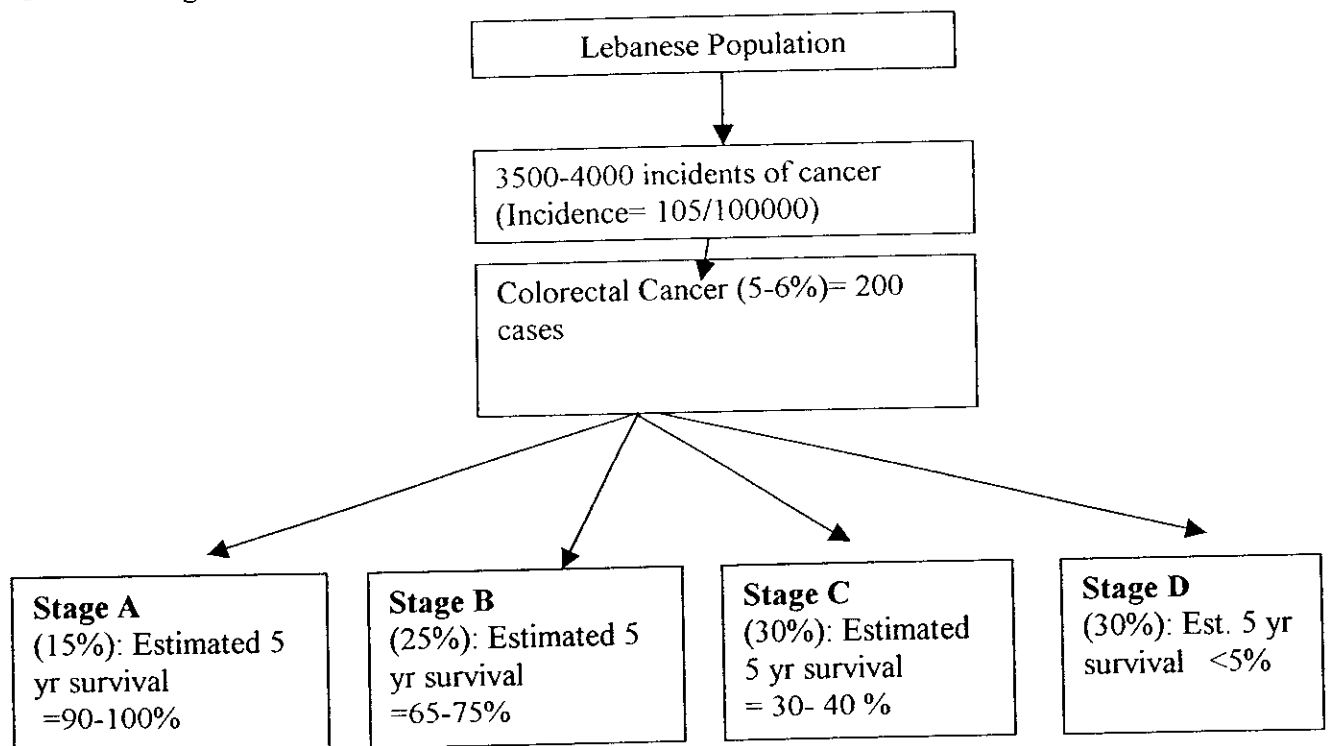
Colon cancer tends to arise proximally. Kabbara (1999) reported that 65% arose in the left colon while Ibrahim and Abdulkarim (1986) reported that 77.5% started in the left colon, with an average symptom duration of 3 to 6 months. In the series of Ibrahim and Abdulkarim (1986), patients were diagnosed relatively late with 68% identified in stage C and 23% diagnosed in stage D. Kabbara (1999) noted that 50% of the young patients were diagnosed in stage D of Dukes. Nabbout (1992) reported that 44% of cases of rectal cancer were diagnosed in stage B, 35% in stage C, and 21% in stage D.

The survival rates by stage, observed by Kabbara (1999) and Nabbout (1992), were similar to those reported in the literature. However, the 5-year survival rate for younger patients was 43%, which is less than the 51-59% reported in the literature.

Comments

Colorectal cancer represents 5-6% of all cancers in Lebanon, with almost equal distribution between males and females. The majority of patients present in later stages, with poor prognosis.

The following flowchart suggests



7.1.3 PANCREATIC TUMOR

Background³

Pancreatic cancer is diagnosed in more than 28,000 people in the US every year, two thirds of whom are males. Its natural history, presentation, and subsequent course vary by the origin of the tumor within the pancreas from which the tumor arises. Jaundice caused by the enlarging cancer obstructing the common bile duct is the most common presentation of cancers of the head of the pancreas. For carcinomas of the tail of the pancreas, it is the metastatic disease that usually leads to awareness of the presence of cancer, with pain as the presenting symptom. Jaundice in these patients may represent replacement of significant portions of the liver by metastases.

Invasion of retro-peritoneal lymphatics is the most common route of cancer dissemination, usually associated with the back pain typical in these patients. Peritoneal metastases occur with approximately the same frequency as liver metastases and can cause bowel obstruction and refractory ascites. Death is often precipitated by a septic event such as cholangitis or pneumonia.

Smoking is directly correlated with cancer of the pancreas. The relative risk of patients who smoked more than a pack of cigarettes daily is approximately four times that of those who never smoked (4). Cessation of smoking does not return the risk of developing pancreatic cancer to levels of those who have never smoked until 15 years or more have passed (5). Alcohol seems to be more commonly associated with pancreatitis.

Patients with pancreatic cancer are 5 to 13 times more likely to report a family history of pancreatic cancer than are controls (18). It is currently estimated that familial traits account for approximately 4% of the pancreatic cancer patients.

The vast majority of human pancreatic cancers are ductal in origin, while each of the less common forms represents 2 to 4% of all cases. Two thirds of the ductal carcinomas of the pancreas are located in the head of the pancreas. The diagnosis of pancreatic cancer is rarely made at an early stage. At the time of diagnosis, 60% would have liver metastases, malignant ascites, or other evidence of tumor dissemination. For the remaining 40% with tumors still grossly localized to the pancreas, only half are surgically resectable. Overall, fewer than 5% of the patients have resections, and of those up to 20% survive 5 years. Hence, even in the most favorable groups, the median survival is less than 18 months. The vast majority of patients in whom pancreatic cancer is diagnosed die within 1 year of diagnosis.

³ References:

1. Holland JF, Bast RC Jr, Morton DL, Frei E, III, Kufe DW, Weichselbaum RR. Cancer Medicine. 4th Ed, Vol I. Williams & Wilkins. Baltimore. 1997. Chap126.

Pancreatic Tumor in Lebanon

Available Relevant References in Lebanon

Only one reference was available about the cancer of the pancreas:
Table 7.1.3-1 Reference regarding pancreatic cancer in Lebanon

Author (year)	Methodology
Uthman S. (1991)	File review of 111 patients admitted to AUBMC between 1979-1987

Summary Findings

In his article, Uthman (1991) referred to an earlier study (which we could not find) conducted by Azar in which 13 cases of pancreatic cancer were identified over the years 1953-1960 at AUBMC. Uthman himself collected 111 cases from AUBMC during a period of 9 years from 1979 and 1987 inclusive. The author reported a low incidence of pancreatic cancer in Lebanon, since it accounted for 111 cases admitted over 9 years to a tertiary center that receives an average of 15000 admissions per year. The ratio of males to females was 2.5.

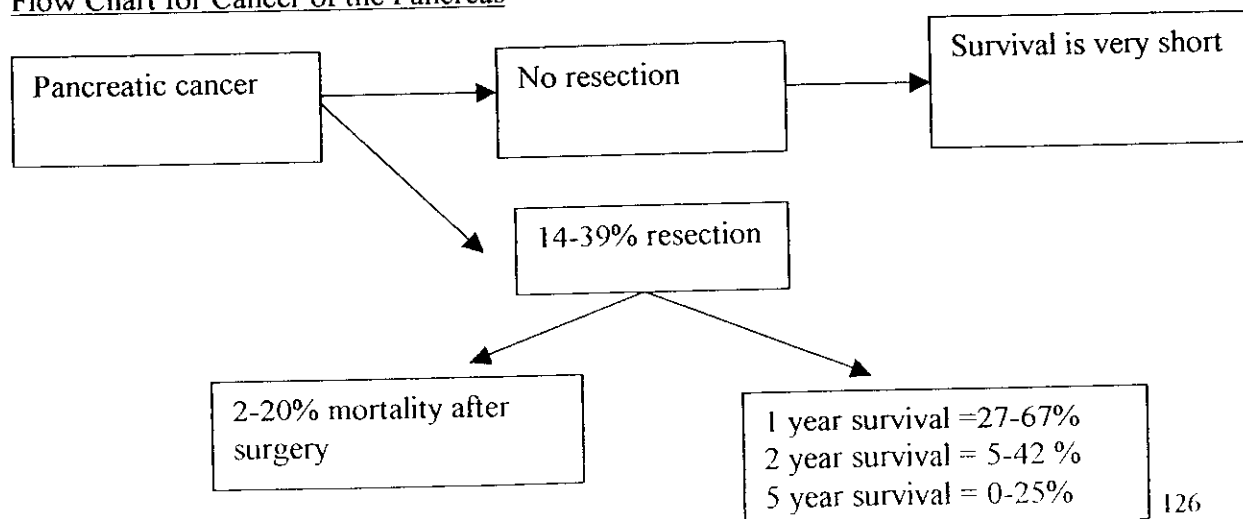
In its most recent annual report of 1999-2000, the AUBMC cancer registry reported that cancer of the pancreas represents 1.7% of all cancer patients. The male to female ratio was 1.00. In the previous years at AUBMC, pancreatic cancer did not make to the list of the top 10 cancers. In Ghosn et al. (1992) series of HDF 1989 cases, pancreatic cancer accounted for less than 1%.

Uthman (1991) reported that the average age of diagnosis was 62.3 years (range 31-92), with pain as the predominant symptom. The outcome was documented in 37 out of the 111 cases. Of these, 23 underwent surgery; 6 died post-operation and 15 lived an average of one year. The remaining 14 did not undergo surgery- 9 died in the hospital and 5 died within 4 months.

Comments

Pancreatic cancer is not very common in Lebanon (less than 2%) with the usual aggressive and low prognosis behavior.

Flow Chart for Cancer of the Pancreas



7.1.4 LUNG CANCER

Background⁴

Lung cancer is the most common cancer in males, and the second most common in females after breast cancer. It may arise at many sites in the respiratory tree beyond the trachea, but most of these tumors occur in small airways within the lung itself. There are four main histological subtypes that can be grouped into 2 families:

- Non-small cell carcinoma, which includes adenocarcinoma, squamous cell carcinoma, and large cell undifferentiated
- Small cell undifferentiated

Adenocarcinoma is the most common type among non-smokers, while squamous cell tumors are the most common among smokers. Women who smoke have a high frequency of small cell undifferentiated cancers. Small cell undifferentiated tumors, as compared to the others, are always metastasized when diagnosed and are more responsive to combined chemotherapy and radiation.

At least two thirds of lung cancers spread beyond the local site by the time of diagnosis. About 90 percent of patients die within two years of diagnosis. The following presents the average doubling time and histological distribution of different lung cancers.

Cancer	%	Doubling Time (years)
Adenocarcinoma	10	15
Squamous carcinoma	40	8
Large cell carcinoma	25	-
Small cell carcinoma	25	3

The most important risk factor for lung cancer is cigarette smoking. Other risk factors such as asbestos, radon, and exposure to bis-chloromethylether (BCME), nickel, and chromates have also been implicated. Dietary and serum studies show a decreased risk in persons eating large amounts of foods containing beta-carotene and in those with higher blood levels of this substance.

Various methods of early detection of lung cancer (such as periodic chest radiographs and examination of sputum cytology) have been tested, but none has been shown to be effective.

Surgical resection of lung cancer offers the only real chance of cure. Only 20% of all cases are suitable for resection and only 25-30% survive for five years. Chemotherapy for small-cell cancer has resulted in a fivefold increase in median survival from 2 to 10 months. A small number of patients enjoy several years of remission. Non-small-cell lung cancer response rate to newly introduced drugs exceeds 20%. Combination chemotherapy leads to a better response rate, with median survivals of 6 months and 10-12 months in

⁴ References:

1. Casciato DA, Lowitz BB. Manual of Clinical Oncology, 2nd Ed. Little Brown, 1988.
2. Kumar P, Clark M. Clinical Medicine, 4th Ed. W.B.Saunders, 1998.

responding patients. Most patients achieve their best response after 2 to 3 courses of treatment.

Radiation therapy can palliate symptoms and, in some patients, may extend survival. A small fraction of patients with small cell undifferentiated tumors appear to have prolonged survival following intensive radiation or chemotherapy.

Lung cancer is staged using the TNM classification, where T represents the size of the tumor and its immediate extensions, N the involvement of lymph nodes, and M distant metastasis.

- Stage I presents a tumor with no direct extension to the chest wall, no nodal involvement, and no distant metastasis.
- Stage II similar to Stage I, but with metastasis to peribronchial lymph nodes, but no distant metastasis, or a tumor with direct extension into the chest wall, but no metastasis.
- Stage III presents tumors with metastasis to more distant lymph nodes or tumors with direct invasion of the mediastinum.
- Stage IV includes tumors of any size with distant metastasis.

Lung Cancer in Lebanon

Available relevant references in Lebanon

Table 7.1.4-1 Selected references regarding lung cancer in Lebanon

Author (year)	Study Population/Methodology
Khayat G. et al. (1998)	Review of medical files (1979 - 1995). A description of 386 cases in HDF in Beirut
Sleilati G.G. (1996)	Retrospective, file review. A description of 27 cases in 1995 HDF
Abdel Jalil A, Nasr V, Bahous J. (1992): Revue Medicale Libanaise 1992; 4: 71-74	Retrospective file review. A description of 139 cases between 1984 and 1988 in HSG.

Summary Findings

Lung cancer in Lebanon is the most common malignancy seen in men (17-18% of all male cancers), which is consistent with the international literature. However, it represents less than 4% of cancer in women.

Table 7.1.4-2 Frequency of lung cancer according to the reviewed studies

Author	% of all male cancers	% of all female cancers	Sample
El-Saghir et al. (1998)	17.98	3.2	10220
Ghosn et al. (1992)	19	5.6	541
AUBMC cancer registry 1999-2000	12.5	3.7	2378

Lung cancer has a male predominance of 4 to 1, as shown in the following table:

Risk factors of lung cancer were not properly addressed in any study in Lebanon. However, several descriptive studies noted the high prevalence of smoking (> 87%) among the cases.

Author	Stage I	Stage II	Stage IIIa	Stage IIIb	Stage IV
Khayat et al. (1998)	23.2%	4.7%	12.6%	26.9%	32.4%
Abdel-Jalil et al. (1992)	22%	8%	70%		
					--

Table 7.1.4-6 Reported stages of lung cancer in selected studies

The two studies also reported that most of the cases were diagnosed late, with more than 60% in stage III.

Author (year)	Epidermoid (squamous)	Adenocarcinoma	Large cell carcinoma	Small cell carcinoma	Total
	N	N	N	N	
	%	%	%	%	
Khayat et al. (1998)	144	125	55	62	386
	37.3%	32.4%	14.2%	16%	
Abdel-Jalil et al. (1992)	58	37	19	25	139
	41.7%	26.6%	13.7%	18%	

Table 7.1.4-5 Lung cancer distribution by histologic type in selected studies

In the two studies that reported the histological type of lung cancer (Khayat et al. 1998; Abdeljalil et al. 1992), small cell carcinoma constituted less than 20% of the overall number of cases. Squamous cell carcinoma (Epidermoid) was the most frequent histological type in men, while adenocarcinoma was more frequent in women (50%) and among non-smokers.

*The numbers were extrapolated from a diagram. Inaccuracies are possible.

Author	0-29	30-40	41-50	51-60	61-70	71-80	>81	Total
Khayat et al. (1998)								
	Males	48	--	107	115	57	7	338
	Females	--	10	15	18	7	0	48
	Total	58	--	122	133	64	7	386
Abdeljalil et al. (1992)								
	Males	4	10	36	46	26	5	112
	Females	--	0	5	11	11	0	27
	Total	--	4	41	62	40	6	139
Ghoss et al. (1992)								
	Males	1	6	16	35	33	8	59
	Females	--	--	5	12	9	1	13
	Total	1	6	21	47	42	9	72

Table 7.1.4-4 Distribution of lung cancer cases by age and sex according to the reviewed studies

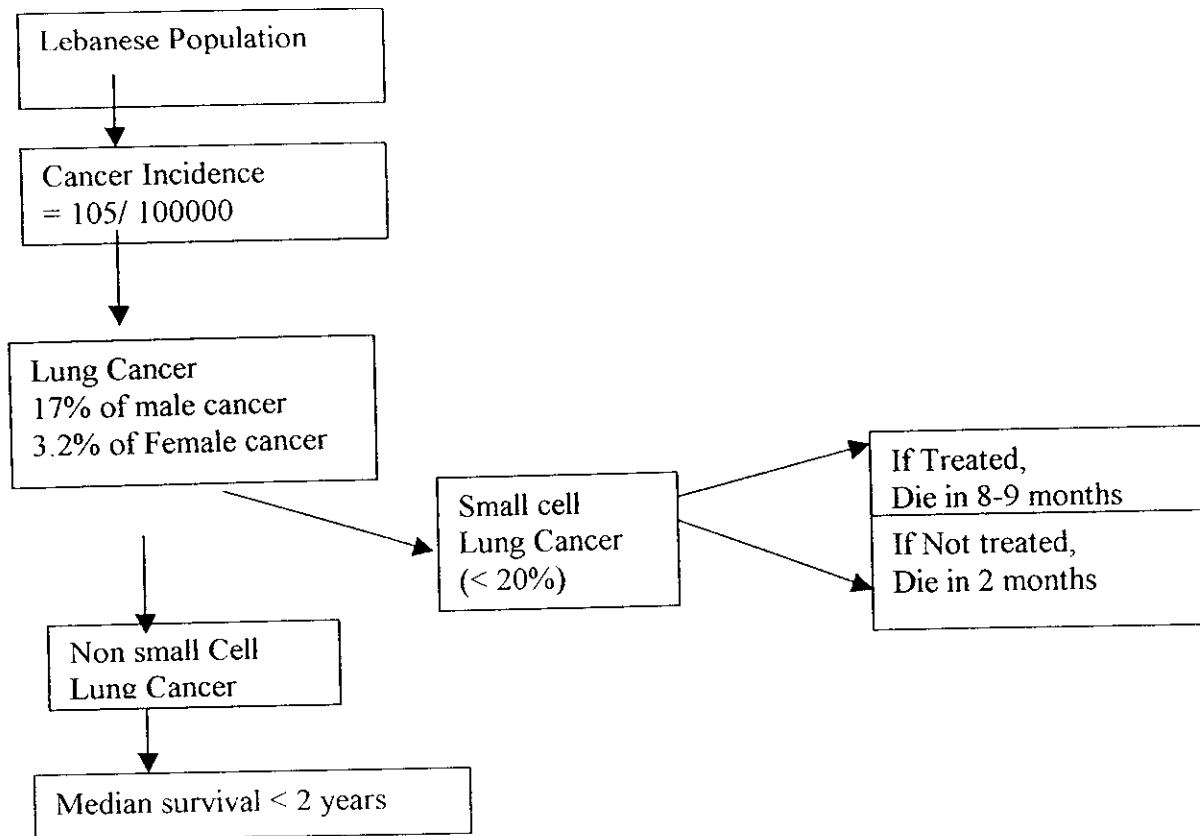
The number of cases of lung cancer increases progressively from age 40 to peak at age 60-70. Abdeljalil et al. (1992) reported, in their review of 139 cases at St. Georges Hospital, that the mean age was 64.4 years (SD 9.9).

Author	Male %	Female %	Lung cancer cases
Ghoss et al. (1992)	82	18	72
Khayat et al. (1998)	87.5	12.5	386
Siellati (1996)	81.5	18.5	27
Abdeljalil et al. (1992)	80.57	19.43	139
AUBMC cancer registry 1999-2000	78	22	197

Table 7.1.4-3 Distribution of lung cancer cases by sex according to each reviewed study

Comments

The following flowchart summarizes some of the above findings:



7.1.5 BREAST CANCER

Background⁵

Breast cancer is the most common cancer in women. After initial treatment the patients often follow a path of remission and relapse. Recurrence is common after a prolonged survival free of disease.

There are approximately 575,000 new cases of breast cancer in the world each year; 40% of which occur in developing countries. Areas of highest incidence include North America and Western Europe (between 50 and 80 per 100,000), whereas incidence is lowest in Japan (about 20 per 100,000). Mortality and incidence rates increase progressively with age until the time of menopause, when the rate of increase is less.

There is little consensus as to what constitutes a "high risk" woman. Women exposed to ionizing radiation, nulliparous women, women with delayed pregnancy, women of earlier menarche and later menopause, and women with increased consumption of dietary fat, calories, and alcohol are at higher risk. The most common risk factor, however, remains age as shown here:

Age (years)	Risk of breast cancer development (%)	Risk of breast cancer death (%)
20-40	0.49	0.09
35-55	2.53	0.56
50-70	4.67	1.04
65-85	5.48	1.01

Breast cancer is ductal in 78% of the cases, lobular in 9%, adenocarcinoma in 5%, medullary in 4%, and other in 4%. It is staged as follows:

Stage	Size of primary tumor	Lymph node involved	Distant metastasis
I	< 2 cm	Axillary lymph node	none
II	2 – 5 cm	Homolateral axillary nodes positive But not fixed	none
IIIA	> 5cm	Homolateral axillary nodes positive and fixed to one another, to skin or chest	none
IIIB	any size with skin nodule or ulceration peau d'orange, breast edema	Supraclavicular or infraclavicular edema of the arm	none
IV present	any size	any status	

⁵ References:

1. Casciato D.A. Lowitz BB. Manual of Clinical Oncology, 2nd Ed. Little Brown, 1988.
2. Jamison D. Disease control Priorities in developing countries. Oxford Medical Publication, 1993.

Screening, via mammography and physician examination of the breast, and early detection were found to reduce breast cancer mortality by about 30 percent.

Surgical resection of the tumor is the standard initial therapy for breast cancer. In the United States, approximately 70 percent of breast cancer patients survive five years. Radioterhapy, chemotherapy, and hormonal therapy supplement surgery.

Breast Cancer in Lebanon

Available Relevant References in Lebanon

Table 7.1.5-1 Selected references regarding breast cancer in Lebanon

Author (author)	Study Population/ Methodology
Dib M. (1995)	Retrospective file review. A description of 289 breast cancer cases (1987-1994) at HDF
Lakkis N. (1985)	Case control study: 2 control groups (females with other medical condition than cancer and female healthy non-relative visitors) compared to 102 breast cancer cases (1984) at AUH, SGH and private clinics
Younan T. (1996)	Retrospective file review of breast cancer in young women, 2 groups were studiedone below 30 yr. The other between 30 –35. A total number of 59/737 breast cancer cases identified at HDF
Fakhoury W. (1997)	Observational study (pathology lab). A description of 51 mastectomy specimen in 95-96 at HDF
Meguerian Z. (1991)	Retrospective file review of 70/300 breast cancer cases from Jan 89 to March 91 at SGH and HDF
Zaarour P. (1993)	Retrospective file review of 63 cases (1991) at HDF

Summary Findings

Breast cancer is the most common cancer among women in Lebanon accounting for almost one third of all cancers in women. In the mid-sixties, it represented 18%, of all cancers in women (Abou Daoud 1966). This might indicate an increase in incidence, similar to the experience of countries with reliable data, or an increase in diagnosis and reporting. Less than 2% of all breast tumors occurred in men.

Over 50% of the cases occurred between the age of 40 and 60 year:

Table 7.1.5-2 Age distribution of cancer cases in selected studies

Author	<30 years	30-40 years	40-60 years	>60	Total
Dib (1995)	3.6%	20.85%	50.6%	24%	289
Lakkis (1985)	--	--	69.8%		102

All studies reported that more than two-thirds (up to 80%) of all breast cancers were ductal in origin and less than 15% were lobular.

Table 7.1.5-3 Distribution of breast cancer cases by site of origin in selected studies

Author (year)	Sample size	Ductal	Lobular	Adenoca.	Medullary	Unspec ified
Cascitos &Lowitz (Lietratuttre)	-	78%	9%	5%	4%	--
Lakkis (1985)	-	78.4%	2%	5.9%	2.0%	6.9%
Younan (1996)	737	77-80%	7%	--	--	--
Fakhoury (1997)	51	85%	3%	1.9%	1.9%	--
Meguerian (1991)	70	68.6%	12.8%	--	--	--

In a case-control study, Lakkis (1985) noted an increased risk in breast cancer in women with later age at first marriage, later age at first live birth or first pregnancy, and low parity or gravida.

Studies in Lebanon report that most breast cancers are diagnosed in Stage II:
Table 7.1.5-4 Distribution of breast cancer cases by stage at diagnosis in selected studies

Author	Stage 1	Stage2	Stage3	Stage4	Unknown
Dib (1995)	17%	48.4%	24%	4%	9.6%
Zaarour (1993)	19%	71%	4%	6%	--
Lakkis (1985)	6.9%	38.2%	14.7%	32.4%	7.8%

In his review of breast cancer in women younger than 40 years of age, Younan (1996) reported that 45% were in stage II at the time of diagnosis, as compared to 47% in the literature.

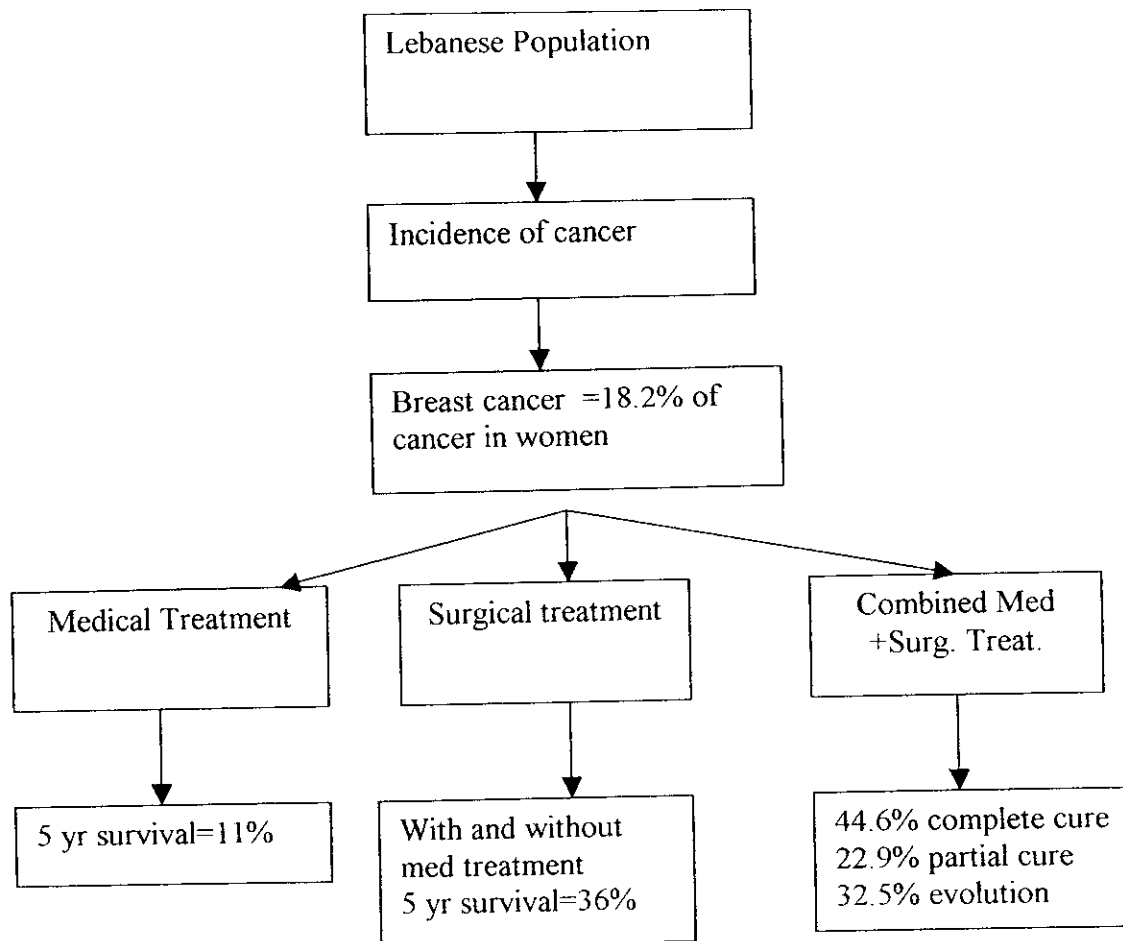
Younan (1996) reported a 5-year survival of 75% following mastectomy. Dib (1995) reported that surgery, with chemotherapy and/or radiotherapy, resulted in 45% complete cure, 23% partial cure, and 33% evolution. The 5-year survival was 36% in patients undergoing surgical treatment, with and without medical treatment, while it was 11% in patients with medical treatment only.

Comments

- Breast cancer is the number one cancer in women (30% of all cancers in women).
- Up to 80% are ductal in origin.
- The majority present as stage I followed by stage II.
- The majority of cases occur in women older than 40 years of age.

The following flowchart was adapted to Lebanese data.

Flowchart for breast cancer



7.1.6 CANCER OF THE UTERINE CERVIX

Background⁶

Cervical carcinoma is a very common cancer among women worldwide. It is now largely viewed as a spectrum of sexually transmitted disease, given the initiating role of the venereal transmitted human papilloma virus (HPV), which is identified in over 90% of cervical cancer cases worldwide.

Cervical carcinoma has been associated with exposure to HPV at an early age, number of lifetime sexual partners, intercourse with males who had multiple partners, sexually transmitted diseases, or penile carcinoma, lower levels of education and income, and cancer-promoting risk factors (cigarette smoking, herpes simplex virus infection, and poor nutrition). Human immunodeficiency virus (HIV) infection, transplant medication, and chronic steroid use have also been implicated.

The following table shows the different stages and survival rates of cervical cancer. The disease is believed to start at the squamo-columnar junction. The progression from mild to severe cervical dysplasia to carcinoma in situ requires 5 to 10 years. The progression of carcinoma in situ to invasive cancer requires an additional 3 to 10 years. However, once invasive cancer is established, it spreads into other pelvic structures and sequentially along lymph node chains.

The 5 Year Survival Rate of Cervical Cancer by Stage

Stage	Extent	5-year survival (%)
0	Carcinoma in situ	95-100
I	Strictly confined to cervix	80
II	Beyond cervix, not involving pelvic wall or upper third of vagina	60
III	Extension to pelvic wall or lower third of vagina	30
IV	Biopsy-proven involvement of the rectal or bladder mucosa or distant metastases	5

The above clearly supports the role of screening. However, although PAP smear testing has been confirmed as a cost-effective screening device, it is still underutilized in developing countries, as well as in developed countries.

Localized lesions, in which invasion is microscopically evident, can be treated with conization. Hysterectomy is not needed in patients where carcinoma is strictly confined to the cervix, with negative margins. Conization with endocervical and ectocervical Pap testing every 3 months for 2 years are the mainstay treatment. Radiation therapy is used for any large or advanced cervical carcinoma and is responsible for doubling the survival

⁶ References:

1. Rakel R. Conn's Current Therapy. Stanford University School of Medicine. WB Saunders. Stanford, 1997.
2. Caxiato DA, Lowitz BB. Manual of Clinical Oncology. 2nd Ed. Little Brown, 1988.

rate in the last 2 decades. Recurrent disease develops in nearly half of women with cervical carcinoma and carries a poor prognosis.

Cervical Cancer in Lebanon

Available Relevant References in Lebanon

Table 7.1.6-1 Selected references regarding cervical cancer in Lebanon

Author (year)	Study Population/ Methodology
Geahchan N.G. (1994)	Retrospective file review of 81/102 cases with invasive cervical cancer from 1985-1993 at HDF.
El Khoury M. (1999)	Retrospective file review of 177 invasive cervical cancer cases from 1978 till May 1998 at HDF.
Dahdouh O. (1998)	Retrospective file review of 54 cases from 1988 till August 1997 followed and treated by 2 physicians at HDF.
Ammar W. et al. (2000)	Survey and health education campaign in Shouf (1286 women surveyed/ 742 women included in educational campaign)
Tomb J. (1971)	Cito-analysis of 225 sputum of 79 clinically and radiologically suspected patients (from Jan 1 st , 1970 till Dec. 31 st , 1970) .5 specimen on 5 consecutive days were collected.

Summary Findings

El-Saghir et al. (1998) reported that cancer of the uterine cervix represented 10.4% of all female cancers at AUBMC (1983-1995). The proportion dropped to 4% in the more recent AUBMC registry report of 1999-2000.

The mean age of women with cervical cancer was 52.85 years [range: 49.3 - 57], with 62.7% between age 41 and 60, 23.5% above 60, and 13.7% below 40 (Geahchan 1994). Approximately 70% were squamous cell cancer (Geahchan 1994).

Most patients (> 70%) were diagnosed in the early stages of I to II b

Table 7.1.6-2 Cancer cases by stage at diagnosis in selected studies

Author	Stage I		Stage II		Stage III		Stage IV
	Ia	Ib	IIa	IIb	IIIa	IIIb	
Khoury (1999)	10%	31%	19%	24%	10%		6%
Dahdouh (1998)			36%	26%	23%	10%	3.33%
Geahchan (1994)	22%		14.6%	36.58			12.2%

A specific percentage for each stage was not possible because of the initial selection by the authors.

Survival was strongly correlated with the stage at diagnosis. Geahchan (1994) reported a 5-year survival rate of up to 65% for stage I patients, while Khoury (1999) reported a 5-year survival rate of 78.5% for all his series (which includes Geachan's). This was consistent with the literature.

Table 7.1.6-3 Survival rates for cervical cancer patients by stage at diagnosis in selected studies

Author	Stage I	Stage II		Stage III	Stage IV
	I	IIa	IIb		
Geahchan (1994)	65%	55%	42%		18%
Casciato & Lwitz	80%	60%		30%	5

Cervical cancers diagnosed in stages I to IIb had a 4-fold increased chance of complete remission after chemotherapy (Dahdouh 1998)]. A decrease in response to chemotherapy was observed with advanced stages. The mean survival rate was 30.6 months with the maximum being 40.9 months after chemotherapy. The 3 year survival rate was equal to 29%, and the one year survival rate was equal to 59%.

As far as risk factors are concerned, Geachan (1994) and Khoury (1998) reported a 60-75% prevalence of smoking among women with cervical cancer. In a review of 81 cases of invasive cervical cancer cases (1985-1993 in HDF), Geahchan (1994) found that the mean age of first time intercourse was 18 years (range 14-23) and the mean age of menarche was 13.35 yr. A total of 84% had 2 or more children. Similarly, Khoury (1999) in his series of 155 cases (1998-1998) in the same hospital found that 82% of patients had at least 2 children but he did not report the age of first intercourse, age of first pregnancy, number of sexual partners, or any history of venereal disease. Neither of the two studies had a control comparison group.

Symptoms of invasive cervical cancer included vaginal discharge bleeding, particularly postcoital spotting (Khoury 1999)]. However, most patients with cervical cancer were asymptomatic and were detected by routine Pap smear screening.

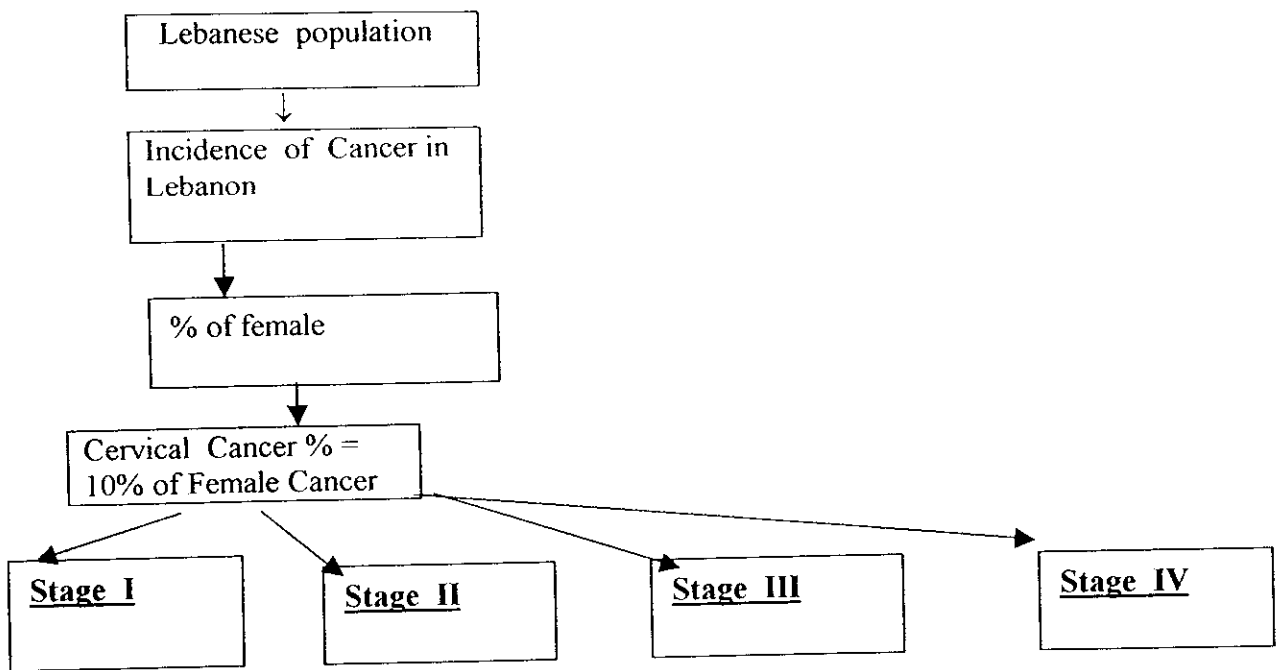
The mortality of cervical cancer has declined by about 50% as a result of early detection and treatment. This drop in mortality has been demonstrated by the screening survey in Shouf area (Ammar et al. 2000) where the average survival rate in invasive cervical cancer was around 38%, and in a properly managed carcinoma in situ was 98%. Ammar et al. (2000) concluded that down staging a population would yield a 60% survival benefit. Tomb J, in 1971, also concluded that screening helps in a reduction of around 50% in death rate.

Ammar et al. (2000) reported that during the 2000 campaign in Shouf area, 2826 Pap smears were performed. Of these, 61% were negative and 39% were class II (inflammatory). Only 7 cases were in class V (malignant).

Comments

- Cervical cancer represents 10% of cancer in women.
- Most of the cervical cancer cases are detected in early stages.
- The 5-year survival rate is relatively high in early stages.
- Pap smear and education have demonstrated a reduction of late stages of cervical cancer and an increased survival.

Flowchart for cervical cancer



7.1.7 PROSTATE CANCER

Background⁷

Prostate cancer is primarily a disease of the Western world. Sweden, Germany, Norway, Luxembourg, and Switzerland have the highest death rates (24 to 33 deaths per 100,000 population per year). In the United States, carcinoma of the prostate is now the second cause of cancer-related deaths. Both its incidence and mortality rates have been steadily increasing. Between 1987 and 1992, the number of prostate cancer cases detected increased 38%, the number of prostate biopsies performed increased 330%, and the number of radical prostatectomies increased 460%, according to Medicare claims data. In parallel, survival from this disease has improved since 1960.

Prostate cancer is uncommon in men younger than 45 years of age, but increases with age (1100 clinically evident cases per 100,000 men of 85-90 years of age). The incidence and mortality rates for prostate cancer vary with ethnic background. It is highest worldwide among African American men. In addition to age and race, it has been linked to chemical exposures (cadmium, loggers, chemists, farmers' textile workers, painters, rubber tire workers), family history, and higher intake of fat.

Stage	Over 95% of prostate cancers are adenocarcinomas	It is staged as follows:
	Extent of the Disease	10 Year-Median Survival
A	Incidental histologic finding of cancer; prostate normal	60%
B	Tumor palpable but confined to prostate	40%
C	Tumor is localized to periprostatic area	30%
D	Advanced disease	10%

Currently available screening tests (digital rectal examination, ultrasound, MRI, CT) are of limited prognostic value. Even needle biopsies are not recommended because of the histological heterogeneity of the prostate.

Serum Prostate Specific Antigen (PSA) increases in benign prostatic diseases (prostatitis, BPH), as well as in cancer. It is the level of PSA elevation that is important. Patients in whom the PSA is more than 10 ng/mL usually have prostate cancer. If the PSA value is greater than 10 and the gland is palpably normal, the chance for a positive biopsy on transrectal ultrasound-directed examination is approximately 50%. In men with an elevated serum PSA level, particularly those with a PSA between 4 and 10 ng/mL, cancer is more likely when free PSA is less than 20% of the total.

Radical prostatectomy remains the main method of treatment.

⁷ References:

1. Holland J.F, Bast RC Jr, Morton DL, Frei E III, Kufe DW, Weichselbaum RR. Cancer Medicine, 4th Ed, Vol I. Williams & Wilkins, 1997. Chap 126.

Prostate Cancer in Lebanon

Available Relevant References in Lebanon

Table 7.1.7-1 Reference regarding prostate cancer in Lebanon

Author/ Reference	Study Population /Methodology
Merhej S. (1998)	National survey for screening for prostate cancer : - Media campaign encouraging men to be evaluated. - A questionnaire. - Blood sample for PSA. - Digital rectal exam by a urologist to palpate the prostate.

Summary Findings

Only the national survey provided information of relevance to the purpose of this report.

A total of 7452 men with ages ranging from 34 to 92 years (mean 62.4 / SD 7.9) were surveyed. Of those, 961 (12.9%) had already received a medical treatment for an unspecified urinary problem, 2,220 (29.8%) had a history of urinary tract infection, 1349 (18.1%) mentioned a family history of prostatic adenoma, and 216 (2.9%) reported a family history of prostate cancer.

A total of 7296 men were 50 years of age or more with the following age distribution:

Table 7.1.7-2 Age distribution of minimum screened for prostate cancer

Age	50-59 years	60-69 years	>70 years	Total
N (% of the total)	2705 (37.1)	3068 (42.1)	1523 (20.9)	7296

Source: Merhej S. 1998

Digital rectal exam was performed in 6475 of the 7296, and the results were:

	N	%
Benign	5689	87.9
Suspect	734	11.3
Malignant	52	0.8

Of those 7296 men, 591 (8.1%) had prostate hypertrophy.

The number of men who warranted prostate biopsy (PSA $\geq$ 4 ng/ml) was 1844 of the 7282 sampled (25.3%). The proportion of a PSA greater than 4 ng/ml increased with age as follows:

Table 7.1.7-3 Population of men surgery with prostate cancer

50-59 years	60-69 years	70-79 years	80+ years
21.8%	25.7%	30.9%	44.9%

Source: Merhej S. 1998

Comments

No information is available on prognosis of prostate cancer in Lebanon. The national survey suggests an increased risk with age. In his report, Merhej estimates the prevalence of prostate cancer at around 5%.

7.1.8 LEUKEMIA

Background⁸

Leukemia is classified into acute (lymphoblastic or myelogenous) and chronic (myelocytic or lymphocytic) leukemia. Its occurrence has been associated with exposure to ionizing radiation, electromagnetic radiation, cigarette smoking, chemicals, viruses (such as human T-cell lymphotropic virus (HTLV) type 1 and 2), and the presence of a genetic syndrome (such as Down's).

Acute leukemias are rare diseases that account for less than 3% of all cancers. However, they are the leading cause of death due to cancer in the United States in persons under 35 years of age. Its incidence in the US has not changed over the last 20 years, although there is a slight trend towards more ALL and less AML. Incidence rates for acute leukemia are similar worldwide.

Acute lymphoblastic leukemia (ALL): With an incidence rate of around 1.3 per 100,000 persons in the USA, it affects about 4000 people a year with male predominance. The incidence in blacks is about half that in whites. ALL is the most common malignancy in children. It accounts for one fourth of all childhood cancers and approximately 75% of all cases of childhood leukemia. The peak incidence of ALL occurs at approximately 4 years of age. The incidence of ALL is higher among boys than girls; the difference is greatest among pubertal children.

Acute myelogenous leukemia (AML): Its incidence rate in the USA is about 2.5 per 100,000 persons, with a slight male predominance (M/F ratio 1.5). It accounts for 25% of both acute and chronic leukemias, affecting around 9000 people a year in the United States. Approximately 2500 cases of childhood leukemia are newly diagnosed each year (AML/ALL is approximately 1:4) and only 40% of newly diagnosed children with AML are expected to be cured.

Chronic leukemias are rare in childhood. The most common type, chronic myelocytic leukemia (CML), accounts for less than 5% of all childhood leukemias.

Chronic myelocytic leukemia (CML): Is primarily a disease of middle age. The peak incidence is in the fourth and fifth decades. More than 80% of pediatric cases of CML are diagnosed after age 4 years and 60% after age 6 years.

Chronic lymphocytic leukemia (CLL): is the most common leukemia, with an annual incidence of 1.8 to 3.0 per 100,000 population in the United States. Its incidence is age-related with 5.2 per 100,000 persons between 35 and 59 years of age and 30.4 per 100,000 between 80 and 84 years of age. It affects twice as many men as women. CLL is less common in Japanese and other Asian populations. Clusters of CLL in families have

⁸ References:

1. Rakel R. Conn's Current Therapy. Stanford University School of Medicine. Stanford :WB Saunders, 1997.
2. Pizzo PA, Poplack DG. Principles and Practice of Pediatric Oncology. Philadelphia: Lippincott-Raven, 1997.

been reported, and first-degree relatives of patients with CLL have a threefold increase of getting leukemia.

Leukemia in Lebanon

Available Relevant References in Lebanon

Only one study, 35 years old, was identified.

Table 7.1.8-1 Selected references regarding leukemia in Lebanon

Author (year)	Study Population/ Methodology
Abou Daoud K (1966).	Review of hospital files, hematology lab records, and hematologist private clinics In Beirut: 119 cases from 1963 to 1965.

Summary Findings

Hospital-based registries or case series have mostly reported leukemia at less than 5% of all cancers in males and females.

The studies published by Abou Daoud in 1966 and 1967 reviewed all 119 known leukemia cases in the city of Beirut (1963-1965). The second publication expanded on the first by adding the cases of Hodgkin's and non-Hodgkin's lymphoma.

Abou Daoud estimated the annual incidence of leukemia at 3.0 per 100000 (4.4 for males and 1.7 for females), with the following age-sex distribution:

Table 7.1.8-2 Age and sex distribution of leukemia cases in Lebanon

Age (years)	No. of incident male cases (%)	No. of incident female cases (%)	Total incident cases (%)
0-4	12 (3.9)	6 (2.2)	18 (3.2)
5-9	8 (2.9)	3 (1.1)	11 (2.0)
10-19	7 (1.6)	4 (0.9)	11 (1.2)
20-29	9 (3.1)	1 (0.3)	10 (1.7)
30-39	9 (4.0)	2 (0.9)	11 (2.4)
40-49	3 (1.7)	1 (0.6)	4 (1.2)
50-59	9 (11.5)	3 (3.8)	12 (7.7)
60-69	13 (16.6)	5 (6.3)	18 (11.5)
70-79	6 (7.6)	0 (0.0)	6 (3.8)
>80	1 (2.5)	0 (0.0)	1 (1.3)
Undetermined	8 (-)	9 (-)	17 (-)
All Ages	85 (4.4)	34 (1.7)	119 (3.0)

Source: Abou Daoud K. 1966

Leukemia cases were highest in the age groups under 4 years and 60-69. A predominance of males over females was observed. The incidence in persons under 15 years was 2.3 per 100,000. Of all cases, 25% occurred in children < 9 years and 25% in people between 50-69 year.

The distribution of leukemia by histological type (Abou Daoud 1966) was as follows:

Table 7.1.8-3 Distribution of leukemia patients by histological type

	No. of patients	% of total
AML	17	14.3
ALL	16	13.4
CML	32	26.9
CLL	29	24.5
Acute stem cell	10	8.4
Acute monocytic	3	2.5
Not specified	12	10.0
All types	119	100%

Source: Abou Daoud K. 1966

Comments

No recent studies have been published on leukemia to update Abou Daoud's findings in 1966.

References

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2. Abou Daoud K. Incidence of leukemia in the Lebanese population. *Int. J of Cancer*, 1966; **1**: 305-307.
3. Abou Daoud KT. Smoking habits of a Lebanese group and cancer of the lung and larynx. *LMJ*, 1970; **23**: 11-18.
4. Adib SM, Mufarrij AA, Shamseddine AI, Kahwaji SG, Issa P, el-Saghir NS. Cancer in Lebanon: An epidemical review of the American University of Beirut Medical Center tumor registry. *AEP*, 1998; **8**: 46-51.
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7.2 DIABETES MELLITUS

Joseph Kahhaleh & Iman Nuwayhid

Background¹

Diabetes is a state of chronic hyperglycemia. It is divided into two types: Type I (Insulin Dependent Diabetes Mellitus, IDDM) and Type II (Non Insulin Dependent Diabetes Mellitus).

Type I, IDDM

The prevalence of IDDM in people younger than 20 years in the US is about 1.7 per 1000. It is estimated that there are about 125,000 children and teenagers with IDDM in the US. The incidence of IDDM is rising in many parts of the world and has doubled in Europe over the past 20-30 years. It appears to vary greatly between different ethnic groups, being most common in white people. It presents most commonly in childhood, with a peak at 10-13 years of age, but can present at any age. Around 25-50 percent of patients present with Diabetes before the age of fifteen years, and it is nearly always acute in onset.

Type II, NIDDM

NIDDM is common in all populations enjoying an affluent lifestyle, but large ethnic differences exist. The disease may be present in a subclinical form for years before diagnosis. Its incidence increases markedly with age and degree of obesity. Those with non-insulin-dependent diabetes mellitus (NIDDM) usually suffer from a less severe illness and a slower onset than those with IDDM. NIDDM is most common in the older age groups (older than forty years). However, people with NIDDM suffer from the same long-term complications as those with IDDM, such as retinopathy, nephropathy, neuropathy, and ischemic heart disease.

In general, the longer a patient survives with either form of diabetes, the more likely it is that such complications will develop.

Nephropathy

In industrial countries, diabetic kidney disease is present in one in six diabetics and directly causes or contributes to premature death in 50 % of those in whom IDDM began in

¹ References:

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2. Krowelski A, Warram J. Natural History of Diabetes Mellitus. In Principles and practice of Endocrinology and Metabolism, 3rd Ed. Lippincott, Williams and Wilkins, 2001. Pp 1320-1325.
3. Rakel R. Conn's Current Therapy. Stanford University School of Medicine. WB Saunders, California. 1997.
4. WHO 1985?
5. Foster DW. Diabetes Mellitus. In: Harrison's Principles of Internal Medicine, 14th Ed, Vol. 2. 1998.

youth. The incidence rate of persistent proteinuria in patients with type I diabetes increases with the duration of diabetes during the first 15 years and then declines afterwards. Overall, only 1 out of 3 individuals with the illness ever develops nephropathy.

Retinopathy

Nearly all IDDM patients and many NIDDM patients will eventually develop some form of eye disease. They would develop, in particular, some degree of background retinopathy within the first 5-15 years of diabetes. The incidence rate of retinopathy is almost nil during the first 10 years of diabetes, but thereafter it increases rapidly to 30 per 1000 per year and remains at this level during the subsequent 30 years.

Coronary Heart disease (CHD)

In many countries, most notably the USA, the ultimate complication for patients with diabetes is coronary heart disease. The risk of CHD is two to three times higher in both IDDM and NIDDM patients older than forty years, in industrial countries. There is also evidence that good control of the disease can delay (and may even prevent) the onset of long-term pathological complications. The mortality rate increases rapidly with increasing age, so that, by age 55, one of 3 patients with diabetes may die of CHD. Males and females are affected equally, thus CHD is the principal cause of premature death in persons with type I and type II diabetes.

Earlier cohort studies have shown that, regardless of the age at onset of type I diabetes, few deaths occurred before age 30. The proportion surviving declined rapidly, and by age 50 only 71% of the women and 65% of the men were still alive. The cause of death was about equally divided between renal disease and CHD with only 12% due to other causes.

Reduction in the incidence of new cases of diabetes will only be achieved by primary prevention strategies, whereas the incidence of diabetes complications may be reduced by improvements in case management, and through earlier case detection. If patients with diabetes are well controlled they may live for fifteen or more years before the onset of complications, although life expectancy is generally reduced by up to one third. Early recognition and treatment of retinopathy and foot problems, for example, can reduce disability and prolong life. Correction of hypertension and hyperlipidemia are also important to prolong survival.

Diabetes Mellitus in Lebanon

Available Relevant References in Lebanon

Several published and unpublished studies have focused on the treatment of diabetes in Lebanon and are listed in the reference section. The following studies were found relevant to this project.

Table 7.2-1 Selected references regarding diabetes in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Salti IS et al. (1997)	A cross-sectional study of 2518 Lebanese subjects (1138 males, 1380 females) older than 30 years from 3 communities: Aisha Bakkar (Beirut), AUB, and Hammana (Mt. Lebanon). Screening between November 1994 and September 1995. Interview and examination, including glucose tolerance. NIDDM if fasting blood sugar (FBS) > 140 mg/dl and/or 2-hour glucose value was > 200 mg/dl. Impaired glucose tolerance (IGT) if FBS < 140 mg/dl and 2-hour glucose was between 140-200 mg/dl.
Abou-Daoud KT (1969)	Screened 1121 AUB full-time workers for blood sugar
Hirbli KI et al. (1992)	A total of 436 persons (202 men and 234 women) from all over Lebanon responded to a national TV campaign in 1989 for the prevention of cardiovascular diseases inviting people to participate in a screening for lipid profile and blood sugar. Volunteers were seen in 11 medical centers spread all over Lebanon. Those on medications or known to be diabetic or on medications were excluded. A blood sugar level of 140mg/dl or above was considered diabetic.
Merhej S. (1998)	National survey for screening for prostate cancer : - Media campaign encouraging men to be evaluated. - A questionnaire. - Blood sample for PSA. - Digital rectal exam by a urologist to palpate the prostate.
Hirbli KI et al. (1990)	Two descriptive studies 1985at Rizk and St. Joseph Hospitals: 1737 persons presenting to clinical laboratories for blood tests (a blood glucose level of 140 mg/dl used as cutoff for diabetes/ 120 mg/dl cutoff for intolerance) Chart review of a sample of hospitalized patients (n= 2434) in 1970, 1975, 1980, and 1980.
Hirbli K, Droubi T (1996)	566 type-II diabetic patients (310 men and 256 women) compared to 502 non-diabetic individuals. Method of selection not described.
Bassil Z (1996)	Descriptive study of 22 files of neonates of diabetic mothers (1986-1995) at HDF

Summary Findings

General population

Out of a weighted sample of 32,838 individuals from all over Lebanon, 3.1% (2.9% of males and 3.3% of females) reported diabetes (MOPH-NHHEUS 1999). In the Beirut 1992-1993 survey conducted by FHS-AUB, 3.4% of 4297 males and 3.9% of 4609 females residing in Beirut reported diabetes (Nuwayhid et al. 1997). The prevalence of diabetes by age and sex was as follows:

Table 7.2-2 Prevalence of diabetes by age and sex in Beirut sample

	Age group (years)								All ages
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	>=70	
Males	0%	0.1%	0.2%	0.9%	3.2%	10.4%	12.5%	15.5%	3.4%
Females	0%	0.0%	0.2%	0.6%	3.4%	11.4%	17.8%	14.2%	3.9%

Source: Nuwayhid et al. 1997

Both surveys depended on self-reporting in contrast to the survey by Salti et al. (1997), which tested for fasting blood sugar and glucose intolerance. Out of a total of 2518 adult subjects (> 30 years), 13.1% had NIDDM and 6% had impaired glucose tolerance, with the following age-sex distribution (Salti et al. 1997):

Table 7.2-3 Prevalence of IDPM and glucose in tolerance in the Lebanese communities

	Prevalence of NIDDM					
	30-39	40-49	50-59	60-64	>=65	All ages
Males	1.0%	8.8%	16.1%	23.1%	28.5%	13.1%
Females	0.3%	5.4%	16.9%	24.1%	30.2%	13.2%
Total	0.7%	6.9%	16.5%	23.7%	29.4%	13.1%

	Prevalence of Impaired Glucose Intolerance					
	30-39	40-49	50-59	60-64	>=65	All ages
Males	1.0%	5.6%	7.7%	8.3%	8.4%	5.6%
Females	1.0%	4.9%	6.2%	7.6%	15.8%	6.4%
Total	1.0%	5.2%	6.8%	7.9%	12.5%	6.0%

Source: Salti et al. 1997

The prevalence of NIDDM was lower among the AUB population (4.9% among those 30-64 years old and 22.5% among those >= 65 years) than in Hammana (12.3% and 29.1%, respectively) and Aisha Bakkar (17.2% and 32.4%).

It is worthy to note that in 1965, more than a 1000 AUB full-time workers (i.e., less than 65 years of age) were screened for blood sugar and 3.3% were reported as diabetic (Abou-Daoud 1969). The prevalence by age and sex was as follows:

Table 7.2-3 Prevalence of Diabetes in AUB employees - 1965

	Prevalence of Diabetes			
	25-34	35-44	45-54	55-64
Males	0%	2.5%	5.2%	21.9%
Females	0%	2.6%	5.5%	8.1%

Source: Abou-Daoud. 1969

In their study of 436 persons who volunteered from all over Lebanon in response to a televised campaign, 4.8% (6.4% of males and 3.4% of females) were reported as diabetic (Hirbli et al. 1992). The prevalence among different age groups was as follows: 0% (< 20 years), 4.2% (21-30 years), 9.1% (31-40 years), 12.0% (41-50 years), 11.6% (51-60 years), 13.1% (61-70 years), and 21.2% (> 70 years).

In the national screening campaign for prostate cancer in 1998, 15.7% of the volunteer 7452 men (age 34-92 (mean age 62.4 years; SD7.9; range 34-92) were found to be diabetic (Merhej 1998).

Special Populations

Hirbli et al. (1990) assessed prevalence of diabetes among a group of patients presenting to clinical labs for blood analysis and another group of hospitalized patients (no age restrictions). A total of 497 out of the 1737 ambulatory patients (28.6%: 29.2% of males and 28.1% of females) and 319 out of the 2434 inpatients (13.1%: 14.3% of males and 11.7% of females) were found to be diabetic. Almost three-quarters of the diabetics were 55 years of age or older.

Hirbli et al. (1996) compared 586 type II- diabetics to 502 non-diabetics. Of those, 382 diabetics reported the age at onset as follows:

Table 7.2-5 Age of type II diabetes on set

Age	N	%
20-30	9	2%
30-40	69	18%
40-50	140	37%
50-60	104	27%
60-70	50	13%
70-80	10	3%
Total	382	100%

Source: Hirbli et al. 1996

Outcome

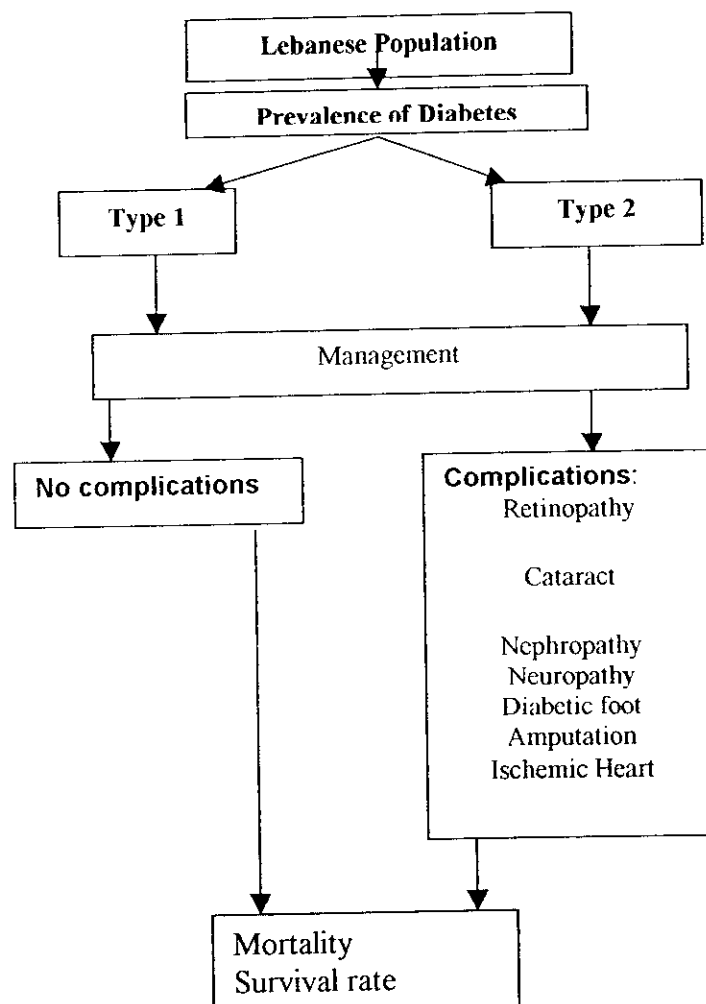
The number of patients with a discharge diagnosis of diabetes was 1579 out of more than 60000 discharge diagnoses (2.6%) reported by AUBMC, Makassed, and SGH in 1999-2000 (see Chapter 5). In 1999, MedNet processed 94 diabetes insurance claims out of 40000 (0.2%).

No studies about the prognosis and complications of diabetes in Lebanon were identified. Bassil (1996) reported on a series of 22 diabetic pregnant women: 37% of the deliveries were premature, 13.6% of the newborns had congenital malformations, and 50% of the newborns developed hypoglycemia

Comments

All identified documents addressed NIDDM or diabetes in general without specification. The prevalence of diabetes clearly increases with age, with a sharp rise among those older than 50 years of age. No striking differences are noted between males and females. The overall prevalence in the adult age groups (> 40 years) ranged between 3-7% for those between 40-49, 10-17% for those between 50-59, 13-24% for those between 60-69, and more than 20% (up to 30%) for those older than 65-70 years of age.

A flow chart was developed for potential use in the BDS project.



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7.3.1 DEPRESSION

Omar Fattal & Iman Nuwayhid

Background¹

Major Depressive Disorder (MDD) is a mood disorder in which the patient suffers only from depressive episodes (without manic episodes). It is also referred to as unipolar depression (as opposed to bipolar depression where manic episodes are present). Patients with MDD usually suffer in addition to the depressed mood from disturbances in their appetite, sleep, energy level, and concentration. They may also have feelings of guilt and thoughts about death. These impairments are usually severe enough to result in impaired interpersonal, social, and occupational functioning.

The lifetime prevalence of MDD is about 15%. It can reach as high as 25% for women. There is a twofold greater prevalence of MDD in women than men. The mean age of onset for MDD is about 40 years and 50% of patients have an onset between the ages of 20 to 50. The prevalence of MDD does not differ between races. In general, MDD occurs most often in persons who have no close interpersonal relationships or who are divorced or separated. There is no association between MDD and socioeconomic status.

There is no clearly defined etiology for MDD. However, biologic factors (mainly dysregulations in the secretions of Norepinephrine and Serotonin), genetic factors and psychosocial factors (like environmental stress, life events and premorbid personality factors) have all been implicated.

In 1990, mental health problems accounted for 8.1 % of the global burden of disease (GBD). Depression alone was the fourth leading cause of disability-adjusted life-years (DALYs) globally, and it is projected to become the second leading cause by the year 2020.

According to the DSM-IV, the diagnosis of MDD is made whenever the patient has 5 or more of a group of symptoms continuously for at least 2 weeks. At least one of the symptoms should be depressed mood or loss of interest or pleasure. The remaining symptoms are: significant weight loss, gain, decrease, increase in appetite, insomnia or hypersomnia, psychomotor retardation or agitation, fatigue or loss of energy, feelings of worthlessness or excessive or inappropriate guilt, diminished ability to think or concentrate, recurrent thought of death or suicidal ideation with or without a plan.

These symptoms cannot be better explained by a general medical condition, drugs/substance abuse, or bereavement (loss of a loved one). Furthermore, these symptoms must be causing significant clinical distress or impairment in social, occupational or other

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1. Kaplan HI, Sadock BJ, Grebb JA. Synopsis of Psychiatry, 7th Ed. Williams and Wilkins. Baltimore, 1994.
2. Murray CJL, Lopez AD. The Global Burden of Disease and Injury, Volume 1. Cambridge, MA: Harvard University Press. 1996.

important areas of functioning. Finally, manic episodes should be ruled out to rule out Bipolar disorder.

MDD is classified using different scales.

a) Clinical severity and social impairment:

Mild: Few, if any, symptoms in excess of those required to make the diagnosis with only minor impairment in occupational functioning or in usual social activities or relations with others.

Moderate: Symptoms or functional impairment between mild and severe

Severe: Several symptoms in excess of those required to make the diagnosis and the symptoms markedly interfere with occupational functioning or with usual social activities or relations with others. Severe MDD can be further classified according to the presence or absence of psychotic symptoms (delusions or hallucinations).

b) Duration and presence/absence of symptoms:

MDD single episode: The first symptoms of MDD

MDD recurrent: In patients who are experiencing at least their second episode of depression. To be considered separate episodes, there must be an interval of at least 2 consecutive months in which criteria are not met for a MDD.

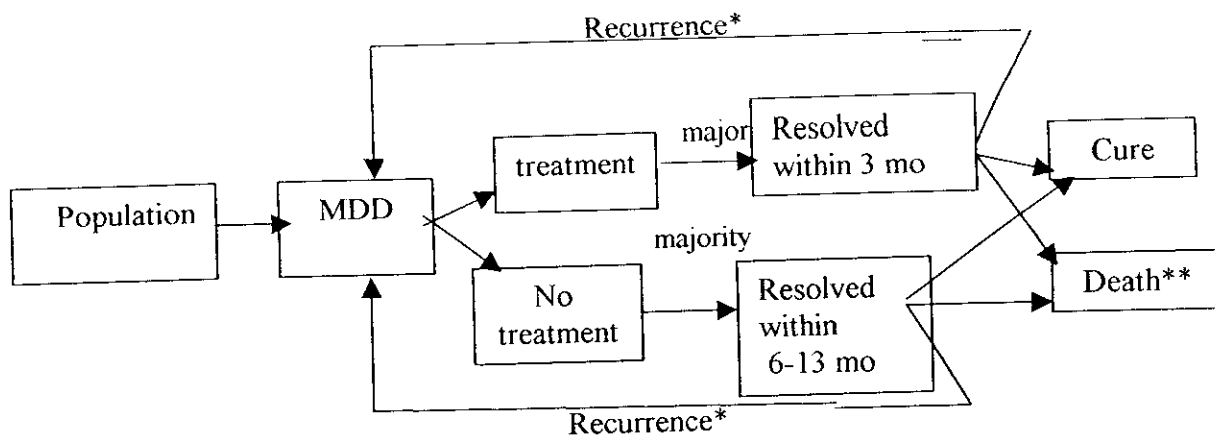
MDD in partial remission: Symptoms of major depressive episode are present but full criteria are not met, or there is a period without any significant symptoms of a major depressive episode lasting less than 2 months following the end of a major depressive episode.

MDD in full remission: During the past 2 months, no significant signs or symptoms of the disturbance.

In general, MDD tends to have long courses and patients tend to have relapses. Around 2/3 of all depressed patients contemplate suicide, and 10-15% actually commit suicide. About 50% of patients in the first episode of MDD experience significant depressive symptoms before the first identified episode. Therefore early identification and treatment of early symptoms may prevent the development of a full depressive episode. The first depressive episode occurs before age 40 in about 50% of patients. An untreated depressive episode lasts 6 to 13 months, while most treated episodes last about three months. As the course of the disorder progresses, patients tend to have more frequent episodes that last longer. Over a 20-year period the mean number of episodes is five to six.

Patients who have been hospitalized for a first episode of MDD have about a 50% chance of recovering in the first year, and 85-90% chance of recovering in the first 5 years. About 25% of patients experience a recurrence in the first 6 months after release from a hospital, 30-50% in the first 2 years, and 50-70% in five years. The incidence of relapse is lower in patients who continue prophylactic treatment and in patients who have had only one to two depressive episodes.

Diagram illustrating natural history of MDD:



* Over a 20-year period the mean number of episodes is 5 to 6

** 10-15 % of patients with MDD will commit suicide

Prognostic indicators include mild episodes, absence of psychotic symptoms, short hospital stay, solid premorbid social functioning, absence of a comorbid psychiatric disorder, and the absence of a personality disorder are all good prognostic factors. Being a male, alcohol and substance abuse, the presence of anxiety disorder symptoms and the presence of more than one previous disorder are all bad prognostic factors.

In general, most studies indicate that treatment consisting of pharmacological agents combined with individual psychotherapy is the most effective for MDD. Three types of short-term psychotherapies have been studied regarding their efficacy in the treatment of MDD; these are cognitive therapy, interpersonal therapy and behavioral therapy. Electro Convulsive Therapy (ECT) is also a used modality in the treatment of patients with MDD. ECT is used mainly in patients who cannot tolerate the side effects of medications, are not responding to medications or in cases where the clinical situation is so severe that the rapid improvement seen with ECT is needed. ECT is usually the treatment of choice for elderly patients.

Depression in Lebanon

Available Relevant References in Lebanon

More than 40 published and unpublished documents regarding depression in Lebanon were identified and reviewed. The following table presents a complete bibliography of the references found relevant to the purpose of this report.

Table 7.3.1-1 Selected references regarding depression in Lebanon

Author (year)	Study Population/ Methodology
Katchadourian M and Racy J (1969)	- Description of 4636 patients who constituted 95% of the patients seen by 20 out of the 21 psychiatrists and 3 out of the 3 psychiatric hospitals in Lebanon in 1964. - Patients were reported to the authors by these psychiatrists based on their diagnosis of depression.
Karam et al. (1998)	658 Lebanese subjects selected at random from 4 areas in Lebanon. Similar to the one above.
Weissman MM et al. (1996)	- 38000 community subjects from 10 countries [Lebanon, Taiwan, Korea, Puerto Rico, USA, West Germany, Canada (Edmonton, Alberta), New Zealand (Christchurch), Italy (Florence), France (Paris)]. - Dr Elie Karam led the study in Lebanon. - 526 subjects (18-65 years) from 4 areas in Lebanon (Achrafieh, Ain Remmaneh, Kornet Shahwan and Bejjeh) in 1988-1989. - The diagnosis of depression was made using the Diagnostic Interview Schedule (DIS) and Hamilton Depression Scale.
Bryce J et al. (1989a)	- 192 women (20-53 years old) selected at random for being mothers of 192 children from 3 schools in Beirut (1985-1986) - Mothers interviewed and depression diagnosed using the Beck Depression Inventory
Farhood L et al. (1993)	- 540 Lebanese families chosen by random from West Beirut in 1987. - Depression diagnosed using the Beck Depression Inventory (having at least 4 symptoms for at least one month).
Farhood L and Nouredine S (1999)	Follow of 93 Lebanese subjects, 30 of whom were exposed to a church explosion in Beirut. (Unpublished study)
El Khoury N (1988)	100 pregnant women from Hotel Dieu Hospital in Beirut. Depression was diagnosed using Hamilton Depression Scale and the Diagnosis Interview Schedule (DIS). (Unpublished thesis)
Bryce J et al. (1989b)	Same as above (smaller sample size: 152 mothers)
Macksoud (1991)	224 children (88% of them Lebanese) from 8 schools in Lebanon (Beirut, Southern suburbs of Beirut, Saida). Depression symptoms were elicited using the Child Behavior Inventory (CBI). (Unpublished project for the Center for the Study of Human Rights at Columbia University)
Chimienti G et al. (1989)	- 1039 children aged 3 to 9 years from 21 schools from Lebanon (Beirut, Saida and Tripoli) in 1985 - Depressive symptoms (cries easily, withdrawal, generally unhappy, difficulty coping) were elicited by asking the mothers of these children
Saigh P (1988)	- Follow-up of 12 students from AUB 12 days before and 8, 37, and 316 days after exposure to a significant war event - Diagnosis of depression using the Beck Depression Inventory

Summary Findings

Except for Katchadourian M and Racy J (1969) study, which was conducted in 1964, almost all studies on depression in Lebanon were conducted during the war or linked to war events and special subgroups.

- Based on clinical diagnosis of depression, Katchadourian and Racy (1969) reported a point prevalence (defined as the number of cases that were already being followed up at the beginning of the study) of Depression of 3 per 100,000 population in 1964 (58 patients out of a population of 1,952,000). The point prevalence for males was 2.2/100,000 and for females it was 3.7/100,000. However this prevalence excludes patients with depression with psychotic features. There is no information about the age distribution.

- Katchadourian and Racy (1969) also reported that 185 new cases were diagnosed over a period of 6 months since the start of their study and computed a 6-month incidence rate of 9.5 per 100,000 (185 new cases/1,952,000). The incidence for males was 8.4/100,000 and for females it was 10.6/100,000. Again, these incidences do not include cases of depression with psychotic features.

- Karam et al. (1998) reported a lifetime prevalence of depression (as defined by DSM-III-R) of 27.8% in their study of around 700 subjects in the late 1980's. Lifetime prevalence of depression did not vary significantly by age: 18-29 years (29.4%), 30-44 years (26.3%), and 45-69 years (27.6%).

- Karam et al. (1998) reported a lifetime prevalence of depression for females of 30%, which was significantly higher than the lifetime prevalence for males who did not participate in the military (20%). The lifetime prevalence for all males, including those who participated in the military, was 24.5%.

- Lifetime risk of depression (defined as the probability that a subject will suffer at least 1 episode of depression lasting 1 year or more in his/her lifetime) was found to be 19% in Lebanon (Weissman et al., 1996) in 1988-1989, the highest among the 10 study countries (Taiwan 1.5%, Korea 2.9%, Puerto Rico 4.3%, USA 5.2%, West Germany 9.2%, Canada (Edmonton, Alberta) 9.6%, New Zealand (Christchurch) 11.6%, Italy (Florence) 12.4% and France (Paris) 16.4%). The lifetime risk of depression was 23.1% for Lebanese females and 14.7% for the Lebanese males with a female to male ratio of 1.6. The range for all 10 countries was 1.6 to 3.1.

- The following symptoms were reported by more than 60% of the Lebanese individuals with MDD (Weissman et al., 1996): poor appetite, insomnia, loss of energy, and slowed thinking.

- The annual rate of depression ranged from 0.8cases/100 adults to 5.8cases/100 adults in the 10 countries studied (Weissman et al., 1996). No specific data about Lebanon.

- Bryce et al. (1989) reported that the 192 mothers interviewed in 1986 were, on the average, mildly depressed.

- Farhood et al. (1993) reported that 9.9% of the individuals interviewed in 1987 were clinically depressed. Adolescent females and mothers had higher rates of depression

than adolescent males and fathers, respectively. The difference, however, was not statistically significant. Among females, the highest rate of depression was in the 40-59 years age group.

- Farhood and Nouredine (1999), who evaluated 93 subjects exposed to a church explosion in early 1990's, reported that females were 2.6 times more at risk of getting depressed than males. 39% of the subjects had PTSD (post traumatic stress disorder) of whom 51 % were also depressed. There was no non-exposed comparison group.

- In her study of 100 pregnant women, El Khoury (1988) reported that 19% were found to have depression.

- Except where mentioned, there was no information about age distribution in the above studies. However, Weissman et al. (1996) reported that the mean age of onset of MDD in Lebanese patients was 25.2 years, on the lower edge of the range for the 10 countries (24.8-34.8 years). The mean age of onset for males and females was 27.7 years and 23.6 years, respectively.

- In the overall study sample of 38000 persons, it was found that those separated or divorced had a 2 to 4 fold increase in the rates of MDD than married persons (Weissman et al. 1996). Specific data on Lebanese patients was not presented.

- Katchadourian and Racy (1969) reported a high rate of depression among the high income people (36/100,000) as compared to the middle (14/100,000) and low income (15/100,000).

The remainder of this section focuses on the risk factors identified to be associated with depression in Lebanon:

- Bryce et al. (1989b) reported that negative perception of one's own life events, higher exposure to war events, and emotional reaction to war events were associated with an increased reporting of depression symptoms among women.

- Bryce et al. (1989b) reported that environmental problems (unavailability of water, toilet, electricity...), crowding, and number of children at home under the 15 were also positively correlated with increased levels of depressive symptoms among women. Women with higher levels of income or education reported fewer depressive symptoms.

- In their study of 540 Lebanese families in 1987, Farhood et al. (1993) reported that reduction in social network and increase in war related events were significantly associated with depression among fathers and mothers. As for adolescents, reduction in social network was significantly associated with depression.

- Macksoud (1991) reported that children who witnessed separation from their parents as part of war events had higher symptoms of depression than children who witnessed other war events.

- Chimienti et al. (1989) reported that children who experienced a trauma (death of a family member, destruction of home, forced displacement of family, witnessing death)

were about 1.7 times more likely, as compared to children with no experience of trauma, to exhibit depressive symptoms (cries easily, withdrawal, generally unhappy, difficulty coping) in reaction to general war stress.

- In his follow-up study of 12 students from AUB, Saigh (1988) found that the majority of respondents reported higher level of depression 8 days after the trauma (exposure to bombardment of the city), which returned to pre-trauma level 37 and 316 days after the trauma.

- Karam et al. (1998) reported that the most important parameter predicting the development of depression during the war was a pre-war history of depression. Exposure to war events was also related to the reporting of major depression, even when other relevant factors were controlled for.

Comments

The four studies that offer findings that could be relatively generalized to the Lebanese population are Katchadourian and Racy (1969), Farhood et al. (1993), Weissman et al. (1996), and Karam et al. (1998). The first is almost 40 years old and was limited to clinical depression diagnosed and treated by the majority of the psychiatrists in 1964. The more recent ones were performed during the war, which protracted over 15 years (1975-1990).

The recent studies reported a high prevalence of depression among the Lebanese population. The lifetime risk was 19% (Weissman et al. 1996) in 1988-1989, with 1.6 female to male ratio. Farhood et al. (1993) reported a 9.9% prevalence in 540 families in 1987. Karam et al. (1998) reported that the prevalence of depression in Lebanon was 27.8%. (sample size <700, all from Beirut).

Farhood et al. (1993) reported that among the depressed females, the highest rate of depression was in the 40-59 year age group. Karam et al. (1998) reported no significant difference in the lifetime prevalence of depression by age.

The average age of onset of depression in Lebanon was 25.2 years (Weissman et al., 1996), which is much lower than the age of onset (40 years) reported in the international literature. The range of the age of onset of the total 10 countries in which the study was conducted was 24.8 - 34.8 years, putting Lebanon on the lowest side of the range.

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15. Weissman MM, Bland RC, Canino GC, Faravelli C, Greenwald S, Hwu HG, Joyce PR, Kaaram EG, Lee CK, Lellouch J, Lepine JP, Newman SC, Rubio-Stipec M, Wells JE, Wickramaratne PJ, Wittchen H, Yeh EK. (Cross national collaborative group). Cross-national epidemiology of major depression and bipolar disorder. *JAMA*, 1996; **276**: 293-299.

7.3.2 SCHIZOPHRENIA

Omar Fattal & Iman Nuwayhid

Background²

The term schizophrenia refers to the presence of a schism (split) between thought, emotion, and behavior in affected patients.

In the United States, the lifetime prevalence of schizophrenia has been variously reported as ranging from 1 to 1.5%. About 0.025 to 0.05 % of the total population are treated for schizophrenia in any one year. Schizophrenia is equally prevalent in men and women. Men have an earlier onset of schizophrenia than women. The peak ages of onset for men are 15-25, while the peak ages of onset for women are 25-35. In general, 90% of patients in treatment for schizophrenia are between 15 and 55 years old. The onset of schizophrenia before age 10 or after age 50 is extremely rare. Schizophrenia has been described in different cultures and socioeconomic groups. In industrialized nations, a disproportionate number of schizophrenic patients are in low socioeconomic groups.

According to the DSM IV, schizophrenia is diagnosed if the following characteristics/criteria are present:

A-Characteristic symptoms: two or more of the following: delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behavior, or negative symptoms (i.e., affective flattening).

Each symptom should be present for a significant portion of a one month period (or less if successfully treated). Only one of the above symptoms is required, if delusions are bizarre or hallucinations consist of a voice a running a commentary on the person's behavior or thoughts, or two or more voices conversing with each other.

B-Dysfunction: one or more major areas of functioning such as work, interpersonal relations, or self-care, is markedly below the level achieved prior to the onset.

C-Duration: continuous signs of the disturbance persist for at least six months. The six month period must include at least 1 month of symptoms (criteria A) and may include periods of prodromal or residual symptoms.

In addition to the above criteria, other psychiatric disorders and substance abuse disorders should be excluded.

² References:

1. Kaplan HI, Sadock BJ, Grebb JA. Synopsis of Psychiatry. 7th Ed. Williams and Wilkins. Baltimore, 1994.

There are five major schizophrenia subtypes:

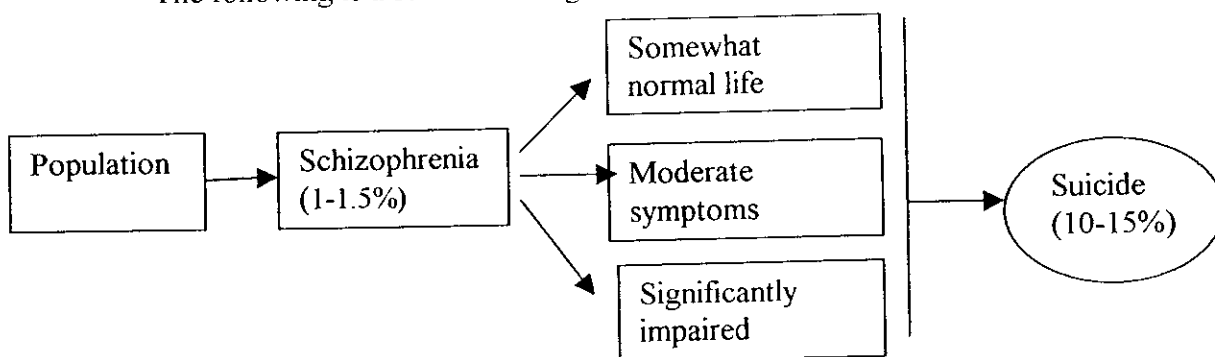
- The Paranoid Type: preoccupation with one or more delusions or frequent auditory hallucinations.
- The Disorganized Type: prominence of disorganized speech, disorganized behavior and flat or inappropriate affect.
- The Catatonic Type: classically a marked disturbance in motor function, which may involve stupor, negativism, rigidity, excitement, or posturing.
- The Undifferentiated Type: not classifiable under any of the above types.
- The Residual Type: continuing evidence of the schizophrenic disturbance, in the absence of a complete set of active symptoms or sufficient symptoms to meet another type of schizophrenia.

Three points should be always remembered: 1) no clinical sign or symptom is pathognomonic (i.e. characteristic and exclusive) for schizophrenia, 2) the patient's symptoms may change with time, and 3) the clinician should take into account the patient's educational level, intellectual ability and cultural and subcultural membership.

In general, the outcome for females is better than the outcome for males. Men are more likely than women to be impaired by negative symptoms, while women are more likely to have better social functioning than men.

The typical course of schizophrenia starts with a psychotic episode, after which the patient has a gradual period of recovery, which can be followed by a lengthy period of relatively normal functioning. However, a relapse usually occurs, and the general pattern of illness that is evidenced in the first five years after the diagnosis is usually predictive of the course that the patient follows. Each relapse of psychosis is followed by a further deterioration in the patient's baseline functioning. The classic course of schizophrenia is one of exacerbations and remissions, with failure to return to baseline functioning after each relapse.

The following is a schematic diagram of the outcome/prognosis of schizophrenia



Schizophrenia is postulated to be multifactorial where biological factors (increased dopaminergic activity, serotonin, norepinephrine, amino acids), genetic factors (the likelihood of having schizophrenia is correlated with the closeness of the relationship to a schizophrenic patient), and psychosocial factors (individual and family) interact.

Most schizophrenic patients benefit from the combined use of antipsychotics and psychosocial treatment tailored to individual need. Hospitalization is primarily indicated for diagnostic purposes, stabilization of medications, patient's safety.

Schizophrenia in Lebanon

Available Relevant References in Lebanon.

A total of 6 documents were reviewed, three of which were found relevant, and were used in writing this report (table below).

Table 7.3.2-1 Selected references regarding schizophrenia in Lebanon

Author (year)	Study Population/ Methodology
Hachem DG (1996)	Review of the medical charts of 6988 patients admitted to Deir As-Salib Hospital (1980-1990). Diagnosis of schizophrenia as per medical chart. A total of 276 patients were identified.
Katchadourian HA and Sutherland JV (1975)	February 1964 -August 1964: A survey of all 4636 patients seen by 20 out of the 21 psychiatrists and 3 out of the 3 psychiatric hospitals in Lebanon. Schizophrenia diagnosed clinically by the participating psychiatrists. 'Schizophrenia', 'paranoia', and 'paranoid states' were lumped into one category called 'schizophrenic reactions'. A total of 837 patients were identified.
Yaktin US and Labban S (1992)	Medical charts of 230 patients admitted between 1971 and 1986 for the first time with the diagnosis of schizophrenia to Al-Fanar hospital in South Lebanon. Interviews with 40 of these patients selected at random (not specified). Diagnosis as per medical chart.

Summary Findings

Hachem (1996) reported that 55% of the patients admitted to Deir As-Salib between 1980 and 1990 were paranoid schizophrenia. Katchadourian and Sutherland (1975) broke down their series of prevalent cases of schizophrenia in 1964 into chronic undifferentiated (43%), paranoid type (31%), and catatonic type, not further classified and others (26%).

The following points summarize the magnitude of the problem:

- Katchadourian and Sutherland (1975) reported a total of 837 patients with schizophrenic reactions (schizophrenia, paranoia and paranoid states) in Lebanon in 1964, for a point prevalence of 42.9 per 100,000 (population estimated at 1,920,000). The point prevalence for men was 49.8/100,000 and for women 35.9/100,000; male to female ratio was 1.4. If the diagnosis of schizophrenia is used strictly, then the point prevalence becomes 39.2/100,000.
- Katchadourian and Sutherland (1975) estimated the overall incidence of schizophrenic reactions in 1964 at 13.2/100,000 (17.5 for men and 8.9 for women).
- Katchadourian and Sutherland (1975) reported that 65% of the cases were in the 20-44 year age group. Similarly, Hachem (1996) noted that the mean age of onset for the schizophrenic patients admitted to Deir As-Salib (1980-1990) was 20.5 years with a range of 17-24 years. The male to female ratio in Hachem's study (1996) was 2.44.

The remainder of this section reports on the description of patients and suggested risk factors. It is worth noting that no comparison groups were included in these studies. Furthermore, in Yaktin and Labban's study (1992) description was limited

to a sample of 40 interviewed patients.

- In Katchadourian and Sutherland series of patients (1975), 67% were unmarried, 24% married, and 6% previously married. Hachem (1996) reported that 82% were single. Yaktin and Labban (1992) reported that of the patients interviewed, 69.5% were single.
- Hachem (1996) reported that 46% of the patients belonged to the lower middle class. While in Katchadourian and Sutherland (1975), 73% were in the lowest income group, 16% in the middle income, 3% in the upper income, and 8% not specified. Yaktin and Labban (1992) reported that 76% of the patients were unemployed.
- 36% of the patients in Hachem's series (1996) completed secondary school. In Katchadourian and Sutherland's study (1975), only 84% reported this information. Of those, 73% had no more than 6 years of education, 25% had up to 11 years of school, and 2 % had at least some college education.
- Yaktin and Labban (1992) noted an increase in the number of admissions of patients with schizophrenia into Al-Fanar Hospital in certain periods as seen in the following table:

Table 7.3.2-2 Number of admissions of schizophrenia to Al-Fanar Hospital, by year.

Year	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
No. admissions	6	3	1	4	3	11	10	25	14	19	7	23	20	22	30	32
Total	14				49				63				104			

Source: Yaktin U.S. and Labban S. 1992

They noted that the most significant increase occurred either following intensive fighting episodes, or months later due to the additive effect of stress. Traumatic war events were regarded of primary importance in triggering the onset of schizophrenia. Many of them reported exposure to war events, such as shelling (65%), displacement (48%), and loss a father (40%).

- Hachem (1992) reported that the mean length of stay was 62 days (SD 42 days) and the average number of admissions was 5.

Comments

The only study that reports overall prevalence of schizophrenia in Lebanon is almost 40 years old (Katchadourian and Sutherland 1975). It reported a prevalence rate of 39.2/100,000. The number is limited to patients under the care of physicians and assumes that 95% of all psychiatric patients in 1964 were captured. Furthermore, the definition of schizophrenia was wide, including 'schizophrenia', 'paranoia' and 'paranoid states' and might have differed between physicians. The reported prevalence is much lower than that currently reported in the United States, which is 1000-1500/100,000 .

The proportion of males exceeded that of females in all reviewed studies.

References

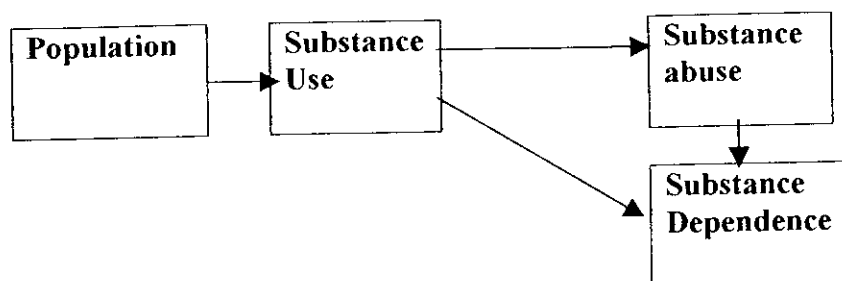
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5. Yaktin US, Labban S. Traumatic war. Stress & schizophrenia. *J PsychosocNmurs Ment Health Serv*, 1992; **30**: 29-33.

7.3.3 SUBSTANCE USE/ABUSE

Omar Fattal & Iman Nuwayhid

Background³

The following diagram summarizes the link between substance use, abuse, and dependence:



Substance dependence invokes two concepts- behavioral dependence (substance-seeking activities and evidence of pathological use patterns) and physical dependence (substance-seeking activities and evidence of pathological use patterns). According to the DSM-IV, both substance abuse and substance dependence are maladaptive patterns of substance use, leading to clinically significant impairment or distress.

Substance dependence is manifested by three or more of the following, occurring at any time in the same 12-month period: tolerance, withdrawal, intake of larger amounts or over a longer period than was intended, persistent desire or unsuccessful efforts to cut down or control use, a great deal of time is spent in substance-related activities, giving up of important social, occupational or recreational activities, or use is continued despite knowledge of persistent or recurrent physical or psychological problems.

Substance abuse is manifested by one or more of the following occurring within a 12-month period: recurrent use resulting in a failure to fulfill obligations, recurrent substance use in situations in which it is physically hazardous, recurrent substance-related legal problems, or continued use despite social or interpersonal problems.

The United Nations Office for Drug Control and Crime Prevention (ODCCP) estimates that some 180 million people worldwide - 4.2 per cent of those aged 15 and above - consumed illicit drugs in the late 1990s. This figure includes 144 million consuming cannabis, 29 million people consuming amphetamine type stimulants, 14

³References:

1. Kaplan HI, Sadock BJ, Grebb JA. *Synopsis of Psychiatry*, 7th Ed. Williams and Wilkins. Baltimore, 1994.
2. Mohit A. Psychoactive substance use (drug abuse) and a resource oriented strategy to confront it in the Eastern Mediterranean region. *Eastern Mediterranean Health Journal*, 1998; 4 (supp): S149-S164.
3. United Nations Office for Drug Control and Crime Prevention, World Drug Report 2000, ExecutiveSummary. Found at http://www.odccp.org/wdr_executive_summary_2000.html.

million people taking cocaine and 13 million people abusing opiates, 9 million of whom were addicted to heroin. Due to poly-drug abuse, these numbers do not add up to the 180 million global estimate. (World Drug Report 2000-Executive Summary)

In the USA, around 15% of the population over 18 years of age have serious substance use problems, with about two thirds of them abusing alcohol primarily and the other one third abusing substances other than alcohol primarily. The lifetime prevalence for alcohol abuse or dependence was 13.8%, and for nonalcohol substances it was 6.2%.

The prevalence of use of illicit substances in the US is highest among the age group 18-25. Males are significantly more likely to use illicit substances than females, the M/F ratio is 1.4. Differences are more marked for nonalcohol substances than for alcohol. Blacks are significantly more likely to use illicit substances than whites and hispanics. Residents of large metropolitan areas are the most likely to use illicit substances. Substance abuse is also higher among the unemployed and among some minority groups.

It is estimated that 76% of men and 65% of women with a diagnosis of substance abuse or dependence have an additional psychiatric diagnosis. The most common comorbidity involves two substances of abuse, usually alcohol abuse and the abuse of some other substance. Other psychiatric diagnoses that are commonly associated with substance abuse are antisocial personality disorder, phobias (and other anxiety disorders), major depressive disorder, and dysthymic disorder.

Persons who abuse substances are about 20 times more likely to die by suicide than are the general population. About 15 % of persons with alcohol abuse or alcohol dependence have been reported to commit suicide.

Drug abuse has several effects on the person's health in general. It increases the susceptibility to accidents and injuries, cancer, cardiovascular diseases, respiratory diseases, infectious and immune system diseases (especially AIDS), and psychiatric illnesses. It is associated with suicide and violence. It is associated with decreased productivity, social functioning and quality of life. In general, there is a direct relationship between crime, corruption and drug abuse (Mohit, 1998).

Substance Abuse in Lebanon

Available Relevant References in Lebanon

In addition to several newspaper articles that reported on the issue, the following table lists the documents found relevant to the purpose of this report.

Table 7.3.3-1 Selected references regarding substance abuse in Lebanon

Author (year)	Study population/ Methodology
Katchadourian HT and Sutherland VJ (1975)	Description of "addicted" patients among all 4624 psychiatric patients seen by 20/21 psychiatrists and 3/3 psychiatric hospitals in Lebanon in 1964 ('addicts' in jail were included)
An-Nahar newspaper (February 2000)	Estimation of the cost of drugs in 1998.

An-Nahar newspaper (June 2000)	Assessed the amount of confiscated cocaine and confiscated heroin in Lebanon
Baddoura C (1992)	Review of the medical charts of 990 patients admitted to the Hospital of the Cross with the diagnosis of substance abuse in the period of 1973-1991
Nehme (1989)	Assesment of drug use/abuse in Lebanon. Causes and preventive measures.
Karam E (1993)	A report to WHO on substance abuse in Lebanon
Puzantian (1973)	Out of 874 admissions, there were 211 drug addicts treated in the prison hospital.
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Yabroudi P et al. (1999)	1- Review of medical charts of 222 patients admitted to SGH psychiatric unit in the period of 1980-1992. Inclusion criteria were Lebanese origin and present or past history of substance abuse 2- Interview with 208 subjects selected at random from Achrafieh and Ain ElRummaneh. The Composite International Diagnostic Interview (CIDI) was used.
Nassar N et al. (1973)	436 students selected at random from AUB 1972-1973 (Part I: Use). Inquired about use of LSD, amphetamines, and marijuana.
Karam E et al. (2000)	1851 students selected at random from USJ and AUB in 1991. Students completed the D.I.S (Diagnostic Interview Schedule) Arabic version. Inquired about alcohol and several illicit and prescription drugs.
Makki A and Hourri M (1995)	3180 students selected at random from Lebanese University in Bekaa and in Beirut and from LAU. Iquired about illicit drugs.
Sibai A and Kanaan N (1998)	A random sample of sampling units (70) based on a two-stage sampling design using the sampling frame of schools from the Ministry of Education. 100 students were selected randomly from each sampling unit. Five public schools and nine private schools located mainly in administrative Beirut. Students aged between 15-24
Affi et al	SIBER project
Antoun (1996)	
Zaarour R (1994)	Review of the medical charts of 852 patients admitted to SGH and the Hospital of the Cross with the diagnosis of substance abuse in the period of 1980-1993
Abdel Malak N (1989)	Same as Baddoura (1992) but on 622 patients (1973-1987)
Melikian L et al. (1973)	436 students selected at random from AUB 1972-1973 (Part II: personal correlates)

Summary findings

This section will be divided into two subsections. The first will review the overall status of substance use from a legal point of view. The other is similar to other reviews where the magnitude of the problem within the population is reviewed.

Table 7.3.3-3 Frequency and Intensity of Alcohol consumption among current and former drinkers by sex, Beirut 1992-1993.

Frequency	Males						Females					
	Current		Former		TOTAL		Current		Former		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%
Occasionally	144	61	20	61	164	61	68	91	2	50	70	89
1-2 times/wk	51	21	3	9	54	20	3	4	1	25	4	5
>=3 times/wk	42	18	10	30	52	19	4	5	1	25	5	6
Intensity (more than 2 glasses on each drinking occasion)	Males						Females					
	Current		Former		TOTAL		Current		Former		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%
Rarely	138	58	13	39	151	56	60	80	2	50	62	79
Sometimes	56	24	4	12	60	22	8	11	1	25	9	11
Most of the time	43	18	16	49	59	22	17	9	1	25	8	10

Source: Nuwayhid et al. 1997

- Yabroudi et al. (1999) interviewed 208 community subjects from Beirut in 1995 and reported that 65% were ever drinkers (consumed at least 12 drinks in any 1-year period of one's life); 74% of males and 45% of females. Of those, 5.3% were alcohol abusers and 2.9% were dependent on alcohol. In males, 18% were alcohol abusers/dependent as compared to 0.9% of the females.
- Karam (1993) reported a personal communication with Father Succar (the late president of JAD) who stated that less than 3% of the Lebanese population have ever tried any drug. In a 1992 interview, Succar estimated the total number of 'drug addicts' in Lebanon to be 100,000.

ii- University Students

The knowledge of the high vulnerability of the youth to substance use and abuse have stimulated several epidemiological studies among university students. It is worth noting, however, that the majority of the study populations were conveniently selected.

- Nassar et al. (1973) reported the following prevalences among 436 AUB students in 1973:

Table 7.3.3-4 Percentage of students (%) using different drugs (N=436)

	Number of times used				
	Never	1-2	3-5	6-9	>= 10
Marijuana	83	7.0	3.0	2.0	5.0
LSD	98	0.6	0.6	0.6	0.2
Amphetamines	93	3.0	1.0	1.0	3.0

Source: Nassar et al. 1973

In sum, 17% used Marijuana at least once, 2% used LSD at least once, and 8% used Amphetamines at least once. In addition, 15% have used sleeping pills at least once and 17% have used tranquilizers at least once (not shown in table).

Table 7.3.3-7 Number (%) of students who reported ever using substances (N=3180)

Ever used:	Yes	
	N	%
Hashish	84	2.6
Opium	23	0.7
Cocaine	29	0.9
Others(tranquilizers, sleeping pills, other illicit drugs)	17	0.5

Source: Makki and Hourii. 1995

A total of 55 (1.7%), 40 (1.2%), and 30 (0.9%) students considered themselves 'addicted' to alcohol, tranquilizers, and drugs, respectively. In addition, 7.5% of the students expressed their willingness to try drugs.

- The latest study available was the one conducted by FHS (SIBER project) on all new students (Freshman/ Sophomore) joining AUB in 1998. A total of 954 were included (90% of all new students). Answers reflect pre-university behavior.

Table 7.3.3-8 Substance use by sex in AUB student population

	Males		Females		Total	
	N	%	N	%	N	%
Ever tried illegal drugs**	74	14.7	39	8.8	114	12.0
Ever used sedatives*	42	8.3	53	12.1	96	10.2
Ever used alcohol **	359	70.9	270	61.4	631	66.5

** $p \leq 0.01$; * borderline significance

- The only study among secondary school students was the one conducted by Sibai and Kanaan in 1997. lifetime alcohol drinking was estimated a 47% among boys and 37% among girls and for drug abuse it was 4.5% and 0.5% respectively.

iii- Hospitalized patients (hospitals/rehabilitation centers)

- Katchadourian and Sutherland (1975) reported that 315 patients were under treatment for drug abuse in Lebanon in 1964. This included the cases at the beginning of the study (161cases), the new cases over the 6-months of the study (142 cases), and the readmitted cases (112cases).
- Recent studies did not compute the overall number of admitted people for substance abuse. Instead, reports were limited to specific hospitals. Nehme (1989) reported that the number of patients admitted to the Hospital of the Cross for substance abuse (including alcohol) increased gradually between from 1977 (n= 122) and 1987 (n =338). Antoun (1996) reported that 804 patients were treated in 1994 at JAD, Oum-El-Nour and St Charles Hospital. In 1996, 141 admitted to JAD and Oum-El-Nour. 63 making a total of 141 patients for these 2 institutions. Oum-El-Nour rehabilitation center website reported a gradual increase in the number of their admitted patients from 27 in 1993, to 53 in 1995, to 107 in 1997, 149 in 1999, and 177 in2000.

iv- Substance Use/abuse by Demographic Characteristics

Gender

- In their 1991 survey of university students, Karam et al. (2000) reported that females were significantly less likely to ever drink alcohol than males (41% vs 50%). Males were 10 times more likely than females to be abusers and/or dependent on alcohol (10% vs 1%). However, females were found to have a higher tendency to ever use tranquilizers and barbiturates, while a higher proportion of males ever used cannabis.
- Among AUB students in 1973 (Nassar et al. 1973), the proportion of ever use was as follows: Marijuana (18% males; 14% females), LSD (3% males; 2% females) amphetamines (8% males; 6% females).
- Makki and Houry (1995) reported that more university males students (13%) were willing to try any illicit drug than female students (3%).
- The preponderance of males is even more striking when the number of addicts or patients admitted to hospitals or rehabilitation centers are compared. In 1964, the M:F ratio was 49 (Katchadourian & Sutherland, 1975). Baddoura (1992) reported a M:F ratio of 10 in 1986-1987 among those admitted to the Hospital of the Cross, a striking increase from the 1.5 ratio in 1973-1974. The average M:F ratio of patients admitted to Oum-El-Nour rehabilitation center for the period of 1993-2000 was 19 (Oum-El-Nour website), being 8 in 1999 and 2000. In an interview with the late Succar in 1992, he stated that 82% of the addicts in Lebanon were males (M:F ratio of 4.5). Zaarour reported a 13-year average of an M:F ratio of 12.6 among those admitted to SGH and Hospital of the Cross.

In his report to the WHO, Karam (1993) presented the following table:

Table 7.3.3-9 M/F ratio of Substance Abuse patients in different clinical settings

Service	Years	# patients	M:F ratio
Oum-El-Nour	89-92	95	9.0
Hospital of the Cross	73-90	827	6.5
St George Hospital	80-92	153	2.5
Outpatient Clinic	88-92	18	1.0

Source: Karam, 1993

Age of Onset

- All surveys of university students showed, as expected, that their use of different substances started in the university or in senior high schools, corresponding to age

group 18-22 years. A sizable proportion of students reported recent use of illicit substances.

- The age of onset for substance abuse was later among those admitted to SGH (1980-1992), where the mean age of onset was 24.6 for males and 28.9 years for females (Yabroudi et al., 1999). The same was noted in the 1964 study of Katchadourian and Sutherland (1975).

Table 7.3.3-10 Age of onset of substance abuse in Lebanese psychiatric institution patients

Age (years)	Males		Females		TOTAL	
	N	%	N	%	N	%
<= 24	54	17.5	4	50	59	18.4
25-29	56	18.2	0	0	56	17.8
30-39	139	45.3	3	37.5	142	45.0
>= 40	58	18.9	1	12.5	59	18.8
TOTAL	307	100	8	100	315	100

Source: Katchadourian and Sutherland. 1975

Similarly, the age of patients admitted for treatment of substance abuse were mostly in their late twenties and early thirties (Abdle Malak 1989, Zaarour 1994, Oum-El-Nour website).

- The Beirut 1992-1993 survey (Nuwayhid et al. 1997) reported on the distribution of status of alcohol consumption by sex and age:

Table 7.3.3-11 Distribution of status of alcohol consumption among Beirut residents by sex and age

Age (years)	Males						Females					
	Never Drinker		Former Drinker		Current Drinker		Never Drinker		Former Drinker		Current Drinker	
	N	%	N	%	N	%	N	%	N	%	N	%
18-19	42	10	0	0	9	4	43	10	0	0	4	5
20-29	147	34	3	9	60	25	158	36	0	0	23	31
30-39	57	13	3	9	42	18	65	15	0	0	18	24
40-49	63	14	5	15	43	18	42	10	1	25	14	19
50-59	56	13	8	24	42	18	65	15	2	50	7	9
60+	68	16	14	43	41	17	60	14	1	25	9	2
TOTAL	433	100	33	100	237	100	433	100	4	100	75	100

Source: Nuwayhid et al. 1997

Marital status

- The majority of the studies on patients of substance abuse revealed that 50-60% were single/unmarried, 30-40% married, and the remainder separated or widowed.

Education

- The educational level of the majority of admitted patients on substance abuse was elementary or intermediate. University education was reported in less than 20% of patients.

Region

- Only Zarour (1994) reported the geographical region of the patients admitted SGH and Hospital of the Cross (1980-1993) as follows: Beiurt (31%), North (28%), Bekaa (10%), South (9%), and Mt. Lebanon (22%).

iv- Types of Drug Used:

- This section summarizes the main types of drugs used by patients in the different studies. Katchadourian and Sutherland (1975) reported that heroin and hashish alone or in combination with other drugs topped the list in their 1964 patients. Abdel Malak (1989) reported that 81% of the patients admitted to the Hospital of the Cross (1973-1987) used heroin with 37% in combination hashish. Among the patients admitted to Oum-El-Nour (1993-2000), heroin accounted for 59% and each of cannabis, cocaine, amphetamine, and alcohol for 30-34%. In the SGH and Hospital of the Cross series between 1980 and 1993, Zaarour (1994) reported that heroin accounted for 72% with other drugs less than 10% each. Yabroudi et al. (1999) reported on patients admitted to SGH (1980-1992): alcohol (50%) and heroin, cannabis, and cocaine (each 21-23%). Multiple substance abuse was noted in 45%.

The latter point brings attention to the fact that patients of substance abuse used multiple drugs (Melikian et al. 1975, Karam et al. 2000) and they also suffered from other mental health problems (Yabroudi et al. 1999, Baddoura 1992)

Comments

- The following table compares the prevalence of substance use among university students across studies.

Table 7.3.3-12 Substance abuse in Lebanese university students by study

	Prevalence of ever use (%)			
	Nassar et al. (1975): AUB 1973	Karam et al. (2000): USJ & AUB 1991	Makki and Hourri (1995): LU & LAU 1994-95?	Shediac-Rizkallah et al. (2001): AUB 1998
Alcohol		49.7		
Hashish			2.6	
Opium			0.7	
Cocaine		0.5	0.9	
Marijuana	17			
LSD	2			
Amphetamines	8			
Tranquilizers	17	10.2		
Barbiturates		8.4		
Opiate derivatives		0.9		
Stimulants		1.8		
Codeine		3.2		
Cannabis		2.6		
Heroin		0.4		
Sleeping pills	15			
Sedatives				

- The prevalence of 'drug addicts' was estimated by Succar to be 100,000 cases in 1992. If we assume the Lebanese population to be 4,000,000 then the prevalence becomes 2.5%.
- More than one-third of males and less than 20% of females drink alcohol.
- In general, males use and abuse of substances and drugs is a multiple of that of females.
- Most use of substances starts in the late teens and early twenties. However, addiction and admission for treatment follows in about 10 years.

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7.4 ISCHEMIC HEART DISEASE

Joseph Kahhaleh & Iman Nuwayhid

Background¹

Ischemic heart disease (IHD) has been described as a modern epidemic in Western societies. In England and Wales, 30 % of all deaths among men and 22 % among women are the result of IHD. More than 1 in 15 men die of coronary heart disease before the age of 65 accounting for more than one-quarter of all premature deaths. Women follow the same trend, but lag men by about 10 years.

There are marked international differences in the rate of occurrence of and death from IHD. Among men aged 40-50 years initially free of IHD, the annual occurrence of new cases varied from 15 per 10000 in Japan to 198 per 10000 in Finland. Mortality statistics show a similar picture as illustrated below:

Table 7.4-1 Age-standardized IHD death rates per 100000 population aged 35-74

Country	Year	Men	Women	Country	Year	Men	Women
Latvia	1994	919	303	Norway	1993	276	81
Russian Fed.	1994	812	280	Croatia	1994	269	132
Estonia	1994	707	252	Sweden	1993	252	77
Belarus	1993	664	256	USA	1993	248	100
Lithuania	1994	663	223	Austria	1994	241	80
Japan	1994	49	18	Germany	1994	237	79
Hungary	1994	452	173	Australia	1994	217	79
Ireland	1992	380	136	Canada	1994	212	75
Romania	1993	367	166	Israel	1994	199	93
Bulgaria	1994	352	132	Netherlands	1994	196	67
Finland	1994	346	98	Greece	1994	168	48
UK	1994	325	120	Italy	1992	153	43
New Zealand	1993	308	120	Spain	1993	130	36
Denmark	1993	306	120	Portugal	1994	128	47
Poland	1994	281	84	France	1994	94	24
Czechoslovakia	1993	460	166				

Source: British Heart Foundation Database. 1998

Variations between countries are partly due to differences in diagnostic practices and in coding of death certificates, but numerous studies have confirmed that the differences are real. Migrant studies provide support to environmental and behavioral differences.

¹ References:

1. Marmot MG and Mann JJ. Ischemic Heart Disease. In *Oxford Textbook of Medicine*, 3rd Ed. Weatherall DJ, Ledingham JGG, Warrell DA. Oxford: Oxford University Press, 1996. Pp 2305-2334.
2. Marmot MG, Mann JJ, Meade TW. Epidemiology and prevention of ischemic heart disease. In *Concise Oxford Textbook of Medicine*, 3rd Ed. Ledingham JGG, Warrell DA. Oxford: Oxford University Press, 2000. Pp 56-63.
3. Braunwald E. *Atlas of heart diseases. Chronic ischemic heart disease*. St.Louis: Mosby, 1995.

Risk factors have been associated with ischemic heart disease:

- *biological characteristics*, such as older age, male sex, and genetic predisposition,
- *physiological characteristics*, such as high blood pressure, high serum cholesterol level, high fibrinogen, and obesity
- *behavioral characteristic*, such as fatty food, excessive smoking, oral contraceptive (mild alcohol consumption has positive effect).
- *social characteristics* such as high social class and certain ethnic group

In the USA, there are approximately 1.5 million cases of myocardial infarctions each year. Approximately twice as many are admitted to the hospital with unstable angina pectoris and suspected or known myocardial infarction. Recently in the UK, 156,000 die from IHD every year and 115,000 are discharged from hospital discharges with the diagnosis IHD. In 60% of all fatal myocardial infarctions, death occurs in the first hours after attack There are approximately 300,000 new myocardial infarctions per year. Only half of these survive the acute event (60% of those die within hours of the attack) and 20% die in the first two years. Only 50% of initial survivors are alive at ten years.

Age is perhaps the greatest general predictor of risk of death from coronary heart disease. The case fatality rate is much higher in the old. Myocardial infarction in a 40-year-old man has a 5 week mortality risk of < 5%, whereas in a 75 year old man the risk of death is about 30%.

Ischemic Heart Disease in Lebanon

Available relevant references in Lebanon

In addition to national and local surveys, the following documents were found relevant to the purpose of this report.

Table 7.4-2 Selected references regarding IHD in Lebanon

Author (year)	Study Population/ Methodology
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
McLaren DS et al. (1964)	Descriptive study on 81 patients from the outpatient department (OPD) of AUBMC (August 1962- July 1963)
Abou-Daoud K (1968)	A case-control study that compared 91 Lebanese patients with CHD to a matched group of 100 controls (1964-1966) in AUBMC.
Sawaya JI et al. (1979)	Descriptive study on 763 patients admitted to CCU of AUBMC (July 1977- December 1978)
Jazra C et al. (1995)	Prospective study done on 201 patients admitted with MI to 6 hospital-CCUs in 1993. Assessed hospital survival.
Kassabian E (1996)	Descriptive study of 100 patients (> 70 years) admitted to HDF between January 1993 and October 1995 for CABG (coronary artery bypass).
Achou P (1996)	The study compared the specificity and sensitivity of TroponinT versus CPK-MB in the diagnosis of MI.

	It was done in HDF on 50 patient admitted because of angina.
Yazigi A et al. (1998)	Follow-up on 100 with CABG in HDF to evaluate the prognostic value of recording ST-segment changes within 24 hours after bypass.
Sawaya J et al. (1999)	Prospective study (Jan-June 1996) on 433 patients admitted to CCU of 18 medical centers in different regions in Lebanon. Assessed gender differences.
No Author. (Hospital 1988; 11: 42-46)	This report describes 1950 open-heart cases (1991- 1997) at Notre Dame de Secours- Jbeil.
Sibai A et al. (2001)	A follow up study of 1567 individuals 50-years of age and over to estimate overall cardiovascular diseases and overall mortality.

Summary Findings

General Population

In its survey of the 8906 residents of Beirut in 1993-1994 (Nuwayhid et al. 1997), the FHS survey reported the prevalence (%) of heart disease (i.e., IHD and other heart diseases) by age and sex:

Table 7.4-3 Prevalence of IHD by age and sex in Lebanon

	0-9	10-19	20-29	30-39	40-49	50-59	60-69	>=70	All ages
Males	0.4	0.0	0.2	0.9	4.6	11.7	15.0	24.1	4.3
Females	0.2	0.3	0.2	0.9	3.2	8.2	16.4	24.4	3.9

Source: Nuwayhid et. Al. 1997

The NHHEUS 1999 reported that 3.5% of a weighted sample of 32838 persons from all over Lebanon reported cardiac problems (3.8% males; 3.3% females).

In the Prostate Screening Campaign (1997-1998), 15% of the 7452 men (mean age 62.4, SD 7.9) reported cardiac disease.

In their follow up study, Sibai et al (2001) estimated a proportionate mortality rate of 40.4 for IHD out of a total 416 deaths. Ten-year mortality rate was estimated at 16.2, 95%CI (3.5-19.5) per 1000 person years for males and 7.6 per 1000 person years (5.82-9.93) for females.

Use of Health Services

Cardiovascular diseases were the leading causes of death in the Beirut 1992-1993 population (Nuwayhid et al. 1997). It is reported that 4000 cases of myocardial infarction, 4000 cases of sudden death, and 3000 open heart surgeries occur every year, in addition to a noted increase in the incidence of cardiac disease among the young population.

The NHHEUS 1999 reported that 13% of all 3981 hospital admissions were due to diseases of the circulatory system (not specified further). The list of discharge diagnoses provided by the three hospitals in Beirut (Chapter 5) showed that 4500 out of 60,000 diagnoses (7.5%) were due to IHD. IHD also accounted for 784 out of the 41,000 MedNet insurance claims (1.9%).

Demographic Characteristics

The following table indirectly reveals that the male to female ratio among IHD patients is around 4:

Table 7.4-4 Percentage of IHD cases by sex in selected studies

Author (yar)	% Female	% Male	Study Population
McLaren et al. (1964)	16%	84%	81(AUBMC: 1962-1963)
Abou Daoud (1968)	22%	78%	91(AUBMC: 1964-1966)
Sawaya et al. (1979)	20%	80%	763 (AUBMC: 1977-1978)
Jazra et al. (1995)	25%	75%	201 (6 hospitals: 1993)
Kassabian (1996)	22%	78%	100 older than 70 (HDF: 1993-1995)
Achou (1996)	32%	68%	50 angina (HDF: 1995 or 1996)
Yazigi et al. (1998)	22%	78%	100 underwent CABG (HDF)
Sawaya et al. (1999)	23%	77%	432 (18 centers: 1996)

The majority of patients with IHD fall in the 50-70 years age group. The following table summarizes some of the findings from different studies:

Table 7.4-5 Age distribution if IHD patients in selected studies

	<40	40-50	50-60	60-70	>70	Study population
McLaren DS et al. (1964)	4.9%	16%	31%	34.5%	13.6%	81 OPD patients (1963)
Abou Daoud K (1968)	5.5%	12.1%	38.5%	30.8%	13.1%	91 CHD (1964-1966)
Hospital (1989)	9.2%	31.1%	59.7%			1950 open heart surgery (1991-1997)
Jazra C et al. (1995)	4.47%	18.4%	27.9%	33.8%	15.42%	201 MI patients in 1993

A higher proportion of young patients (< 40 years) were noted among those undergoing open-heart surgery (Hospital 1989). This is higher than the proportion reported in other centers in other countries: Mexico-Centro Medico Laraza (5.6%), France-Val de Grace (4.2%), USA-Atlanta University (2.5%).

Hospital Survival

In their multicenter study of 201 MI patients in 1993, Jazra et al. (1995) reported that 29 patients (18 males and 11 females) died within one week. The overall mortality rate was 14.4% distributed by age as follows:

Table 7.4-6 Mortality rate of IHD patients by age

<65 years	65-75 years	>75 years
11%	27%	21%

Source: Jazara et al. 1995

In their study of gender differences, Sawaya et al. (1999) reported that the incidence of recurrent MI was higher in females than males (11 vs. 3%, $p=0.003$) as was that of recurrent ischemia (32 vs. 22%, $p=0.05$). The average length of stay in CCU was similar in both groups (5.26 days $\pm$ 3.07 in males vs. 5.61 $\pm$ 3.04 in females). The overall mortality rate for the whole population was 10.2% (16.2% for females vs. 8.1% for males, $p=0.037$). Mortality was higher in females for all age groups above 50 years.

Table 7.4-7 Mortality rates of IHD by age

	<51	51-60	61-70	>70	All ages
Males	6.9%	5.4%	10.8%	13.2%	8%
Females	7.7%	12.3%	16.1%	24.6%	16%

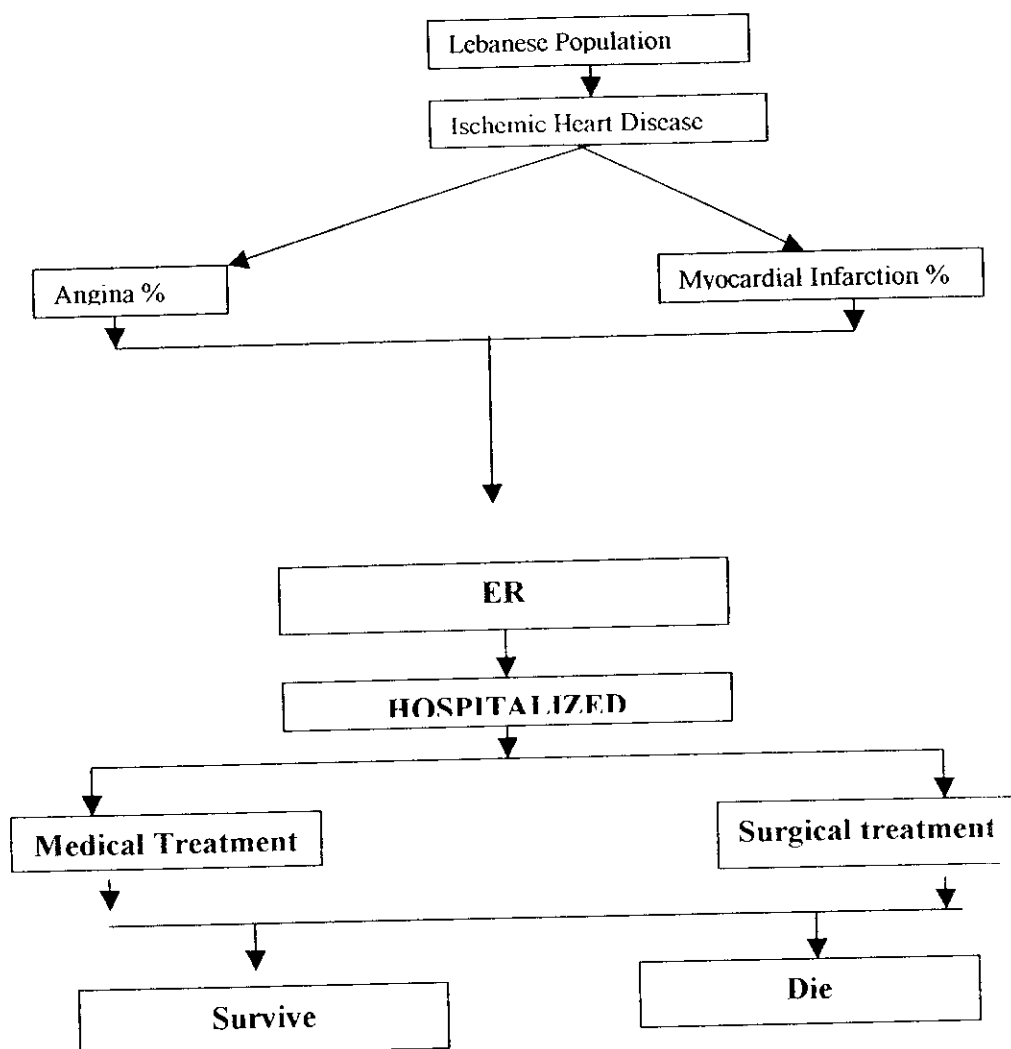
Numbers are computed from the diagram. scaling error is possible

Source: Sawaya et. al. 1999

Comments

- The prevalence of reported heart problems in the general population increases gradually with age, with almost a quarter of the population older than 70 years of age.
- The prevalence of reported heart problems in the general population is not strikingly different between males and females.
- The male to female ratio of patients admitted to hospitals or operated on for IHD is around 4.
- An increase of MI patients and open-heart surgery is noted in the less than the 40 years old population.
- Mortality is higher among females admitted to hospitals with MI.
- In-hospital mortality of MI patients increases with the age of the patient.
- Hospital survival for MI patients in Lebanon is not strikingly different than in western countries.

The following flowchart will help guide the natural history of a patient with IHD:



References

1. Abou Daoud K. Coronary heart disease. Associations observed in hospitalized patients. *J Med Liban*, 1968; **21**:49-57.
2. Achou P. Troponine T et infarctus du myocarde. *These*. USJ, Faculte de Medecine. Beirut, Lebanon, 1996.
3. Ghosn R, Ghossaini S, Hajjar I, Hajjar M, Al Kass HF, Hasbini D, Hassan R, Helou B. Atherosclerosis in Lebanon: Why? A student project. Beirut: American University of Beirut, Faculty of Health Sciences, 1991.
4. Jazra C, Khoury A, Adem N, Alam S, Chalak W, Farhat F, Khoury J, Najjar F, Obeid M. Survie hospitaliere dans l'infarctus du myocarde. Etude multicentrique de 201 patients en 1993. *J Med Liban*, 1995; **4**: 131-134.
5. Kassabian E. Les pontages aorto-coronariens chez les patients ages de plus de 70 ans. *These*. USJ, Faculte des Sciences Medicales, 1996.
6. McLaren DS, Ammoun C, Houry G, Foster I. Coronary heart disease in Lebanon. A public health problem. *J Med Liban*, 1964; **17**:15-21.
7. Ministry of Public Health (MOPH). National Household Health Expenditure and Utilization Survey (NHHEUS). 1999.
8. Nuwayhid I, Sibai A, Adib S, Shaar K. Morbidity, mortality, and risk factors. In Beirut: A Health Profile 1984-1994. Deeb M, (ed). Beirut: American University of Beirut, 1997. Pp.123-182.
9. Sawaya J, Jazra C, Farhat F, Alam S, Eid EV, Sabra R. In-hospital mortality after acute myocardial infarction in Lebanon: incidence, associations, and influence of newer treatment regimens. *J Med Liban*, 2000; **48**:63-69.
10. Sawaya J, Jazra C, Eid E, Sabra R. Gender differences in the diagnosis and treatment of acute myocardial infarction in Lebanon. *J Med Liban*, 1999; **47**:2-6.
11. Sawaya JI, Mujais SK, Armenian HK. Early diagnosis of pericarditis in acute myocardial infarction. *Am Heart J*, 1980; **100**:144-151.
12. Sawaya JI, Atweh G, Armenian H. Coronary care experience in a university hospital. *M. E. J. Anaesth*, 1979; **5**:249-267.
13. Sibai AM, Armenian HK, Alam S. Wartime determinants of arteriographically confirmed coronary artery disease in Beirut. *Am J Epidemiol*, 1989; **130**:623-631.
14. Sibai AM, Fletcher A, Hills M, Campbel O. Non-communicable disease mortality rates using the verbal autopsy in a cohort of middle aged and older population in Beirut during wartime, 1983-93. *J Epidemiol Community Hlth*, 2201

15. Yazigi A, Richa F, Gebara F, et al. Prognostic importance of automated ST-segment monitoring after coronary bypass graft surgery. *Acta Anaesthesiol Scand*, 1998; **42**:532-535.

16. Other references:

- a. An interview with Dr. C Jazra: Smoking is the most dangerous and prevention is possible. In As-Safir Daily Newspaper July 31, 1999.
- b. No author. Smoking, cholesterol, hyperload, hypertension. Four Reasons for one result: Cardiac disease before the age of 40. Hospital 1998; 11:42-46.

7.5.1 CHRONIC OBSTRUCTIVE PULMONARY DISEASES (COPD)

Joseph Kahhaleh & Iman Nuwayhid

Background¹

The American Thoracic Society (ATS) defines chronic obstructive pulmonary disease (COPD) as a disease state characterized by the presence of airflow obstruction due to chronic bronchitis or emphysema. The airflow obstruction is generally progressive and may be accompanied by airway reactivity and be partially reversible. It is a separate condition from asthma that is characterized by airways obstruction that is completely irreversible.

Chronic bronchitis is defined as the presence of chronic productive cough on most days for 3 months, in each of two consecutive years, in a patient in whom other causes of chronic cough have been excluded.

Emphysema is defined as abnormal, permanent enlargement of the air spaces distal to terminal bronchioles, accompanied by destruction of their walls and without obvious fibrosis.

COPD is diagnosed on the basis of a reduction in FEV₁ of 2 standard deviations below predicted. Cigarette smoking is a major factor in the development of COPD and a dose response relationship has been established. The risk of death from COPD in a patient smoking 30 cigarettes per day is 20 times that of non-smokers. It occurs in 18% of males and 14% of female smokers as compared to 7 % and 6% of never smokers, respectively. A survey of urban and rural populations in the UK reported a history of chronic bronchitis in 17.6% of males aged 55-64 who were heavy smokers, in 0.9% of light smokers, in 4.4% of ex-smokers and 0% in non-smokers. Pipe and cigar smokers have a much lower prevalence of chronic bronchitis and less impairment of respiratory function, despite a similar capacity for cigarette smoke and cigar smoke to cause bronchial reactivity.

Compared to smoking, climate and air pollution are of less importance. Nevertheless there is a great increase in mortality from COPD during periods of heavy atmospheric pollution. The effect of urbanization, social class and occupation may also play a part in etiology but these effects are difficult to separate from that of smoking. Diet appears to be a risk factor for COPD. Fresh fruit and vegetables may be preventative.

Chronic bronchitis and emphysema are contributory factors to cause of death. Most of the mortality from this condition occurs in the over 65 years age group.

¹ References:

1. Seaton A, Seaton D, Gordon L.A. Crofton and Douglas's Respiratory Diseases, 5th Ed. Blackwell Science, 2000.
2. Kumar P, Clark M. Clinical Medicine, 4th Ed. WB Saunders, 1997.

COPD in Lebanon

Available Relevant References in Lebanon

In addition to national or local surveys, only one article was identified regarding COPD in Lebanon.

7.5-1 Selected references regarding respiratory diseases and COPD in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Habib Y (1971)	Review of the medical charts of 2000 patients with respiratory problems (excluding tuberculosis) seen in Bhanes Sanatorium/ Hospital and author's private clinic between 1968-1971

Summary Findings

General Population

The NHHEUS 1999 survey (MOPH 1999) inquired about chronic diseases in a weighted sample of 32,838 individuals and reported that 4% of respondents had a chronic disease of the respiratory system diagnosed by a medical professional (4.4% of males and 3.7% of females).

Similarly, when asked about chronic diseases, 1% of males and 1.3% of females of the FHS 1992-1993 Beirut survey (Nuwayhid et al. 1997) reported the presence of a respiratory disease. The distribution among the 8906 residents of Beirut by age and sex was as follows:

Table 7.5-2 Presence of respiratory diseases by age and sex in Beirut

Respiratory diseases	0-9	10-19	20-29	30-39	40-49	50-59	60-69	=>70	All ages
Males	1.2	1.1	0.5	0.5	0.9	1.1	1.6	2.1	1.0
Females	1.2	0.9	0.5	1.0	1.1	1.9	2.2	6.6	1.3

Source: Nuwayhid et al. 1997

It is important to note that the two surveys inquired about respiratory conditions in general, and not COPD in specific.

Clinical Setup

Out of the 60,000 discharge diagnoses reported by AUBMC, SGH, and Makassed General in 1999-2000, 332 (0.6%) were COPD.

Habib (1971) reviewed the experience of a single referral sanatorium (Bhannes) in addition to his own personal experience. The medical charts of 2000 patients with pulmonary diseases (excluding tuberculosis) were admitted to the hospital or treated in the clinic over a period of 3 years (1968-1971). A total of 223 patients (11%) had chronic bronchitis distributed as follows: simple bronchitis (40%), emphysematous bronchitis (55%), and asthmatic bronchitis (5%). Of those, 72% were males and 70% came from Beirut and its suburbs. Patients ranged in age from 21 to 80 years with the following distribution:

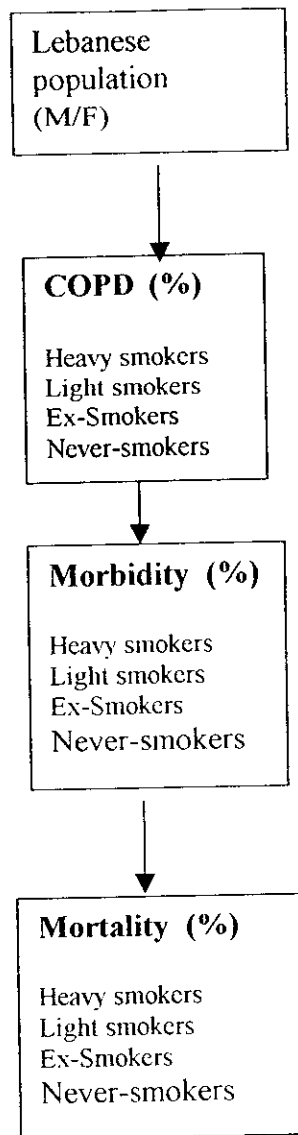
21-30	31-40	41-50	51-60	61-70	71-80
7%	13%	16%	24%	30%	10%

Two thirds of the patients were smokers with gender differences. Whereas 81% of the males were smokers, only 31% of the females were.

Comments

Recent data on COPD in Lebanon is non-existent. Nevertheless, we should not be surprised if the prevalence of COPD is on the rise with the increased prevalence of smoking, especially among women, and with air pollution.

The following flowchart might be helpful in future estimates:



References

1. Habib Y. Contribution to the study of chronic bronchitis in Lebanon. *LMJ*, 1971; **24**: 611-618.
2. Ministry of Public Health. National Household Health Expenditure and Utilization Survey (NHHEUS). 1999.
3. Nuwayhid I, Sibai AM, Adib S, Shaar K. Morbidity, mortality, and risk factors. In Beirut: A health profile 1984-1994, Deeb M (ed). Beirut: American University of Beirut, 1997. Pp 123-182.
4. Sibai AM, Fletcher A, Hills M, Campbel O. Non-communicable disease mortality rates using the verbal autopsy in a cohort of middle aged and older population in Beirut during wartime, 1983-93. *J Epidemiol Community Hlth*, 2201

7.5.2 ASTHMA

Joseph Kahhaleh & Iman Nuwayhid

Background ²

Asthma is a disease of the airways, characterized by airways inflammation and increased responsiveness to a wide variety of stimuli. For many years, it has been taught that asthma is a disease characterized by reversible airway obstruction with no long-term deterioration in lung function. Recently asthma is referred to as a potentially irreversible condition. Recurrent asthmatic events produce chronic changes in airway morphology. These result in permanent and poorly alterable abnormalities in lung function that worsen with time and put the affected individuals at risk for increased morbidity and or death.

Asthma is the most common chronic disease of children affecting 7-10% of the pediatric population. It is widely distributed with a prevalence that is geographically variable. The prevalence of asthma is increasing in many countries. The cumulative prevalence of asthma in western countries shifted from 6 to 12% between 1975 and 1988.

In the USA, the incidence of diagnosed asthma is highest in the first year of life. In childhood, the incidence is higher in boys than girls, but it reverses in the age group 15-50 years and reverses again in the older age group when the incidence among men increases once more.

The natural history of asthma has not yet been resolved. Studies focused mostly on the course of the disease from early childhood to young adulthood. Several cohort studies have demonstrated that as many as 50 % of infants and children with recurrent cough and or wheezing outgrow asthma in later childhood and adolescence.

² References:

1. McFadden ER. Natural history of chronic asthma and its long-term effects on pulmonary function. *J. Allergy Clin. Immunol.*, 2000; **105**: 535-539.
2. Silverstein MD, Reed CE, O'Connell EJ, Melton LJ, O'Fallon WM, Yunginger JW. Long term survival of a cohort of community residents with asthma. *N Engl J Med*, 1994; **331**: 1537-41.
3. American Thoracic Society. Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med*, 1995; **152**: S77-S121.
4. Settipane GA, Greisner WA, Settipane RJ. Natural history of asthma: a 23-year followup of college students. *Ann Allergy Asthma Immunol.* 2000; **84**: 499-503.
5. Warner JO, Pohunek P, Marguet C, Roche WR, Clough JB. Issues in understanding childhood asthma. *J. Allergy Clin. Immunol.*, 2000; **105**: S473-476.
6. Bernstein DI. The natural history of adult asthma: What do we know? *Ann Allergy Asthma Immunol.* 2000; **84**: 469-470.
7. Kumar and Clark. *Clinical Medicine*. 4th ed. Saunders, 1988. Pp 786.
8. Seaton A, Seaton D, Gordon LA. *Crofton & Douglas's Respiratory Diseases*, 5th Ed. Blackwell Sciences, 2000.
9. Majdalani PE. Severe asthma in children. *J Med Liban.* 1995; **43**: 83-8.

In a 23 year follow-up study of college students, 84 out of the 738 individuals recontacted reported a history of asthma. Of these, 44 (52%) had active asthma and 40 (48%) were symptom free. A majority of (85%) of those with inactive asthma were symptom free for 5 years or longer. New asthma occurred in 36 (5.2%) of those at risk to develop new asthma in this 23-year period, for a rate of 0.23% per year. It was concluded that the cumulative prevalence of asthma continues to increase as the individuals become older.

The economic burden of asthma is considerable. In the United Kingdom in 1993, asthma accounted for 11% of the total costs of prescription drugs and more than 100,000 hospital admissions. The indirect cost of asthma cannot be easily quantitated. However, a negative impact of asthma on expected longevity has not been documented. According to the Centers for Disease Control and Prevention (CDC), there were 10 million individuals with asthma and 5106 deaths from asthma in 1991 in the US.

Asthma In Lebanon

Available Relevant References in Lebanon

In addition to a few national or local surveys, the following documents were found relevant to this report.

Table 7.5.2-1 Selected references regarding asthma in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Ramadan F et al. (1999)	To assess prevalence of allergic rhinitis and atopic eczema in school children (13-14 years) in Beirut. More than 2000 children completed the ISAAC written and video questionnaires in 1996.
Yazigi A & Mudawwar F (year is not listed)	Review of all 3049 pediatric patients (< 14 years) who presented to the emergency service of AUBMC (September 1980 – August 1981): 472 asthma.
Mouannes W (1997)	Review of all 11600 patients who visited the emergency service of HDF in one year (December 1995 - December 1996): 142 had asthma.

Summary Findings

General Population

The NHHEUS (MOPH 1999) reported an overall prevalence of asthma of 1.7% all over Lebanon (1.9% males and 1.6% females).

The Beirut 1992-1993 FHS survey (Nuwayhid et al. 1997) reported that 2.1% of all males and 1.8% of all females reported asthma. The distribution by age and sex among the 8906 residents of Beirut was as follows:

Table 7.5.2-2 Age and sex distribution of Beirut residents reporting asthma

	0-9	10-19	20-29	30-39	40-49	50-59	60-69	=>70	All ages
Asthma									
Males	2.8	3.6	1.2	0.5	1.4	1.3	1.4	4.8	2.1
Females	1.6	2.4	1.1	1.5	2.7	2.4	3.3	3.0	1.8

Source: Nuwayhid et al. 1997

A U-shape relationship was noted with higher prevalence of asthma in the younger and older populations.

Ramadan F et al. (1999), in a cross-sectional study of 13-14 year old children in 32 schools in Beirut, reported that 23% of the 2059 interviewed students ever wheezed.

Clinical Setup

Asthma accounted for 243 out of the 60,000 discharge diagnoses (0.4%) listed by 3 major hospitals in Beirut in 1999-2000 and for 308 medical insurance claims out of 41,000 claims (0.75%) processed by MedNet in 1999 (Chapter 5).

Yazigi and Mudawwar reviewed the emergency records of all pediatric patients (less than 14 years of age) who visited AUBMC-ER over one year (1980-1981). A total of 3049 complained of a respiratory problem among which 2577 had respiratory infection (84.5%) and 472 had asthma (15.5%). Mouannes (1997) reported that over a one year period (1995-1996) at the HDF-ER, a total of 11600 patients were seen out of which 142 were diagnosed with asthma (1.2%).

A high male to female ratio was noted in both studies. The distribution by age was as follows:

Table 7.5.2- 3 Age distribution of Lebanese asthmatic patients in selected studies

	7 m.	<2 yr	2-5 yr	5-14 yr	14-45 yr	45-84 yr	unknown	Total
Yazigi & Mudawwar (year is not listed)		58 (12.3%)	116 (24.1%)	295 (62.6%)			3 (0.5%)	472
Mouannes (1996)		80 (56.3%)			27 (19%)	35 (24.6%)		142

Mouannes noted that a higher proportion of older people presenting to ER with asthma were admitted to hospital:

Table 7.5.2-4 Age distribution of asthmatic patients in the HDF-ER

Age group	ER	Hosp Admission
Pediatric	80 (56%)	4/80 (5%)
Adult	27 (19%)	3/27 (11.1%)
Elderly	35 (24%)	6/35 (17.1%)

Source: Mouannes. 1996

Both studies noted that ER visits for asthma were highest in the autumn and lowest in the winter.

Comments

Less than 2% of the Lebanese population reported asthma, with a higher prevalence in the younger and older populations. No studies were identified regarding hospital use and morbidity of asthmatic patients.

References

1. Ministry of Public Health. National Household Health Expenditure and Utilization Survey (NHHEUS). 1999.
2. Mouannes W. Etude epidemiologique sur l'asthma. *These*. USJ, Beirut, 1997.
3. Nuwayhid I, Sibai AM, Adib S, Shaar K. Morbidity, mortality, and risk factors. In Beirut: A health profile 1984-1994. Deeb M (ed). Beirut: American University of Beirut, 1997. Pp.123-182.
4. Ramadan FM, Khoury MN, Hajjar TA, Mroueh SM. Prevalence of allergic diseases in children in Beirut: comparison to worldwide data. *LMJ*, 1999; **47**: 216-221.
5. Yazigi A, Mudawwar F. Childhood asthma in Lebanon: An epidemiologic study. *Arab Journal of Medicine*, (year is not listed); **2**:6-8.

7.6.1 PEPTIC ULCER

Joseph Kahhaleh & Iman Nuwayhid

Background¹

Duodenal Ulcer (DU) and Gastric Ulcer (GU) are often grouped together as peptic ulcers. However, they differ in their epidemiology, natural history, and outcome.

Duodenal Ulcer (DU)

DU is a superficial or deep break in the mucosa of the duodenum. Its etiology is not clear. It is generally assumed to be the product of an imbalance between the damaging effects of acid and pepsin and the mucosal defense. Those at higher risk for DU are not known, nor the reasons behind the episodes of intermittent relapses.

DU may affect 10 to 15% of a population, but this varies widely by geographical location. DU is also more common in men than women. Its prevalence among women increases after the menopause, suggesting a role for the sex hormones in its etiology. Risk factors include low-residue diet, coffee, and soft drinks. Smoking and intake of alcohol and anti-inflammatory drugs are weakly associated with DU. Genetic predisposition is suggested, since it is more common in close family members and patients with blood group O. A role for *Helicobacter pylori* has been suggested, as well as for stress and life style.

The characteristics of the disease appear to change with time. A decrease in the incidence of perforated ulcers in males and an increase in the rate of ulceration in elderly women has been noticed. In general, DU is changing with time towards a less severe clinical form.

The main symptom of DU is pain. Nausea and vomiting are unusual, unless there is pyloric stenosis. Mid-back pain, or pancreatitis, result from posterior penetration of a duodenal ulcer into the pancreas. The course of the illness is variable. DU is a condition of spontaneous relapses and remissions. Some patients suffer only a single episode of ulcer while in others the illness is progressive, with rare remissions and severe complications 15 % hemorrhage and 1 % perforation. Approximately 50% of patients who die from a peptic ulcer are unaware of their ulcer at the time of their fatal admission.

Gastric Ulcer (GU)

Gastric ulcer is a break in the gastric mucosa, mostly on the lesser curvature. Its size varies from a few millimetres to several centimetres in diameter. The cause of benign GU is uncertain but approximately 80% are associated with *H. pylori* infection. Associations with other medical conditions are doubtful, but non-steroidal anti-inflammatory drugs may cause gastric ulceration.

¹ References:

1. Misiewicz JJ, Pounder RE. Peptic Ulcer. In *Oxford Textbook of Medicine*, 3rd Ed. Weatherall DJ, Ledingham GG, Warrell DA (eds). Oxford: Oxford University Press, 1996.

GU is common in both genders, older age groups, and in patients of low socioeconomic status. It is less common than duodenal ulcer. Benign GU typically presents with epigastric pain, but many patients remain asymptomatic until they present with a complication. Gastric ulceration is a recurrent chronic condition. GU complications include acute or occult gastrointestinal hemorrhage (15% of patients), perforation (1%), or pyloric stenosis. Ten percent of those who bleed die. However, the average age of GU patients presenting with hemorrhage is gradually increasing.

Peptic Ulcer in Lebanon

Available Relevant References in Lebanon

Only three documents that addressed peptic ulcer among the Lebanese were identified. The three were clinical, but will be used to extract a few numbers.

Table 7.6-1 Selected references regarding peptic ulcer in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Jidejian Y (1966)	Review of AUBMC's experience (1946-1963) with surgical treatment of gastro-duodenal ulcer (1150 PU cases: 643 Lebanese/ 507 non-Lebanese)
Fadel P (1997)	Review of 63 cases of sclerotherapy in the treatment of hemorrhagic ulcer (January 1990 – June 1996 at HDF)
Sayegh R et al. (1992)	A two-month follow-up of 21 patients treated with Famotidine for GU in HDF.

Summary Findings

General Population

The NHHEUS 1999 survey (MOPH 1999) found that 3.1% of more than 32000 surveyed individuals reported peptic ulcer (3.0% males, 3.1% females). A few years earlier, the FHS survey of a sample of residents of Beirut in 1992-1993 (Nuwayhid et al. 1997) reported that 1.8% of the total sample had peptic ulcer. The age-sex distribution of the prevalence (%) of PU in Beirut was as follows :

Table 7.6-2 Age and sex distribution of Beirut residents with peptic ulcer

	No. cases	0-9	10-19	20-29	30-39	40-49	50-59	60-69	>= 70	All
Males	82	0.0	0.2	0.8	0.9	3.7	3.6	7.6	4.3	1.9
Females	82	0.0	0.0	0.7	2.1	3.0	4.1	4.6	3.0	1.8

Clinical Setup

Out of the 60,000 discharge diagnoses listed by three main hospitals in Beirut for 1999-2000, 271 (0.45%) were peptic ulcer (See Chapter 5).

In the AUBMC series of 1150 PU patients between 1946-1963 (Jidejian 1966), the following findings were reported:

- 56% (643/1150) were Lebanese
- 88% had DU and 15% had GU
- 80% of DU and 71% of GU were males
- The sample was split almost equally between Christians and Moslems
- 50% of the DU patients and 43% of the GU underwent surgery.
- Overall complication rate was 10.6 % (66/1150).
- The mortality rate was 1.1%

More recently, Fadel (1997) reviewed the characteristics of 140 cases of gastrointestinal hemorrhage admitted to HDF between January 1990 and June 1996. Of those, 63 were due to PU and had the following characteristics:

- 76% (48/63) were males
- The mean age was 59 years (range 10-89yr), with 56% older than 60 years half of the younger patients (< 60 years) were between 50 -60 years
- Non-steroidal anti-inflammatory drugs (NSAID) were reported in 65% of the cases, smoking in 37%, and alcohol in 7%
- The complication rate from a procedure was 9.5%
- The mortality rate from hemorrhage was 7.9%

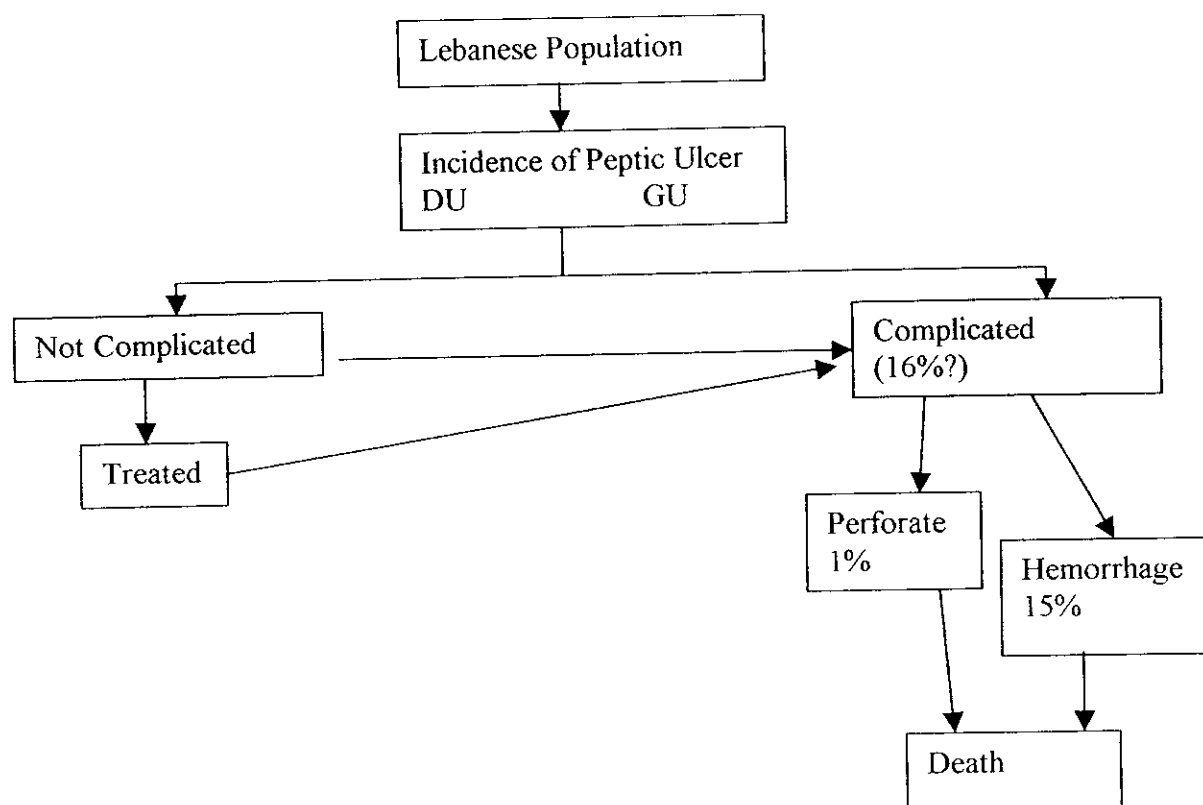
Using a small sample size, Sayegh et al (1992) evaluated the use of famotidine in the treatment of gastric ulcer. The mean age of their 21 patients was 49 years (SD 14). Two-thirds were women.

Comments

Information about PU in Lebanon is very limited. The national and local surveys suggest an overall prevalence of 2-3%, which increases gradually with age. While no major differences between males and females regarding prevalence were observed. The clinical studies have pointed to a higher proportion of males. Those studies, however, are limited to specific centers and have evaluated specific modes of therapy.

Natural History of Peptic Ulcer - Lebanon

The following flowchart is helpful for later evaluation.



References

1. Fadel P. Sclerotherapy in the treatment of gastrointestinal bleeding due to ulcer. *Thesis*, USJ, 1996-1997.
2. Jidejian Y. 35 years of gastroduodenal ulcer surgery in Lebanon. *Rev Med Moyen Orient*, 1966; **23**: 8-16.
3. Ministry of Public Health. National Household Health Expenditure and Utilization Survey (NHHEUS). 1999.
4. Nuwayhid I, Sibai AM, Adib S, Shaar K. Morbidity, mortality, and risk factors. In Beirut: A health profile 1984-1994, Deeb M, (ed). Beirut: American University of Beirut, 1997. Pp. 123-182.
5. Sayegh R, Khoury K, Nassr W. Famotidine in the treatment of stomach ulcer. *J Med Liban*. 1992; **40**:11-15.
6. Sibai AM, Fletcher A, Hills M, Campbel O. Non-communicable disease mortality rates using the verbal autopsy in a cohort of middle aged and older population in Beirut during wartime, 1983-93. *J Epidemiol Community Hlth*, 2201

7.7.1 CHRONIC RENAL FAILURE

Joseph Kakhaleh & Iman Nuwayhid

Background¹

Chronic renal failure (CRF) is an irreversible, substantial, and usually long standing loss of renal function. It is classified based on kidney function (glomerular filtrate rate (GFR)) into mild (GFR = 30-50 ml/min), moderate (GFR = 10-29 ml/min), severe (GFR <10 ml/min), and end-stage (GFR <5 ml/min). End-stage renal disease (ESRD) requires renal replacement treatment (dialysis or transplant). In spite of its relatively low prevalence compared to cancer or heart diseases, renal failure represents a substantial burden on health services.

The prevalence of CRF is always underestimated because many patients remain asymptomatic. Hence, the magnitude of the problem is indirectly measured by assessing the number of new and old cases of ESRD that require dialysis or transplant. This, however, is strongly dependant on the availability of renal replacement treatments and their accessibility to patients.

The annual incidence and prevalence of ESRD differs by country as shown in the table below.

Table 7.7-1 Incidence and prevalence of ESRD by selected countries

Country	Incidence (per million)	Prevalence (per million)
USA (1990)	169	659
Austria (1992)	110	440
France (1992)	77	409
W. Germany (1992)	94	387
Sweden (1992)	99	509
UK (1992)	65	382
Australia (1993)	61	403

¹ References:

1. Weatherall DJ, Ledingham JGG, Warrell DA. Oxford Textbook of Medicine. 3rd Ed. Oxford: Oxford University Press, 1996.
2. Davidson A et al. Oxford textbook of clinical nephrology. 2nd Ed. Oxford Medical Publications, 1998.

The incidence of chronic renal failure also differs by age as reflected by the experience from the United Kingdom:

Age (years)	Incidence (per million)	Confidence interval
0-19	6	2-14
20-49	58	38-78
50-59	160	96-224
60-69	282	197-271
70-79	503	370-636
80+	588	422-754

The incidence of ESRD among children was also shown to be 1-5 per million in other European countries. In west Germany, the incidence increased from 1.6 per million among 0-5 year old children, to 4 among 5-10 year old children, and .1 per million for those 10-16 years old. The proportion of children who received renal replacement treatment also increased with age. In the USA, the adjusted incidence of ESRD was 11 per million children of 0-19 years old. The incidence of CRF in children remains underestimated because of variable, and sometimes strict, control on provision of renal replacement therapy to children, especially young ones.

Differences are also noted among genders and different ethnic groups. In the USA, the annual incidence of ESRD among African and native American is nearly four times that among Caucasians (424 vs. 114 per million).

Survival from ESRD should account for age, comorbid conditions, poverty, and race. The experience of Japan and several North American and European countries suggest the following:

Age (years)	SURVIVAL (%)		
	1-year	2- year	3-year
60-74	65-80	47-65	17-37
>= 75	54-75	28-58	4-20

Admission to hospital and hospital stay also increases with the age of patient with ESRD and the presence of comorbid conditions. Patients older than 60 years on peritoneal dialysis spend 18 days a year in hospital as compared to 15.4 days a year for those younger than 60. Patients older than 65 on hemodialysis spend 15 days a year (1.9 admissions) as compared to 9.8 days (1.4 admissions) for those aged 45 to 64 years. Diabetic patients over 65 years of age averaged 18 days a year as compared with 12 days for non-diabetics.

Chronic Renal Failure in Lebanon

Available Relevant References in Lebanon

In addition to national and local surveys, more than 20 documents about renal diseases in Lebanon were identified. However, only four documents were relevant to the purpose of this report. The others lacked epidemiological data or were literature reviews or case reports.

Table 7.7-2 Selected references regarding renal failure in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Nassif E and Kutran K (1985)	Reviewed the social and demographic profile of all 407 ESRD patients undergoing hemodialysis in Lebanon under the MOPH (1983-1984).
Farah G (1989)	Review of medical charts of 88 cases admitted to HDF (1987-1989)
Youssef J (1999)	Review of medical charts of 20 pediatric patients admitted to HDF (January 1993 - June 1998)
Mourani et al. (1999)	Study of all 20 Lebanese patients with ESRD on hemodialysis in June 1997.

Summary Findings

General Population

The NHHEUS 1999 survey (MOPH 1999) reported that 1.8% of its sample from all over Lebanon (1.4% males; 2.2% females) reported a kidney problem that had been documented by a physician. The Beirut 1992-1993 survey conducted by FHS (Nuwayhid et al. 1997) presented the following age-sex distribution of the prevalence (%) of any renal condition among 8906 residents:

Table 7.7-3 Age and sex distribution of Beirut residents with a renal condition

	No. cases	0-9	10-19	20-29	30-39	40-49	50-59	60-69	=>70	All ages
Males	70	0.0	0.2	1.5	1.6	3.2	3.2	3.0	4.3	1.6
Females	123	0.0	0.3	1.5	3.9	4.7	4.5	6.0	4.6	2.7

Source: Nuwayhid et al. 1997

Clinical Setup

A total of 1157 diagnoses of nephritis and nephrosis (1.9%) were reported among the 60,000 discharge diagnoses listed by three main hospitals in Beirut for 1999-2000 (See chapter 5).

Nassif and Kutran (1985) reviewed the characteristics of all ESRD patients treated in Lebanon under MOPH. This was based on the system introduced by the Unit for Health Systems Planning at MOPH in 1983, which required the registration of all ESRD patients undergoing hemodialysis covered by MOPH. The study sample included 407 ESRD patients registered under the newly implemented system up till the end of December 1984. Of 407, only 20 patients (5%) have either died or terminated hemodialysis at the time of the study. The distribution by gender was 54% males and 46% females, and by age as follows:

Table 7.7-4 Age distribution of hemodialysis patients registered with MOPH

Age (years)					
<25	25-34	35-44	45-54	55-60	>60
50 (12%)	46 (11%)	51 (13%)	97 (24%)	55 (14%)	107 (26%)

Source: Nassif and Kutran. 1985

Nassif and Kutran (1985) also reported the primary etiology of chronic renal failure among the 407 treated hemodialysis patients in Lebanon in 1984:

Pyelonephritis	114	28%
Chronic glomerulonephritis	98	24%
Nephroangiosclerosis	33	8%
Diabetic nephropathy	26	6%
Polycystic Kidney disease	13	3%
Primary hypertension	11	3%
Interstitial nephritis	9	2%
Others	18	5%
Not stated	85	21%

Farah (1989) limited her review to 88 patients with renal failure on dialysis in HDU between 1987-1989. Males constituted 66% of the sample, and the majority of patients (41%) were older than 60 years of age. Follows is the age-sex distribution of the sample:

Table 7.7-5 Age and sex distribution of dialysis patients at HDK

	Age (years)							Unknown
	0-10	11-20	21-30	31-40	41-50	51-60	>61	
Male (%)	2	0	4 (5%)	1 (1%)	8 (9%)	17 (19%)	22 (25%)	4 (5%)
Female (%)	1	1	2 (2%)	2 (2%)	3 (3%)	6 (7%)	14 (17%)	1 (1%)
Total (%)	3 (3%)	1 (1%)	6 (7%)	3 (3%)	11 (13%)	23 (26%)	36 (41%)	5 (6%)

Source: Farah, 1989

The etiology of renal failure was reported as follows (Farah1989):

Interstitial nephritis	27%
Diabetic nephropathy	18%
Glomerulonephritis	16%
Polykystic Kidney	11%

Youssef J (1999) reported that, between 1993 and 1998, 16 pediatric patients (age < 15 years) underwent kidney transplant. Twelve of them (75%) were males. Their distribution by age was: 2 years (n= 1), 3-5 years (n= 4), 5-10 years (n= 9), and >10 years (n= 2). The mean hospital stay was 37 days.

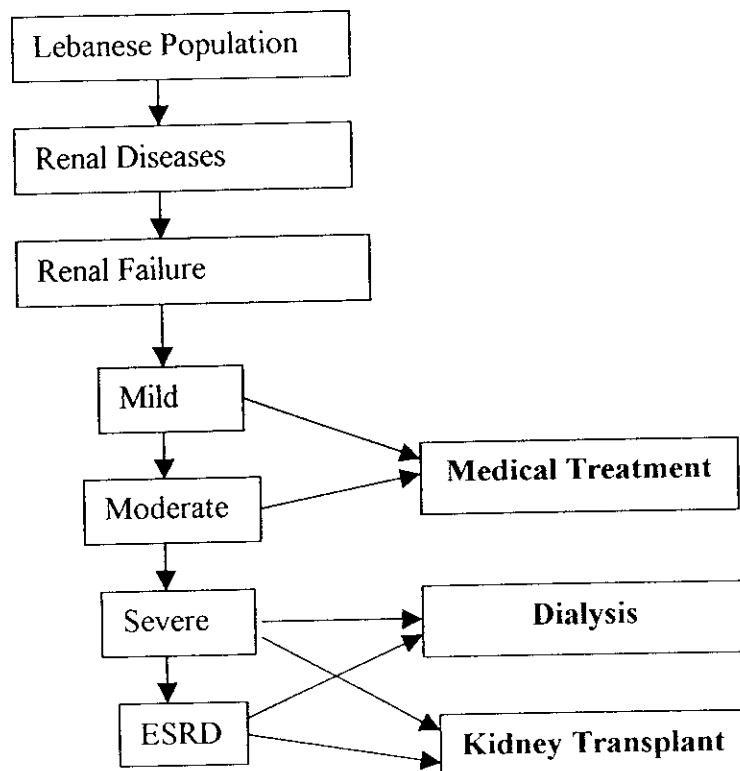
Mourani et al. (1999) conducted a retrospective study in June 1997 on all Lebanese children with ESRD. Twenty children and infants (age less than 15) were being dialyzed regularly. The important finding in this study was the fact that none of the children was attending school regularly and no psychological support was provided for the children and their families.

Comments

Around 2% of the Lebanese population suffers some kind of a renal disease. Renal failure is a small portion of this group, estimated in the mid-eighties to be more than 400 (on dialysis). The number of children less than 15 years of age on dialysis was 20 in 1997.

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

Natural History of Renal Failure - Lebanon



References

1. Farah G. Etude etiologique sur l'insuffisance renale au Liban. *These*. USJ, Faculte de Pharmacie, 1988-1989.
2. Ministry of Public Health. National Household Health Expenditure and Utilization Survey (NHHEUS). 1999.
3. Mourani C, Kfoury W, Mallat S, Afiouni N, Ghobril R, Kassouf J, Abboud S, Karam J, Alame H, Manader A, Akatcherian C. Multicenter study of children with terminal renal failure in Lebanon. *J Med Liban*, 1999; 47: 309-12.
4. Nassif E, Kutran K. Social and demographic profile of hemodialysis patients in Lebanon. *J Med Liban*, 1985; 35: 125-132.
5. Nuwayhid I, Sibai AM, Adib S, Shaar K. Morbidity, mortality, and risk factors. In Beirut: A health profile 1984-1994, Deeb M (ed). Beirut: American University of Beirut, 1997.
6. Youssef J. La Transplantation renale pediatrique a l'Hotel-Dieu de France. *Memoire*. USJ, 1998-1999.

7.8.1 ARTHRITIS

Joseph Kahhaleh & Iman Nuwayhid

Background¹

The background section briefly reviews osteoarthritis and rheumatoid arthritis.

Osteoarthritis (OA)

OA is a degenerative joint disease in which articular cartilage is involved more than bone, and inflammation is secondary to the disease. It is the result of a progressive breakdown of the joint surface and can follow any insult to any joint. It may develop acutely but its evolution usually takes years.

OA is the most common form of arthritis. The joints commonly affected are hands, knees, hips, and spine. The prevalence rates rise steeply with age so that radiographic changes are almost universal in the elderly. Nevertheless, symptomatic OA is less common than radiographic change with many damaged joints remaining asymptomatic. Radiographic OA also differ by race and gender. Some joints, such as the ankle, are rarely affected.

The overall adult prevalence of symptomatic osteoarthritis is estimated at 1%, but prevalence rises to around 10% among those older than 65 years of age. The cost of OA in the United States has been estimated in 1994 at \$15 billion per year.

The age- and sex-standardized incidence rate for hip osteoarthritis is approximately 88 cases per 100,000 person-years (95 percent CI: 75 to 101). Hip osteoarthritis rarely occurs before the age of 50. The prevalence markedly increases with age and it is more common among women as compared to men. The prevalence of mild and severe hip OA in men older than 55 years was 5-11% and 1-3.5%, respectively, as compared to 2-26% and 0.5-10% for women.

Knee OA is more common than other forms and rarely occurs before the age of 50. The age- and sex- standardized incidence rate for knee osteoarthritis is approximately 240 cases per 100,000 person-years (95 percent CI: 218 to 262). Its prevalence is higher for men than women, up to age 45 years, after which the reverse is true. The prevalence of knee osteoarthritis is approximately 30 percent among those 75 years and older.

The age- and sex- standardized incidence rate for hand OA is approximately 100 cases per 100,000 person-years (95 percent CI: 86 to 115). Its incidence ranges between zero cases for women younger than 40 years to 529 cases per 100,000 person-years for women between the ages 70 and 79 years.

¹ References:

1. Weatherall DJ, Ledingham JGG, Warrell DA. Oxford Textbook of medicine, 3rd Ed. Oxford: Oxford University Press. 1996.
2. Ruddy S, Harris E, Sledge C. Epidemiology of the rheumatic diseases. In Kelly's Textbook of rheumatology, 6th Ed.

Rheumatoid Arthritis (RA)

RA is a chronic inflammatory disease of the joints, in which the inflammation is the result of an abnormality of both cellular and humoral immunity. The cause of the disease itself is still unknown.

RA afflicts approximately 1 to 2 % of the adult population worldwide. Its prevalence increases with age, with 2 to 3 times as many women as men affected. RA begins in the 3rd to 5th decades of life. Its incidence in men rises steeply with age, but in women, the incidence rises up to age 45 and plateaus until 75 years, after which it declines. By age 55, nearly 5 % of women and 2 % of men have the disease.

R.A. has a high incidence of disability and accelerated mortality as well. Disease-modifying anti-rheumatic drugs need to be instituted within a few months of disease onset.

Arthritis in Lebanon

Available Relevant References in Lebanon

In addition to national and local surveys, only one document was identified regarding arthritis in Lebanon.

Table 7.8.1-A Selected references regarding arthritis in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Bitar E (1970)	Study limited to 100 cases of hip osteoarthritis selected from 10,000 observations in a rheumatology practice over a 9.5-year period. Selection method and years of study not specified.

Summary Findings

General population

The NHHEUS in 1999 (MOPH 1999) reported that the prevalence of rheumatoid arthritis, diagnosed by medical professional, was 5.3% (3.3% males; 7.2% females). In the Beirut 1992-1993 survey of 8906 residents, the overall prevalence (%) of arthritis was 2.2% among males and 7.2% among females. The prevalence of arthritis by age and sex was as follows:

Table 7.8.1-B Age and sex distribution of Beirut residents reporting arthritis

	No. of cases	0-9	10-19	20-29	30-39	40-49	50-59	60-69	=>70	All ages
Males	96	0.7	1.0	1.0	1.4	0.7	4.5	6.8	9.6	2.2
Females	332	0.6	2.2	2.5	5.5	9.7	15.5	19.7	20.8	7.2

Source: Beirut. A Health Profile 1984-1994

Clinical Setup

Over a period of one year (1999-2000), three main hospitals in Beirut reported a total of 52 RA diagnoses and 219 OA diagnoses out of 60,000 overall discharge diagnoses and 3500 musculoskeletal discharge diagnoses (see chapter 5).

The sole identified document described the characteristics of 100 cases of hip OA (Bitar 1970). The frequency of hip osteoarthritis was 1% (100 hip OA out of 10000 rheumatology cases), with 86% older than 40 years of age and 75% being females. The majority of the patients (70%) lived in rural areas. Geographically, 20% came from Beirut, 34% from Mt. Lebanon, 31% from North Lebanon, 8% from the South, 3% from Bekaa, and 4% from Syria.

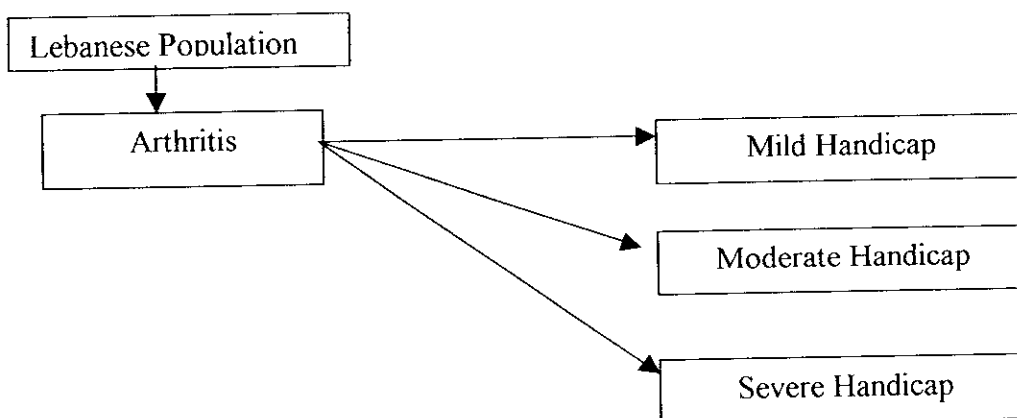
As for severity, they varied from mild (79%) to moderate (15%) to severe (6%) handicap. Hip OA was bilateral in 33% and unilateral in 67%. One third was assumed to be primary OA with two-thirds older than 60 years. The remaining 66% of patients exhibited secondary osteoarthritis, with 38% due to dysplasia and 35% to dislocation.

Comments

The only useful data is limited to the prevalence of arthritis by age and sex. The current studies cannot be used to identify the proportion of the different types of arthritis. It might be prudent to assume that the reported prevalence refer to all types of arthritis combined, rather to OA or RA.

Natural History of Arthritis – Lebanon

The following is a suggested flowchart for potential future use:



References

1. Bitar E. Hip osteoarthritis in rheumatology practice. *J Med Liban*, 1970; **28**:1
2. Ministry of Public Health. National Household Health Expenditure and Utilization Survey (NHHEUS). 1999.
3. Nuwayhid I, Sibai AM, Adib S, Shaar K. Morbidity, mortality, and risk factors. In Beirut: A health profile 1984-1994. Deeb M (ed). Beirut: American University of Beirut, 1997. Pp.123-182.

7.8.2 BACK PAIN

Joseph Kahhaleh & Iman Nuwayhid

Background²

Back pain is not a disease, but a symptom resulting from various conditions: *trauma, mechanical causes* (muscular pain, postural back pain, prolapsed disc, spinal stenosis, spondylolisthesis, fibromyalgia), *inflammatory causes* (infection, ankylosing spondylolisthesis), *metabolic causes* (osteoporosis, osteomalacia, Paget's disease), *neoplasm* (metastases, multiple myeloma, primary bone tumors) and *referred pain*.

Low back pain is the 5th most common reason for visits to physician in the US and the second most common in France. Some assume it is an expected or even "normal" part of life. Rarely, the pain lasts longer than two weeks.

Most back pain presenting to a primary physician needs no investigation. Pain between ages 20 and 55 years is likely to be mechanical, and is managed with analgesia, brief rest and physiotherapy. Patients should stay active within the limits of their pain. Early treatment of the acute episode, advice and exercise programs reduces long-term problems and prevents chronic pain syndromes.

Common lumbago is very frequent in France and other industrialized countries. Its annual incidence is estimated between 5% and 10%, with a recurrence rate of about 60 to 85% and a mean point prevalence of 30%. Low back pain has a relatively high prevalence even during school years. This varies by country (Finland 20%, England 26%, Canada 33%, USA 36%, Switzerland 51%). The annual incidence for low back pain increases from 12% to 21-25% during ages 12-15 years. The increase is higher among boys and associated with sports activities.

Studies of back pain among nurses, other occupational groups, and the general population have reported that chronic or recurrent back symptoms are common. An earlier back pain episode is a strong predictor of future episodes and recurrences. The impact of those episodes on daily life and disability is enormous, but needs further documentation.

² References:

1. Smedley J, Inskip H, Cooper C, Coggon D. Natural history of low back pain. A longitudinal study in nurses. *Spine*, 1998; **23**: 2422-26.
2. Smedley J, Egger P, Cooper C, Coggon D. Prospective cohort study of predictors on incident low back pain in nurses. *BMJ*, 1997; **314**:1225-8
3. Burton AK, Clarke RD, McClune TD, Tillotson KM. The natural history of low back pain in adolescent. *Spine*, 1996; **23**: 2323-2328.
4. Rakel R. Conn's Current Therapy. Stanford University School of Medicine. WB Saunders, California, 1997.
5. Kumar P, Clark M. Clinical Medicine, 4th Ed. WB Saunders, 1997.
6. Proceedings of the November 2000 annual scientific meeting " Back pain, current paradigm and future prospects" held by the Lebanese Epidemiological Association, Beirut, Lebanon.

Back Pain in Lebanon

Available Relevant References in Lebanon

In addition to national and local surveys, the main relevant documents were abstracted from the proceedings of the November 2000 annual scientific meeting "Back pain, current paradigm and future prospects" held by the Lebanese Epidemiological Association, Beirut, Lebanon. Only several studies were reviewed, the following table provides a complete bibliography of references found relevant to the purpose of the report.

Table 7.8.2.A Selected references regarding backpain in Lebanon.

Author (year)	Study Population/ Methodolgy
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Baddoura R. (2000a)	Three independent observational studies (1997-1999) to assess the prevalence of low back pain (as self reported) via a questionnaire among: 1035 adults (random sample from a national household survey sample frame) 633 nurses from 4 hospitals 201 employees out of 3800 population
Ghoussoub K et al. (2000)	Assessed back pain among students in one or two schools: one questionnaire completed by 706 students and another for their parents.
Baddoura R (2000b)	A questionnaire was sent to hundreds of physicians (who might manage back pain) to inquire about the last 5 consecutive ambulatory patients with LBP they treated. A total of 233 physicians responded.
Bou Khalil T et al. (2000)	A review of back pain reported by all AUB employees registered under the University Health services.
Nuwayhid et al. (1994)	The prevalence of back pain among nurses working at the AUBMC in 1994 was assessed through a self-administered questionnaire.

Summary Findings

General population

The NHHEUS of 1999 (MOPH 1999) reported that 6.5% of the weighted sample of 32,000 individuals reported low back pain diagnosed by a medical professional (5.3% of males and 8.6% females). The 1992-1993 survey of 8906 residents of Beirut (Nuwayhid et al. 1997) reported a not very different finding where 3.2% of all males and 7.9% of all females had low back pain. The age-sex prevalence was as follows.

Table 7.8.2-2 Age-sex distribution of Beirut residents reporting back pain

	No. of cases	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70+	All ages
Males	137	0.0	0.4	1.7	3.9	5.0	8.5	7.6	5.9	3.2
Females	365	0.2	0.2	1.8	8.5	17.4	17.7	18.0	16.2	7.9

Source: Nuwayhid et al. 1994

In Baddoura's study on a random sample of adult population (2000a), 13.1% (CI 11.0-14.2%) reported suffering from low back pain on any given day. The mean age of those with back pain was 41.8 years (SD 16.3). The prevalence among females was higher with a male-to-female sex ratio of 0.7. A specific diagnosis is reported by only 53.7% (CI: 45.3-62.1%). Degenerative spine disorders were the most common cause.

Ghoussoub et al. (2000) reported that 57% of 706 students who carry a school bag experience back pain. Of those, 56% were boys and one-third sought medical advice.

Occupational Groups

Baddoura (2000a) reported that 54% (CI: 50-58%) of interviewed nurses and 50% (CI 43-57%) of the 201 interviewed employees reported low back pain.

Within the AUB employees, Bou Khalil (2000) found that back pain was the fifth most common diagnosis accounting for 2.5% of the visits to UHS and the second most common cause of sick leaves (7.9%). Those with back pain were equally divided by gender but were mostly young with 34% younger than 30 years. The nursing staff accounted for 49% of all back pain sick leaves.

Nuwayhid et al. (1994) interviewed 381 nurses at AUBMC in 1994. Of those, 66% reported back pain, distributed as follows: 33% low back pain, 12% upper back pain, and 21% both.

Comments

The above studies confirm the high prevalence of back pain among the Lebanese population. However, no studies have investigated the burden of this problem on the health care system and the population.

References

1. Baddoura R. Low back pain in Lebanon: A hint on the magnitude of the problem. lebanese epidemiological association, Annual Scientific Meeting, Nov25, 2000. Saint Joseph University, Medical Faculty. (2000a)
2. Baddoura R. Low Back Pain in medical practice. Lebanese Epidemiological Association, Annual Scientific Meeting, Nov25, 2000. Saint Joseph University, Medical Faculty. (2000b)
3. Bou Khalil T. Back pain at the American University Health Services. Lebanese Epidemiological Association, Annual Scientific Meeting, Nov25, 2000. Saint Joseph University, Medical Faculty.
4. Ghoussoub K et al. Problems related to pupils carrier; epidemiological study over 706 students. Lebanese Epidemiological association, Annual Scientific Meeting, Nov25, 2000. Saint Joseph University, Medical Faculty.
5. Khalili A. Low back pain at the tobacco national agency: A retrospective study. Lebanese Epidemiological Association, Annual Scientific Meeting, Nov25, 2000. Saint Joseph University, Medical Faculty.
6. Ministry of Public Health. National Household Health Expenditure and Utilization Survey (NHHEUS). 1999.
7. Nuwayhid I, Usta J, El Kouatly-Kambris M, Abou Khalil T. Determinants of back pain among nurses at AUBMC. *Unpublished study*, 1994.
8. Nuwayhid I, Sibai AM, Adib S, Shaar K. Morbidity, mortality, and risk factors. In Beirut: A health profile 1984-1994. Deeb M (ed). Beirut: American University of Beirut, 1997. Pp.123-182.

7.8.3 OSTEOPOROSIS

Audella Eid & Iman Nuwayhid

Background³

Osteoporosis is defined as “ a progressive systemic skeletal disease characterized by low bone mass and micro-architectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture” (Consensus development conference, 1991).

The comparatively recent widespread interest in osteoporosis arose mainly from a recognized financial and medical burden that results from osteoporosis related fractures. It is estimated that approximately a third of white women will suffer a vertebral fracture by age 65 and a hip fracture by age 90.

Osteoporosis and osteoporosis related fractures occur particularly after menopause in women, but the disorder is not restricted to this group since it can occur in the young, in both sexes, and at all ages.

In the US, 30 % of Caucasian women above the age of 50 are osteoporotic at the spine, hip or forearm. Clear geographic variations exist in the prevalence and incidence of osteoporosis. In Northern Europe and in the US, the annual standardized age-adjusted incidence of hip fractures is estimated at 150/100,000, while it is lower in Eastern Europe estimated at 50/100,000.

Post-menopause, old age, and reduced mobility are the main recognized causes of osteoporosis. Bone loss could also result from non age-related factors, such as immobility, prolonged bed rest, neurological injury, space flight, rheumatoid arthritis, endocrine diseases, nutritional, genetic, and others disorders. Life style risk factors such as excessive smoking and alcohol consumption and lack of exercise are also incriminated. Aging and gonadal status remain the main risk factors associated with osteoporosis.

Deformity and loss of height due to vertebral collapse are the most common features of osteoporosis. It is imperative to establish that osteoporosis is present and that other significant bone diseases are absent. The management of osteoporosis should be directed at treating the acute complications, while attempting to identify the causes for bone loss, and to halt progression of the disease.

³ References:

1. Consensus development conference. Diagnosis, prophylaxis and treatment of osteoporosis. *Am J Med*, 1991; **90**:107-110.
2. El-Hajj Fuleihan G. Osteoporosis: an update. *J Med Liban*, 1998; **46**: 23-28.
3. El-Hajj Fuleihan G. Osteoporosis: an overview of practice guidelines for bone density measurements and osteoporosis treatment strategies. *J Med Liban*, 1999; **47**: 222-228.

Osteoporosis in Lebanon

Available Relevant References in Lebanon

A few documents about osteoporosis in Lebanon were identified. Those deemed relevant to this report appear in the table below.

Table 7.8.3-1 Selected references regarding osteoporosis in Lebanon

Author (year)	Study Population/ Methodology
Baddoura R & Awada H (1999)	Arabic version of EULAR questionnaire was administered to a random sample of general population (n= 1003) of 50 years of age. Mean age 61.3 years and F/M sex ratio 0.9. Osteoporosis was identified by the presence of any type of fractures occurring after 50 years of age
Maalouf G (1997)	Bone mineral density measured on a sample of 950 individuals (126 male and 824 female) in 1994
Maalouf G et al. (1997)	Cross-sectional study of Thalassemic children (9-18 years) measuring bone mineral density (BMD) of thalassemic children and comparing them with that of matched controls.

Summary Findings

General Population

The NHHEUS 1999 and the Beirut 1992-1993 did not report the prevalence of osteoporosis in their study populations.

Baddoura and Awadah (1999), evaluated the prevalence of osteoporosis fractures in Lebanon by administering an Arabic version of EULAR questionnaire for osteoporosis to a random sample of people 50 years of age and above (mean age 61.3/ F/M sex ratio 0.9). The prevalence of osteoporotic fractures among the 1003 interviewed individuals was 11.1% (95% confidence interval 8.9-13.3%). It was 8.7% in males and 13.4% in females (1.54 fold increase in females).

A progressive increase of prevalence with age was only noted for hip and vertebral fractures. For women of 50 years of age, the lifetime risk of hip fracture was 2% as compared with 17.5% in the USA. The estimated incidence of fractures was 0.4% for the hip and 2.4% for any type of fracture. Baddoura and Awadah (1999) concluded that in Lebanon the prevalence of osteoporosis fractures is low.

In a sample of 126 men and 824 women visiting one hospital in Beirut in 1994, Maalouf (1997) reported that the Lebanese normal bone mineral density (BMD) is lower than the European by 0.05 to 0.06 g/cm² across all ages except for the femur bone at middle age where the difference decreases. The study reported that 25% of men and 50% of women have osteoporosis.

Risk Factors and Clinical Setup

Baddoura and Awadah (1999) reported that the significant risk factors associated with osteoporotic fractures in their study sample included decreased mean age at menopause, increased post-menopause duration, and use of corticosteroids for more than 3 months. Less than 40% of the fracture population received any form of treatment: calcium (38%), vitamin D (35.9%), calcitonin (1.96%), alendronate (2.2%) and HRT (in 4.9% of the women).

Maalouf (1997) reported the risk factors among the 950 individuals studied. No comparison group was available. He reported that about 85% of them did not do any type of exercise, 73% are smokers, and 53% of them had fractures in the last 3 years. 50% of the with osteoporosis had not yet reached menopause.

Maalouf et al. (1997) reported that Lebanese beta-thalassemic children had a significantly lower BMD than their healthy counterparts and that about 25% of them have low gonadotropic hormones, a factor also shown to correlate with low BMD.

Comments

All studies and reviews concur that osteoporosis is and will become a major public health problem in Lebanon, mainly due to its high association with fractures and increased risk for morbidity and mortality especially among older women. Maalouf (1997) reports that BMD among the Lebanese is less than that of the Europeans and consequently estimates a high number of osteoporotic individuals in Lebanon. Baddoura and Awadeh (1999) reported that the occurrence of fractures among those older than 50, mostly attributed to osteoporosis, is low and less than what is reported among other Caucasian populations (North America or Europe).

7.9 DENTAL CARIES

Hassan Ghamrawi & Iman Nuwayhid

Background¹

A variety of diseases affect the oral cavity. Dental caries, the disease causing cavities in the teeth, is common worldwide. Untreated caries may lead to infections in the pulp, an infection that may spread to the supporting tissues and jaws, with or without pain to the individual.

Dental caries is characterized by the dissolution of the hard tissues of the teeth (enamel, dentin), eventually leading to the destruction of the affected tooth surface, or of the tooth itself. The immediate cause is the organic acids produced by certain microorganisms present in the tooth. The bacteria, together with a matrix made up mainly of extracellular polysaccharides produced from sucrose by the microorganisms, form the so-called dental plaque. The acids are formed when fermentable carbohydrates are added to the plaque. Each time such a process is started, the tooth will be damaged, but if the process does not occur too often, the natural capacity of the body to remineralize the tooth will prevent the formation of a cavity.

Several risk factors affect the severity and time needed for dental caries to occur, such as: (1) the amount of dental plaque on a tooth and whether or not it contains cariogenic microorganisms (e.g., *Streptococcus sorbinus*) that produce acids, (2) the composition of diet (especially sucrose content) and the frequency of eating, and (3) effective remineralization, which is dependent on saliva flow and composition and the presence of fluorides.

The prevalence of dental caries is measured using an index of the total number of Decayed, Missing, and Filled Teeth (DMF-T). The number of decayed, missing, and filled teeth increases with age; hence, the DMF-T index should be compared among same age groups from different populations. Age groups 6, 12, 15, 35-44, and 65-74 were internationally chosen to monitor dental caries (DMF-T). In fact, the 12-year age group is the global monitoring age of caries and can be used for international comparisons and monitoring of disease trends.

¹ References:

1. Hussein SA, Doumit M, Dughan B, Nadeef M. Oral Health in Lebanon: a pilot pathfinder survey. *Eastern Mediterranean Health Journal*, 1996; 2: 299-303.
2. Bratthall D, Barmes D E. Oral Health. In: Disease control priorities in developing countries. Jamison D T, Mosley W H, Measham, Bobadilla JL (Eds). Oxford University Press, Published for The World Bank, 1993. Pp 647-659.

The studies used the same procedures to determine the DMF-T of each individual (clinical examination in accordance with the WHO criteria) giving strength and reliability to the obtained results. Doughan and Doumit (1996) reported a higher DMF-T for males at 6 and 12 years of age as compared to females of the same age, but a higher score among females in the remaining age groups.

The DMF-T index in Lebanon was found to be one of the highest when compared to developed countries and other developing countries in the region as shown below for the age group 35-44 years (reprinted from *Int Dent J.* 2000 Dec;50(6):395-9):

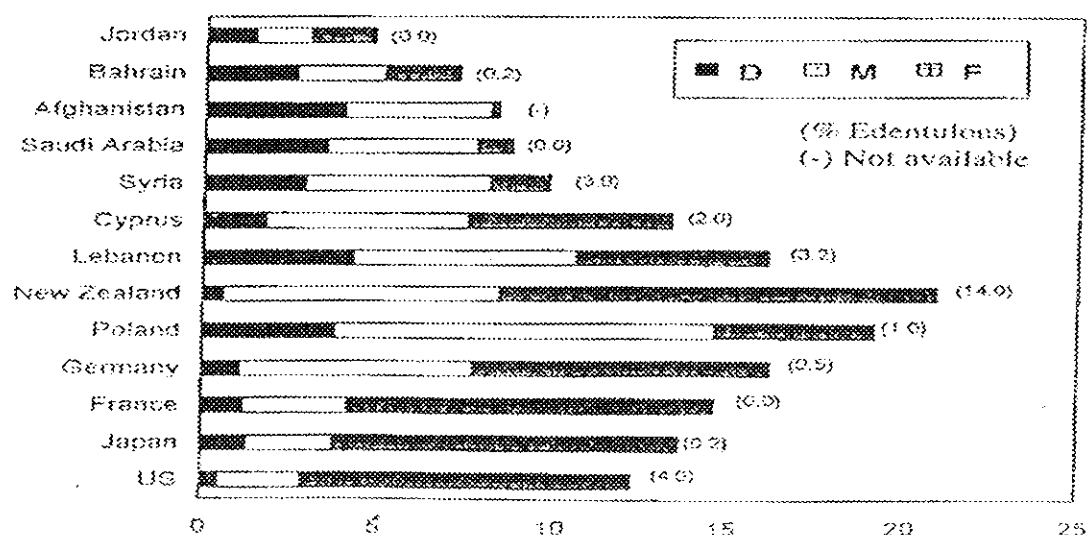


Figure 1. DMF of countries for 35-44 year-olds. Source: WHO, 1999¹²

Utilization of Dental Health Care

The utilization of dental services in Lebanon was investigated in the Beirut 1992-93 household survey (Kassak et al. 1997).

Table 7.9-3 Frequency of dental visits in Beirut population

Last visit to dentist ²	Age group (year) ¹					Total %
	0-6 %	7-12 %	13-29 %	30-59 %	60-98 %	
Never	68.3	35.1	21.6	20.5	33.1	27.6
One year or more ago	20.9	31.5	40.6	38.2	43.3	37.6
One month to 1 year	6.4	23.3	25.0	27.1	14.8	22.9
Past month	4.5	10.1	12.8	14.2	8.9	11.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Kassak et al. 1997

1-Missing information on 32 individuals

2-Missing information on 5 individuals

The utilization of dental services increased with advancing age, with a slight drop among those older than 60 years of age; perhaps reflecting an increased use of dentures. Females tended to use dental services more frequently than males. For both sexes, cavity (38.8%) and surgical procedures (17%) were reported as the main reasons for visits to the dentist.

Comments

A high prevalence of dental caries might be associated with recurrent morbid conditions and significant loss of productivity.

References

1. Doughan B, Doumit M. Oral health in Lebanon, a situation analysis. *Nashrat Al Bahth Al 'Ilmi*, Sep. 1996: 18.
2. Doughan B, Kassak K, Bourgeois DM. Oral health status and treatment needs of 35-44-year old adults in Lebanon. *Int Dent*, Dec 2000; 50: 395-9.
3. Hussein SA, Doumit M, Dughan B, Nadeef M. Oral health in Lebanon: a pilot pathfinder survey. *Eastern Mediterranean Health Journal*, 1996; 2: 299-303.
4. Kassak KM, Dagher R, Doughan B. Oral hygiene and lifestyle correlates among new undergraduate students. *J Am Coll Health*, 2001; 50:15-20.
5. Karam N, Moh'd Ali A, Kassak K, Khayat R, Hajjar H. Utilization of Health Services. In: Beirut: A Health Profile 1984-1994. Deeb M (ed). Beirut: American University of Beirut, 1997. Pp. 89-122.

7.10 BETA-THALASSEMIA

Mylene Tewtel-Salem & Iman Nuwayhid

Background¹

Thalassemias are a heterogeneous group of genetic disorders of hemoglobin synthesis, inherited in a simple Mendelian co-dominant fashion in which the synthesis of one or more of the globin chains is reduced. Thalassemias are divided into 4 varieties based on the globin chain, which is produced in a reduced amount:

- Alpha-Thalassemia:
 - Alpha⁰ (No globin synthesis)
 - Alpha⁺ (Globin chain is synthesized at a reduced rate)
- Beta-Thalassemia:
 - Beta⁰ (No globin synthesis)
 - Beta⁺ (Globin chain is synthesized at a reduced rate)
- Delta-Beta-Thalassemia:
 - (Delta Beta)⁰
 - Haemoglobin Lepore (Delta Beta)⁺
 - (Epsilon Gamma Delta Beta)⁰ Thalassemia.
- Delta-Thalassemias

Heterozygous patients for thalassemia are usually symptomless. The more severely affected patients are homozygous for alpha or beta thalassemia, compound heterozygous for different molecular forms of alpha or beta thalassemia, or compound heterozygous for one or other forms of thalassemia, plus a gene of structural hemoglobin variant.

Beta Thalassemia is widespread in the regions where *Plasmodium falciparum* malaria was endemic, i.e. throughout the Mediterranean region, the Middle East, Transcaucasus, Central Asia, Indian sub-continent, Far East and Africa. Cyprus (14%) and Sardinia (12%) reveal the highest incidences.

Beta-thalassemia is extremely heterogeneous at the molecular level. About 200 mutations have been identified as being responsible for the defective synthesis of beta-globin chains. However, four to ten mutations in each population at risk comprise the majority of beta-globin disease-causing alleles. Different phenotypes of beta-thalassemia (beta-thalassemia zero and beta-thalassemia plus) will result depending on the region of the gene and the location of the mutation.

¹ References:

1. Beutler E. *Williams Hematology*. 6th Ed. New York: Mc Graw Hill, 2001.
2. Weatherell DJ, Ledingham JGG, Warrell DA. *Oxford Textbook of Medicine*. 3rd Ed, Vol 3. Oxford: Oxford University Press, 1996.
3. Olivieri N. The Beta-Thalassemias. *Medical Progress*, 1999; **341**(2).
4. Cao A, Galanello R. Beta-Thalassemia. University of Washington, Seattle. Last Update Revision September 28, 2000. Found at: <http://www.geneclinics.org/profiles/b-thal/details.html>

The pathophysiology of beta-thalassemia is related almost entirely to the primary imbalance of globin-chain synthesis. The absence or reduced rate of beta-chain globin production results in an excess of alpha-globin chains. This interferes with red-cell maturation and circulation of red cells. Thus, the anemia of beta-thalassemia is the result of ineffective erythropoiesis and a shortened red cell survival.

Clinically, thalassemias are divided by severity into major (transfusion dependent disorder), intermediate, and minor (symptomless carrier state) forms. Prognosis is strongly related to the type of thalassemia and the associated genes.

Thalassemia major is diagnosed in the first two years of life. The symptoms are failure to thrive, poor feeding, intermittent bouts of fever, failure to improve after an infection, irritability, paleness, and progressive enlargement of the abdomen due to splenomegaly.

If well transfused at this stage, the child's development is normal until the age of 10-11 years when the effects of iron loading appear. The iron-loading effects which include, growth retardation, failure of sexual maturation, and hepatic, endocrine and cardiac complications, depends on the compliance of the infant to iron chelation therapy. If the infant is not appropriately transfused, then the classical clinical picture of homozygous beta-thalassemia develops and these infants will usually die before the third decade. These patients show growth retardation, pallor, jaundice, brown pigmentation of the skin, poor musculature, hepatosplenomegaly, and skeletal changes.

In the case of Thalassemia intermedia, symptoms are milder and include, among others, pallor, jaundice, liver and spleen enlargement, moderate to severe skeletal changes, and leg ulcers. In contrast to thalassemia major, thalassemia intermedia requires intermittent transfusions according to the needs of the patient.

The only interventions that can be administered to a major or severe beta-thalassemia case are regular transfusions, splenectomy (if hypersplenism develops), and the administration of desferrioxamine as a chelating agent. Thalassemia intermedia are treated on a symptomatic basis with splenectomy and folic acid supplementation. Thalassemia has also been treated with bone marrow transplantation, but the success of such a procedure relies on several factors, including the general health of the patient and the availability of a matched donor.

Prevention, in the form of genetic screening and counseling of couples, plays an important role in the control of the prevalence of thalassemia in a population.

Beta-Thalassemia in Lebanon

Available Relevant References in Lebanon

Several published and unpublished documents were accessed regarding thalassemia in Lebanon. Studies about the alpha/beta globin chain ratio, the molecular basis of thalassemia, and psychosocial, economic, and behavioral factors were not included in this review.

Table 7.10-1 Selected references regarding beta-thalassemia in Lebanon

Author (year)	Study Population/ Methodology
Naaman and Mroueh (2000)	Screening for the prevalence of thalassemia trait among 2500 Lebanese males aged 18-19 years old during their military service in 2000
Nabulsi M (1993)	Screening for the prevalence of thalassemias and hemoglobinopathies among 3000 consecutive patients admitted to a hospital in North Lebanon in 1993 over a 4-month period (April-August). Blood was analyzed for red cell indices, red cell morphology, and Hb-electrophoresis.
Angastiniotis (1993)	Assignment report on thalassemia control programme in Lebanon (Chronic Care Center)
Chronic Care Center (1996)	Description of all 544 patients registered at CCC by 2000: number of new and old patients registered at CCC by year (1994-2000), distribution of 383 registered cases by sex, age, current address, and origin
Qaianani MT (1998)	Molecular analysis of beta-thalassemias intermedia in Lebanon. Provided information about 350 beta-thalassemia patients registered at CCC.
Zahed L and Bou Dames J (1997)	A study on acceptance of prenatal diagnosis. Characteristics of 83 couples provided.

Summary Findings

The above studies addressed two issues: prevalence of thalassemia trait in the Lebanese population and the characteristics of thalassemic patients.

Thalassemia Trait

Naaman and Mroueh (2000) reported that 2.5% of 2500 military male recruits (18-19 years old) carried a thalassemia trait.

Nabulsi et al. (1993) examined the prevalence of hemoglobinopathies among 3000 consecutive admissions over a 4 months period to the Islamic Hospital of Tripoli. A total of 128 (4.26%) hemoglobinopathies were detected: 2.9% showed a carrier trait for beta-thalassemia, 0.2% had thalassemia major, and 0.23% had sickle cell- thalassemia

The following table presents the prevalence of each type of hemoglobinopathy:

Table 7.10-2 Prevalence of hemoglobinopathy by type in a Lebanese hospital, Sayda

	Cases	%
Beta-Thalassemia Homozygous	6	0.2%
Beta-thalassemia Trait	87	2.9%
Sickle Cell Homozygous	3	0.1%
Sickle Cell Carriers	20	0.66%
Sickle Cell-Thalassemia	7	0.23%
HbC Carriers	4	0.13%
HbC Homozygous	1	0.03%
Total of Hemoglobinopathies	128	4.25%

Source: Nabulsi et. al. 1993

Note: Consulted hematologists report that the presence of HbC seems to be confined to the Akkar district of North Lebanon and that HbH disease is an extremely rare finding (Angastiniotis, 1993).

The following 3 tables present the prevalence of different hemoglobinopathies by sex, age, and region (Nabulsi et al. 1993).

Table 7.10-3 Distribution of hemoglobinopathies by sex

	MALES N (% of 3000)	FEMALES N (% of 3000)
Beta-Thalassemia Homozygous	2 (0.06%)	4 (0.13%)
Beta-thalassemia Trait	42 (1.4%)	45 (1.5%)
Sickle Cell Homozygous	2 (0.06%)	1 (0.03%)
Sickle Cell Carriers	7 (0.23%)	13 (0.4%)
Sickle Cell-Thalassemia	5 (0.16%)	2 (0.06%)
HbC Carriers	0	4 (0.13%)
HbC Homozygous	0	1 (0.03%)
Total of Hemoglobinopathies	58 (1.93%)	70 (2.33%)

Source: Nabulsi et. al. 1993

* % of 3000 is reported since distribution by sex is not known

Table 7.10-4 Distribution of hemoglobinopathies by age

	0-9 years N (% of 3000)	10-20 years N (% of 3000)	> 20 years N (% of 3000)
Beta-Thalassemia Homozygous	3 (0.1)	2 (0.06%)	1 (0.03%)
Beta-thalassemia Trait	31 (1.03%)	36 (1.2%)	20 (0.66%)
Sickle Cell Homozygous	0	2 (0.06%)	1 (0.03%)
Sickle Cell Carriers	3 (0.1%)	6 (0.19%)	11 (0.36%)
Sickle Cell-Thalassemia	5 (0.16%)	1 (0.03%)	1 (0.03%)
HbC Carriers	1 (0.03%)	0	3 (0.1%)
HbC Homozygous	0	0	1 (0.03%)
Total of Hemoglobinopathies	43 (1.43%)	47 (1.57%)	38 (1.27%)

Source: Nabulsi et. al. 1993

* % of 3000 is reported since distribution by age is not known

Table 7.10-5 Prevalence of hemoglobinopathies by region

	Region 1 N (prev. %)	Region 2 N (prev. %)	Region 3 rev. %)	Region 4 rev. %)	Region 5 rev. %)
Beta-Thalassemia Homozygous	7 (0.44)	0	4 (1.31)	0	1 (0.54)
Beta-thalassemia Trait	42 (2.66)	19 (2.45)	7 (2.29)	9 (5.9)	8 (4.37)
Sickle Cell Homozygous	1 (0.06)	1 (0.12)	0	0	1 (0.54)
Sickle Cell Carriers	7 (0.44)	3 (0.37)	5 (1.63)	4 (2.55)	1 (0.54)
Sickle Cell-Thalassemia	4 (0.25)	1 (0.12%)	2 (0.65)	0	0
HbC Carriers	2 (0.12)	1 (0.12)	0	0	1 (0.54%)
HbC Homozygous	0	0	0	0	1 (0.54%)
Total of Hemoglobinopathies	63/ 1586 (3.97)	25/773 (3.18)	18/306 (5.88)	13/152 (8.45)	13/183 (7.07)

Source: Nabulsi et. al. 1993

* Region 1: Tripoli and suburbs; Region 2: Akkar; Region 3: Menie & Derammar;

Region 4: El-Koura; Region 5: El Dannyc

** Prevalence is reported in this table since distribution by region was available

Thalassemic Patients

The Chronic Care Center² is the main center for the treatment and counseling of thalassemic patients in Lebanon. The following table summarizes the number of current and new patients registered at the CCC between 1993 and 2000.

Table 7.10-6 Registered patients by year at the CCC center

Year	1993	1994	1995	1996	1997	1998	1999	2000
Number of all Patients registered at the CCC	312	362	416	447	489	512	531	544
Number of New Patients registered at the CCC		50	54	31	42	23	19	13

Source: Chronic Care Center

*Deaths excluded

² The Chronic Care Center (CCC) was founded in 1992 but officially inaugurated in 1994. It is a nongovernmental organization financed by private donations in addition to grants from the Lebanese government. The CCC provides social support, counseling on patient care at home, and part of the needs for drug therapy to children and families with thalassemia, hemoglobinopathies, and diabetes. In 2000, the Center served 544 thalassemic and 733 diabetic patients. The CCC provides patients with education, counseling, and medicine/material for treatment at a cost based on the patient's income. The CCC also promotes prevention through training sessions and community awareness building campaigns.

The CCC also provided information on 383 registered cases by age, sex, current address and origin. All reviewed patients were Lebanese, came regularly to the center, and had two complete records at the time of the study.

Table 7.10-7 Age, sex distribution and origin of CCC patients

Variable	Percentage
Sex	
Male	54.8
Female	45.2
Age	
0-10	33.0
11-20	40.5
21-30	16.9
31-40	5.4
41-50	3.2
50+	1.1
Mean (Range)	16.1 years (2-58 years)
Current Address	
Beirut	30.0
North	24.5
South	15.9
Mount Lebanon	15.2
Bekaa	14.4
Origin	
South	28.5
North	25.3
Bekaa	20.7
Mount Lebanon	14.1
Beirut	11.4

Source: Chronic Care Center

In a 1993 report to WHO, Dr. Angastiniotis reported the following age distribution for 314 thalassemia cases in Lebanon from the CCC database.

Table 7.10-8 Age distribution of thalassemia patients at the CCC

Age (Years)	Number of Cases (%)
1-3	31 (9.87)
4-5	66 (21.01)
7-9	59 (18.79)
10-12	42 (13.38)
13-15	44 (14.01)
16-18	28 (8.92)
19-21	16 (5.09)
22-24	11 (3.50)
25-27	8 (2.55)
28-31	4 (1.28)
>31	5 (1.59)
Total	314 (100%)

Source: Angastiniotis M. 1993

Qaianani (1998) reported that of 350 cases of beta-thalassemia registered at the CCC, approximately 1/3 were beta-thalassemia intermedia (116 cases), and 2/3 beta-thalassemia major (233 cases).

A study conducted by Zahed and Bou Damesi (1997) on 83 couples of child bearing age, randomly selected at the CCC, showed that 80% were Muslims and 20% were Christians, 73% originated from the North, Beirut and the South, and the majority of the couples were poorly educated and of low socio-economic status.

Economic Burden

The CCC estimates the average cost per thalassemic patient per year at \$ 9,506. The actual cost per case varies according to patient's age, diagnosis, and severity, as well as compliance.

The average number of visits of a thalassemic patient to CCC is 6 visits per year. It varies for thalassemia major, intermedia, and sickle thalassemia. For example, the number of blood transfusions is 18 per year for thalassemia major patients.

Comments

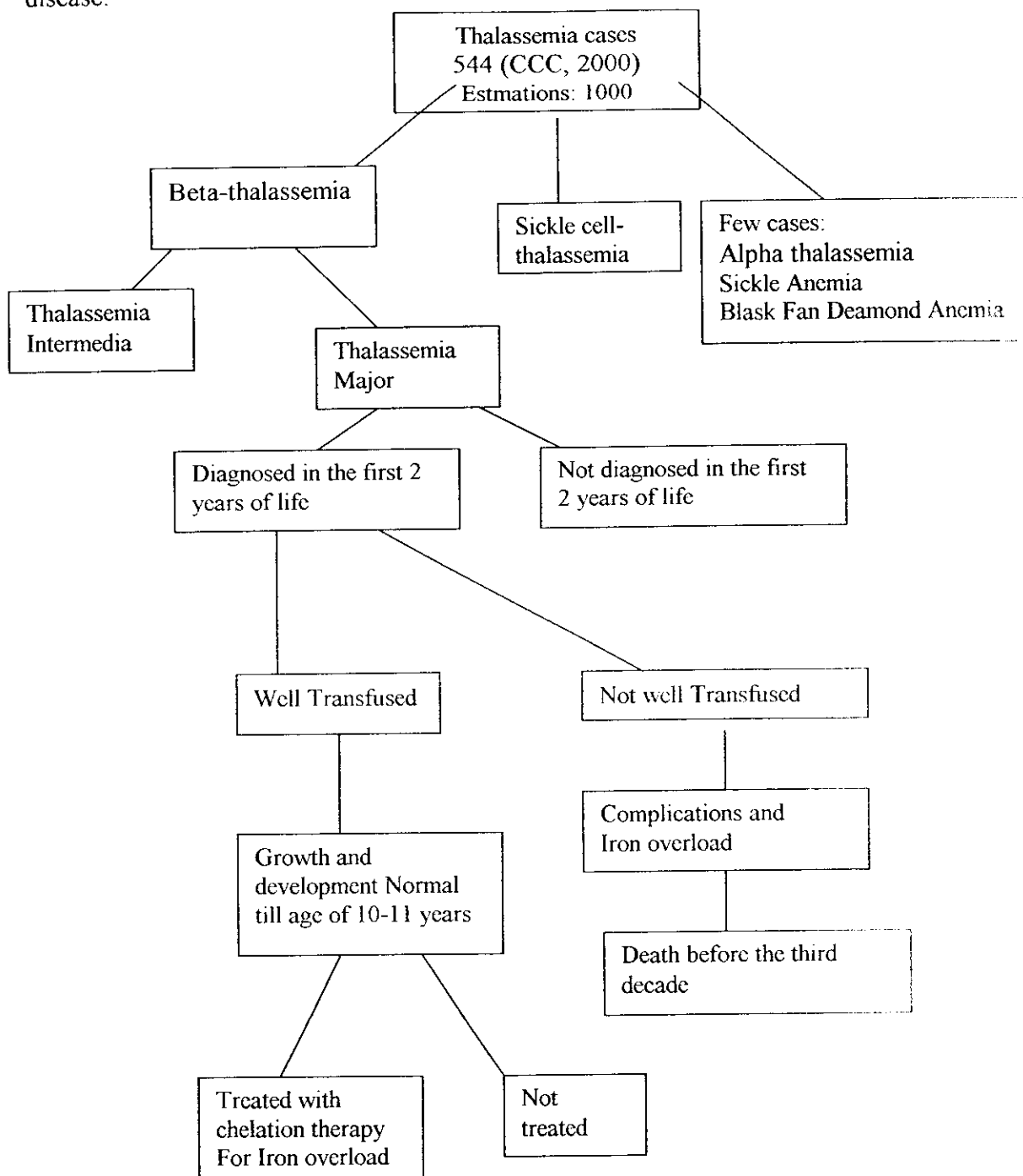
Nabulsi et al. (1993) and Naaman and Mroueh (2000) reported a prevalence of the thalassemia trait carrier of 2.9% and 2.5%, respectively, in totally different populations.

As for thalassemic patients, a total of 544 cases were registered at the CCC in 2000, suggesting a prevalence of 15.6 thalassemic patients per 100,000 population (544/3,500,000). The 544 cases at CCC are essentially beta-thalassemia (intermedia and major) and sickle-thalassemia. They are essentially Lebanese since only Lebanese patients are treated by the CCC. Few cases are Syrians, Palestinians, and Iraqis. However, the CCC might be missing those residing in remote areas and some patients who do not seek CCC for treatment for different reasons. In 1995-1996, Dr. Salim Ferzli (Clinical Professor of Pediatrics-Oncologist at AUBMC) estimated the number of thalassemia

patients in Lebanon at 1,000. In North Lebanon, Nabulsi et al. (1993) reported an estimated prevalence of 0.43% of thalassemia (0.2% of thalassemia major and 0.23% of thalassemia-sickle cell); i.e., 430 per 100,000. One fourth of the CCC registered patients are originally from the North. We can note a discrepancy between the estimated prevalence of thalassemia based on the CCC data (2000) and on the Nabulsi et al. (1993) data.

The distribution of the CCC cases by sex hovered around one. The highest proportion of thalassemia cases were in the age group 11-20, followed by the age group 0-10. The same was observed for those screened by Nabulsi et al. (1993) for thalassemia traits. As for region of origin, 29% of the CCC came from the South, followed by 25% from the North, and 21% from Bekaa.

The following flowchart might be helpful in future evaluation of the burden of this disease:



References

1. Angastiniotis M. Control of thalassemia in Lebanon. WHO, 1993.
2. Chronic Care Center. Building up healthy generations, 1996.
3. Moukheiber L. Beyond thalassemia: Education for Healthy generations. The Chronic Care Center, Lebanon, 1996.
4. Nabulsi M. Incidence of thalassemias and hemoglobinopathies in north Lebanon. *Unpublished Study*, 1993.
5. Qaianani MT. The Molecular analysis of beta-thalassemis intermedia in Lebanon. *Unpublished Thesis*. AUB, 1998.
6. Zahed L, Bou-Dames J. Acceptance of first-trimester prenatal diagnosis for the haemoglobinopathies in Lebanon. *Prenatal Diagnosis*, 1997; 17: 423-428.

7.11 ADVERSE DRUG REACTION

Hassan Ghamrawi & Iman Nuwayhid

Background¹

Any substance that is capable of producing a therapeutic effect can also produce unwanted or adverse effects. The risk of such effects ranges from near zero to high. WHO's definition of an adverse drug reaction is "a response to a drug that is noxious and unintended and occurs at doses normally used in man for the prophylaxis, diagnosis or therapy of disease, or for modification of physiological function". A more precise definition of adverse drug reaction is "an appreciably harmful or unpleasant reaction, resulting from an intervention related to the use of a medicinal product, which predicts hazard from future administration and warrants prevention or specific treatment, or alteration of the dosage regimen, or withdrawal of the product".

The term "adverse effect" is preferable to other terms such as "toxic effect" or "side effect". The term "adverse effect" encompasses all unwanted effects. It makes no assumptions about mechanism, evokes no ambiguity, and avoids the risk of misclassifications. "Toxic effect" occurs as an exaggeration of the desired therapeutic effect, and which is not common at normal doses. It is always dose-related. An "unwanted side effect" occurs via some other mechanisms and may or may not be dose-related. WHO states that a side effect "is related to the pharmacological properties of the drug".

The terms "adverse reaction" and "adverse effect" are interchangeable, except that an adverse effect is seen from the point of view of the drug, whereas an adverse reaction is seen from the point of view of the patient.

The following variables should be observed or measured in order to diagnose adverse drug reactions:

- Timing: The adverse drug reaction occurs after the intake of medication. The time between the use of the drug and the occurrence of the reaction is variable.
- Pattern recognition: The pattern of the adverse effect may fit the known pharmacology or allergy pattern of one of the suspected medicines, or of chemically related or pharmacologically related compounds. Some patterns are pathognomonic or nearly so. However, adverse drug reactions may not be known, or even predictable, from the pharmacology of a medicine.
- Frequency: The background frequency of the event (suspected drug reaction) and how often it is associated with a drug should be considered. Headache, for

¹ References:

1. Edwards I. R, Aronson J. K. Adverse drug reaction: Definitions, diagnosis, and management. *Lancet*, 2000; 356: 1255-1259.

example, is a relatively common event, so its association with a particular medicine as an adverse reaction may be due to chance. In contrast, aplastic anaemia has a low background incidence. If reported after taking a particular medicine, it is more likely to be an adverse drug reaction.

Adverse drug reaction could be classified as follows:

Table 7.11.1 Classification of adverse drug reactions

Type of reaction	Features
Dose-related (Augmented)	1-Common 2-Related to a pharmacological action of the drug 3-Predictable 4-Low mortality
Non-dose-related (Bizarre)	1-Uncommon 2-Not related to a pharmacological action of the drug 3-Unpredictable 4-High mortality
Dose-related and time-related (Chronic)	1-Uncommon 2-Related to the cumulative dose
Time-related (Delayed)	1-Uncommon 2-Usually dose-related 3-Occurs or becomes apparent some time after the use of the drug

Adverse Drug Reaction in Lebanon

Available Relevant References in Lebanon

Studies on adverse drug reaction are scarce in Lebanon. The following two documents were identified.

Table 7.11.2 Selected references regarding adverse drug reactions in Lebanon

Author (year)	Study Population/ Methodology
Major S et al. (1998)	Prevalence of drug related illness in general and adverse drug reaction in particular in patients admitted to AUBMC over a one-month period. The total sample size was 1,745 adults and 457 children.
Slim (1995)	Investigated 39 allergic adverse drug reaction cases in the Saint Joseph University from 1984-1995

Summary Findings

Major et al. (1998) reported that 177 out of 1,745 adult patients (10.2%) and 36 out of 457 pediatric patients (7.9%) were admitted to hospital because of a drug-related illness. Adverse drug reactions accounted for 122 adult (7%) and 26 pediatric (5.7%) patients. The remainder were due to therapeutic failures. In general, adverse drug reactions in adults were mostly caused by nonsteroidal anti-inflammatory drugs (NSAID), including aspirin followed by cancer drugs, chemotherapeutic agents and cardiovascular drugs. The

References

1. Major S, Badr S, Bahlawan L, Hassan G, Khogaoghlanian T, Khalil R, Melhem A, Richani R, Younes F, Yeretian J, Khogali M, Sabra R. Drug-related hospitalization at a tertiary teaching center in Lebanon: incidence, associations, and relation to self-medicating behavior. *Clin Pharmacol Ther*, 1998, **64**: 456-61.
2. Slim. Allergic adverse drug reaction cases. *Thesis*. USJ, Faculte de Medecine, 1995.

8. UNINTENTIONAL INJURIES

Omar Dewachi & Iman Nuwayhid

Background¹

Injury can be defined as a bodily lesion at the organic level, resulting from acute exposure to energy (mechanical, thermal, electric, chemical, or radiant) in amounts that exceed the threshold of physiologic tolerance. In some cases (e.g. drowning, strangulation, or freezing), the injury results from an insufficiency of a vital element (air, heat).

Injuries are usually classified into intentional and unintentional. Intentional injuries include self-inflicted injury, homicide, violence, and war, while unintentional injuries include events such as, road traffic accidents (RTA), poisoning, falls, fires, and drowning.

It is estimated that around 16,000 people around the world die from injuries every day. In 1998, 5.8 million people worldwide died from injuries (3.8 million males and 2.0 million females). The leading causes of fatal injuries worldwide were RTA and self-inflicted injuries. In low and middle-income countries, RTA, self-inflicted injury and interpersonal violence are among the leading causes of death, in addition to drowning and war-related injuries.

Around 16% of the global burden of disease in 1998 was attributed to injuries after accounting for disabilities that resulted from injuries. The overall characteristics were computed by the GBD 1990:

- Injuries account for about 12.5 per cent of all male deaths, compared with 7.4 per cent among females.
- There is a marked regional variation in mortality from violent causes (Established Market Economies (EME) < sub-Saharan Africa and Latin America).
- Injury deaths have a very skewed age distribution, with the majority killed being comparatively young. Globally, 30 per cent of male injury deaths and 25% of female injury deaths occur at ages 15-29 years.

¹ References:

1. Krug E, Sharma G, Lozano R. The Global burden of Injury. *American Journal of Public Health*, 2000; **90**: 523-6.
2. Murray C, Lopez A. The Global Burden of Disease. Global Burden of Disease and Injury Series Volume I. Harvard School of Public Health, World Health Organization, and World Bank, 1990.
3. Murray C and Lopez A. Health Dimensions of Sex and Reproduction: The Global Burden of sexually transmitted diseases, HIV, maternal conditions, perinatal disorders and congenital anomalies. In The Global Burden of Disease. Global Burden of Disease and Injury Series Volume III. World Health Organization, Harvard School of Public Health, and World Bank, 1998.

Unintentional Injuries in Lebanon

Available Relevant References in Lebanon

In addition to the annual reports from the Division of Informatics within the Internal Security Forces (ISF) and a few national or local surveys, the following references were used to extract data about injuries in Lebanon.

Table 8-1 Selected references regarding unintentional injuries in Lebanon

Author/ Year	Study Population/ Methodology
Abou-Daoud K (1970)	Examination of death certificates as reported to the registry of the Health Department of the municipality of the City of Beirut. Review of 297 fatal accidents that occurred in the city and its neighboring areas in 1968 and 1969. Deaths due to suicide and homicide were not included.
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Ministry of Social Affairs (1996)	A household survey (PAP child survey) examined 4600 households (2156 children < 5 years). Information was gathered on type, place, and outcome of injury.
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Harfouche et al. (1967)	A review of the records of 1020 pediatric patients (birth through 13 years) admitted to AUBMC (July 1959 - June 1960).
Abou-Daoud K (1974)	Review of 2410 injuries admitted to the emergency room (ER) of AUBMC over 6 months (January-June 1971). Information was extracted from a carbon copy of the emergency room admission sheet.
Gerbaka B et al. (1996)	Review of 1671 children (<18 years) who visited the emergency department of HDF in 1987-1988.
Nuwayhid et al. (1992)	Review of all 5918 childhood injuries (<16 years old) presented to the emergency of AUBMC, SGH, and Makassed in 1992
Tabbarah R (2000)	Data obtained from the Directorate General of the Internal Security Forces.
Fayad R, et al. (2000)	A total of 8432 visa forms (1 or more for each injury) were filed by MedNct (a third party administrator in Lebanon) in 1998 for work related injuries. 4186 forms reflecting 3748 injured workers were reviewed, in addition to the claims filed by the insurance companies
Afifi-Soweid R (1999)	A total of 354 home injuries among children (<19 years) were identified from selected hospital emergency rooms and fire stations in four of the five Mohafazat (governates) of Lebanon: Beirut, North, South, and Bekaa. Homes were visited for on site observations of the place where the injury took place.

Summary Findings

Due to the complexity of this topic, the findings will first be presented under five subtitles:

- General population: reporting on population surveys at national or local levels
- Hospital/ emergency room populations: reporting on studies that described patients presenting to hospitals with an injury
- Road traffic incidents
- Home injuries
- Occupational injuries

General Population

Abou-Daoud (1970)

A total of 6248 deaths were reported in 1968 and 1969 in the city of Beirut. Of these, 297 (4.8%) were due to accidents. Those were divided into two groups: motor vehicle accidents (n=124; 2% of all deaths; 42% of all accidents) and other accidents (n=173; 2.8 of all deaths; 58% of all accidents). 70% were males (M:F ratio = 2.6) and about half were 5-34 years old.

The following table present the age-sex distribution of fatal injuries in Beirut for 1968-1969.

Table 8-2 Accident Deaths in Beirut Area, 1968 and 1969, by age and sex

Age	RTA			Other accidents			All accidents		
	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes
Under 5	4	2	6	8	7	15	12	9	21
5-14	9	2	11	21	14	35	30	16	46
15-24	16	1	17	26	11	37	42	12	54
25-34	14	1	15	17	8	25	31	9	40
35-44	10	2	12	9	2	11	19	4	23
45-54	11	2	13	12	6	18	23	8	31
55-64	9	7	16	6	1	7	15	8	23
65-74	12	7	19	7	4	11	19	11	30
75 & over	9	3	12	8	1	9	17	4	21
Not recorded	3	0	3	3	2	5	6	2	8
All ages	97	27	124	117	56	173	214	83	297

Source: Abou Daouk K. 1970

The following table presents the cause of non-traffic fatal injuries by sex:

Table 8-3 Deaths due to non-transport accidents in Beirut area, 1968 and 1969, by sex and cause

Cause classification	Males		Females		Both sexes	
	N	%	N	%	N	%
Description						
Accidental poisoning	15	12.9	13	23.2	28	16.2
Accidental falls	34	29.1	17	30.3	51	29.5
Accidentant caused by fire and explosion of combustable material	13	11.1	11	19.6	24	13.9
Accidents caused by firearms	3	2.6	3	5.4	6	3.5
Accidental drowning and submersion	14	11.9	2	3.6	16	9.2
All other accident causes	38	32.4	10	17.9	48	27.7
All non-transport accident deaths	117	100.0	56	100.0	173	100.0

Source: Abou Daouk K. 1970

Beirut Survey 1992-1993 (Nuwayhid et al. 1997)

Among families surveyed in 1992-93, 388 deaths were reported during the 10 years preceding the interview. Deaths due to accidents and injuries comprised 16.8%. However, this included the 1982-1990 years of the civil war. If limited to the period of 1992-1993, accidents and injury related deaths comprised 10% of the total deaths.

The Beirut 1992-1993 survey also inquired about all injuries in the six months that preceded the survey. A total of 196 injuries were reported: 117 males (59.7%) and 79 females (40.3%). Population at risk for males was 4297 while for females it was 4610. The incidence in the entire population was estimated to be 44.3 injuries per 1000 person-years, which was higher among males (54.7 per 100,000) than females (34.6 per 100,000). In addition, the incidence was higher among males in the younger age group and among females in the older age group. The incidence rate (per 1000 person-years) of injuries was as follows:

Table 8-4 Estimated injury incidence rates (per 1,000 person-years), by age, Beirut 1992-3.

Age	Total		
	No. Injured in past six months	Population at risk	Incidence rate
<1	0	87	0.0
1-4	11	372	60.0
5-14	35	1,537	46.1
15-24	49	1,890	52.5
25-34	17	1,395	24.5
35-44	13	1,017	25.7
45-64	48	1,908	51.0
>=65	22	710	63.8
Total	195	8,907	44.3

Source: Nuwayhid et. al. 1997

The distribution of injuries by type, sex, and age was as follows:
Table 8-5 Distribution of injuries by type, sex and age, Beirut 1992-93.

Table 8-5 Distribution of injuries by type, sex and age, Beirut 1992				
Type of injury	Age (years) at injury			Total
	0-14	15-44	>=45	
MALE				
Fracture/Dislocation	9	29	18	56
Wounds	15	16	4	35
Burn	2	5	1	8
Other	4	6	7	17
Total	30	56	30	116
Population at risk	1,037	2,027	1,233	4,297
FEMALES				
Fracture/Dislocation	9	7	24	40
Wounds	3	6	4	13
Burn	3	8	2	13
Other	1	2	10	13
Total	16	23	40	79
Population at risk	959	2,275	1,376	4,610

Source: Nuwayhid et. al. 1997

The majority of the 196 injuries occurred at home (43.9%), followed by those that occurred outdoors (28.6%), in traffic (15.3%), and at work (19.7%).

Two thirds of the injured females suffered their injuries at home; the remaining injuries occurred outdoors. None of the females injuries occurred at work, however, 3.8% percent were injured in traffic accidents. Less than one third of the injured males were hurt at home. However one fourth of the injured males were injured outdoors; one-fourth in traffic accidents; and 16% were injured at work.

The outcome of the injuries was calculated according to the days of mobility lost and to the type of medical management received.

Table 8-6 Distribution of injuries according to medical treatment and number of days of mobility lost, Beirut 1992-93.

Number of days of mobility lost*	No.	%
0	61	31.4
1-2	14	7.2
3-7	31	16.0
8-14	16	8.2
15-30	45	23.2
31-90	23	11.9
>90	4	2.1
Type of medical management		
Hospital	63	32.1
Emergency services	76	38.8
Physician	23	11.7
Pharmacy	4	2.1
Home care	13	6.6
No treatment	4	2.1
Other	13	6.6

*missing information for 2 individuals.

Source: Nuwayhid et. al. 1997

MOSA- PAP Child Survey (1996)

The PAP Child survey, a national household survey, was conducted in 1996 and covered 4600 families including 2156 children below age 5 years. A total of 34 boys out of 1137 (3%) and 24 girls out of 1019 (2.4%) were reported to have suffered from an injury. The following table presents the distribution of injuries among these children:

Table 8-7 Type and place of injury among children below 5 years by sex

Sex	Injuries/ Total no. of children	Type of injury (%)					Place of injury (%)		
		Wound	Burn	Fracture	Poisoning	Other	Inside home	Outside home	Other
M	34/1137	38.1	26.5	5.7	9.1	20.6	76.1	12.1	11.0
F	24/1019	29.2	41.7	8.4	4.4	16.3	70.9	20.7	7
T	58/2156	34.4	32.7	6.8	7.2	18.8	74.0	15.7	10.3

Source: MOSA. 1996

A total of 28% reported a long-life disability associated with injury (29.8% of males and 25.4% of females).

Hospital/ Emergency Cases

MOPH-NHHEUS (1999)

A total of 10,357 out of more than 32,000 surveyed persons (weighted sample) reported seeking outpatient clinical care during the past month. Of those, 3.2% reported injuries as a reason. The proportion (%) of visits to outpatient clinics due to injuries by age and sex was as follows:

Table 8-8 Age and sex distribution of outpatients seeking medical care for injuries

Sex	< 5	5-14	15-59	>60	Total
Male	1.5	5.3	5.7	2.1	4.3
Female	1.2	2.2	1.6	1.4	1.6

Source: MOPH. 1999

Injuries/accidents constituted 13% of the 785 one-day surgery cases reported in the past 6 months. The proportion (%) of one-day surgery due to injuries by age and sex was as follows:

Table 8-9 Age and sex distribution of one-day surgery cases due to injuries

Sex	< 5	5-14	15-59	>60	Total
Male	7.8	21.6	23.2	1.4	17.6
Female	15.8	29.8	7.4	8.7	9.3

Source: MOPH. 1999

Injuries/ accidents also constituted 6% of the 3981 hospitalizations reported in the past 12 months. The proportion (%) of hospitalizations due to injuries by age and sex was as follows:

Table 8-10 Age and sex distribution of hospitalized patients due to injuries

Sex	< 5	5-14	15-59	>60	Total
Male	3.6	10.5	11.9	5.5	9.1
Female	2.6	5.0	2.8	5.6	3.6

Source: MOPH. 1999

Harfouche et al. (1967)

This study examined 1020 pediatric presentations to AUBMC over a period of one year (1959-1960). Accidents ranked fifth among the reasons for presentation accounting for 11.3%. In the age group 2-5 years, accidental injuries were the second most common diagnosis.

A total of 71 patients were hospitalized for accidental injuries accounting for 6.8% of all admissions. The 71 hospitalized cases were distributed as follows:

Table 8-11 Pediatric presentation to AUBMC by type of injury

Type	Frequency	%
Fracture	25	35.2
Burns	18	25.4
Foreign body	18	25.4
Accidental poisoning	10	14.0
Total	71	100

Source: Harfouche et. al. 1967

The following summarizes the main findings of the study:

Variation by sex

- Accidental injuries of all types were more common in males than females. They accounted for 7.3% of all admissions in males and for 6.2% in females.
- Sex variation was also related to the type of injury. Fractures were three times more common in males than females.
- Wounds were more common in males and burns more common in females. When taken together, these two accounted for 2.2% of admissions in females and for 1.5% in males.
- Admission rate for foreign body aspiration was about equal in the two sexes (1.8% males 1.6% females).
- Accidental poisoning was slightly higher in females (1.3% and 0.8%).

Variation by age

- At less than six months, fractures due to birth injury were the only variety which required hospitalization.
- The highest frequency for fractures occurred in the school period. At this age, fractures accounted for 5.6% of all admissions. It accounted for 1.6% in pre-school age.
- Foreign bodies had the highest frequency in pre-school age and the second highest during the second year of life (12-23 months). However, in the first period they accounted for 3.3 % of admissions as compared to 3.6 % in the second.
- Burn and wounds also had the highest frequency in preschool age and the second highest in school age. In the first, they accounted for 2.9 % of admissions, and in the second 2.0%.

- The risk of accidental poisoning was highest during the second half of the first year of life (3.2%) and decreased with age: 1.9% (12-23 months), 0.9% (2-5 years), and 0.6% (6-13 years).

Abou-Daoud (1974)

A total of 15,694 patients were admitted to the emergency service of AUBMC over a 6 months period in 1971. Of those, 2410 (15%) presented with an injury. Their distribution by type and sex follows:

Table 8-12 Distributed by AUBMC emergency patients by type of injury and sex

	Males		Females		Both Sexes	
	N	%	N	%	N	%
Trauma	492	32.1	221	25.1	713	29.5
Falls	258	16.9	204	23.2	462	19.2
Road traffic	239	15.5	133	15.1	372	15.8
Foreign body	210	13.7	99	11.3	309	12.8
Laceration	170	11.1	63	7.2	233	9.6
Burns	59	3.9	73	8.3	132	5.4
Poisoning	51	3.3	54	6.1	105	4.3
Suicidal attempts	10	0.7	24	2.7	34	1.4
Gunshot wounds	27	1.8	4	0.5	31	1.3
Dog and other bites	15	1.0	4	0.5	19	0.7
Total	1531	100.0	879	100.0	2410	100.0

Source: Abou Daoud. 1974

The following table presents the distribution by cause, sex, and age:
Table 8-13 AUBMC emergency patients, distributed by age, sex and type of injury

		0-4	5-14	15-24	25-34	35-44	45-54	55-64	65+	All
Falls	M	59	77	58	23	18	5	4	13	257
	F	24	44	45	40	16	9	11	15	204
	T	83	121	103	63	34	14	15	28	461
RTA	M	22	50	68	34	25	19	9	12	239
	F	12	25	28	33	11	11	9	4	133
	T	34	75	96	67	36	30	18	16	372
Foreign Body	M	38	43	47	48	25	6	1	2	210
	F	22	24	17	14	9	6	5	2	99
	T	60	67	64	62	34	12	6	4	309
Laceration	M	25	43	42	22	19	6	5	8	170
	F	14	15	15	10	5	3	1	0	63
	T	39	58	57	32	24	9	6	8	233
Burns	M	13	19	19	3	4	1	0	0	59
	F	14	8	13	13	12	8	3	2	73
	T	27	27	32	16	16	9	3	2	132
Poisoning	M	30	1	10	5	4	0	0	1	51
	F	17	4	19	9	2	1	1	1	54
	T	47	5	29	14	6	1	1	2	105
Suicidal attempts	M	0	0	6	4	0	0	0	0	10
	F	0	0	10	12	0	0	0	0	22
	T	0	0	16	16	0	0	0	0	32
Gunshot wounds	M	2	7	8	6	3	1	0	0	27
	F	0	1	1	1	1	0	0	0	4
	T	2	8	9	7	4	1	0	0	31
Dog & Other bites	M	6	3	3	1	1	1	0	0	15
	F	1	1	1	1	0	0	0	0	4
	T	7	4	4	2	1	1	0	0	19

Source: Abou Daoud. 1974

The following summarize the main findings of the study:

1. Trauma and Falls

- Trauma and falls constituted around half of the accidents seen in the emergency.
- Although falls occurred mostly in the active young adult ages, leveling off between 45 and 64, the number of patients with falls increased after the age of 65 years. Perhaps this reflects the decline in sight and adequate muscle control in those elderly persons.

2- Road Traffic Accidents

- Injury was mostly to the head and extremities.
- Injuries were clustered in the young adult ages under 35 years.
- It is to be noted that quite a few of these patients were children under the age of five years.

3. Foreign Bodies

- The organ most commonly affected was the eye. Foreign bodies in the ear, nose and throat, particularly fish bones in the throat, were relatively numerous. Another one of the specific injuries by foreign bodies resulted from stepping on sea urchins by swimmers on the beach.
- All these injuries occurred in people under 55 years of age.

- Penetrating needles and nails were commonly encountered foreign body injuries, sustained by 36 males and 41 females. Usually this resulted from stepping on these objects. In females, needles in fingers, hand and breast were also encountered.

4. *Lacerations*

- The condition tapered off after middle age.

5. *Burns*

- Burns were mostly caused by hot water, hot oil, fire and electricity.
- The injured parts in order of decreasing frequency were the face, hands and legs.
- Burns of the buttocks occurred in children under 5 years of age probably resulting from sitting on hot objects.
- The number of such accidents decreased as age advanced after 45 years.

6. *Poisonings*

- About half of these cases occurred in children under 5 years of age reflecting a serious risk to children in this age-group.
- Among the potential poisons that were swallowed were common articles and medicines found at home within reach of occupants such as aspro, valium and trinitrine tablets, kerosene, naphthalene, turpentine and machine oil. A few were cases of food poisoning.

7. *Suicidal Attempts*

- Their ages were limited to 15-35 years, the critically strenuous period of life.
- Substances used by males were D.D.T., sulfuric acid and aspro, while females used maprobamate, valium and aspro.

8. *Gunshot Wounds*

- These were limited to ages under 45 years.
- The injuries were mostly to the extremities neck and chest. Gunshot injuries are responsible for a relatively higher proportional mortality in Lebanon than in other countries.

9. *Dog and other Animal Bites*

- The bites were mainly inflicted by dogs, cats, horses, rats, bees and scorpions.
- This injury seems to be relatively more common in males than in females and affecting persons under 55 years of age.

Gerbaka et al. (1996)

In 1987-1988, 1671 children aged less than 18 years presented to the emergency department of HDF with an injury. Minor traumas represented less than half the cases. Five percent required primary care, 11% were admitted (10% in the Pediatric Intensive Care Unit), and 0.5% died upon arrival. The study also reported that 15% of the pediatric Intensive Care Unit population was admitted for accidents.

Following minor traumas, the most frequent accidents were falls (21.3%), traffic road accidents (8.9%), poisoning (5.7%) and burns (5%). Firearms injuries were rare (2.8%) but topped the causes of mortality. Foreign body inhalation was very rare (<1%) but again a significant cause of mortality.

The following table presents the distribution of injuries by sex, age, and type:
Table 8-14 HDF emergency patients distributed by type of injury, sex, peak age (years), and hospitalization

Type of accident	N (%)	Males N (%)	Females N (%)	Peak age	Hospitaliz ed N (%)
Minor injuries	818 (49.0)	573 (70.0)	245 (30.0)	-	37 (4.5)
Falls	375 (21.0)	248 (70.0)	109 (30.0)	<4, >15	49 (13.7)
RTA	149 (8.9)	109 (73.0)	40 (27.0)	-	43 (28.8)
Poisoning	95 (5.7)	45 (47.5)	50 (52.5)	2-3, >15	15 (15.8)
Burn	85 (5.1)	50 (59.0)	35 (41.0)	2-3	17 (20.0)
Work	61 (3.6)	61 (100.0)	-	16-17	-
Firearms	47 (2.8)	35 (74.5)	12 (25.5)	>13	19 (40.0)
Animal bite	25 (1.5)	16 (64.0)	9 (36.0)	16-8	-
Foreign body in skin	17 (1.0)	8 (47.0)	9 (53.0)	-	1 (5.9)
Inhalation	15 (< 1.0)	9(60.0)	6 (40.0)	<4	5 (33.3)
	2	1(50.0)	1 (50.0)	-	-
Total	1671(100)	1155(69.0)	516 (31.0)	-	186 (11.0)

Source: Gerbaka et. al. 1996

Nuwayhid et al. 1992

This study reviewed the logbooks and medical forms of 3 major hospitals' emergency services in the city of Beirut. The study was limited to childhood injuries presenting during the year 1992 and to children of 16 years of age or less. This study explored both the cause and the outcome of the injuries, which are presented in detail in Annexes A and B.

The following tables present the number of cases presenting to ER and the proportion admitted to hospital by cause and nature of injury.

Table 8-15 Cause of injuries that led to hospital admission among 354 children

	Number presenting to ER	Proportion (%) admitted to hospital
Road traffic accidents	419	15.3
Poisoning	223	19.0
Falls	1495	7.3
Fires and Flames	14	7.1
Bites	70	4.3
Air deprivation	181	8.3
Machinery/Struck	242	4.1
Piercing/cutting instruments	1955	2.3
Firearms/ explosives	23	26.1
Caustic/ steam	62	6.5
Electricity	16	31.3
Overexertion	6	0.0
TOTAL	4706	6.5

Source: Nuwayhid et. al. 1992

Table 8-16 Nature of injuries that led to hospital admission among 354 children

Outcome of injury	Number presenting to ER	Proportion (%) admitted to hospital
Fractures	514	15.2

Dislocation	22	4.5
Sprains and strains	76	2.6
Intracranial injury	284	18.5
Internal injury	9	88.9
Open wounds	2612	1.5
Injury to blood vessels	2	100.0
Superficial injuries/Contusion	834	2.0
Crushing injury	31	9.7
Foreign body	146	7.5
Burns	101	10.9
Injuries to nerves and spinal cord	6	66.7
Known body part but type of injury n.s	690	5.2
Poisoning	225	19.1
Not recorded	359	12.8
TOTAL	5913	6.0

Source: Nuwayhid et. al. 1992

The study estimated the incidence rate of emergency childhood injuries in Beirut to be around 600 per 10,000 child-years. The annual rate for hospital admission was calculated to be less than 36 per 10,000 child-years and fatality was estimated to be between 1.8-3.0 per 10,000child-years.

Road Traffic Incidents

Ministry of Interior (1999 and 2000)

The Internal Security Forces reported 4043 traffic incidents in 1999 and 3715 in 2000. These incidents included crashes, hit, run-over, and slipping. The outcome from these incidents were as follows:

Table 8-17 Number of RTA deaths and injuries in 1999 and 2000

Year	Accidents	Deaths	Injured
1999	4043	331	4539
2000	3715	306	4407

Source: Tabbarah. 1999-2000

Tabbarah (2000) reviewed data from the ISF for the year 1996 and reported that deaths from RTA rose from 337 in 1996 to an estimated 389 deaths in 1999. The number of injured people rose from 3215 to an estimated 4060 persons during the same period. The total number of dead and injured reached 4449 in 1999, which constituted a rate of 1368 per million of the population.

Home Injuries

Afifi-Soweid/ UNICEF (1999)

A total of 354 home injuries were identified through a focused sentinel health event surveillance system in the emergency rooms of selected hospitals and fire stations in four of the five Mohafazat of Lebanon: Beirut, North, South, and Bekaa. Injuries took place between March and December 1998.

The injuries were distributed as follows: 54% in Beirut, 30% in the North (Tripoli), 8% in the Bekaa, and 8% in the South. Of those, 320 cases (90%) had home observations.

Injuries distribution by age and sex was as follows:

Table 8-18 Number and percent of all injuries in children by age and gender

Age group	Males	Females	Total
Less than 1 year of age	12 (5.8%)	6 (4.1%)	18 (5.1%)
1-4 years of age	110 (53.4%)	82 (55.4%)	192 (54.2%)
5-9 years of age	54 (26.2%)	29 (19.6%)	83 (23.4%)
10-14 years of age	25 (12.1%)	25 (16.9%)	50 (14.1%)
15-19 years of age	5 (2.4%)	6 (4.10%)	11 (3.1%)
Total	206 (58.2%)	148 (41.8%)	354 (100%)

Source: Afifi-Soweid. 1999

In terms of injury type, falls were the most common (37.9%), followed by burns (32.2%), and cuts (12.5%).

Table 8-19 Percent of injury by sex and age in children for those with completed observations

Injury type	Sex		Age groups				
	M	F	<= 1	1-4	5-9	10-14	15-19
Falls	41.8	32.8	64.7%	31.0%	42.1%	47.7%	44.4%
Burns	25.9	38.9	17.6%	38.5%	23.7%	25.0%	11.1%
Suffocation	4.8	5.3	11.8%	6.9%	1.3%	2.3%	0
Poisoning	5.8	9.9	0	10.3%	3.9%	4.5%	11.1%
Cuts	14.3	9.2	0	9.8%	22.4%	11.4%	0
Electrical	1.6	1.5	0	1.1%	1.3%	2.3%	11.1%
Guns	1.1	0.0	0	0.6%	0	0	11.1%
Animal Bites	4.2	1.5	5.9%	1.1%	3.9%	6.8%	11.1%
Unspecified	0.5	0.8	0	0.6%	1.3%	0	0
Total	100	100	100	100	100	100	100

Source: Afifi-Soweid. 1999

Occupational Injuries

Fayad (2000)

This study extracted data from the compensation claims filed at five insurance companies for accidents that happened at work during 1998. The claims were part of the companies' portfolios managed by MedNet-Liban (a third party administrator). The study reviewed 4186 MedNet visa forms, out of the 8432 forms issued in 1998. The following data were reported:

Table 8-20 Distribution of the 3748 injured workers by personal characteristics, cause of injury, and type of injury.

	N	%
Personal Characteristics		
Sex		
Males	3642	98.3
Females	64	1.7
<i>Total</i>	3700	100.0
Age		
10-19	455	12.4
20-29	1772	48.4
30-39	919	25.1
40-49	359	9.8
50-59	110	3.0
60-69	41	1.1
70-79	2	0.1
<i>Total</i>	3658	100.0
Cause of injury		
Falls	952	28.6
Contact with object	(2168)	(56.1)
Contact with object unspecified	344	10.3
Struck by objects	1481	44.5
Caught in/compressed by	71	2.1
Hitting objects	272	8.2
Vehicle accident	53	1.6
Exposure to hazardous agents	70	2.1
Slips	33	1.0
Muscular stress	50	1.5
Others	2	0.1
<i>Total</i>	3328	100.0
Type of injury		
Wounds and lacerations	961	27.8
Trauma	753	21.8
Foreign body	559	16.2
Contusion	475	13.7
Fracture	255	7.4
Strain	89	2.6
Burn	56	1.6
Multiple	197	5.7
Death	3	0.1
Others	112	3.2
<i>Total</i>	3460	100

Source: Fayad. 2000

Comments

It is important first to note the following:

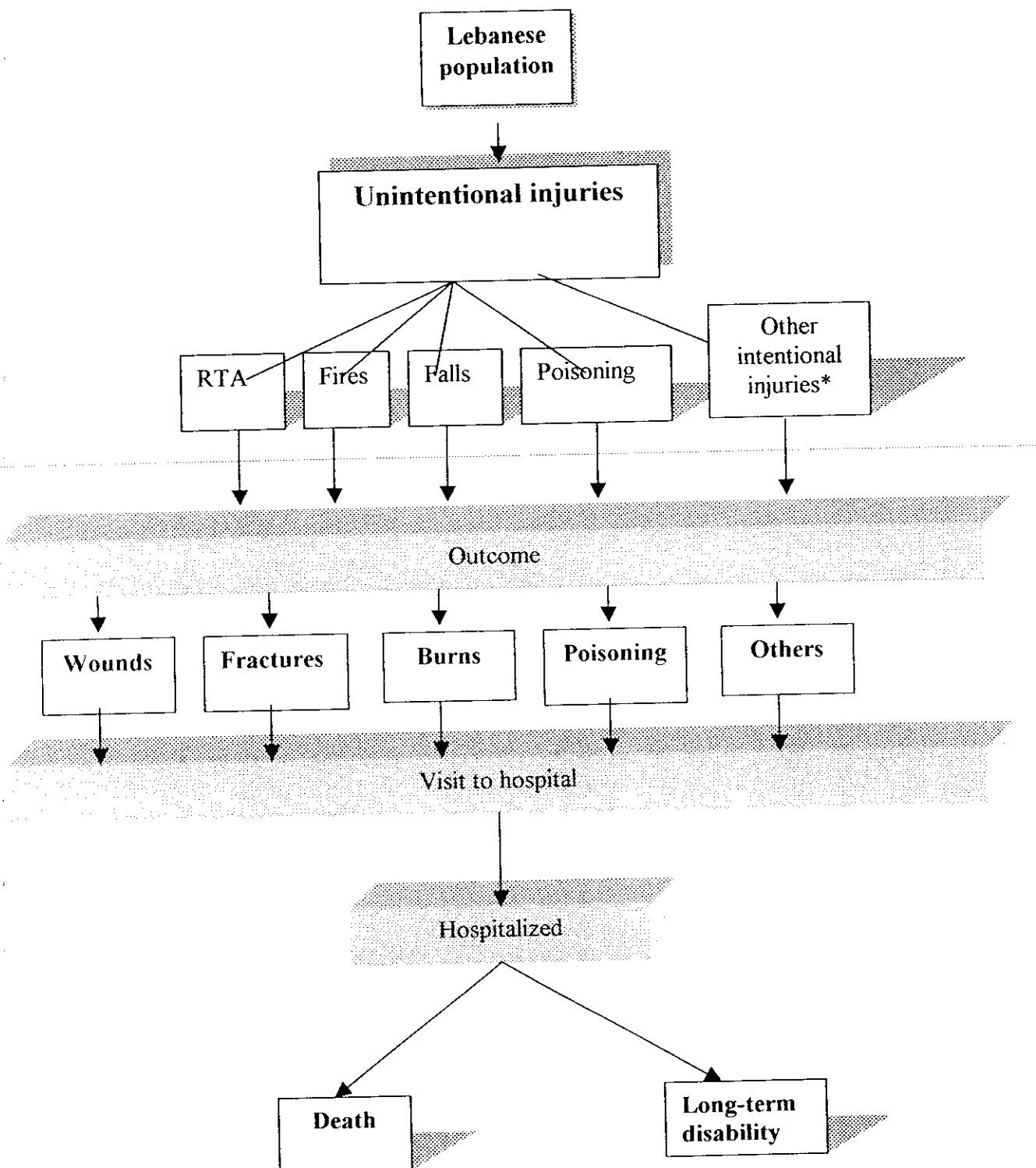
- The populations at risk were difficult to identify in most of the studies
- Information is lacking regarding the link between the causal event for the injury and its outcome.
- Most of the studies were limited to childhood injuries

The overall observations could be summarized as follows:

- Death due to unintentional injuries was estimated around 10% of total deaths.
- Injuries among children remain a leading cause for emergency presentation and hospital admission.
- Injuries among males are much higher than that among females.
- Causes of injuries vary with age.

The remainder of this review on unintentional injuries will present the main findings about different causes and outcomes of injuries. The flowchart summarizes the overall schematic plan.

Flow Chart of Injuries in Lebanon



Causes and Outcome of Injuries

➤ Road Traffic Accidents

Mortality

According to data from the Ministry of Interior, the total number of deaths from RTA in 1999 is 331. If the population at risk is as the whole population of Lebanon, then the incidence death rate due to RTA in 1999 could be estimated at 10 per 100,000 people.

Morbidity

Abou Daoud (1974) reported that the percentage of injuries due to RTA was around 16% in 1971. Gerbaka et al. (1996) reported that RTA contributed to 9% of total childhood accidents admitted to the emergency in 1987. However, around 29% of these cases were admitted to the hospital. Nuwayhid et al. (1992) also reported that 9% of all emergency childhood injuries were due RTA. Of those 15% were admitted to the hospital.

The following table presents the findings from the different studies:

Table 8-11 RTA as a percentage of total injuries in selected studies

Study	% of RTA of total injuries	Population of study	Hospitalization
Abou Daoud (1974)	16	AUBMC emergency (all ages)	
Nuwayhid et al. (1992)	9	Children (< 17) presenting to three hospitals in Beirut city	15% of hospitalized cases
Gerbaka et al. (1996)	9	Children (< 18) admitted to the Emergency department of HDF.	29 %
PAP child survey (1996)	16	Children below 5 years (national survey)	

➤ Poisoning

Mortality

According to Abou Daoud (1970), accidental deaths due to poisoning constituted around 13% for males and 23% for females (a total of 16%) of deaths due to all accidents excluding RTA.

Morbidity

Poisoning constituted 4.3% of all accidents studied by Abou Daoud (1974). It was relatively twice as frequent in females as in males.

For children below 5 who were injured, the prevalence of poisoning was 9% for males, 4% for females and 7% as a total (PAP child survey, 1996).

The prevalence among children (< 16 years) was found to be 4.7% of total injuries- 3.7% for males and 6.9% for females (Nuwayhid et al., 1992). However, poisoning cases constituted 19% of all injuries admitted to the hospital.

Accidental poisoning at home accounted for 5.5% of all home injuries for males and around 10% for females (Afifi-Soweid/Unicef, 1999).

Gerbaka et al. (1996) reported that accidental poisoning accounted for 5.7 of all presenting injuries, with a 15 percent hospitalization.

The following is a summary table:

Table 8-22 Poisoning as a percentage of all injuries in selected studies

Study	% Poisoning	Study population	Hospitalization	Comments
Abou Daoud (1974)	4.3	AUBMC emergency (all ages)		
Nuwayhid et al. (1992)	4.7	Children 16 years and less in three hospitals in Beirut city	19% of hospitalized cases	
Gerbaka et al. (1996)	5.7	Children aged less than 18 years of age admitted to the Emergency department of Hotel-Dieu de France Hospital in Beirut.	16%	
PAP child survey (1996)	7	Children below the age of 5 years who have been exposed to an injury		
UNICEF (1999)	5.5	Children below 19 years		Accidents occurring at home

➤ Falls

Mortality

In 1968 and 1969, deaths from falls constituted about 29.5% of total non-transport accidents deaths (Abou-Daoud, 1970).

Morbidity

Abou Daoud (1974) reported that accidents due to falls were 19% of total accidents admitted to the emergency.

Nuwayhid et al. (1992) reported that around 35% of children (< 17 years) admitted to the emergency were due to falls. Of those, 7 % were admitted to the hospital.

For children 19 years of age or less, falls represented 65% of all injuries among those one year of age or less and 31-48% of those 1-19 years old. (Afifi-Soweid/UNICEF 1999).

Gerbaka et al. (1996) reported that 21% of all injured children (< 18 years) who presented to the emergency were due to falls.

Fayad (2000) found out that falls comprised around 29% of all work-related injury claims in 1998.

The following is a summary table:

Table 8-23 Falls as a percentage of total injuries in selected studies

Study	% falls	Study population	Hospitalization	Comments
Abou Daoud (1974)	19	AUBMC emergency (all ages)		
Nuwayhid et al. (1992)	35	Children 16 years and less in three hospitals in Beirut city	7% of presenting cases	
Gerbaka et al. (1996)	21	Children aged less than 18 years of age admitted to the Emergency department of Hotel-Dieu de France Hospital in Beirut.	13 %	
UNICEF (1999)	37.6%	Children below 19 years with home injuries presenting to the ER		Accidents occurring at home
Fayad, (2000)	29	MedNet complaints		Occupational injuries

➤ Fires

Mortality

Accidental death caused by fire and explosion of combustible materials constituted 14% of all deaths in the emergency (Abou Daoud 1970).

Morbidity

Fire and flames constituted around 0.3% of total injuries admitted to the emergency for children 16 years and below (Nuwayhid et al. 1992). Of those 7% were admitted to the hospital.

➤ Types of injuries

Wounds

Incidence of wound injury was calculated by Nuwayhid et al. (1997) to be around $35/4297 = 81.5$ per 10,000 for males and $13/4610 = 28.2$ per 10,000 per for females.

Open wounds constituted around 44% of injuries occurring among children 16 years and below (Nuwayhid et al. 1992).

Wounds also constituted around 34% of accidents among children 5 years and younger (PAP Child Study, 1996).

Wounds and lacerations constituted 28% of worker's injuries presented to hospitals (Fayad 2000).

Fractures

Incidence of fracture and dislocation was calculated to be $56/4297 = 130.3$ per 10,000 for males and $40/4610 = 86.8$ per 10,000 for females (Nuwayhid et al. 1997).

For children below 5 years, fractures constituted around 7% of total injuries (PAP child 1996).

Nuwayhid et al. (1992) reported that fractures are around 9% of all childhood injuries (< 17 years) seen in the emergency. Of those, 15% were admitted to the hospital.

Fractures constituted around 7% of total occupational injuries (Fayad 2000)

The following is a summary table:

Table 8-24 Fractures as a percentage of all injuries in selected studies

Study	% fractures	Study population	Hospitalization	Comments
Nuwayhid et al. (1992)	9	Children 16 years and less in three hospitals in Beirut city	15% of presenting cases	
PAP child (1996)	7	Children below 5 years		Accidents occurring at home
Fayad (2000)	7	MedNet complaints		Occupational injuries

Burns

The incidence of burns was estimated to be $8/4297 = 18.6$ per 10,000 males and $13/4610 = 28.2$ per 10,000 for females (Nuwayhid et al. 1997).

Mortality from burns was not reported in Abou Daoud's study (1970).

Morbidity

Abou Daoud (1974) reported the percentage of burns out of all injuries admitted to the emergency to be 5.4% (3.9% males and 8.3% females).

For children below 5 years of age, burns constituted around 33% (27% for males and 42% for females) of total injuries (PAP child 1996).

Nuwayhid et al (1992) reported burns to constitute around 1.7% of total injuries among children (< 17 years) admitted to the emergencies. Of those, 11% were admitted to the hospital.

Among children 19 years and less, burns were reported to be 26% for males and 39% among females (Afifi-Soweid/UNICEF 1999).

Gerbaka (1996) reported burns to constitute 5.1% (60% males and 40% females) of total injuries among children aged less than 18 years. Of those, 20% were admitted to the hospital.

Occupational accidents involving burns were around 1.6 of all claims (Fayad 2000).

The following is a summary table:

Table 8-25 Burns as a percentage of total injuries in selected studies

Study	% burns	Study population	Hospitalization	Comments
Abou Daoud (1974)	5.4	AUBMC emergency (all ages)		
Nuwayhid et al. (1992)	1.7	Children 16 years and less in three hospitals in Beirut city	7% of presenting cases	
PAP child (1996)	33	Children below 5 years		
Gerbaka et al. (1996)	5.1	Children aged less than 18 years of age admitted to the Emergency department of Hotel-Dieu de France Hospital in Beirut.	13 %	
Afifi-Soweid/ UNICEF (1999)	33	Children below 19 years		Accidents occurring at home
Fayad (2000)	1.6	MedNet complaints		Occupational injuries

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Annex A

Table(a) : Distribution of the nature of 5913* childhood (<= 16 years old) injuries presenting to emergency room services in 3 hospitals in Beirut, by age and sex

	Age (years)												Total	TOTAL	
	Males						Females								
	<1	1-4	5-9	10-13	14-16	ns**	Total	<1	1-4	5-9	10-13	14-16			ns
Fractures 800-829†	4 (8.3)	58 (4.9)	96 (8.8)	115 (12.0)	86 (11.8)	0	359 (8.9)	4 (11.4)	38 (5.1)	64 (11.6)	37 (10.2)	12 (6.1)	0	155 (8.2)	514 (8.7)
Dislocation 830-839	1 (2.1)	2 (0.2)	1 (0.1)	2 (0.2)	4 (0.5)	0	10 (0.3)	2 (5.7)	7 (0.9)	1 (0.2)	2 (0.5)	0	0	12 (0.6)	22 (0.4)
Sprains and strains 840-848	0	2 (0.2)	6 (0.5)	19 (2.0)	20 (2.7)	0	47 (1.2)	0	5 (0.7)	5 (0.9)	15 (4.1)	4 (2.0)	0	29 (1.5)	76 (1.3)
Intracranial injury 850-854	5 (10.4)	71 (6.0)	41 (3.7)	41 (4.3)	22 (3.0)	0	180 (4.5)	2 (5.7)	40 (5.4)	34 (6.2)	18 (4.9)	11 (5.6)	1 (33.3)	106 (4.8)	286 (4.8)
Internal injury of chest, abdomen, pelvis-- 860-869	0	2 (0.2)	3 (0.3)	1 (0.1)	1 (0.1)	0	7 (0.2)	0	1 (0.1)	0	0	1 (0.5)	0	2 (0.1)	9 (0.2)
Open wounds 870-897	15 (31.2)	593 (44.9)	571 (52.2)	387 (40.4)	284 (38.9)	0	1850 (46.0)	7 (20.0)	330 (44.5)	249 (45.1)	115 (31.6)	61 (31.0)	0	762 (40.3)	2612 (44.2)
Injury to blood vessels 900-904	0	0	1 (0.1)	0	0	0	1 (0.0)	0	0	1 (0.2)	0	0	0	1 (0.0)	2 (0.0)
-- Superficial injury/ Contusions	10 (20.8)	121 (10.2)	135 (12.3)	159 (16.6)	114 (15.6)	0	539 (13.4)	6 (17.1)	87 (11.7)	78 (14.1)	81 (22.3)	41 (20.8)	2 (66.7)	295 (15.6)	834 (14.1)

910-924

Crushing injury 925-929	0	6	2	2	4	0	14	0	11	2	0	4	0	17	31
	--	(0.5)	(0.2)	(0.2)	(0.5)	--	(0.3)	--	(1.5)	(0.4)	--	(2.0)	--	(0.9)	(0.5)
Foreign body through orifice 930-939	1	45	20	13	22	0	101	2	30	6	4	3	0	45	146
	(2.1)	(3.8)	(1.8)	(1.4)	(3.0)	--	(2.5)	(5.7)	(4.0)	(1.1)	(1.1)	(1.5)	--	(2.4)	(2.5)
Burns 940-949	3	36	5	6	4	1	55	3	26	4	10	3	0	46	101
	(6.2)	(3.0)	(0.5)	(0.6)	(0.5)	(50.0)	(1.4)	(8.6)	(3.5)	(0.7)	(2.7)	(1.5)	--	(2.4)	(1.7)
Injury to nerves and spinal cord 950-957	0	0	2	3	1	0	6	0	0	0	0	0	0	0	6
	--	--	(0.2)	(0.3)	(0.1)	--	(0.1)	--	--	--	--	--	--	--	(0.1)
Known body part but type of injury n.s. 959	6	89	125	155	107	1	483	7	65	57	52	26	0	207	690
	(12.5)	(12.5)	(7.5)	(11.4)	(16.2)	(50.0)	(12.0)	(20.0)	(8.8)	(10.3)	(14.3)	(13.2)	--	(10.7)	(11.7)
Poisoning 960-979	0	99	10	5	4	0	118	0	65	14	9	19	0	107	225
	--	(8.3)	(0.9)	(0.5)	(0.5)	--	(2.9)	--	(8.8)	(2.5)	(2.5)	(9.6)	--	(5.7)	(3.8)
Not recorded	3	64	76	49	58	0	250	2	37	37	21	12	0	109	359
	(6.2)	(5.4)	(6.9)	(5.1)	(7.9)	--	(6.2)	(5.7)	(5.0)	(6.7)	(5.8)	(6.1)	--	(5.8)	(6.1)
TOTAL	48	1188	1094	957	731	2	4020	35	742	552	364	197	3	1893	5913

(column percentages in parentheses)

* The sex of 5 out of the total of 5918 cases was not specified.

** ns, not specified.

† ICD-9 codes (WHO 1978).

Annex B

Table (b). Distribution of the causes of 4706* childhood (<= 16 years old) injuries presenting to the emergency room services of 3 hospitals in Beirut, by age and sex

	Age (years)														
	Males					Females									
	<1	1-4	5-9	10-13	14-16	ns**	Total	<1	1-4	5-9	10-13	14-16	ns	Total	TOTAL
Road/ traffic incidents E810-E829†	1 (2.9)	61 (6.1)	73 (8.3)	85 (11.9)	84 (14.7)	0	304 (9.5)	0	29 (4.8)	41 (9.2)	25 (9.2)	19 (11.7)	1 (50.0)	115 (7.6)	419 (8.9)
Poisoning E850-E869	0 --	99 (9.9)	10 (1.1)	5 (0.7)	4 (0.7)	0	118 (3.7)	0	64 (10.6)	13 (2.9)	9 (3.3)	19 (11.7)	0	105 (6.9)	223 (4.7)
Falls E880-E888	18 (52.9)	325 (32.5)	276 (31.4)	206 (28.9)	146 (25.6)	1	972 (100.0)	15 (57.7)	201 (33.3)	158 (35.5)	102 (37.5)	46 (28.2)	1 (50.0)	523 (34.6)	1495 (31.8)
Fire and flames E890-E899	0 --	6 (0.6)	0	1 (0.1)	1 (0.2)	0	8 (0.3)	1 (3.8)	2 (0.3)	0	3 (1.1)	0	0	6 (0.4)	14 (0.3)
Bites E905-E906	1 (2.9)	6 (0.6)	13 (1.5)	19 (2.7)	12 (2.1)	0	51 (1.6)	2 (7.7)	5 (0.8)	6 (1.3)	5 (1.8)	1 (0.6)	0	19 (1.3)	70 (1.5)
Air deprivation E910-E915	1 (2.9)	57 (5.7)	24 (2.7)	20 (2.8)	27 (4.7)	0	129 (4.0)	2 (7.7)	32 (5.3)	9 (2.0)	5 (1.8)	4 (2.5)	0	52 (3.4)	181 (3.8)
Machinery/ Struck‡ E916-E919	0 --	36 (3.6)	36 (4.1)	41 (5.8)	38 (6.7)	0	151 (4.7)	3 (11.5)	39 (6.5)	21 (4.7)	20 (7.4)	8 (4.9)	0	91 (6.0)	242 (5.1)
Piercing/ cutting instruments E920	11 (32.4)	379 (37.9)	435 (49.5)	321 (45.1)	251 (44.0)	0	1397 (43.7)	2 (7.7)	207 (34.3)	194 (43.6)	96 (35.3)	59 (36.2)	0	558 (36.9)	1955 (41.5)

Firearms/ explosives E922-E923	0	1	4	8	4	0	17	0	0	1	2	3	0	6	23
	--	(0.1)	(0.5)	(1.1)	(0.7)	--	(0.5)	--	--	(0.2)	(0.7)	(1.8)	--	(0.4)	(0.5)
Caustic/ steam E924	2	20	3	3	3	0	31	1	21	2	5	2	0	31	62
	(5.9)	(2.0)	(0.3)	(0.4)	(0.5)	--	(1.0)	(3.8)	(3.5)	(0.4)	(1.8)	(1.2)	--	(2.1)	(1.3)
Electricity E925	0	9	2	1	1	0	13	0	3	0	0	0	0	3	16
	--	(0.9)	(0.2)	(0.1)	(0.1)	--	(0.4)	--	(0.5)	--	--	--	--	(0.2)	(0.3)
Overexertion E927	0	0	2	2	0	0	4	0	0	0	0	2	0	2	6
	--	--	(0.2)	(0.3)	--	--	(0.1)	--	--	--	--	(1.2)	--	(0.1)	(0.1)
TOTAL	34	999	878	712	571	1	3195	26	603	445	272	163	2	1511	4706

(column percentages in parentheses)

* The cause was recorded in only 4711 out of the total of 5918 cases, but the sex of 5 cases was not specified.

** ns, not specified.

† ICD-9 E-codes (WHO 1978).

‡ Struck by, struck against, or caught in between machinery

9.1 HYPERTENSION

Joseph Kahhaleh & Iman Nuwayhid

Background¹

Hypertension is either primary or 'essential' (90% of the cases) or secondary. Essential hypertension has a multifactorial etiology: genetic, fetal, and environmental factors.

Blood pressure is a characteristic of each individual with marked inter-individual variation. The blood pressure within a population is distributed around a mean level and varies with the characteristics of the population. Blood pressure rises with age, certainly up to the seventh decade. This rise is more marked for systolic pressure and is more pronounced in men.

The World Health Organization defines hypertension as 160/95 mmHg (systolic/diastolic blood pressure). The Framingham cardiovascular cohort study in the USA defined blood pressure of 160/95 mmHg as definite hypertension and that between 140/90 mmHg and 160/95 mmHg as borderline hypertension. Recent guidelines from the USA recommend a definition of hypertension as 140/90 mmHg, based on at least two readings on separate occasions.

Lower criteria will clearly lead to a higher apparent prevalence of hypertension in the population. Using the latter criteria, 36% of US males in the age range 18-74 years are defined as having hypertension.

The level at which blood pressure becomes associated with a significant increase in risk depends on the age, sex, race and other environmental factors of the population. It is also clear that a single reading of elevated blood pressure may be misleading.

The following are known about hypertension:

- There is progressive increase in relative mortality with increasing systolic and diastolic blood pressures.
- Individuals with blood pressure below the population mean have a relative mortality less than the population average.
- Systolic and diastolic blood pressures are independent risk factors. i.e. for a given diastolic blood pressure a progressive rise in systolic pressure is associated with increasing mortality and vice versa.

Mild hypertension is a much more common clinical problem than moderate or severe hypertension in unselected clinical practice. Even modest elevation of blood pressure impairs prognosis substantially. The life expectancy of a 35-year-old man with a

¹ References:

- 1- Kumar P, Clark M. Clinical Medicine, 4th Ed. W.B. Saunders, 1997.
- 2- Swales JD. Essential Hypertension. In: Oxford Textbook of Medicine, 3rd Ed. Oxford :Oxford University Press, 1996. Pp 2527-2543.

casual blood pressure of 150/100 is reduced from 41.5 years to 35 years; at 55 the relative figures are 23.5 years and 17.5 years.

Individual risk increases markedly and life expectancy decreases sharply in individuals with moderate and severe hypertension (i.e., BP in excess of 160/110 mmHg). Before effective antihypertensive medication was available, malignant hypertension was associated with a 1-year life expectancy of only 10 to 20%. This has now been radically altered, particularly when effective treatment is begun early. A 5-year survival rate in excess of 80% has been reported among patients free of significant renal impairment at presentation.

The predominant causes of death in hypertensive patients are cerebrovascular disease (risk increases by 6 times) and coronary heart disease (3-times risk). Hypertensive patients are also at risk from peripheral arterial disease (risk doubles) and renal failure.

Hypertension in Lebanon

Available relevant references in Lebanon:

More than 30 published and unpublished reports were identified, but only a handful were relevant to the purpose of this report.

Table 9.11-1: Selected reference regarding hypertension in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Salti IS et al. (1997)	A cross-sectional study of 2518 Lebanese subjects (1138 males, 1380 females) older than 30 years from 3 communities: Aisha Bakkar (Beirut), AUB, and Hammana (Mt. Lebanon). Screening between November 1994 and September 1995. Interview and examination.
Abou Daoud (1969)	A cross-sectional survey of 1121 Lebanese males and females aged 25-64 working as full-time basis at AUB. Information on height, weight and blood pressure was collected.
Armenian H et al. (1986)	A study of 477 employees at AUB to investigate the association between snoring and hypertension.
Abi Chedid J et al. (1994)	A medical students' project where compliance of 50 hypertensive patients with recommended diet was assessed via a questionnaire.
Saliba M (1993)	Retrospective study on 50 patients in the outpatient department of HDF. Association between coronary disease and hypertension investigated.
Naba TS 1989)	Cross-sectional study: 50 taxi drivers working in Beirut (Dora station) compared to 50 individuals from several villages and towns (Ras Baalbeck, Bikfaya, Bkaatouta, Baskinta, Hrajel). Subjects completed a questionnaire and BP measured.
Abi Chedid J et al. (1994)	A medical students' project where compliance of 50 hypertensive patients with recommended diet was assessed via a questionnaire.

Summary Findings

General Population

In its national survey, the NHHEUS 1999 (MOPH 1999) reported that 5.5% of the 32,000 surveyed individuals reported hypertension confirmed by a physician (4.5% of males and 6.6% of females). This compared well with the Beirut 1992-1993 survey conducted by FHS among 8906 residents (Nuwayhid et al. 1997) where 4.7% of males and 6.9% of females reported hypertension. Prevalence increased with age, as shown in this table:

Table 9.1-2: Prevalence of hypertension by age and sex among Beirut residents

	No. of cases	0-9	10-19	20-29	30-39	40-49	50-59	60-69	=>70	All ages
Males	202	0.0	0.0	0.3	1.8	5.3	13.4	19.1	18.7	4.7
Females	316	0.0	0.0	0.7	1.0	7.9	17.2	29.5	29.9	6.9

Source: Nuwayhid et al. 1997

Salti et al. (1997) reported that 5.7% of 812 non-diabetic men (30-64 years old) had a diastolic blood pressure of at least 95 mm Hg and 1.5% had systolic blood pressure of at least 165 mm Hg. The prevalence of elevated diastolic and systolic blood pressure among the 990 non-diabetic women (35-64 years old) was 6.3% and 3.3%, respectively. The prevalence of elevated SBP and DBP increased 2-6 times among the diabetic (NIDDM) men and women and those with impaired glucose tolerance. It is important to note that BP was measured in this study.

Abou Daoud reported prevalence by age and sex in his 1969 study of hypertension.

Table 9.1-3: Prevalence of hypertension in age and sex

	25-34	35-44	45-54	55-64	Total
Males	298	280	115	75	766
Females	185	78	55	37	355
Total	483	358	170	110	1121

Source: Abou Daoud KT. 1969

Caution should be exercised when extrapolating the results based on data from 1969 to current estimates particularly since criteria for definition and classification of hypertension has dramatically changed since then.

Special Populations

Armenian H et al. (1986) reported that 185 out of the 477 surveyed AUB employees snored. The prevalence of hypertension was 35% among those who snored (65 out of 185) as compared to 16% among those who did not snore (48 out of 292). The study also revealed that hypertension increased with age among the total population of 477 employees (13% among those younger than 37 years of age as compared to 36% of those older than 37). It is worthy to note that 78% of those with hypertension were males.

In their student report, Abi Chedid et al. (1994) reported the age distribution of the 50 hypertension patients interviewed as follows: 5% < 40 years, 8% between 40 and 50 years,

and 87% > 50 years. Sixty percent of the patients were males. Similarly, Saliba (1993) reported in her study of CD and hypertension that 60% of the patients were males.

Naba (1989) reported that 33 out of the 50 taxi drivers in Beirut were hypertensive (66%), as compared to 10 out of the 50 living in towns and villages (20%). The age distribution of the two populations was as follows:

Table 9.1-4 Age distribution of hypertension taxi drivers Urban vs non urban

	Age of Hypertension Patients				Total
	30-39	40-49	50-59	60-69	
Taxi drivers	12 (24%)	16 (32%)	19 (38%)	3 (6%)	50 (100%)
Control	11 (22%)	20 (40%)	12 (24%)	7 (14%)	50 (100%)

Source: Naba, 1989

Use of Health Services

No data were available on the number of patients discharged from the three surveyed hospitals in Beirut in 1999-2000 (see Chapter 5) with hypertension. The Mednet reported that 261 out of the 42,000 processed claims in 1999 were due to hypertension.

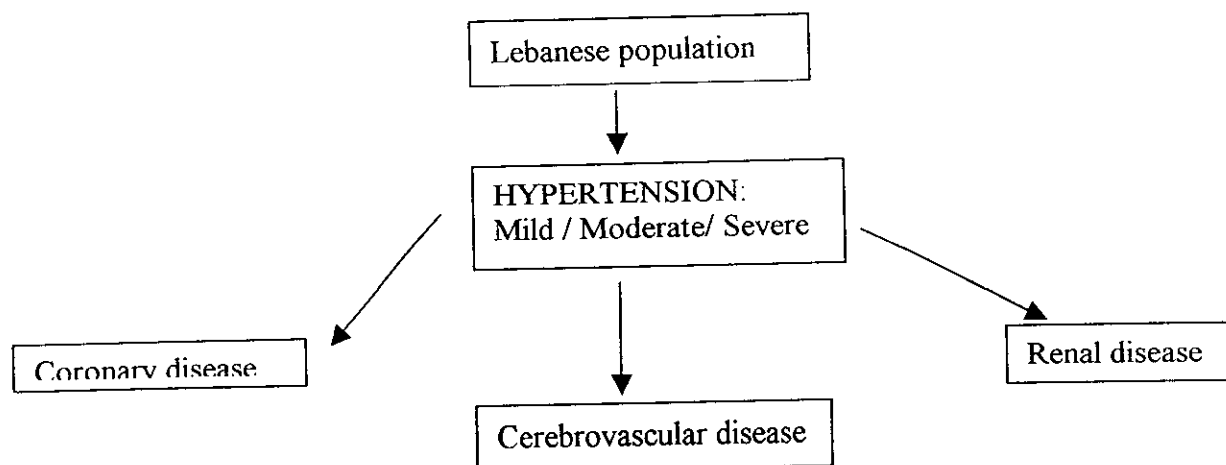
Saliba (1993) noted that 36% of coronary disease patients had hypertension.

Comments

All studies of the general population revealed a higher prevalence of hypertension among females than males. The overall prevalence of hypertension (diagnosed by a physician) at a national level (NHHEUS 1999) was 4.5% among males and 6.6% among females. A similar prevalence was self-reported among the residents of Beirut in the FHS 1992-1993 although not necessarily confirmed by a physician. When the population was limited to those older than 30 years, the prevalence of hypertension among the residents of Beirut became 10.5% among men and 13.3% among women. In their survey of three community populations, Salti et al. (1997) reported a little bit lower prevalence (6-7% among men and 8-10% of women). However, this study adopted a strict definition of hypertension (165/95mm Hg) rather than 160/95 or even 160/90.

The association between hypertension as a predictor and risk factor of cerebrovascular, cardiovascular, and renal diseases is not properly documented in Lebanon.

The following flow chart might be helpful in later evaluation of the burden of hypertension.



References

1. Abi Chedid J, Aboulhosn L, Ayyash A, Dernaika R, Kalouche L, Khoury N, Mounayar E, Nasreddine W, Sayadi B. Compliance of hypertensive patients with their diet. *Travail de Recherche en Sante Publique*. USJ, Faculte de Medecine, 1994.
2. Abou Daoud KT. Blood pressure, height and weight status of a group of Lebanese. *Leb Med J*, 1969; **22**: 591-601.
3. Armenian HK, Issa JP, Sahakian V, Tawa C, Ariss L, Dona F, Saliba K. Snoring and Hypertension in a Study Sample from Lebanon. *J Med Libanais*, 1986; **36**: 25-27.
4. Ministry of Public Health. National Household Health Expenditure and Utilization Survey (NHHEUS). 1999.
5. Naba TS. Possible contributing factors to hypertension in Lebanese urban and rural Communities. *Thesis AUB*, Faculty of Medicine, 1989.
6. Nuwayhid I, Sibai A, Adib S, Shaar K. Morbidity, mortality, and risk factors. In Beirut: A Health Profile 1984-1994. Deeb M (Ed). Beirut: American University of Beirut, 1997. Pp. 123-182.
7. Saliba M. Incidence de la maladie coronaire dans l'hypertension arterielle essentielle au Liban. *These*. USJ, Faculte de Pharmacie, 1992-1993.
8. Salti IS, Khogali M, Alam S, Abu Haidar N, Masri A. Epidemiology of diabetes mellitus in relation to other cardiovascular risk factors in Lebanon. *Eastern Mediterranean Health Journal*, 1997; **3**: 462-471.

9.2 OBESITY IN LEBANON

Hassan Ghamrawi & Iman Nuwayhid

Background¹:

The prevalence of obesity has approached epidemic proportions during the past few decades, and this condition is now recognized to be a major contributor to the global burden of disease. Trends in obesity vary by region, country, racial or ethnic grouping. Obesity prevalence is still on the rise, including not only in industrialized countries but also non-industrialized countries, particularly those in an economic transition. In fact, "the highest levels of obesity in middle and lower-income countries occur in the Middle East, Western Pacific, and Latin America. Obesity is less common in Asia, but there is evidence that its prevalence is rapidly increasing. The recent shifts in diet, physical activity, and the prevalence of overweight in China are among the most rapid ever-documented". Several dietary, lifestyle and possibly ethnic factors are important in determining the magnitude of the metabolic and mechanical complications associated with obesity. They include non-insulin-dependent diabetes mellitus, cardiovascular diseases, cancers, gastrointestinal diseases and arthritis which are major medical conditions that have hitherto been considered as unrelated to overweight and obesity. As population longevity is increasing, obesity-related outcomes increase gain more importance

There is international consensus that the index put by the Belgium astronomer Quetelet (the body mass index BMI) is the most appropriate for measuring obesity. The BMI is calculated by dividing the weight (kg) by the square of height (m²).

¹ References:

1. Visscher T, Seidell J. The public health impact of obesity. *Annual Review of Public Health*, 2001; 22: 355-375.
2. Popkin B. Obesity as a Worldwide Problem. *Nutrition Research Newsletter*, June 1998.
3. Cole T. Establishing a standard for child overweight and obesity worldwide: International Survey. *British Medical Journal*, May 2000.

Obesity in Lebanon

Available Relevant References in Lebanon

While many studies looked at the clinical manifestations due to obesity, few were done in Lebanon to assess the prevalence of obesity among the Lebanese.

Table 9.2-2 Selected references regarding obesity in Lebanon

Author (year)	Study Population/ Methodology
Baba N (1996)	A national cross-sectional survey of 965 households and 3068 subjects (Age 3 and above) in April-September 1996
Salti IS et al. (1997)	A cross-sectional study of 2518 Lebanese subjects (1138 males, 1380 females) older than 30 years from 3 communities: Aisha Bakkar (Beirut), AUB, and Hammana (Mt. Lebanon) . Screening between November 1994 and September 1995. Interview and examination.
El-Ali N (2000)	Cross-sectional of 440 children (4 – 13years) in 1999-2000: 100 from Akkar and 340 from Beirut

Summary findings

Adult Population

In her national survey, Baba (1998) used the international criteria to assess the prevalence of overweight and obesity among Lebanese adults. The survey revealed that 35% of the 19-34 year old age group were overweight, or obese. The prevalence increased among the 35-50 age group to 64% and rose to 70% in the older than 50 age group. The following table presents the prevalence (%) of different categories by age groups:

Table 9.2-2 Prevalence of overweight and obesity in Lebanon adults

	19-34	35-50	>50
Pre-obese	25.6	44.5	42.5
Obese- Class I	7.4	14.5	21.6
Obese- Class II	1.8	4.3	5.3
Obese- Class III	0.14	1.2	1.4

Source: Baba. 1998

Table 9.2-3 Prevalence of overweight and obesity by sex, age and regionas

	Beqa'a		North		South		Mount Lebanon		Beirut	
	M	F	M	F	M	F	M	F	M	F
<i>Pre-obese</i>										
19-34	41.7	32.5	24.6	21.8	31.0	23.6	31.9	13.8	37.1	12.2
35-50	51.4	50.0	46.7	29.1	41.7	46.3	59.5	36.4	64.7	37.3
>50	40.9	41.3	42.0	32.6	51.4	31.3	42.3	40.6	60.4	40.4
<i>Obese class I</i>										
19-34	6.3	1.3	11.6	8.0	20.7	1.4	4.3	13.1	3.2	4.9
35-50	16.2	16.7	8.9	24.1	27.8	20.4	22.1	31.8	15.7	6.0
>50	18.2	15.2	8.0	32.6	21.6	39.6	17.3	32.6	8.3	17.3
<i>Obese class II</i>										
19-34	0.0	1.0	2.9	0.0	3.4	5.6	0.0	2.1	0.0	2.4
35-50	3.0	4.0	4.4	7.6	5.6	11.1	1.7	3.4	0.0	1.2
>50	2.0	17.0	4.0	8.7	2.7	8.3	1.9	3.1	2.1	3.8
<i>Obese class III</i>										
19-34	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35-50	0.0	0.0	0.0	6.3	0.0	0.0	0.0	1.1	0.0	1.2
>50	0.0	0.0	0.0	4.3	5.4	0.0	0.0	2.3	0.0	3.8

The above table reveals variations by region and an general increase in obesity with age, especially among women.

Salti et al. (1997) reported that 52.6% of the 812 non-diabetic men (30-64 years) and 64.1% of the 990 non-diabetic women (30-64 years) were overweight or obese defined as a BMI > 27kg/m² for men and BMI > 25 kg/m² for women.

Baba (1996) further presented the prevalence of overweight and obesity by sex and regionas follows:

obese defined as a BMI > 27 kg/m² for men and BMI > 25 kg/m² for women.

Child Population

El-Ali (2000) reported that 26.4% of the 440 children were overweight, and 9% were obese. However, this study selected an unconventional age group of 4-13 years old.

Baba(1998) also reported prevalence (%) of overweight and obesity in children as shown in the following table:

Table 9.2-4 Prevalence of overweight and obesity of Lebanese children in selected studies

Study population	El-Ali (2000)	Baba (1996)	
	4-13 years	3-10	11-19.9
Overweight	26.4		
Obese	9.1		

Sources: El-Ali. 2000

Baba. 1998

Comments

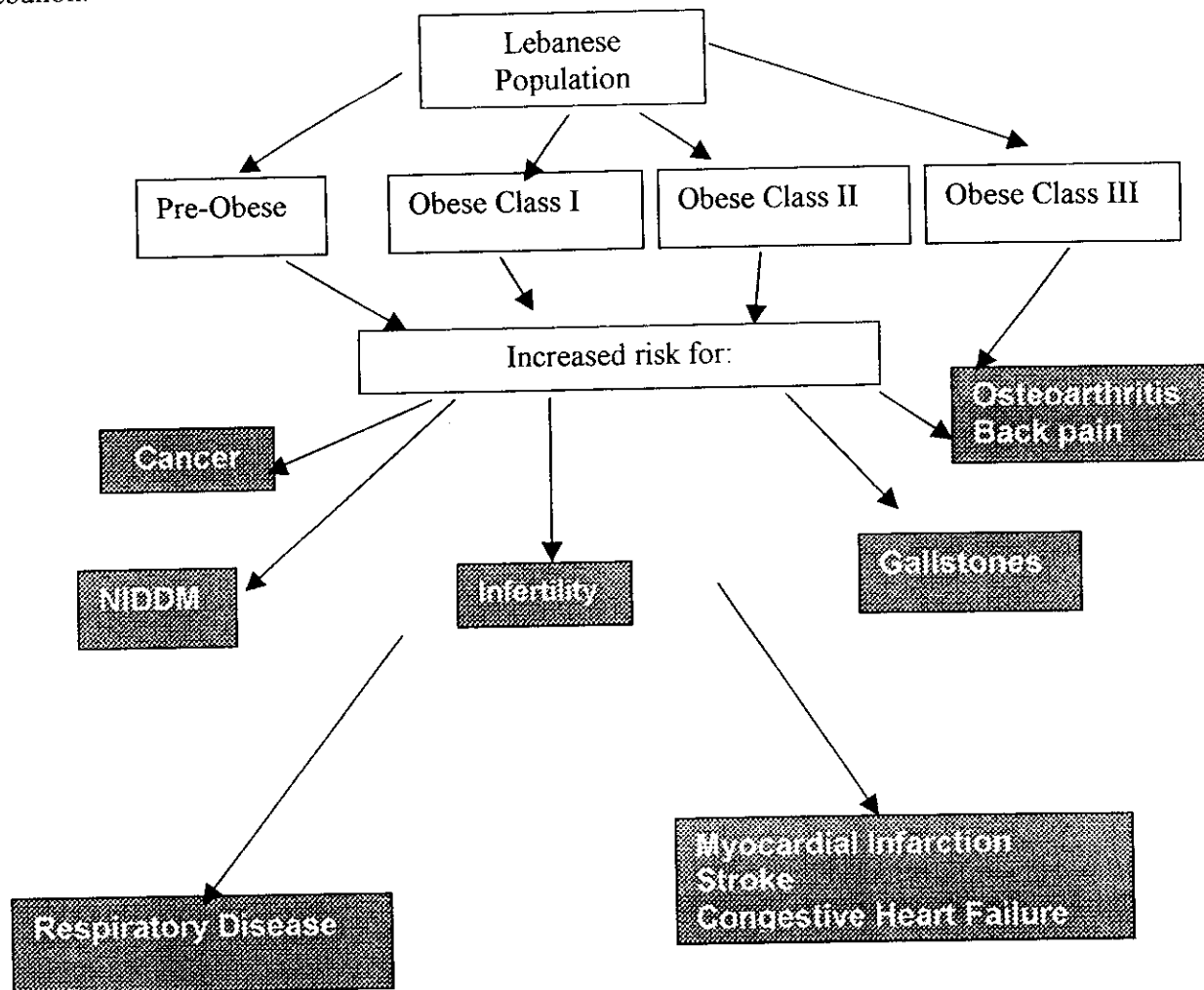
The reviewed studies identified a high prevalence of overweight and obesity among the Lebanese, especially among those older than 35 years old.

Although it is difficult to make valid comparisons between nations, the following table compiles estimates on the prevalence of obesity (BMI > 30) in the age group 40 to 60 years in different countries.

Table 9.2-5 Prevalence of obesity in selected countries

Area	Men	Women
Northern Europe	10	15
Western Europe	13	16
Mediterranean	16	30
Eastern Europe	18	30
USSR (former)	14	44
USA (Caucasian)	15	18
USA (Afro-American)	20	37
Lebanon (Baba 1996)	20% (35-50 years): men and women 28% (> 50 years): men and women	

The following flow chart is helpful for later evaluation of the burden of overweight in Lebanon.



References

1. Baba N, Adra N. Dietary trends and obesity in Lebanon. Report submitted to the WHO, Ministry of Health and Lebanese National Research Council, 1998.
2. El-Ali N. Obesity in adolescents. *Thesis*. USJ, Faculte de Medcine, 2000.
3. Salti IS, Khogali M, Alam S, Abu Haidar N, Masri A. Epidemiology of diabetes mellitus in relation to other cardiovascular risk factors in Lebanon. *Eastern Mediterranean Health Journal*, 1997; **3**: 462-471.

9.3 SMOKING

Mylene Tewtel-Salem & Iman Nuwayhid

Background¹

Smoking is one of the leading causes of preventable illnesses and premature death in the world. The WHO estimates that tobacco use caused four million deaths in 1998, and is expected to cause ten million deaths a year by 2025 worldwide. Over 70% of these deaths will be in the developing world, which the tobacco companies are targeting to make up for their diminishing market share in the developed world. As a result, US cigarette exports increased from 8% in 1984 to 30% by 1994. The full health consequences of smoking in the developing world will be experienced later because of the long delay between the onset of persistent smoking and the development of its full effects.

Smoking causes a large array of diseases, predominantly lung cancer, chronic obstructive pulmonary disease (COPD), cerebrovascular disease, and cardiovascular disease. The following table published by American Cancer Society's Cancer Prevention Study II (CPS-II) estimated the relative risk of dying from different diseases among current and former smokers as compared to non-smokers:

¹ References:

1. World Health Organization. The World Health Report 1999. Combating the tobacco epidemic. Found at: <http://www.who.int/whr/1999/en/pdf/chapter5.pdf>
2. Bartecchi CE, MacKenzie TD. The global tobacco epidemic. *Scientific American*, May 1995; 275:44-51.
3. Jamison DT, Mosley WH, Measham AR, Bobadilla JL. Disease Control Priorities in Developing Countries. Oxford: Oxford University Press, Published for the World Bank, 1993.
4. World Bank. Curbing the Epidemic: Governments and the Economics of Tobacco Control. Found at <http://www1.worldbank.org/tobacco/reports.htm>.
5. International Agency for Research on Cancer. *Monograph on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: Tobacco Smoking*. Volume 38, 1986.
6. Henningfield JE, Hartel CR. Scientific basis For tobacco policy: Nicotine research travails. In Drug Abuse: Origin and Interventions. Meyer D, Glantz, Christine R, Hartel (Eds). Washington D.C: American Psychological Association, 1999. Pp 431-446.
7. Murray CJL, Lopez AD. The Global Burden Of Disease. World Health organization, 1996.
8. Murray CJL, Lopez AD. Global mortality, disability, and the contribution of risk factors: Global burden of disease study. *The Lancet*, 1997; 349: 1436-1442.
9. Australian Institute of Health and Welfare. The Burden of Disease and Injury in Australia. Mathers C, Vos T, Stevenson C (Ed). Canberra: AIHW, 1999.
10. Murray CJL, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global burden of disease study. *The Lancet*, 1997; 349: 1498-1504.

Table 9.3-1 Selected mortality risks for smokers and former smokers

Underlying Cause of Death	Males(b)		Females(b)		Association (b) & (c)
	Current Smokers	Former Smokers	Current Smokers	Former Smokers	
All Causes	2.34	1.58	1.90	1.32	
CHD:					Major cause (men and women)
Age < 35	1.94	1.41	1.78	1.31	
Age 35-64	2.81	1.75	3.00	1.43	
Age ≥ 65	1.62	1.29	1.60	1.29	
Other Heart Disease	1.85	1.32	1.69	1.16	
Cerebrovascular					Cause
Age < 35	2.24	1.29	1.84	1.06	
Age 35-64	3.67	1.38	4.80	1.41	
Age ≥ 65	1.94	1.27	1.47	1.01	
Other Circulatory Disease	4.06	2.33	3.00	1.34	
COPD	9.65	8.75	10.47	7.04	Most important cause (pulmonary emphysema and chronic bronchitis)
Other Respiratory Disease	1.99	1.56	2.18	1.38	
Lip, Oral Cavity, Pharynx Cancer	27.48	8.80	5.59	2.88	Major cause
Esophagus Cancer	7.60	5.83	10.25	3.16	Major cause
Pancreas Cancer	2.14	1.12	2.33	1.78	Contributory factor
Larynx Cancer	10.48	5.24	17.78	11.88	Major cause (men and women)
Lung Cancer	22.36	9.36	11.94	4.69	Major cause (men and women)
Cervix Uteri Cancer	NA*	NA*	2.14	1.94	
Kidney Cancer	2.95	0.95	1.41	1.16	Cause
Bladder, Other Urinary Organs Cancer	2.86	1.90	2.58	1.85	Cause

Source: American Cancer Society, CPS II

* NA: Not Applicable (a) CPS II, a prospective cohort study began in 1982 (1.2 million subjects), and mortality follow up of all CPS II cohort members remains active. In the table above (surgeon general report 1989), are reported the preliminary results of the first 4 years of follow up (1982-1986) of CPS II. For these 4 years, ascertainment of the fact of death among enrollees is thought to be virtually completed according to the surgeon general report 1989. (b) Source: Surgeon General 1989 Report. Relative risk estimates in these tables provide a comparison of the risk of developing various diseases for smokers compared to non-smokers. A relative risk of 1.0 would indicate that the risk of developing the disease is the same in smokers as non-smokers. A relative risk above 1.0 indicates that smokers have a higher risk than non-smokers. (c) International Agency for Research on Cancer, Monograph on the Evaluation of the Carcinogenic Risk of Chemicals to Humans: Tobacco Smoking, Volume 38, 1986.

Exposure to environmental tobacco smoke (ETS) has also been associated with lung cancer (relative risk estimated at 1.3), with risk increasing with duration of exposure.

The US National Institute for Occupational Safety and Health has classified ETS as a class A (known human) carcinogen. The following table summarizes the health effects associated with exposure to ETS and estimated annual morbidity and mortality.

Table 9.3-2 Health effects associated with ETS

Condition	In the U.S.
Developmental Effects Low birthweight Sudden Infant Death Syndrome (SIDS)	9700 - 18600 cases 1900 -2700 deaths
Respiratory Effects in Children Overall Middle Ear Infection Asthma Induction Asthma Exacerbation Bronchitis or Pneumonia (≤ 18 months)	0.7 - 1.6 million physician office visits 8000- 26000 new cases 400,000 - 1,000,000 children 150,000 - 300,000 cases 7500- 15000 hospitalizations & 136-212 deaths
Cancer Lung Nasal Sinus	3000 deaths Not available
Cardiovascular Effects Ischemic Heart Disease	35,000-62,000 deaths

Source: Office of Environmental Health Hazards Assessment.

Spontaneous abortion, adverse impact on cognition and behavior, exacerbation of cystic fibrosis, decreased pulmonary infection, and cervical cancer have been suggested to be associated with ETS exposure.

Murray and Lopez (1997) estimated that 3 million people died in the world in 1990 from smoking, accounting for 6% of all deaths, 2.9% of years of life lost, 2.1% of years of life with disability, and 2.6% of disability-adjusted life years (DALYs). The contribution of smoking to DALYs (%) was higher in the developed world as shown here:

Table 9.3-3 Contribution of smoking to DALYs by region of the world

EME	FSE	IND	CHN	OAI	SSA	LAC	MEC	Developed	Developing	World
11.7	12.5	0.6	3.9	1.5	0.4	1.4	1.2	12.1	1.4	2.6

Source: Murray C & Lopez AD. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *The Lancet*, 1997; 349: 1436-1442.

EME=established market economies; FSE=formerly socialist economies of Europe; IND=India; CHN=China; OAI= Other Asia and islands; SSA=sub-Saharan Africa; LAC- Latin America and the Caribbean; MEC=middle eastern crescent.

Murray and Lopez (1996) warned that the burden attributable to tobacco shown above has been calculated based on past exposure. The global burden in the future will increase further (up to 9.0% of global DALYs) with most of it carried by the developing world.

Smoking in Lebanon

Available Relevant References in Lebanon

Relevant references were compiled in two sets. The first shown below provides data on prevalence, age of onset, intensity, cessation, and type of smoking. The second (shown in the later table) includes analytical studies that investigated health effects.

Table 9.3-4 Selected references regarding smoking in Lebanon

Author (year)	Study Population/ Methodology
MOPH (1999)	National Household Health Expenditure and Utilization Survey (NHHEUS) in 1999: A total of 6544 households representative of Lebanon were included (a weighted sample of 32000)
Khogali M et al. (1999)	Dar El Fatwa-Aisha Bakkar (Beirut): Spring-Summer 1999 Household survey (questionnaire) of all 2,846 adults (25-64 years old) (Males/Females: 0.77) residents of the Aisha Bakkar area. Response rate 80%. Only 42% completed blood screening + height/weight checkups.
Chidiac C (1998)	Random sample of households all over Lebanon based on a multi-stage sampling using data from the 1996 MOSA survey. Individuals selected randomly. A total of 727 adults interviewed in 1998. (≥ 20 years old, mean age: 40.1 years) (M/F: 0.95). Response rate: 88.12%
Nuwayhid et al. (1997)	A household survey of Beirut conducted in 1992-1993 by the Faculty of Health Sciences. A follow-up of the population surveyed in the Beirut 1983-1984 survey. Information on 2017 households (8,940 individuals). Information on type, place, and outcome of injury was collected.
Abou Daoud KT (1970)	Faculty, staff, and employees at AUB (25-64 years old) participating in a screening survey program for Diabetes Mellitus in 1967-1968. Direct interviews of 1,121 individuals. (M/F: 2.16) (Response rate: 81.6%)
Nuwayhid I et al. (1998)	A survey of 238 medical students, interns, and residents at AUB (September 1998) (Age 21-27 years) (M/F: 1.77).
Shediac-Rizkallah M et al. (2001)	A survey of 954 students newly entering the American University of Beirut in Fall 1998. (Age 16- 19 + with 64% 18 years) (M/F: 1.15) Self-administered questionnaire.
An-Nahar newspaper (1997)	Survey of 1146 students in 5 universities in Lebanon (AUB, LAU, USJ, BAU, LU) in May-June 1996. (Mean age 20 years old, except for LU 21 years old). (All faculties except USJ- School of Engineering). Students randomly chosen. Methodology not presented.
Makki A & Hourri M (1995)	3180 students in Lebanese University (Beirut), LU (Bekaa), Lebanese American University (LAU) surveyed in 1995. No information about methodology.
Papazian T (1993)	Questionnaires distributed to 200 women (age 18-20) currently enrolled in four institutions of higher learning (AUB, LAU, Haigazian College, Saint Joseph University). No further information is available. 1993.
Nassar N et al. (1980)	A 20% systematic random sample of students at American University of Beirut Mailed questionnaire (with reminders to non-respondents) in 1974-1975. 730 students responded (Response rate: 77.7%).
Uthman S (1964)	All 160 medical students (very few women) at AUB in 1964. Self-administered questionnaires.

Chidiac C (1998)	Random sample of households all over Lebanon based on a multi-stage sampling. From the selected sample, 306 secondary students (15-19 years old; mean 17.1) are surveyed randomly proportionally to the structure of the student population. (M/F: 1) (Beirut 34%; Mount Lebanon 26.8%; North 13.1%; South 13.1%; Bekaa: 13.1%) Questionnaires. Response rate: 46%
Chidiac C (1998)	A total of 380 adolescent girl scouts in Beirut and suburbs (age 11-15 years/ mean 13.6). Questionnaires administered in 1998 during an information session after brief explanations. Response rate: 92.7%
Mokdad F et al. (1997)	A total of 31 hospitals throughout Lebanon included according to geographic distribution, presence of women practitioners, and access. Self-administered questionnaires to 635 physicians (M/F: 2.43) representing 9.6% of all doctors resident in Lebanon in 1996 (Interns, pharmacologists, and dentists excluded).
Abi Saleh N et al. (1988)	110 physicians (M/F: 2.8) interviewed in 1988 in Hotel Dieu de France and Saint George Hospitals. "Study conducted according to statistical procedures". No information on sampling method or data collection
Chidiac C (1998)	Random sample of households all over Lebanon based on a multi-stage sampling using data from the 1996 MOSA survey. Individuals selected randomly. A total of 75 secondary teachers interviewed in 1998. (age: 23-62 years) (M/F: 1.88). Self-administered questionnaires.
Sibai A and Kanaan A (1997)	A random sample of sampling units (70) based on a two-stage sampling design using the sampling frame of schools from the Ministry of Education. 100 students were selected randomly from each sampling unit. Five public schools and nine private schools located mainly in administrative Beirut. Students aged between 15-24 (mean/SD: 17.5 /1.36) (M/F: 0.89). Self-administered questionnaires.

A few studies tried to illustrate the health effects of smoking in Lebanon.

Table 9.3-5 Selected references regarding health effects of smoking in Lebanon

Author (year)	Study population/ Methodology
Abou-Daoud KT (1980)	<i>To examine the association of smoking, coffee, and alcohol with bladder cancer</i> . Forty-nine cases of bladder cancer treated in Beirut were matched (by age within five years, sex, nationality, region and treatment class) with patients admitted for other cancers in these centers. Patients having a cancer known to be associated with smoking were excluded. Patients interviewed and more information was obtained from treatment records.
Khachadurian AK et al. (1972)	<i>To examine the association between different risk factors (including smoking) and coronary heart disease:</i> 100 consecutive inpatients or outpatients (≤ 45 years old) admitted/referred to AUBMC with coronary heart disease. Clinical and laboratory data, including info about smoking, were obtained. Findings compared to those of 62 age- and sex-matched patients from the outpatient clinic, as well as to healthy controls.

Nuwayhid et al. (1998)	<i>To examine the association between narghile smoking, cigarette smoking, and low birth weight and other pregnancy outcomes:</i> 895 pregnant women (106 narghile smokers, 277 cigarette smokers, and 512 non-smokers) delivering in hospitals throughout Lebanon (1993-1995). Interviewed about their smoking habits before and during pregnancy, exposure to passive smoking, and other variables. From the medical record: weight of the newborn, weeks of pregnancy, 1-minute and 5-minute Apgar scores, head circumference, type of delivery and presence of meconium, respiratory distress, or malformation. Only singletons live births and those that completed 28 weeks of gestation were eligible for the study.
Abou Khalil - Sassine R. (1995)	<i>To assess the prevalence of several risk factors (including smoking) among patients with cardiovascular disease:</i> Patients with cardiovascular disease admitted to the Cardiology Department at HDF (January-April, 1995). Self-administered questionnaire. No control group.
Saade K (1990)	<i>To assess the prevalence of several risk factors (including smoking) among cancer patients:</i> 56 cancer patients from the archives of HDF (1989-1990). No control group and no further information on study design.
Loiselet J et al. (1971)	<i>To assess the correlation between smoking and blood lipid levels:</i> Lebanese males (16-45 years old) undergoing medical examinations for clearance for emigration to another country. Questionnaires and lab tests.
Khogali M et al. (1999)	<i>To assess the correlation between smoking and blood lipid levels:</i> A household survey of 2846 adults (25-64 years) residing in Aicha Bakkar- Beirut in 1999. (Response rate 80%) (M/F: 0.77). Only 42% completed blood and screening tests.
Sibai A et al. (2001)	<i>To determine the causes of death in a cohort of men and women:</i> Vital status and cause of death were respectively ascertained and obtained by verbal autopsy for 1567 men and women (≥ 50 years old) who participated in the cross-sectional survey of Beirut 1982-1983. Verbal interviews were conducted (June 1993- August 1994). Causes of death assessed through interviews.

Summary Findings

This section reports on the prevalence of smoking and summarizes the studies that examined the adverse effects of smoking on health.

I. Prevalence of Smoking

The set of tables that follow are self-explanatory and report the prevalence rates of smoking.

• Prevalence of Current Smoking

Table 9.3-6 Prevalence of smoking in Lebanon reported in selected studies

	Pop./ year of study	Male	Female	Total
Author (year)				
- MOPH (1999)	Lebanon/1999	33.7% ¹	18.3% ¹	25.8% ¹
- Khogali et al. (1999)	Beirut/1999	61% ¹	57% ¹	59% ¹
- Chidiac (1998)	Lebanon/1998	60.7% ²	46.9% ²	53.6% ²
- Nuwayhid et al. (1997)	Beirut/1992-93	53%	35%	
- Abou Daoud (1970)	AUB/1967-68	57% ³	28.5% ³	48% ³
University Students:				
- Nuwayhid et al. (1998)	AUB, 1998	20% ⁴	9% ⁴	18% ⁴
- Shediach-Rizkallah et al. (2001)	AUB, 1998	14.25% ⁵	12.0% ⁵	13.16% ⁵
- An-Nahar newspaper (1997)	AUB, LAU, USJ, BAU, LU/1996	38%	22.6%	32%
- Makki & Hourri (1995)	LU Beirut, LU Bekaa, LAU/ 1995			17.95% (N=571) ⁷
- Papazian (1993)	AUB, Haigazian, USJ/ 1993		22.5% ⁶	
- Nassar et al. (1980)	AUB/74-75	43%	39%	42%
- Uthman (1964)	AUB/1964			50%
School Students:				
- Sibai (1997)	Secondary school students, greater Beirut, 1997	16% (Cigarettes) 31% (Hubble-bubble)	7% (Cigarettes) 16% (Hubble bubble)	11% (Cigarettes) 31% (Hubble bubble)
- Chidiac (1998)	Lebanon/1998			16.4% ⁸
- Chidiac (1998)	Adolescent girl scouts. Beirut and its Suburbs/1998		4.7% ⁹	
Physicians:				
- Mokdad et al. (1997)	Lebanon/1996	36.2% ¹⁰	17.3% ¹⁰	30.7% ¹⁰
- Abi Saleh et al. (1988)	Beirut/1988	27%	0% ¹¹	27%
Secondary Teachers:				
- Chidiac (1998) ¹²	Lebanon/1998	45%	19%	36%

1. Smoke either cigarettes or hubble-bubble, or both
2. Persons who responded yes to the question: do you currently smoke?
3. Cigarette smokers
4. Those who smoke cigarettes on daily basis regardless of number of cigarettes/day. The total is a weighted value.
5. Regular smokers
6. Only females in the sample
7. Smoke a lot (N=86) and smoke moderately (N=121) and smoke a little (N=364)
8. The proportion of ever smokers were, 41.8% for males, 24.6% for females, and 33.7% for total
9. Only females in the sample
10. Persons who responded yes to the question: Do you smoke?
11. The sample size of women was very small (N=4)
12. Type of smoking is cigarettes for 100% of the cases

- Prevalence of current smoking by sex and type of smoking:

Table 9.3-8 Prevalence of smoking by type of smoking and sex in Lebanon reported in selected studies

Table 9.3-8 Prevalence of smoking by type of smoking and sex in Lebanon reported in selected studies													
Author (year)	Pop./ year of study	Cigarette smoking			Hubble-Bubble			Cigar			Pipe		
		M	F	T	M	F	T	M	F	T	M	F	T
Adults													
MOPH (1999)	Lebanon 1999	31.7	18.1	24.7	5.7	3.1	4.4	0.3	0.0	0.2	0.1	0.0	0.1
Khogali et al. (1999)	Beirut 1999	42%	31%	36%	27% (9.3) ¹	34% (13.3) ¹	31% (11.6) ¹						
Nuwayhid et al. (1997)	Beirut 1992-93	46%	27%	38%	12%	13%	13%	6%: Males only					
Abou Daoud (1970)	AUB 1967-68	57%	28.5%	48%									
School Students													
Kanaan & Sibai (1997)	Mainly administrative Beirut, 1997	16.4% ²	7.0% ²	11.3% ²	31% ³	15.7% ³	23% ³						
University Students													
Nuwayhid et al. (1998)	AUB 1998	20%	9%	18%	53% ⁴	44% ⁴	51% ⁴	30% ⁴	9% ⁴	26% ⁴			
Nassar et al. (1980)	AUB, 1974-75	40% 30% ⁵	39% 39% ⁵	40% 33% ⁵						9%: Males only			
Utthman (1964)	AUB, 1964			46.3%									
Physicians													
Mokdad et al. (1997)	Hospitals/ Lebanon 1996	30% ⁶	16% ⁷	26% ⁸				1.2% ⁶		0.86% ⁸	4.7% ⁶	1.3% ⁷	3.7% ⁸

¹ Regular smokers

² Smoked cigarettes on one or more of the 30 days preceding the survey

³ Current smoking (past 30 days)

⁴ Occasionally

⁵ Cigarettes only

⁶ Computed from the total current smoking (cigarette smoking constitutes 83.52%, pipe 13.07%, and cigars and cigarillos 3.41% of total smoking for males

⁷ Computed from the total current smoking (cigarette smoking constitutes 92.3%, pipe 7.7% of total smoking for females)

⁸ Computed from the total current smoking (cigarette smoking constitutes 85.11%, pipe 12.09%, and cigars and cigarillos 2.8% of total smoking for total population)

- **Prevalence of cigarette smoking among males by age**

Table 9.9-9 Prevalence of smoking among males by age in Lebanon, reported in selected studies

Population	Age (years)									
	18-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64 65 +
Nuwayhid et al. (1997): Beirut 1992-93	27	43			56	56		49		40
Khogali et al. (1999): Beirut 1999				42%		42%		45%		40%
Abou Daoud (1970): AUB 1967-68				56.7% ¹			57.3% ¹			

¹ Only cigarette smoking was assessed

- **Prevalence of cigarette smoking among females by age**

Table 9.9-10 Prevalence of smoking among females by age in Lebanon, reported in selected studies

Population	Age (years)									
	18-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64 65 +
Nuwayhid et al. (1997): Beirut 1992-93	4	22			54	37		24		16
Khogali et al. (1999): Beirut 1999				24%		41%		32%		21%
Abou Daoud (1970): AUB 1967-68				25.4% ¹			31.8% ¹			

¹ Only cigarette smoking was assessed

II. Adverse Health Effects of Smoking

- Prevalence of hubble-bubble smoking among males by age**

Table 9.3-11 Prevalence of hubble-bubble smoking among males by age in Lebanon reported in selected studies

Population	Age (years)										
	18-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 +
Nuwayhid et al. (1997); Beirut 1992-93	6		11		14		16		18		9
Khogali et al. (1999); Beirut 1999				8% ¹		7% ¹		11% ¹		11% ¹	

¹Regular smokers

- Prevalence of hubble-bubble smoking among females by age**

Table 9.3-12 Prevalence of hubble-bubble smoking among females by age in Lebanon reported in selected studies

Population	Age (years)										
	18-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 +
Nuwayhid et al. (1997); Beirut 1992-93	2	12			12		14		18		17
Khogali et al. (1999); Beirut 1999				9% ¹		11% ¹		15% ¹		20% ¹	

¹Regular smokers

- Prevalence of pipe smoking among males by age**

Table 9.3-13 Prevalence of pipe smoking among males in Lebanon

Population	Age (years)										
	18-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 +
Nuwayhid et al. (1997); Beirut 1992-93	0%		3%		10%		9%		10%		5%

Source: Nuwayhid et al. 1997

Abou-Daoud (1980) reported that 84% of the patients with bladder cancer smoked (mostly cigarettes) as compared to 59% of the control group (Odds Ratio 4).

Khachadurian et al. (1972) also noted that the odds of being a smoker among patients with coronary heart disease was 1.7 that of the control group (75% vs. 44%). The authors noted that in 13 patients, smoking was the only risk factor.

Nuwayhid et al. (1998) confirmed that cigarette smoking during pregnancy is associated with low birth weight (< 2500 g) and a decrease in mean birth weight and strongly suggested such an association for pregnant women who smoked narghile. The following table summarizes the main findings:

Table 9.3-14 Association of narghile and cigarette smoking with low birth weight in Lebanon

	Adjusted odds ratio (95% confidence interval) of low birth weight	Adjusted mean birth weight (kg)
Narghile smokers vs. non-smokers		
Non-smokers	1.00 (Reference)	3.34 (3.26-3.42)
All narghile smokers	2.17 (0.74-6.33)	3.30 (3.22-3.38)
Smoked <1 narghile/day	2.36 (0.52-10.73)	3.34 (3.26-3.42)
Smoked ≥1 narghile/day	2.07 (0.54-7.94)	3.23 (3.15-3.31)
Started smoking narghile first trimester	2.93 (0.97-8.83)	3.22 (3.14-3.30)
Started smoking narghile second/third trimester	Undefined	3.27 (3.20-3.36)
Cigarette smokers vs. non-smokers		
Non-smokers	1.00 (Reference)	3.32 (3.24-3.39)
All cigarette smokers	2.00 (0.96-4.20)	3.20 (3.12-3.27)
Smoked 1-4 cigarettes/day	1.22 (0.26-5.76)	3.27 (3.20-3.34)
Smoked 5-10 cigarettes/day	1.29 (0.39-4.20)	3.24 (3.16-3.31)
Smoked 11-20 cigarettes/day	1.88 (0.62-5.75)	3.23 (3.15-3.30)
Smoked >20 cigarettes/day	4.56 (1.62-12.89)	3.02 (2.93-3.10)
Started smoking cigarettes first trimester	2.25 (1.04-4.86)	3.16 (3.09-3.23)
Started smoking cigarettes second/third trimester	1.24 (0.27-5.78)	3.29 (3.22-3.36)

Source: Nuwayhid et al. 1997

Abou Khalil-Sassine (1995) found that 75% of the cardiovascular patients were smokers, with 57% smoking 20 or more cigarettes a day and 17% at least 40 cigarettes a day.

Saade (1990) observed that 93% of the 56 reviewed cancer patients were smokers.

Loiselet et al. (1971) observed that total lipids and triglycerides but not cholesterol increase proportionally with the magnitude of smoking among healthy males of 16-45 years of age.

Table 9.3-15 Impact of smoking on lipids, triglycerides, and cholesterol levels

Cigarettes	Number	Total Lipids*	Cholesterol*	Triglycerides*
0	116	5.87	1.62	0.81
+	134	6.18	1.64	0.94
++	20	6.53	1.73	1.05
+++	5	8.76	2.03	1.58
Variances Ratio		5.13	1.60	5.02
Probability		<0.01	NS	<0.01

Source: Loiselet et al. 1971

* In grams per liter

Similarly, Khogali et al. (1999) reported an increase in the proportion of abnormal values of high-density lipoprotein (HDL) and triglycerides among smokers as compared to non-smokers:

Table 9.3-16 HDL and triglyceride levels in smokers vs. non-smokers

Smoking	Abnormal Values					
	LDL (≥ 150) N=252	HDL (≤ 35) N=144	Cholesterol (≥ 240) N=222	CH-HDL (≥ 5) N=368	Glucose (≥ 126) N=140	Triglycerids (≥ 160) N=442
Smokers	147 (58%)	99 (69%)	131 (59%)	240 (65%)	78 (56%)	277 (63%)
Non-Smokers	105 (42%)	45 (31%)	91 (41%)	128 (35%)	62 (44%)	165 (37%)
P-Value	0.362	0.001	0.286	0.000	0.984	0.000

Source : Khogali et al. 1999

Sibai et al. (2001) estimated the total mortality rates in their study population at 33.7 and 25.2/1000 person years among men and women, respectively. They noted that smoking related diseases were the leading causes of death (circulatory disease 60%; cancer 15%).

Comments

The diversity of the reported surveys by region, target population, indicators for smoking, or age groups, does not allow for an exact assessment of the prevalence of smoking in Lebanon. However, the different study estimations might be generalized to the population as a whole or to specific groups such as physicians, adolescents, or university students.

The two national household studies reported a prevalence rate of smoking of 54% among adults aged 18 years and above in 1998 (Chidiac 1998) and 26% among adults aged 15 years and above (MOPH 1999). If the second study is limited to adults of 20 years of age and older, the prevalence rate will be 29.5%. The proportion of smoking males and smoking

females was 61% and 47%, respectively, in the first study as compared to 34% and 18% in the second. The estimates provided by studies limited to Beirut (Aisha Bakkar 1998, Beirut 1992-93) were closer to Chidiac's study (1998). However, Chidiac (1998) reported that the prevalence of current smoking in Beirut is significantly higher than in the other regions of the country. It is worth noting that the prevalence rate of current smoking among US adults was estimated in 1995 at 25% (27% of males and 23 of females).

Smoking prevalence varies with age and sex. If we allow comparison between studies over time, then smoking slightly increased in men in Beirut from 53% in 1992-93 (Nuwayhid et al. 1997) to 61% in Aisha Bakkar in 1998-1999 (Khogali et al. 1999). However, smoking considerably increased in women from 28% in 1967-68 (Abou Daoud 1970) to 35% in 1992-93 (Nuwayhid et al. 1997) to 57% in 1999 (Khogali et al. 1999). The proportion of women reported to be current smokers (57%) in the Aisha Bakkar survey in 1999 (Khogali et al. 1999) was higher than what was reported in the Lebanese surveys of 1998 (Chidiac 1998) or 1999 (MOPH 1999) where it was 46.9% and 18%, respectively. The difference could be attributed to the high prevalence of hubble-bubble smoking in Aisha Bakkar.

The prevalence rates of smoking in Lebanon are much higher than that in other countries in the Arab world:

Table 9.3-17 Smoking prevalence in Lebanon vs. other Arab countries

Arab Country	Total	Men	Women
Jordan	50%	88%	12%
United Arab Emirates	10%	21%	1%
Bahrain	17%	25%	9%
Tunis	35%	61%	8%
Lebanon	54%	61%	47%

Source: WHO, yearly report 1998

Smoking prevalence tends to peak in the middle age: 30-39 years old (Chidiac 1998) and 35-54 years old (Khogali et al. 1999) and decrease in the older age groups. In the US, smoking prevalence peaks in the age group 35-44 in males and females.

Intensity of smoking differed between the population of Aisha Bakkar (Khogali et al. 1999) where 31% of adults were heavy smokers as compared to 67% who smoked 1 pack a day or more at a national level (Chidiac 1998).

Cigarette smoking remains the most prevalent type of smoking with 36% of adults smoking cigarettes in Aisha Bakkar-Beirut in 1999 (Khogali et al. 1999) and 38% in Beirut in 1992-93 (Nuwayhid et al. 1997). Current cigarette smoking peaked in the middle age especially for females. Mid-thirties seem to be correlated with a high prevalence of smoking in females. In spite of its increase, women still tend to consume fewer cigarettes daily than men.

As for narghile (hubble-bubble), 31% of the study population in Aisha Bakkar smoked it (Khogali et al. 1999). The proportion of current smokers of narghile among males (12%) and females (13%) in Beirut 1992-93 (Nuwayhid et al. 1997) were comparable, but it was

greater among females (34%) than males (27%) in Aisha Bakkar in 1999 (Khogali et al 1999). In the NHHEUS national survey (MOPH 1999), 4.4% currently smoked hubble-bubble (5.7% of males; 3.1% of females).

As for people attempting to stop smoking, the quit ratio (former smokers/ever smokers) seemed to be correlated with age and sex. It increased with age and was higher in females than in males in the National study (Chidiac 1998). (23% for males vs. 28% for females). On the other hand in 1992-93 (Nuwayhid et al. 1997) more males tended to quit (cigarette) smoking rather than females (20% in males vs. 11.6% in females).

The following table summarizes tobacco use prevalence in Lebanon:

Table 9.3-18 Summary of tobacco use prevalence in Lebanon

Characteristics	Males	Females	TOTAL
Prevalence of current Smoking in Lebanon	60.7% (Chidiac 1998) 33.7% (MOPH 1999)	46.9% (Chidiac 1998) 18.3% (MOPH 1999)	53.6% (Chidiac 1998) 25.8% (MOPH 1999)
WHO estimates (1998)	61.0%	47.0%	54.0%
Prevalence of Current Adult Smoking by Age	Beirut (Khogali 1999) 25-34: 59% 35-44: 63% 45-54: 64% 55-64: 58%	Beirut (Khogali 1999) 25-34: 47% 35-44: 65% 45-54: 60% 55-64: 53%	Beirut (Khogali 1999) 25-34: 53% 35-44: 64% 45-54: 62% 55-64: 55% Lebanon (Chidiac 1998) 20-29: 48% 30-39: 59.5% 40-49: 58.6% 50-59: 58.7% 60-69: 46% >or=70: 45.2%
Prevalence of current Adult cigarettes smoking	42% (Khogali 1999)	31% (Khogali 1999)	36% (Khogali 1999)
Prevalence of current Adult hubble-bubble smoking	27% (Khogali 1999)	34% (Khogali 1999)	31% (Khogali 1999)
Prevalence of current youth 15-19 years of age smoking	Ever smokers 41.8% (Chidiac 1998)	Ever smokers 24.8% (Chidiac 1998)	16.4% (Chidiac 1998)
Age at Onset of Adult			19.7 (Chidiac 1998)
% of heavy cigarette smokers	42% (Khojali 1999)	20% (Khojali 1999)	31% (Khojali 1999)
Quit Ratio	0.23 (Chidiac 1998)	0.28 (Chidiac 1998)	0.25 (Chidiac 1998)

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Burden of Disease in Lebanon: Top 40 main diseases

A Panel Discussion on

July 14, 2000

4:00-8:00 p.m. (AUB Alumni Club)

List of Participants

Name	Affiliation
Dr. Walid Ammar	Ministry of Public Health
Dr. Nabil Kronfol	Interministerial Health Reform Committee
Ms. Nadia Tawtal	Ministry of Social Affairs
Dr. Alissar Radi	WHO
Dr. Ali El-Zein	UNICEF
Mr. Moh'd Ali Hamandi	Syndicate of Private Hospitals
Dr. Samir Malat	Order of Physicians
Dr. Abdallah Adra	Order of Physicians in North Lebanon
Dr. Munir Dumit	Order of Dentists
Dr. Rafic Baddoura	Lebanese Epidemiological Association
Dr. Ramzi Sabra	AUB-Faculty of Medicine
	LU- Medicine
Dr. Nadim Karam	Balamand – Health Sciences
Dr. Nabil Shamseddine	LU – Health Sciences
Dr. Najib Jahshan	USJ – Medicine
Dr. Toby Zakhia	USJ – Health Management Institute
Dr. Mostafa Khogali	AUB – Family Medicine
Dr. Farid Kahwaji	MedNet
Dr. Leila Al Hebr	NSSF
Dr. Dureid Oweidat	COOP
Dr. Abdul hamid El Ater	
Ms. Marlene Zakhia	Lebanese NGO Forum
Dr. Nabil Kharat	NGO Collective
Dr. Kamel Mhanna	AMEL
Dr. Kassem Alloush	
Dr. Hani Lababidi	Makassed-Health Directorate
Dr. Leila Farhood	Federation Of Nursing Association in Lebanon
Dr. Hussein Salhab	Islamic Health Association
Dr. Abba Sibai	AUB- Faculty of Health Sciences
Mrs. Nadia Dallul	Order of Pharmacists

Participants from Faculty of Health Sciences

Organizers

Iman Nuwayhid
Aruba Osseiran

Assistants

Reem Fayad
Mona Othman
Sahag

List of the Top 30 Diseases in Lebanon as Marked by the Lebanese Order of Physicians in a Survey During June 2000.

Road traffic accidents	20 Maternal hemorrhage	5 Obsessive-compulsive disorders	1
Diabetes mellitus	19 Birth asphyxia and birth trauma	5 Panic disorders	1
Hepatitis B and hepatitis C	18 Bladder cancer	5 Cleft palate	1
Ischemic heart disease	18 Dementia/other degen./heredit. CNS disorders	5 Other unintentional injuries	1
Colon and rectum cancers	17 Rheumatic heart diseases	5 Behcet disease	1
Cerebrovascular disease	17 War	5 Intracranial aneurysm	1
Lower respiratory infections	16 Chlamydia	4 Migraine	1
Breast cancer	16 Iodine deficiency	4 Typhoid fever	1
Prostate cancer	15 Pancreas cancer	4 UTI	1
Tuberculosis	14 Ovary cancer	4 Skin infections	1
Upper respiratory infections	13 Nephritis and nephrosis	4 CHF	1
Asthma	13 Skin diseases	4 Phlebitis	1
Benign prostatic hypertrophy	13 Fires	4 Pulmonary embolism	1
Diarrheal diseases	12 STD excluding HIV	3 Subdural hematoma	1
Otitis media	11 Poliomyelitis	3 Osteoporosis	1
Lymphoma and multiple myelomas	11 Measles	3 Bed sores	1
Peptic ulcer	11 Tetanus	3 Incontinence	1
HIV	10 Maternal sepsis	3 Hypertension	1
Drug use	10 Protein-energy malnutrition	3 Urolithiasis	1
Violence	9 Mouth and oropharynx cancers	3 Drug induced glomerular diseases	1
Abortion	9 Schizophrenia	3	
Iron-deficiency anemia	9 Post-traumatic stress disorder	3	
Trachea, bronchus and lung cancer	9 Cirrhosis of the liver	3	
Cervix uteri cancer	9 Appendicitis	3	
Leukemia	9 Down syndrome	3	
Parkinson disease	9 Congenital heart anomalies	3	
Poisonings	9 Self-inflicted injuries	3	
Ascariasis	8 Syphilis	2	
Stomach cancer	8 Gonorrhea	2	
Epilepsy	8 Malaria	2	
Multiple sclerosis	8 Esophagus cancer	2	
Osteoarthritis	8 Liver cancer	2	
Falls	8 Melanoma and other skin cancers	2	
Hypertensive disorders of pregnancy	7 Bipolar disorders	2	
Endocrine disorders	7 Glaucoma	2	
Alcohol use	7 Periodontal disease	2	
Cataracts	7 Hyperlipidemia	2	
Chronic obstructive pulmonary disease	7 Schistosomiasis	1	
Rheumatoid arthritis	7 Leprosy	1	
Dental caries	7 Trichuriasis	1	
Low birth weight	6 Ancylostomiasis and necatoriasis	1	
Unipolar major depression	6 Obstructed labor	1	
Drownings	6 Corpus uteri cancer	1	
Bacterial meningitis and meningococemia	5 Other neoplasms	1	

Exercise II

** The following diseases & injuries have been grouped into the top 20 diseases according to the different data sources

Hospitals	MedNet	Societies	Surveys
Ischaemic heart disease	Sprains and strains	Road traffic accidents	
Endocrine disorders	Open wound	Diabetes mellitus	
Lower respiratory infections	Fracture	Hepatitis B and hepatitis C	
Diabetes mellitus	Intestinal infectious diseases	Ischemic heart disease	
Nephritis and nephrosis	Pyrexia of unknown origin	Colon and rectum cancers	
Other neoplasms	Abdominal pain	Cerebrovascular disease	
Diarrhoeal diseases	Chest pain	Lower respiratory infections	
Cerebrovascular disease	Diseases of esophagus, stomach and duodenum	Breast cancer	
Skin diseases	Ischemic heart disease/ angina pectoris/ acute myocardial infarction	Prostate cancer	
Cataracts	Pneumonia and influenza	Tuberculosis	
Benign prostatic hypertrophy	Mainly in the course of labor and delivery	Upper respiratory infections	
Birth asphyxia and birth trauma	Dislocation	Asthma	
Congenital heart anomalies	Calculus of kidney and ureter	Benign prostatic hypertrophy	
Otitis media	Concussion	Diarrheal diseases	
Abortion	Renal colic	Otitis media	
Upper respiratory infections	Other pregnancy with abortive outcome	Lymphoma and multiple myelomas	
Leukaemia	Acute bronchitis and bronchiolitis	Peptic ulcer	
Low birth weight	Other diseases of intestines and peritoneum	HIV	
Chronic obstructive pulmonary disease	Cholelithiasis	Drug use	
Trachea, bronchus and lung cancers	Inguinal hernia	Violence	
Lymphomas and multiple myeloma			

Define your criteria for PRIORITY and re-arrange the list into the following table:

Priority I	Priority II	Priority III	Not a Priority
Add one or two more diseases or injuries to each of the four categories			

Table x: Distribution (%) of chronic conditions among 8906 residents* of Beirut, by age group and sex, 1992-1993, as reported by Nuwayhia I, In: Beirut: Health Profiles 1984-1994, American University of Beirut Publications, 1997.

Chronic Condition	Age (years)								All Ages	No.
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	≥ 70		
Hypertension										
Males	0.0	0.0	0.3	1.8	5.3	13.4	19.1	18.7	4.7	202
Females	0.0	0.0	0.7	1.0	7.9	17.2	29.5	29.9	6.9	316
Back Pain										
Males	0.0	0.4	1.7	3.9	5.0	8.5	7.6	5.9	3.2	137
Females	0.2	0.2	1.8	8.5	17.4	17.7	18.0	16.2	7.9	365
Arthritis										
Males	0.7	1.0	1.0	1.4	0.7	4.5	6.8	9.6	2.2	96
Females	0.6	2.2	2.5	5.5	9.7	15.5	19.7	20.8	7.2	332
Heart Disease										
Males	0.4	0.0	0.2	0.9	4.6	11.7	15	24.1	4.3	183
Females	0.2	0.3	0.2	0.9	3.2	8.2	16.4	24.4	3.9	182
Dyslipidemia										
Males	0.0	0.0	0.2	1.8	8.9	12.6	10.1	8.0	3.7	160
Females	0.0	0.1	0.1	0.4	6.1	14.4	15.3	11.7	4.2	195
Diabetes Mellitus										
Males	0.0	0.1	0.2	0.9	3.2	10.4	12.5	15.5	3.4	145
Females	0.0	0.0	0.2	0.6	3.4	11.4	17.8	14.2	3.9	179
Migraine										
Males	0.0	0.3	1.5	2.7	1.8	1.5	1.4	0.5	1.1	49
Females	0.0	1.1	3.5	5.1	9.5	5.2	5.2	4.6	4.0	183
Anemia										
Males	1.1	0.5	0.6	0.2	0.7	0.4	1.1	2.1	0.7	30
Females	1.8	1.1	3.8	6.3	7.9	3.7	4.7	7.6	4.1	189
Renal Condition										
Males	0.0	0.2	1.5	1.6	3.2	3.2	3.0	4.3	1.6	70
Females	0.0	0.3	1.5	3.9	4.7	4.5	6.0	4.6	2.7	123
Asthma										
Males	2.8	3.6	1.2	0.5	1.4	1.3	1.4	4.8	2.1	89
Females	1.6	2.4	1.1	1.5	2.7	2.4	3.3	3.0	2.0	95
Peptic Ulcer										
Males	0.0	0.2	0.8	0.9	3.7	3.6	7.6	4.3	1.9	82
Females	0.0	0.0	0.7	2.1	3.0	4.1	4.6	3.0	1.8	82
Thyroid Problem										
Males	0.2	0.2	0.1	0.5	0.2	0.9	0.3	0.0	0.3	12
Females	0.0	0.5	3.3	5.5	6.6	4.5	3.3	0.5	3.1	144

Reported frequencies of Diseases according to some Health Care Centers in Lebanon

DESCRIPTION CATEGORY	Malta Organization-Kobayat center					Malta Org.-Nabatiyeh					AUB-Infirmiry				
	1999					july 99-july 2000					july 99-july 2000				
	SEX		SEX		Total	SEX		SEX		Total	SEX		SEX		Total
	F	M	F	M		F	M	F	M		F	M	F	M	
ASTHMA	7	20	27	14	24	38	5	9		14	159	221			380
BRONCHITIS & BRONCHIOLITIS, ACUTE	29	32	61	56	71	127	84	88		172	220	281	4		505
BRONCHITIS, CHRONIC & BRONCHIECTASIS							1	1		2	17	32			49
EMPHYSEMA & COPD	1		1								1	8			9
HAY FEVER	1		1		2	2	7	6		13	119	96	1		216
HYPERTROPHIC/CHRONIC INFECTION OF TONSILLS/ADENOIDS											4	10			14
Influenza						126	142			268					
LARYNGITIS & TRACHEITIS, ACUTE						56	49			105	10	17			27
OTHER RESPIRATORY SYSTEM DISEASES						5	2			7	39	37	1		77
PLEURAL EFFUSION NOT OTHERWISE SPECIFIED												1			1
PNEUMONIA	2		2	2	4	6					20	41	3		64
SINUSITIS, ACUTE & CHRONIC	6	8	14	3	4	7	85	86		171	261	358	15		634
TONSILLITIS ACUTE & QUINSY	44	50	94	88	82	171	92	72		164	860	1068	34		1962
UPPER RESPIRATORY TRACT INFECTION ACUTE															
Respiratory Total	90	110	200	169	195	365	464	461		925	1916	2341	61		4318
ARTHRITIS not elsewhere classified (NEC) / DIFFUSE CONNECTIVE TISSUE DISEASE											11	56	1		164
BACK PAIN WITH RADIATING SYMPTOMS							1			1	129	157	30		316
BACK PAIN WITHOUT RADIATING SYMPTOMS	4		4					2		2	368	459	18		845
BURSITIS & SYNOVITIS		1	1	1		1					65	60			125
CERVICAL SPINE SYNDROMES	1		1				5	5		10	176	89			265
GANGLION OF JOINT & TENDON											8	15			23
KNEE CHRONIC INTERNAL DERANGEMENT							1	1		2	143	179	8		330
OSTEOARTHRITIS & ALLIED CONDITIONS										1	68	36			104
OSTEOARTHRITIS OF SPINE	1		1	3		3					13	6			19
OSTEOCHONDROSIS											8	7			15
OSTEOPOROSIS											117	13			130
OTHER MUSCULOSKELETAL, CONNECTIVE DISEASE											515	484	2		1001
OTHER NONARTICULAR RHEUMATISM											38	22			60
PAIN & OTHER LIMB SYMPTOMS							5	3		8	225	161	23		409

ANAL FISSURE / FISTULA / ABSCESS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

		18	14	32	34	23	57	3	16	19	35		
	VISUAL DISTURBANCE												
	Optalmology Total								3	154	174	6	334
Male GENITO-URINARY	HYDROCELE									5			5
	ORCHITIS & EPIDIDYMITIS									8			8
	OTHER MALE GENITAL ORGAN DISEASES								1	67	1		69
	PROSTATIC HYPERTROPHY BENIGN					1	1		3	81			84
	PROSTATIS & SEMINAL VESICULITIS					1	1		3	22	1		26
Male GU Total						2	2		7	183	2		192
Neoplasm BENIGN	BREAST BENIGN NEOPLASM								41	1			42
	HEMANGIOMA & LYMPHANGIOMA								1	2			3
	LIPOMA, ANY SITE								6	9			15
	NEOPLASM NYD AS BENIGN OR MALIGNANT								8	7			15
	OTHER BENIGN NEOPLASMS NEC								6	1			7
	SKIN BENIGN NEOPLASM								5	19			24
Neoplasm BENIGN Total									67	39			106
Obstetrics	ABORTION, SPONTANEOUS & N.O.S								7				7
	BLEEDING DURING PREGNANCY								3	2	2		7
	COMPLICATED DELIVERY								1				1
	DIAGNOSING PREGNANCY								12				12
	MASTITIS & LACTATION DISORDERS					1	1		1				1
	NORMAL DELIVERY							4	3	1			4
	OTHER COMPLICATIONS OF PREGNANCY					1			7	1	11		19
	POSTNATAL CARE								1				1
	PRENATAL CARE		4			4		5	43	1			44
	URINARY INFECTION, DURING PREGNANCY & POSTPARTUM								6	2			8
	Obstetrics Total			5	5	0	0	9	84	7	13		104
Neoplasm Malignant	BREAST MALIGNANT NEOPLASM								23				23
	GASTROINTESTINAL TRACT MALIGNANT NEOPLASM	2	1	3			1		2	4	3		9
	GENITAL TRACT MALIGNANT NEOPLASM, FEMALE								4				4
	LEUKEMIA, HODGKINS DISEASE, LYMPHOMA		2	2						3			3
	OTHER MALIGNANT NEOPLASMS NEC								3	11			14
	RESPIRATORY TRACT MALIGNANT NEOPLASM	2		2		1	1		1	7			8

**Frequency of Admission Per Discharge Disease From January 1, 1999 To
December 31, 1999 as Reported by MedNet**

Disease Chapter	Description	Frequency
INFECTIOUS AND PARASITIC DISEASES	INTESTINAL INFECTIOUS DISEASES	1,426
	TYPHOID AND PARATYPHOID FEVERS	70
	OTHER DISEASES DUE TO VIRUSES AND CHLAMIDIAE	60
	VIRAL HEPATITIS	58
	OTHER BACTERIAL DISEASES	41
	VIRAL DISEASES ACCOMPANIED BY EXANTHEM	35
	INFECTIOUS AND PARASITIC DISEASES	26
	OTHER INFECTIOUS AND PARASITIC DISEASES	13
	TUBERCULOSIS	13
	AMEBIASIS	11
	ECHINOCOCCOSIS	5
	SLOW VIRUS INFECTION OF CENTRAL NERVOUS SYSTEM	5
	MYCOSES	4
	SARCOIDOSIS	4
	ARTHROPOD-BORNE VIRAL DISEASES	3
	RICKETTSIOSES AND OTHER ARTHROPOD-BORNE DISEASES	2
	SYPHILIS AND OTHER VENERAL DISEASES	2
	LATE EFFECTS OF INFECTIOUS AND PARASITIC DISEASES	1
	POLIOMYELITIS AND OTHER NON-ARTHROPOD- BORNE VIRAL DISEASES OF CENTRAL NERVOUS SYSTEM	1
	ZOONOTIC BACTERIAL DISEASES	1
TOTAL		1,781
NEOPLASMS	BENIGN NEOPLASM OF SKIN	123
	BENIGN NEOPLASM OF BREAST	77
	BENIGN NEOPLASM OF BONE AND ARTICULAR CARTILAGE	22
	BENIGN NEOPLASM OF BRAIN AND OTHER PARTS OF NERVOUS SYSTEM	15
	BENIGN NEOPLASM OF LIP, ORAL CAVITY, AND PHARYNX	11
	BENIGN NEOPLASM OF BLADDER	7
	BENIGN NEOPLASM OF BRONCHUS AND LUNG	7
	BENIGN NEOPLASM OF VAGINA	7
	BENIGN NEOPLASM OF OVARY	6
	BENIGN NEOPLASM OF LYMPH NODES	5
	BENIGN NEOPLASM OF OTHER ENDOCRINE GLANDS AND RELATED STRUCTURES	5
	BENIGN NEOPLASM OF RESPIRATORY AND INTRATHORACIC ORGANS	5
	BENIGN NEOPLASM OF NASAL CAVITIES, MIDDLE EAR, AND ACCESSORY SINUSES	4
	BENIGN NEOPLASM OF OTHER AND UNSPECIFIED SITES	4
	BENIGN NEOPLASM OF OTHER SPECIFIED SITES OF FEMALE GENITAL ORGANS	4
	BENIGN NEOPLASM OF COLON	3
	BENIGN NEOPLASM OF OTHER FEMALE GENITAL ORGANS	3
	BENIGN NEOPLASM OF PITUITARY GLAND AND	3

	CRANIOPHARYNGEAL DUCT	3
	BENIGN NEOPLASM OF PROSTATE	3
	BENIGN NEOPLASM OF STOMACH	3
NEOPLASMS	BENIGN NEOPLASM OF VULVA	2
	BENIGN NEOPLASM OF EYE	2
	BENIGN NEOPLASM OF LARYNX	2
	BENIGN NEOPLASM OF LIVER AND BILIARY PASSAGES	2
	BENIGN NEOPLASM OF SCROTUM	2
	BENIGN NEOPLASM OF TESTIS	2
	BENIGN NEOPLASM OF THYROID GLANDS	2
	BENIGN NEOPLASM OF FEMALE GENITAL ORGAN, SITE UNSPECIFIED	1
	BENIGN NEOPLASM OF MALE GENITAL ORGANS	1
	BENIGN NEOPLASM OF MEDIASTINUM	1
	BENIGN NEOPLASM OF OTHER AND UNSPECIFIED SITE IN THE DIGESTIVE SYSTEM	1
	BENIGN NEOPLASM OF OTHER PARTS OF DIGESTIVE SYSTEM	1
	BENIGN NEOPLASM OF OTHER SPECIFIED SITES OF URINARY ORGANS	1
	BENIGN NEOPLASM OF PANCREAS, EXCEPT ISLETS OF LANGERHANS	1
	BENIGN NEOPLASM OF PARATHYROID GLAND	1
	BENIGN NEOPLASM OF RECTUM AND ANAL CANAL	1
	BENIGN NEOPLASM OF RETROPERITONEUM AND PERITONEUM	1
	CHEMOTHERAPY	1,010
	LIPOMA	133
	MALIGNANT NEOPLASM OF FEMALE BREAST	127
	UTERINE LEIOMYOMA	104
	MALIGNANT NEOPLASM OF TRACHEA, BRONCHUS, AND LUNG	69
	MALIGNANT NEOPLASM OF BLADDER	67
	OTHER BENIGN NEOPLASM OF CONNECTIVE AND OTHER SOFT TISSUE	65
	MALIGNANT NEOPLASM OF PROSTATE	58
	RADIOTHERAPY	54
	MALIGNANT NEOPLASM OF COLON	52
	OTHER BENIGN NEOPLASM OF UTERUS	48
	OTHER MALIGNANT NEOPLASMS OF LYMPHOID AND HISTIOCYTIC TISSUE	39
Malignant**	MALIGNANT NEOPLASM OF RECTUM, RECTOSIGMOID JUNCTION, AND ANUS	27
	MALIGNANT NEOPLASM OF BRAIN	24
	OTHER MALIGNANT NEOPLASM OF SKIN	24
	SECONDARY MALIGNANT NEOPLASM OF OTHER SPECIFIED SITES	24
	MALIGNANT NEOPLASM OF LYMPHATIC AND HEMATOPOIETIC TISSUE	22
	MYELOID LEUKEMIA	22
	MULTIPLE MYELOMA AND	
	IMMUNOPROLIFERATIVE NEOPLASMS	18
	MALIGNANT NEOPLASM OF BONE AND ARTICULAR CARTILAGE	16
	LYMPHOID LEUKEMIA	15
	MALIGNANT NEOPLASM OF STOMACH	15

	MALIGNANT NEOPLASM OF THYROID GLAND	13
	MALIGNANT NEOPLASM OF PANCREAS	12
NEOPLASMS	HODGKIN'S DISEASE	10
	MALIGNANT NEOPLASM OF KIDNEY AND OTHER AND UNSPECIFIED URINARY ORGANS	10
	MALIGNANT NEOPLASM OF OVARY AND OTHER UTERINE ADNEXA	10
	MALIGNANT NEOPLASM OF OROPHARYNX	9
	NEOPLASMS	9
	MALIGNANT NEOPLASM OF LARYNX	8
	CARCINOMA IN SITU OF BREAST AND GENITOURINARY SYSTEM	7
	MALIGNANT NEOPLASM OF TONGUE	7
	MALIGNANT NEOPLASM OF ESOPHAGUS	6
	CARCINOMA IN SITU	5
	LYMPHOSARCOMA AND RETICULOSARCOMA	5
	MALIGNANT MELANOMA OF SKIN	5
	HEMANGIOMA OF SKIN AND SUBCUTANEOUS TISSUE	4
	MALIGNANT NEOPLASM OF CONNECTIVE AND OTHER SOFT TISSUE	4
	MALIGNANT NEOPLASM OF PENIS AND OTHER MALE GENITAL ORGANS	4
	MALIGNANT NEOPLASM OF TESTIS	4
	CARCINOMA IN SITU OF SKIN	3
	MALIGNANT NEOPLASM OF CERVIX UTERI	3
	MALIGNANT NEOPLASM OF GALLBLADDER AND EXTRAHEPATIC BILE DUCTS	3
	MALIGNANT NEOPLASM OF LIVER AND INTRAHEPATIC BILE DUCTS	3
	MALIGNANT NEOPLASM OF RESPIRATORY AND INTRATHORACIC ORGAN	3
	OTHER SPECIFIED LEUKEMIA	3
	MALIGNANT NEOPLASM OF NASAL CAVITIES, MIDDLE EAR, AND ACCESSORY SINUSES	2
	MALIGNANT NEOPLASM OF OTHER AND ILL- DEFINED SITES WITHIN THE DIGESTIVE ORGANS AND PERITONIUM	2
	MALIGNANT NEOPLASM OF OTHER AND UNSPECIFIED PARTS OF NERVOUS SYSTEM	2
	MALIGNANT NEOPLASM OF OTHER AND UNSPECIFIED SITES	2
	MALIGNANT NEOPLASM OF RETROPERITONEUM AND PERITONEUM	2
	MALIGNANT NEOPLASM OF SMALL INTESTINE, INCLUDING DUODENUM	2
	MALIGNANT NEOPLASM OF THYMUS, HEART, AND MEDIASTINUM	2
	MALIGNANT NEOPLASM OF UTERUS, PART UNSPECIFIED	2
	CARCINOMA IN SITU OF RESPIRATORY SYSTEM	1
	ENCOUNTER FOR OTHER AND UNSPECIFIED PROCEDURES AND AFTERCARE	1
	HEMANGIOMA OF OTHER SITES	1
	HEMANGIOMA, ANY SITE	1
	LEUKEMIA OF UNSPECIFIED CELL TYPE	1
	MALIGNANT NEOPLASM OF EYE	1
	MALIGNANT NEOPLASM OF MAJOR SALIVARY	1

	GLANDS	
	MALIGNANT NEOPLASM OF MALE BREAST	1
	MALIGNANT NEOPLASM OF OTHER AND ILL-DEFINED SITES WITHIN THE RESPIRATORY SYSTEM AND INTRATHORACIC ORGANS	1
	MALIGNANT NEOPLASM OF OTHER AND UNSPECIFIED FEMALE GENITAL ORGANS	1
TOTAL		2,551
ENDOCRINE, NUTRITIONAL, METABOLIC DISEASES	DIABETES MELLITUS	66
	NONTOXIC NODULAR GOITER	59
	THYROTOXICOSIS WITH OR WITHOUT GOITER	38
	DISORDERS OF FLUID, ELECTROLYTE, AND ACID-BASE BALANCE	21
	TYPE II DIABETES MELLITUS WITH OTHER SPECIFIED MANIFESTATIONS	18
	DISORDERS OF THYROID GLAND	9
	OTHER DISORDERS OF THYROID	9
	TYPE I DIABETES MELLITUS WITH OTHER SPECIFIED MANIFESTATIONS	9
	HYPOGLYCEMIA, UNSPECIFIED	8
	SIMPLE AND UNSPECIFIED GOITER	8
	THYROIDITIS	7
	DISORDERS OF THE PITUITARY GLAND AND ITS HYPOTHALAMIC CONTROL	5
	ACQUIRED HYPOTHYROIDISM	4
	DISORDERS OF CARBOHYDRATE TRANSPORT AND METABOLISM	4
	HYPERPARATHYROIDISM	4
	OTHER AND UNSPECIFIED DISORDERS OF METABOLISM	4
	DISORDERS OF LIPOID METABOLISM	3
	NUTRITIONAL DEFICIENCIES	3
	DISEASES OF OTHER ENDOCRINE GLANDS	2
	DISORDERS INVOLVING THE IMMUNE MECHANISM	2
	GOUT	2
	HYPOGLYCEMIC COMA	2
	OTHER METABOLIC AND IMMUNITY DISORDERS	2
	CUSHING'S SYNDROME	1
	DIABETES MELLITUS WITHOUT MENTION OF COMPLICATION	1
	DISORDERS OF BILIRUBIN EXCRETION	1
	HYPOPARATHYROIDISM	1
	OBESITY AND OTHER HYPERALIMENTATION	1
	OTHER ANTERIOR PITUITARY DISORDERS	1
	OTHER HYPERINSULINISM	1
	OTHER OVARIAN HYPERFUNCTION	1
	UNSPECIFIED DISORDER OF THE PITUITARY GLAND AND ITS HYPOTHALAMIC CONTROL	1
TOTAL		298
DISEASES OF THE BLOOD AND BLOOD-FORMING ORGANS	APLASTIC ANEMIA	35
	DISEASES OF THE BLOOD AND BLOOD-FORMING ORGANS	33
	OTHER DEFICIENCY ANEMIAS	28
	THALASSEMIAS	25
	IRON DEFICIENCY ANEMIAS	11
	OTHER AND UNSPECIFIED ANEMIAS	8

	PURPURA AND OTHER HEMORRHAGIC CONDITIONS	8
	LYMPHADENITIS, UNSPECIFIED, EXCEPT MESENTERIC	6
DISEASES OF THE BLOOD AND BLOOD-FORMING ORGANS	OTHER DISEASES OF BLOOD AND BLOOD-FORMING ORGANS	6
	HEREDITARY HEMOLYTIC ANEMIAS	3
	NONSPECIFIC MESENTERIC LYMPHADENITIS	3
	ACQUIRED HEMOLYTIC ANEMIAS	2
	COAGULATION DEFECTS	2
	DISEASES OF WHITE BLOOD CELLS	1
	HYPERSPLENISM	1
TOTAL		172
MENTAL DISORDERS	NEUROTIC DISORDERS, PERSONALITY DISORDERS, AND OTHER NONPSYCHOTIC MENTAL DISORDERS	10
	OTHER PSYCHOSES	7
	ORGANIC PSYCHOTIC CONDITIONS	2
	MENTAL DISORDERS	1
	MENTAL RETARDATION	1
TOTAL		21
DISEASES OF THE NERVOUS SYSTEM & SENSE ORGANS	CATARACT	249
	SUPPURATIVE AND UNSPECIFIED OTITIS MEDIA	113
	DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS	105
	DISEASES OF THE EAR AND MASTOID PROCESS	88
	NONSUPPURATIVE OTITIS MEDIA AND EUSTACHIAN TUBE DISORDERS	84
	EPILEPSY	69
	DISORDERS OF THE EYE AND ADNEXA	67
	OTHER DISORDERS OF EYELIDS	67
	MIGRAINE	56
	INFLAMMATION OF EYELIDS	53
	VERTIGINOUS SYNDROMES AND OTHER DISORDERS OF VESTIBULAR SYSTEM	50
	Right Cataract	49
	OTHER DISORDERS OF TYMPANIC MEMBRANE	45
	Left Cataract	40
	OTHER DISORDERS OF EAR	40
	OTHER DISORDERS OF EYE	40
	MULTIPLE SCLEROSIS	33
	RETINAL DETACHMENTS AND DEFECTS	22
	STRABISMUS AND OTHER DISORDERS OF BINOCULAR EYE MOVEMENTS	22
	MONONEURITIS OF UPPER LIMB AND MONONEURITIS MULTIPLEX	20
	DISORDERS OF LACRIMAL SYSTEM	18
	OTHER DISORDERS OF MIDDLE EAR AND MASTOID	18
	DISORDERS OF EXTERNAL EAR	17
	MASTOIDITIS AND RELATED CONDITIONS	17
	CORNEAL OPACITY AND OTHER DISORDERS OF CORNEA	15
	DISORDERS OF CONJUNCTIVA	15
	GLAUCOMA	15
DISEASES OF THE NERVOUS SYSTEM & SENSE ORGANS	OTHER AND UNSPECIFIED DISORDERS OF THE NERVOUS SYSTEM	15
	OTOSCLEROSIS	14
	BACTERIAL MENINGITIS	13

	MENINGITIS OF UNSPECIFIED CAUSE	12
	MENINGITIS DUE TO OTHER ORGANISMS	10
	ENCEPHALITIS, MYELITIS, AND ENCEPHALOMYELITIS	9
	NERVE ROOT AND PLEXUS DISORDERS	9
	OTHER RETINAL DISORDERS	9
	FACIAL NERVE DISORDERS	8
	OTHER PARALYTIC SYNDROMES	7
	DISORDERS OF THE GLOBE	6
	OTHER CONDITIONS OF BRAIN	5
	DISORDERS OF THE ORBIT	4
	DISORDERS OF THE PERIPHERAL NERVOUS SYSTEM	4
	MONONEURITIS OF LOWER LIMB	4
	OTHER CEREBRAL DEGENERATIONS	4
	OTHER DISORDERS OF THE CENTRAL NERVOUS SYSTEM	4
	TRIGEMINAL NERVE DISORDERS	4
	HEARING LOSS	3
	DISORDERS OF THE AUTONOMIC NERVOUS SYSTEM	2
	HEMIPLEGIA	2
	INFANTILE CEREBRAL PALSY	2
	INFLAMMATORY DISEASES OF THE CENTRAL NERVOUS SYSTEM	2
	INFLAMMATORY AND TOXIC NEUROPATHY	2
	KERATITIS	2
	OTHER DEMYELINATING DISEASES OF CENTRAL NERVOUS SYSTEM	2
	PARKINSON'S DISEASE	2
	VISUAL DISTURBANCES	2
	BLINDNESS AND LOW VISION	1
	CHORIORETINAL INFLAMMATIONS, SCARS, AND OTHER DISORDERS OF CHOROID	1
	DISORDERS OF OPTIC NERVE AND VISUAL PATHWAYS	1
TOTAL		1,592
DISEASES OF THE CIRCULATORY SYSTEM	ISCHEMIC HEART DISEASE	441
	ANGINA PECTORIS	239
	HEMORRHOIDS	215
	HYPERTENSIVE DISEASES	188
	ACUTE MYOCARDIAL INFARCTION	104
	ATRIAL FIBRILLATION AND FLUTTER	85
	OPEN HEART	77
	ESSENTIAL HYPERTENSION	73
	HEART FAILURE	70
DISEASES OF THE CIRCULATORY SYSTEM	TRANSIENT CEREBRAL ISCHEMIA	69
	VARICOSE VEINS OF LOWER EXTREMITIES	60
	OTHER ACUTE AND SUBACUTE FORMS OF ISCHEMIC HEART DISEASE	45
	PHLEBITIS AND THROMBOPHLEBITIS	44
	CEREBROVASCULAR DISEASE	41
	OTHER FORMS OF CHRONIC ISCHEMIC HEART DISEASE	39
	PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA	38

	INTRACEREBRAL HEMORRHAGE	33
	HYPOTENSION	28
	ACUTE PULMONARY HEART DISEASE	27
	CARDIAC ARREST	26
	HYPERTENSIVE HEART DISEASE	23
	CARDIAC DYSRHYTHMIAS	21
	CARDIOMYOPATHY	21
	ATHEROSCLEROSIS OF ARTERIES OF THE	
	EXTREMITIES	20
	ACUTE PERICARDITIS	18
	OCCLUSION AND STENOSIS OF PRECEREBRAL	
	ARTERIES	17
	OCCLUSION OF CEREBRAL ARTERIES	16
	ACUTE, BUT ILL-DEFINED, CEREBROVASCULAR	
	DISEASE	15
	VARICOSE VEINS OF OTHER SITES	15
	ATRIOVENTRICULAR BLOCK, COMPLETE	13
	PREMATURE BEATS	13
	OTHER FORMS OF HEART DISEASES	12
	PAROXYSMAL TACHYCARDIA, UNSPECIFIED	11
	SUBARACHNOID HEMORRHAGE	10
	DISEASES OF THE CIRCULATORY SYSTEM	9
	OTHER DISEASES OF PERICARDIUM	8
	AORTIC VALVE DISORDERS	7
	AORTIC ANEURYSM	6
	OTHER VENOUS EMBOLISM AND THROMBOSIS	6
	PAROXYSMAL VENTRICULAR TACHYCARDIA	6
	ARTERIAL EMBOLISM AND THROMBOSIS	5
	MITRAL VALVE DISORDERS	5
	OTHER AND UNSPECIFIED INTRACRANIAL	
	HEMORRHAGE	5
	OTHER DISORDERS OF ARTERIES AND ARTERIOLES	5
	CHRONIC PULMONARY HEART DISEASE	4
	DISEASES OF ARTERIES, ARTERIOLES, &	
	CAPILARIES	4
	HYPERTENSIVE RENAL DISEASE	4
	ABDOMINAL ANEURYSM WITHOUT MENTION OF	
	RUPTURE	3
	CONDUCTION DISORDERS	3
	DISEASES OF MITRAL VALVE	3
DISEASES OF THE CIRCULATORY SYSTEM	LYMPHANGITIS	3
	OTHER DISORDERS OF CIRCULATORY SYSTEM	3
	OTHER PERIPHERAL VASCULAR DISEASE	3
	THORACIC ANEURYSM WITHOUT MENTION OF	
	RUPTURE	3
	ANEURYSM OF ARTERY OF LOWER EXTREMITY	2
	ANEURYSM OF UNSPECIFIED SITE	2
	ARTERIOVENOUS FISTULA, ACQUIRED	2
	ATHEROSCLEROSIS	2
	DISEASES OF MITRAL AND AORTIC VALVES	2
	ENDOCARDITIS, VALVE UNSPECIFIED	2
	OLD MYOCARDIAL INFARCTION	2
	OTHER DISEASES OF PULMONARY CIRCULATION	2
	RHEUMATIC FEVER WITHOUT MENTION OF HEART	
	INVOLVEMENT	2
	VENTRICULAR FIBRILLATION AND FLUTTER	2

	ACUTE AND SUBACUTE ENDOCARDITIS	1
	ANEURYSM OF ILIAC ARTERY	1
	ANEURYSM OF RENAL ARTERY	1
	DISEASES OF AORTIC VALVE	1
	DISEASES OF OTHER ENDOCARDIAL STRUCTURES	1
	ILL-DEFINED DESCRIPTIONS AND COMPLICATIONS OF HEART DISEASE	1
	LATE EFFECTS OF CEREBROVASCULAR DISEASE	1
	NONINFECTIOUS DISORDERS OF LYMPHATIC CHANNELS	1
	OTHER AND ILL-DEFINED CEREBROVASCULAR DISEASE	1
	OTHER DISEASES OF ENDOCARDIUM	1
	POLYARTERITIS NODOSA AND ALLIED CONDITIONS	1
	RHEUMATIC FEVER WITH HEART INVOLVEMENT	1
	SECONDARY HYPERTENSION	1
	ACUTE RHEUMATIC FEVER	-
	DISEASES OF PULMONARY CIRCULATION	-
TOTAL		2,295
DISEASES OF THE RESPIRATORY SYSTEM	PNEUMONIA & INFLUEZA	761
	ACUTE BRONCHITIS AND BRONCHIOLITIS	474
	CHRONIC DISEASE OF TONSILS AND ADENOIDS	355
	DEVIATED NASAL SEPTUM	310
	ASTHMA	308
	ACUTE TONSILLITIS	222
	HYPERTROPHY OF NASAL TURBINATES	154
	BRONCHITIS, NOT SPECIFIED AS ACUTE OR CHRONIC	146
	CHRONIC SINUSITIS	122
	ACUTE RESPIRATORY INFECTIONS	75
	ACUTE SINUSITIS	56
DISEASES OF THE RESPIRATORY SYSTEM	CHRONIC OBSTRUCTIVE PULMONARY DISEASE & ALLIED CONDITIONS	51
	CHRONIC LARYNGITIS AND LARYNGOTRACHEITIS	38
	POLYP OF VOCAL CORD OR LARYNX	38
	OTHER DISEASES OF THE UPPER RESPIRATORY TRACT	33
	BRONCHIECTASIS	28
	CHRONIC BRONCHITIS	19
	OTHER DISEASES OF UPPER RESPIRATORY TRACT	14
	RESPIRATORY FAILURE	14
	OTHER DISEASES OF RESPIRATORY SYSTEM	13
	EDEMA OF LARYNX	12
	PNEUMOTHORAX	12
	CHRONIC AIRWAY OBSTRUCTION, NOT ELSEWHERE CLASSIFIED	11
	ACUTE EDEMA OF LUNG, UNSPECIFIED	10
	CHRONIC PHARYNGITIS AND NASOPHARYNGITIS	9
	DISEASES OF THE RESPIRATORY SYSTEM	9
	EMPHYSEMA	9
	PERITONSILLAR ABSCESS	9
	PLEURISY	9
	OTHER DISEASES OF VOCAL CORDS	7
	PULMONARY CONGESTION AND HYPOSTASIS	6
	NASAL POLYPS	5

	OTHER ALVEOLAR AND PARIETOALVEOLAR PNEUMONOPATHY	5
	ALLERGIC RHINITIS	3
	EMPHYEMA	3
	EXTRINSIC ALLERGIC ALVEOLITIS	3
	OTHER DISEASES OF LUNG	3
	LUNG INVOLVEMENT IN CONDITIONS CLASSIFIED ELSEWHERE	2
	OTHER DISEASES OF RESPIRATORY SYSTEM, NOT ELSEWHERE CLASSIFIED	2
	OTHER DISEASES OF TRACHEA AND BRONCHUS, NOT ELSEWHERE CLASSIFIED	2
	POSTINFLAMMATORY PULMONARY FIBROSIS	2
	ABSCESS OF LUNG AND MEDIASTINUM	1
	MEDIASTINITIS	1
	OTHER DISEASES OF MEDIASTINUM, NOT ELSEWHERE CLASSIFIED	1
	PULMONARY COLLAPSE	1
TOTAL		3,368
DISEASES OF THE DIGESTIVE SYSTEM	DISEASES OF ESOPHAGUS, STOMACH, & DUODENUM	830
	OTHER DISEASES OF INTESTINES & PERITONEUM	394
	CHOLELITHIASIS	387
	INGUINAL HERNIA	370
	GASTRITIS AND DUODENITIS	303
	APPENDICITIS	195
DISEASES OF THE DIGESTIVE SYSTEM	ESOPHAGITIS	65
	DUODENAL ULCER	59
	ANAL FISSURE	51
	Right Hernia	45
	ABSCESS OF ANAL AND RECTAL REGIONS	43
	GASTRIC ULCER	42
	ANAL FISTULA	41
	UMBILICAL HERNIA WITHOUT MENTION OF OBSTRUCTION OR GANGRENE	34
	ANAL FISSURE AND FISTULA	32
	OTHER DISORDERS OF BILIARY TRACT	31
	GASTROINTESTINAL HEMORRHAGE	30
	Left Hernia	30
	HEMORRHAGE OF RECTUM AND ANUS	29
	ACUTE PANCREATITIS	25
	DIVERTICULA OF COLON	25
	OTHER NONINFECTIOUS GASTROENTERITIS AND COLITIS	21
	DIAPHRAGMATIC HERNIA WITHOUT MENTION OF OBSTRUCTION OR GANGRENE	19
	INCISIONAL HERNIA WITHOUT MENTION OF OBSTRUCTION OR GANGRENE	19
	OTHER SPECIFIED DISORDERS OF RECTUM AND ANUS	19
	INTESTINAL OBSTRUCTION WITHOUT MENTION OF HERNIA	18
	OTHER DISORDERS OF LIVER	18
	OTHER SPECIFIED INTESTINAL OBSTRUCTION	18
	PEPTIC ULCER, SITE UNSPECIFIED	18
	CHRONIC LIVER DISEASE AND CIRRHOSIS	17

	OTHER HERNIA OF ABDOMINAL CAVITY WITHOUT MENTION OF OBSTRUCTION OR GANGRENE	16
	DISEASES OF THE SALIVARY GLANDS	15
	VENTRAL HERNIA WITHOUT MENTION OF OBSTRUCTION OR GANGRENE	15
	DIVERTICULA OF INTESTINE	14
	ANAL AND RECTAL POLYP	13
	OTHER DISORDERS OF STOMACH AND DUODENUM	11
	IRRITABLE COLON	10
	DISEASES OF ESOPHAGUS	9
	IMPACTION OF INTESTINE	9
	OTHER DISORDERS OF GALLBLADDER	8
	OTHER DISORDERS OF INTESTINE	8
	RECTAL PROLAPSE	8
	DISEASES OF THE DIGESTIVE SYSTEM	7
	DISORDERS OF FUNCTION OF STOMACH	7
	FUNCTIONAL DIGESTIVE DISORDERS, NOT ELSEWHERE CLASSIFIED	6
	HERNIA OF ABDOMINAL CAVITY	6
	INTESTINAL OR PERITONEAL ADHESIONS WITH OBSTRUCTION	6
DISEASES OF THE DIGESTIVE SYSTEM	INTUSSUSCEPTION	6
	REGIONAL ENTERITIS	6
	CONSTIPATION	5
	DISEASES OF THE ORAL SOFT TISSUES, EXCLUDING LESIONS SPECIFIC FOR GINGIVA AND TONGUE	5
	NONINFECTIOUS ENTERITIS & COLITIS	5
	OTHER DISEASES OF DIGESTIVE SYSTEM	5
	STRICTURE AND STENOSIS OF ESOPHAGUS	5
	ULCERATION OF INTESTINE	5
	CHRONIC PANCREATITIS	3
	COLOSTOMY AND ENTEROSTOMY MALFUNCTION	3
	DISEASES OF ORAL CAVITY, SALIVARY GLANDS, & JAWS	3
	DISEASES OF PANCREAS	3
	HERNIA OF OTHER SPECIFIED SITES WITHOUT MENTION OF OBSTRUCTION OR GANGRENE	3
	IDIOPATHIC PROCTOCOLITIS	3
	VOLVULUS	3
	ACHALASIA AND CARDIOSPASM	2
	ACUTE AND SUBACUTE NECROSIS OF LIVER	2
	ANGIODYSPLASIA OF INTESTINE WITH HEMORRHAGE	2
	CYST AND PSEUDOCYST OF PANCREAS	2
	DISEASES AND OTHER CONDITIONS OF THE TONGUE	2
	DISEASES OF HARD TISSUES OF TEETH	2
	DYSKINESIA OF ESOPHAGUS	2
	FEMORAL HERNIA WITHOUT MENTION OF OBSTRUCTION OR GANGRENE	2
	INTESTINAL MALABSORPTION	2
	OTHER SPECIFIED DISORDERS OF INTESTINES	2
	PARALYTIC ILEUS	2
	PERFORATION OF INTESTINE	2
	STENOSIS OF RECTUM AND ANUS	2
	ABSCESS OF INTESTINE	1

	ANAL OR RECTAL PAIN	1
	ANGIODYSPLASIA OF INTESTINE (WITHOUT MENTION OF HEMORRHAGE)	1
	DISEASES OF PULP AND PERIAPICAL TISSUES	1
	DISORDERS OF TOOTH DEVELOPMENT AND ERUPTION	1
	GASTROJEJUNAL ULCER	1
	GINGIVAL AND PERIODONTAL DISEASES	1
	LIVER ABSCESS AND SEQUELAE OF CHRONIC LIVER DISEASE	1
	MEGACOLON, OTHER THAN HIRSCHSPRUNG'S	1
	OTHER DISEASES AND CONDITIONS OF THE TEETH AND SUPPORTING STRUCTURES	1
	OTHER DISORDERS OF PERITONEUM	1
	OTHER SPECIFIED DISORDERS OF INTESTINE	1
	PERITONEAL EFFUSION (CHRONIC)	1
DISEASES OF THE DIGESTIVE SYSTEM	PERITONITIS	1
	UNSPECIFIED DISORDER OF INTESTINE	1
	VASCULAR INSUFFICIENCY OF INTESTINE	1
TOTAL		3,501
DISEASES OF THE GENITOURINARY SYSTEM	CALCULUS OF KIDNEY AND URETER	536
	URINARY TRACT INFECTION, SITE NOT SPECIFIED	227
	DISORDERS OF MENSTRUATION AND OTHER ABNORMAL BLEEDING FROM FEMALE GENITAL TRACT	123
	FIRST LITHOTRIPSY	120
	HYPERPLASIA OF PROSTATE	118
	INFECTIONS OF KIDNEY	118
	GENITAL PROLAPSE	84
	FOLLICULAR CYST OF OVARY	62
	CALCULUS OF LOWER URINARY TRACT	61
	HEMATURIA	61
	REDUNDANT PREPUCE AND PHIMOSIS	57
	OTHER AND UNSPECIFIED OVARIAN CYST	51
	CYSTITIS	50
	INFERTILITY, FEMALE	50
	INFLAMMATORY DISEASES OF PROSTATE	50
	INFLAMMATORY DISEASE OF CERVIX, VAGINA, AND VULVA	49
	DISORDERS OF UTERUS, NOT ELSEWHERE CLASSIFIED	42
	OTHER DISEASES OF URINARY SYSTEM	42
	OTHER DISORDERS OF BLADDER	41
	URETHRAL STRICTURE	36
	OTHER DISORDERS OF PROSTATE	34
	FIBROADENOSIS OF BREAST	33
	NONINFLAMMATORY DISORDERS OF CERVIX	30
	HYDROCELE	28
	SECOND OR MORE LITHOTRIPSY	25
	CHRONIC RENAL FAILURE	22
	VASCULAR DISORDERS OF MALE GENITAL ORGANS	22
	BLADDER NECK OBSTRUCTION	21
	INFLAMMATORY DISEASE OF OVARY, FALLOPIAN TUBE, PELVIC CELLULAR TISSUE, AND PERITONEUM	19

	MENOPAUSAL AND POSTMENOPAUSAL DISORDERS	18
	NEPHROTIC SYNDROME	18
	NONINFLAMMATORY DISORDERS OF VULVA AND PERINEUM	17
	ENDOMETRIOSIS	16
	NONINFLAMMATORY DISORDERS OF OVARY, FALLOPIAN TUBE, AND BROAD LIGAMENT	16
	SOLITARY CYST OF BREAST	15
	ACUTE GLOMERULONEPHRITIS	14
	ORCHITIS AND EPIDIDYMITIS	14
DISEASES OF THE GENITOURINARY SYSTEM	OTHER DISORDERS OF KIDNEY AND URETER	14
	TORSION OF TESTIS	14
	DISORDERS OF PENIS	13
	OTHER DISORDERS OF BREAST	13
	OTHER DISORDERS OF FEMALE GENITAL ORGANS	13
	OTHER DISORDERS OF URETHRA AND URINARY TRACT	13
	DIFFUSE CYSTIC MASTOPATHY	12
	INFLAMMATORY DISEASES OF UTERUS, EXCEPT CERVIX	11
	OTHER SPECIFIED DISORDERS OF MALE GENITAL ORGANS	11
	PAIN AND OTHER SYMPTOMS ASSOCIATED WITH FEMALE GENITAL ORGANS	11
	URINARY OBSTRUCTION, UNSPECIFIED	11
	ACUTE RENAL FAILURE	9
	CORPUS LUTEUM CYST OR HEMATOMA	9
	NEPHRITIS AND NEPHROPATHY, NOT SPECIFIED AS ACUTE OR CHRONIC	9
	OTHER DISORDERS OF MALE GENITAL ORGANS	9
	HYDRONEPHROSIS	8
	NONINFLAMMATORY DISORDERS OF VAGINA	7
	OTHER URETERIC OBSTRUCTION	7
	VESICoureTERAL REFLUX	7
	INFERTILITY, MALE	6
	OTHER DISORDERS OF FEMALE GENITAL TRACT	6
	STRICTURE OR KINKING OF URETER	6
	ATROPHY OF TESTIS	5
	BENIGN MAMMARY DYSPLASIAS	5
	PROLAPSED URETHRAL MUCOSA	5
	TORSION OF OVARY, OVARIAN PEDICLE, OR FALLOPIAN TUBE	5
	INFLAMMATORY DISEASE OF FEMALE PELVIC ORGANS	4
	OTHER FUNCTIONAL DISORDERS OF BLADDER	4
	ATONY OF BLADDER	3
	DISORDERS RESULTING FROM IMPAIRED RENAL FUNCTION	3
	NEPHRITIS, NEPHROTIC SYNDROME, & NEPHROSIS	3
	CYST OF KIDNEY, ACQUIRED	2
	DISEASES OF MALE GENITAL ORGANS	2
	DISEASES OF THE GENITOURINARY SYSTEM	2
	DISORDERS OF BREAST	2
	DISORDERS OF MALE GENITAL ORGANS IN	2
	DISEASES CLASSIFIED ELSEWHERE	2
	EDEMA OF MALE GENITAL ORGANS	2

	FISTULA INVOLVING FEMALE GENITAL TRACT	2
	OTHER SPECIFIED DISORDERS OF BLADDER	2
	OTHER SPECIFIED DISORDERS OF KIDNEY AND URETER	2
	STRICTURE OF MALE GENITAL ORGANS	2
DISEASES OF THE GENITOURINARY SYSTEM	UNSPECIFIED DISORDER OF BLADDER	2
	OTHER INFLAMMATORY DISORDERS OF MALE GENITAL ORGANS	1
	SMALL KIDNEY OF UNKNOWN CAUSE	1
	UNSPECIFIED DISORDER OF KIDNEY AND URETER	1
	URETHRAL FALSE PASSAGE	1
	URETHRITIS, NOT SEXUALLY TRANSMITTED, AND URETHRAL SYNDROME	1
TOTAL		2,623
COMPLICATIONS OF PREGNANCY, CHILDBIRTH AND THE PUERPERIUM	NORMAL DELIVERY, & OTHER INDICATIONS FOR CARE IN PREGNANCY, LABOR, & DELIVERY	1,779
	COMPLICATIONS OCCURRING MAINLY IN THE COURSE OF LABOR & DELIVERY	721
	OTHER PREGNANCY WITH ABORTIVE OUTCOME	478
	COMPLICATIONS MAINLY RELATED TO PREGNANCY	309
	SUPERVISION OF HIGH-RISK PREGNANCY	28
	CAESARIAN SECTION AFTER CAESARIAN SECTION	26
	ECTOPIC & MOLAR PREGNANCY	19
	COMPLICATIONS OF PREGNANCY, CHILDBIRTH, AND THE PUERPERIUM	11
	CAESARIAN SECTION AFTER NORMAL DELIVERY	10
	NORMAL PREGNANCY	3
	COMPLICATIONS OF THE PUERPERIUM	2
TOTAL		3,386
DISEASE OF THE SKIN AND SUBCUTANEOUS TISSUE	OTHER CELLULITIS AND ABSCESS	191
	DISEASES OF NAIL	189
	PILONIDAL CYST	121
	DISEASES OF SEBACEOUS GLANDS	50
	CELLULITIS AND ABSCESS OF FINGER AND TOE	48
	OTHER LOCAL INFECTIONS OF SKIN AND SUBCUTANEOUS TISSUE	48
	URTICARIA	46
	OTHER HYPERTROPHIC AND ATROPHIC CONDITIONS OF SKIN	44
	OTHER DISEASES OF SKIN & SUBCUTANEOUS TISSUE	40
	OTHER DISORDERS OF SKIN AND SUBCUTANEOUS TISSUE	39
	OTHER INFLAMMATORY CONDITIONS OF SKIN & SUBCUTANEOUS TISSUE	26
	INFECTIONS OF SKIN & SUBCUTANEOUS TISSUE	24
	CORNS AND CALLOSITIES	15
	DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE	15
	ACUTE LYMPHADENITIS	14
	CARBUNCLE AND FURUNCLE	13
	LICHEN	7
	BULLOUS DERMATOSES	5
	ATOPIC DERMATITIS AND RELATED CONDITIONS	4
	DISEASES OF HAIR AND HAIR FOLLICLES	4
	ERYTHEMATOUS CONDITIONS	4

	OTHER DERMATOSES	4
DISEASE OF THE SKIN	CHRONIC ULCER OF SKIN	3
AND	DERMATITIS DUE TO SUBSTANCES TAKEN	3
SUBCUTANEOUS	INTERNALLY	
TISSUE	PRURITUS AND RELATED CONDITIONS	3
	PSORIASIS AND SIMILAR DISORDERS	3
	DISORDERS OF SWEAT GLANDS	2
	ERYTHEMATOSQUAMOUS DERMATOSIS	1
	IMPETIGO	1
TOTAL		967
DISEASES OF THE	DISPLACEMENT OF LUMBAR INTERVERTEBRAL	162
MUSCULOSKELETAL	DISC WITHOUT MYELOPATHY	122
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SYSTEM AND	GANGLION AND CYST OF SYNOVIUM, TENDON,	63
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	INTERNAL DERANGEMENT OF KNEE	45
	ACQUIRED DEFORMITIES OF TOE	43
	BACKACHE, UNSPECIFIED	37
	SYNOVITIS AND TENOSYNOVITIS	33
	LUMBAGO	31
	DEGENERATION OF CERVICAL INTERVERTEBRAL	30
	DISC	26
OTHER DISORDERS OF SYNOVIUM, TENDON, AND BURSA		25
TRIGGER FINGER (ACQUIRED)		25
CONTRACTURE OF PALMAR FASCIA		19
SCIATICA		16
INTERVERTEBRAL DISC DISORDERS		16
OSTEOARTHRITIS AND ALLIED DISORDERS, PELVIC REGION AND		15
THIGH		15
OSTEOPOROSIS		15
BUNION		15
DIFFUSE DISEASES OF CONNECTIVE TISSUE		14
OTHER ACQUIRED DEFORMITIES OF ANKLE AND FOOT		12
CERVICALGIA		12
DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE		12
TISSUE		12
DISORDERS OF MUSCLE, LIGAMENT, AND FASCIA		12
OSTEOARTHRITIS AND ALLIED DISORDERS, LOWER LEG		11
RUPTURE OF TENDON, NONTRAUMATIC		10
FOREIGN BODY GRANULOMA OF MUSCLE		8
OTHER AND UNSPECIFIED ARTHROPATHIES		8
OTHER AND UNSPECIFIED DISORDERS OF BACK		8
OTHER AND UNSPECIFIED DISORDERS OF JOINT		7
ARTHROPATHIES & RELATED DISORDERS		7
ARTHROPATHY ASSOCIATED WITH INFECTIONS, PELVIC REGION AND		7
THIGH		7
ASEPTIC NECROSIS OF BONE		7
PAIN IN JOINT INVOLVING ANKLE AND FOOT		7
SPINAL STENOSIS, OTHER THAN CERVICAL		7
UNSPECIFIED DIFFUSE CONNECTIVE TISSUE DISEASE		6
LAXITY OF LIGAMENT		6
MALUNION AND NONUNION OF FRACTURE		5
LOOSE BODY IN JOINT		5
OSTEOARTHRITIS AND ALLIED DISORDERS		5
OSTEOCHONDROPATHIES		5

OTHER ACQUIRED DEFORMITIES OF FINGER	5
OTHER DERANGEMENT OF JOINT	5
OTHER DISORDERS OF BONE AND CARTILAGE	5
PAIN IN JOINT INVOLVING HAND	5
PAIN IN JOINT INVOLVING PELVIC REGION AND THIGH	5
RHEUMATOID ARTHRITIS AND OTHER INFLAMMATORY POLYARTHROPATHIES	5
RUPTURE OF MUSCLE, NONTRAUMATIC	5
ARTHROPATHY ASSOCIATED WITH INFECTIONS	4
CYST OF BONE	4
DORSOPATHIES	4
MALLET FINGER	4
OSTEITIS DEFORMANS AND OSTEOPATHIES ASSOCIATED WITH OTHER DISORDERS CLASSIFIED ELSEWHERE	4
PAIN IN JOINT INVOLVING LOWER LEG	4
SPINAL STENOSIS IN CERVICAL REGION	4
SPONDYLOSIS WITH MYELOPATHY, LUMBAR REGION	4
ACQUIRED DEFORMITIES OF HIP	3
ARTHROPATHY ASSOCIATED WITH OTHER DISORDERS CLASSIFIED ELSEWHERE	3
EFFUSION OF JOINT OF SHOULDER REGION	3
GENU VALGUM OR VARUM (ACQUIRED)	3
HEMARTHROSIS INVOLVING LOWER LEG	3
OSTEOARTHRISIS AND ALLIED DISORDERS, SHOULDER REGION	3
OSTEOMYELITIS, PERIOSTITIS, AND OTHER INFECTIONS INVOLVING BONE	3
OSTEOPATHIES, CHONDROPATHIES, & ACQUIRED MUSCULOSKELETAL DEFORMITIES	3
OTHER ACQUIRED MUSCULOSKELETAL DEFORMITY	3
OTHER DISORDERS OF CERVICAL REGION	3
PAIN IN JOINT INVOLVING OTHER SPECIFIED SITES	3
PAIN IN JOINT INVOLVING SHOULDER REGION	3
PATHOLOGICAL FRACTURE	3
RHEUMATISM, EXCLUDING THE BACK	3
ARTHROPATHY ASSOCIATED WITH INFECTIONS, SHOULDER REGION	2
DISORDERS OF SACRUM	2
EFFUSION OF HAND JOINT	2
EFFUSION OF LOWER LEG JOINT	2
MUSCULAR WASTING AND DISUSE ATROPHY, NOT ELSEWHERE CLASSIFIED	2
OSTEOARTHRISIS AND ALLIED DISORDERS, HAND	2
OSTEOMYELITIS, PERIOSTITIS, AND OTHER INFECTIONS INVOLVING BONE, UPPER ARM	2
OTHER DISORDERS OF SOFT TISSUES	2
POSTLAMINECTOMY SYNDROME	2
THORACIC OR LUMBOSACRAL NEURITIS OR RADICULITIS, UNSPECIFIED	2
VILLONODULAR SYNOVITIS INVOLVING ANKLE AND FOOT	2
ACQUIRED DEFORMITIES OF OTHER PARTS OF LIMBS	1
ANKYLOSING SPONDYLITIS	1
ARTHROPATHY ASSOCIATED WITH INFECTIONS, ANKLE AND FOOT	1
ARTHROPATHY ASSOCIATED WITH INFECTIONS, FOREARM	1
ARTHROPATHY ASSOCIATED WITH INFECTIONS, LOWER LEG	1
ARTHROPATHY ASSOCIATED WITH INFECTIONS, MULTIPLE SITES	1
ARTHROPATHY ASSOCIATED WITH INFECTIONS, OTHER SPECIFIED SITES	1

CURVATURE OF SPINE	1
DIFFICULTY IN WALKING	1
DISORDERS OF COCCYX	1
NONALLOPATHIC LESIONS, NOT ELSEWHERE CLASSIFIED	1
OSTEITIS CONDENSANS	1
OSTEOARTHRITIS AND ALLIED DISORDERS, ANKLE AND FOOT	1
OSTEOARTHRITIS AND ALLIED DISORDERS, MULTIPLE SITES	1
OSTEOARTHRITIS AND ALLIED DISORDERS, OTHER SPECIFIED SITES	1
OSTEOMYELITIS, PERIOSTITIS, AND OTHER INFECTIONS INVOLVING BONE, ANKLE AND FOOT	1
OSTEOMYELITIS, PERIOSTITIS, AND OTHER INFECTIONS INVOLVING BONE, HAND	1
OSTEOMYELITIS, PERIOSTITIS, AND OTHER INFECTIONS INVOLVING BONE, LOWER LEG	1
OSTEOMYELITIS, PERIOSTITIS, AND OTHER INFECTIONS INVOLVING BONE, OTHER SPECIFIED SITES	1
OSTEOMYELITIS, PERIOSTITIS, AND OTHER INFECTIONS INVOLVING BONE, PELVIC REGION AND THIGH	1
OTHER ACQUIRED DEFORMITIES OF LIMBS	1
OTHER ALLIED DISORDERS OF SPINE	1
PAIN IN JOINT INVOLVING UPPER ARM	1
PAIN IN THORACIC SPINE	1
POLYMYALGIA RHEUMATICA	1
POLYMYOSITIS	1
SPONDYLOSIS AND ALLIED DISORDERS	1
SPONDYLOSIS OF UNSPECIFIED SITE	1
SPONDYLOSIS WITH MYELOPATHY, THORACIC REGION	1
SYSTEMIC LUPUS ERYTHEMATOSUS	1
TORTICOLLIS, UNSPECIFIED	1
VILLONODULAR SYNOVITIS	1
VILLONODULAR SYNOVITIS INVOLVING LOWER LEG	1
VILLONODULAR SYNOVITIS INVOLVING SHOULDER REGION	1
	1,129
CONGENITAL ANOMALIES OF GENITAL ORGANS	41
CERTAIN CONGENITAL MUSCULOSKELETAL DEFORMITIES	25
OTHER CONGENITAL ANOMALIES OF DIGESTIVE SYSTEM	19
CONGENITAL ANOMALIES	16
CONGENITAL ANOMALIES OF URINARY SYSTEM	11
OTHER CONGENITAL MUSCULOSKELETAL ANOMALIES	8
CONGENITAL ANOMALIES OF RESPIRATORY SYSTEM	7
CONGENITAL ANOMALIES OF EYE	6
OTHER AND UNSPECIFIED CONGENITAL ANOMALIES	6
OTHER CONGENITAL ANOMALIES OF HEART	6
OTHER CONGENITAL ANOMALIES OF UPPER ALIMENTARY TRACT	6
CONGENITAL ANOMALIES OF EAR, FACE, AND NECK	3
OTHER CONGENITAL ANOMALIES OF CIRCULATORY SYSTEM	3
OTHER CONGENITAL ANOMALIES OF LIMBS	3
BULBUS CORDIS ANOMALIES AND ANOMALIES OF CARDIAC SEPTAL CLOSURE	2
CLEFT PALATE AND CLEFT LIP	2
OTHER CONGENITAL ANOMALIES OF NERVOUS SYSTEM	2
	166
OTHER PERINATAL JAUNDICE	19
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BIRTHWEIGHT	
RESPIRATORY DISTRESS SYNDROME IN NEWBORN	9
INFECTIONS SPECIFIC TO THE PERINATAL PERIOD	5
FETUS OR NEWBORN AFFECTED BY MATERNAL CONDITIONS WHICH MAY BE UNRELATED TO PRESENT PREGNANCY	2
HEMATOLOGICAL DISORDERS OF FETUS AND NEWBORN	2
HEMOLYTIC DISEASE OF FETUS OR NEWBORN, DUE TO ISOIMMUNIZATION	2
OTHER CONDITIONS ORIGINATING IN THE PERINATAL PERIOD	2
OTHER RESPIRATORY CONDITIONS OF FETUS AND NEWBORN	2
FETAL AND NEONATAL HEMORRHAGE	1
FETUS OR NEWBORN AFFECTED BY OTHER COMPLICATIONS OF LABOR AND DELIVERY	1
OTHER AND ILL-DEFINED CONDITIONS ORIGINATING IN THE PERINATAL PERIOD	1
PERINATAL DISORDERS OF DIGESTIVE SYSTEM	1
	60
PYREXIA OF UNKNOWN ORIGIN	1,173
ABDOMINAL PAIN	1,087
CHEST PAIN	968
RENAL COLIC	506
DYSPNEA AND RESPIRATORY ABNORMALITIES	333
NAUSEA AND VOMITING	267
HEADACHE	205
RASH AND OTHER NONSPECIFIC SKIN ERUPTION	132
DIZZINESS AND GIDDINESS	128
SYNCOPE AND COLLAPSE	102
SYMPTOMS, SIGNS, AND ILL-DEFINED CONDITIONS	92
PALPITATIONS	85
COUGH	84
EPISTAXIS	45
CONVULSIONS	42
SYMPTOMS INVOLVING CARDIOVASCULAR SYSTEM	41
SYMPTOMS INVOLVING URINARY SYSTEM	37
OTHER GENERAL SYMPTOMS	36
GENERAL SYMPTOMS	31
MALaise AND FATIGUE	23
TACHYCARDIA, UNSPECIFIED	20
DYSURIA	16
OTHER SYMPTOMS INVOLVING ABDOMEN AND PELVIS	16
SYMPTOMS INVOLVING RESPIRATORY SYSTEM AND OTHER CHEST SYMPTOMS	15
HEMOPTYSIS	14
RETENTION OF URINE	14
GANGRENE	12
OTHER SYMPTOMS INVOLVING URINARY SYSTEM	12
SYMPTOMS INVOLVING DIGESTIVE SYSTEM	12
ASCITES	9
HEARTBURN	8
STRIDOR	8
SYMPTOMS INVOLVING NERVOUS AND MUSCULOSKELETAL SYSTEMS	8
OTHER SYMPTOMS INVOLVING DIGESTIVE SYSTEM	7
ABNORMAL FECES	6
SYMPTOMS	6
OTHER SYMPTOMS INVOLVING NERVOUS AND MUSCULOSKELETAL	5

SYSTEMS	
OTHER SYMPTOMS INVOLVING RESPIRATORY SYSTEM AND CHEST	5
SLEEP DISTURBANCES	5
THROAT PAIN	5
COMA AND STUPOR	4
DISTURBANCE OF SKIN SENSATION	4
SYMPTOMS INVOLVING SKIN AND OTHER INTEGUMENTARY TISSUE	4
TRANSIENT PARALYSIS OF LIMB	4
ABNORMAL WEIGHT GAIN	3
JAUNDICE, UNSPECIFIED, NOT OF NEWBORN	3
ABNORMAL INVOLUNTARY MOVEMENTS	2
DYSPHAGIA	2
EDEMA	2
FREQUENCY OF URINATION AND POLYURIA	2
OTHER ABNORMALITY OF URINATION	2
OTHER SYMPTOMS INVOLVING HEAD AND NECK	2
SHOCK WITHOUT MENTION OF TRAUMA	2
SYMPTOMS CONCERNING NUTRITION, METABOLISM, AND DEVELOPMENT	2
SYMPTOMS INVOLVING HEAD AND NECK	2
ABNORMAL SPUTUM	1
ABNORMALITY OF GAIT	1
APHASIA	1
CHANGES IN SKIN TEXTURE	1
CYANOSIS	1
ENLARGEMENT OF LYMPH NODES	1
FEEDING DIFFICULTIES AND MISMANAGEMENT	1
HALLUCINATIONS	1
HEPATOMEGALY	1
HICCOUGH	1
LACK OF EXPECTED NORMAL PHYSIOLOGICAL DEVELOPMENT	1
LOCALIZED SUPERFICIAL SWELLING, MASS, OR LUMP	1
OTHER SYMPTOMS INVOLVING CARDIOVASCULAR SYSTEM	1
SWELLING, MASS, OR LUMP IN CHEST	1
SWELLING, MASS, OR LUMP IN HEAD AND NECK	1
TETANY	1
	5,676
SPRAINS AND STRAINS OF ANKLE AND FOOT	1,216
SPRAINS AND STRAINS OF WRIST AND HAND	940
OPEN WOUND OF UPPER LIMB	805
OPEN WOUND OF HEAD, NECK, AND TRUNK	779
SPRAINS AND STRAINS OF KNEE AND LEG	582
CONCUSSION	537
SPRAINS & STRAINS OF JOINTS & ADJACENT MUSCLES	473
OPEN WOUND OF LOWER LIMB	320
FRACTURE OF RADIUS AND ULNA	319
SPRAINS AND STRAINS OF SHOULDER AND UPPER ARM	284
SUPERFICIAL INJURY	257
INJURY AND POISONING	244
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SPRAINS AND STRAINS OF ELBOW AND FOREARM	233
OTHER AND ILL-DEFINED SPRAINS AND STRAINS	222
DISLOCATION OF ANKLE	203
FOREIGN BODY ON EXTERNAL EYE	180

SPRAINS AND STRAINS OF OTHER AND UNSPECIFIED PARTS OF BACK	179
FRACTURE OF ONE OR MORE PHALANGES OF HAND	156
DISLOCATION OF FINGER	141
SPRAINS AND STRAINS OF SACROILIAC REGION	132
FRACTURE OF ANKLE	128
EFFECTS OF FOREIGN BODY ENTERING THROUGH ORIFICE	106
FRACTURE OF TIBIA AND FIBULA	102
FRACTURE OF CARPAL BONE(S)	96
FRACTURE OF ONE OR MORE TARSAL AND METATARSAL BONES	94
OTHER & UNSPECIFIED EFFECTS OF EXTERNAL CAUSES	91
COMPLICATIONS OF SURGICAL & MEDICAL CARE, NOT ELSEWHERE CLASSIFIED	90
FRACTURE OF HUMERUS	89
DISLOCATION OF SHOULDER	82
FRACTURE OF FACE BONES	76
FRACTURE OF METACARPAL BONE(S)	76
SPRAINS AND STRAINS OF HIP AND THIGH	75
DISLOCATION OF KNEE	70
FRACTURE OF ONE OR MORE PHALANGES OF FOOT	65
DISLOCATION OF WRIST	62
BURN OF WRIST(S) AND HAND(S)	52
DISLOCATION OF FOOT	50
POISONING BY DRUGS, MEDICINAL & BIOLOGICAL SUBSTANCES	49
FRACTURES	48
FRACTURE OF NECK OF FEMUR	45
INTERNAL INJURY OF CHEST, ABDOMEN, & PELVIS	40
BURN OF UPPER LIMB, EXCEPT WRIST AND HAND	38
FRACTURE OF CLAVICLE	38
BURN OF LOWER LIMB(S)	36
TOXIC EFFECTS OF SUBSTANCES CHIEFLY NONMEDICAL AS TO SOURCE	36
FRACTURE OF OTHER AND UNSPECIFIED PARTS OF FEMUR	35
BURNS	33
DISLOCATION OF ELBOW	33
FOREIGN BODY IN EAR	28
FRACTURE OF RIB(S), STERNUM, LARYNX, AND TRACHEA	27
CEREBRAL LACERATION AND CONTUSION	26
FRACTURE OF PATELLA	26
DISLOCATION OF HIP	21
FRACTURE OF VERTEBRAL COLUMN WITHOUT MENTION OF SPINAL CORD INJURY	20
FRACTURE OF PELVIS	18
FOREIGN BODY IN MOUTH, ESOPHAGUS, AND STOMACH	17
BURN OF FACE, HEAD, AND NECK	16
FOREIGN BODY IN PHARYNX AND LARYNX	16
DISLOCATION	14
MULTIPLE FRACTURES OF HAND BONES	14
BURNS OF MULTIPLE SPECIFIED SITES	13
FOREIGN BODY IN NOSE	13
INJURY, OTHER AND UNSPECIFIED	13
BURN OF TRUNK	11
FOREIGN BODY IN TRACHEA, BRONCHUS, AND LUNG	10
FRACTURE OF SCAPULA	10
LATE EFFECTS OF INJURIES, POISONINGS, TOXIC EFFECTS, AND OTHER EXTERNAL CAUSES	9

BURN, UNSPECIFIED SITE	8
FRACTURE OF UNSPECIFIED BONES	8
OTHER, MULTIPLE, AND ILL-DEFINED DISLOCATIONS	8
CERTAIN TRAUMATIC COMPLICATIONS & UNSPECIFIED INJURIES	6
INJURY TO PERIPHERAL NERVE(S) OF SHOULDER GIRDLE AND UPPER LIMB	6
SUBARACHNOID, SUBDURAL, AND EXTRADURAL HEMORRHAGE, FOLLOWING INJURY	6
CERTAIN EARLY COMPLICATIONS OF TRAUMA	5
BURN (ANY DEGREE) INVOLVING LESS THAN 10 PERCENT OF BODY SURFACE	4
ILL-DEFINED FRACTURES OF UPPER LIMB	4
INTRACRANIAL INJURY OF OTHER AND UNSPECIFIED NATURE	4
INTRACRANIAL INJURY, EXCLUDING THOSE WITH SKULL FRACTURE	4
POSTTRAUMATIC WOUND INFECTION NOT ELSEWHERE CLASSIFIED	4
INJURY TO BLOOD VESSELS	3
SECONDARY AND RECURRENT HEMORRHAGE AS AN EARLY COMPLICATION OF TRAUMA	3
BURN (ANY DEGREE) INVOLVING 30-39 PERCENT OF BODY SURFACE	2
FOREIGN BODY IN ANUS AND RECTUM	2
FRACTURE OF VAULT OF SKULL	2
FRACTURE OF VERTEBRAL COLUMN WITH SPINAL CORD INJURY	2
INJURY TO OTHER AND UNSPECIFIED NERVES	2
MULTIPLE FRACTURES INVOLVING SKULL OR FACE WITH OTHER BONES	2
OTHER, MULTIPLE, AND ILL-DEFINED FRACTURES OF LOWER LIMB	2
BURN CONFINED TO EYE AND ADNEXA	1
BURNS CLASSIFIED ACCORDING TO EXTENT OF BODY SURFACE INVOLVED	1
DISLOCATION OF JAW	1
FOREIGN BODY IN DIGESTIVE SYSTEM, UNSPECIFIED	1
FOREIGN BODY IN INTESTINE AND COLON	1
ILL-DEFINED FRACTURES OF BONES OF TRUNK	1
INJURY TO NERVE ROOTS AND SPINAL PLEXUS	1
INJURY TO OPTIC NERVE AND PATHWAYS	1
INJURY TO OTHER CRANIAL NERVE(S)	1
MULTIPLE FRACTURES INVOLVING BOTH LOWER LIMBS, LOWER WITH UPPER LIMB, AND LOWER LIMB(S) WITH RIB(S) AND STERNUM	1
OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY	1
TRAUMATIC SUBCUTANEOUS EMPHYSEMA	1
VOLKMANN'S ISCHEMIC CONTRACTURE	1
	10,699
DEATH	18
	18
MISC. EMERGENCY SERVICE TREATMENT	12
	12
ORGAN OR TISSUE REPLACED BY TRANSPLANT	1
	1
ANY DISEASE	625

	625
	40,941

Notes: All admission types are included.

A Detailed List of the Discharge Diagnoses of the 3 Largest Referral Hospitals in Lebanon in 1999-2000

Disease Classification	AUH	Makassed	St. Georges	All
I. Communicable, maternal, perinatal and nutritional condition	8292	7476	2317	18085
I.A. Infectious and parasitic diseases	963	1029	302	2294
I.A.1. Tuberculosis	226	25	4	255
I.A.2. Sexually transmitted diseases excluding HIV	149	18	40	207
I.A.2.a. Syphilis	0	1	0	1
I.A.2.b. Chlamydia		0		0
I.A.2.c. Gonorrhoea	1	0	3	4
I.A.3. HIV		2		2
I.A.4. Diarrhoeal diseases	168	624	69	861
I.A.5. Childhood-cluster diseases	3	5	2	10
I.A.5.a. Pertussis	0	5	1	6
I.A.5.b. Poliomyelitis	3	0	0	3
I.A.5.c. Diphtheria	0	0	0	0
I.A.5.d. Measles	0	0	0	0
I.A.5.e. Tetanus	0	0	1	1
I.A.6. Bacterial meningitis and meningococcaemia	18	11	5	34
I.A.7. Hepatitis B and hepatitis C	25	14	14	53
I.A.8. Malaria	16	1	1	18
I.A.9. Tropical-cluster diseases	0	0	0	0
I.A.9.a. Trypanosomiasis	0	0	0	0
I.A.9.b. Chagas disease	0	0	0	0
I.A.9.c. Schistosomiasis	0	0	0	0
I.A.9.d. Leishmaniasis	0	0	0	0
I.A.9.e. Lymphatic filariasis	0	0	0	0
I.A.9.f. Onchocerciasis	0	0	0	0
I.A.10. Leprosy	0	0	0	0
I.A.11. Dengue	0	0	0	0
I.A.12. Japanese encephalitis	0	0	0	0
I.A.13. Trachoma	0	0	0	0
I.A.14. Intestinal nematode infections	4	0	1	5
I.A.14.a. Ascariasis	0	1	0	1
I.A.14.b. Trichuriasis	0	0	0	0
I.A.14.c. Ancylostomiasis and nectoriasis	0	0	0	0
I.B. Respiratory infections	815	1332	538	2685
I.B.1. Lower respiratory infections	499	954	343	1796
I.B.2. Upper respiratory infections	124	161	89	374
I.B.3. Otitis media	192	217	106	515
I.C. Maternal conditions	3930	4904	1157	9991
I.C.1. Maternal haemorrhage	83	30	14	127

I.C.2. Maternal sepsis	2	0	0	2
I.C.3. Hypertensive disorders of pregnancy	41	26	13	80
I.C.4. Obstructed labor	73	20	0	93
I.C.5. Abortion	183	131	110	424
I.D. Conditions arising during the prenatal period	2180	49	224	2453
I.D.1. Low birth weight	216	70	59	345
I.D.2. Birth asphyxia and birth trauma	409	81	67	557
I.E. Nutritional deficiencies	404	162	96	662
I.E.1. Protein-energy malnutrition	11	0	1	12
I.E.2. Iodine deficiency	3	0	2	5
I.E.3. Vitamin A deficiency	0	0	0	0
I.E.4. Iron-deficiency anaemia	87	162	22	271
II. Noncommunicable diseases	21225	12715	7479	41419
II.A. Malignant neoplasms	1545	1170	360	3075
II.A.1. Mouth and oropharynx cancers	31	25	8	64
II.A.2. Oesophagus cancer	2	6	3	11
II.A.3. Stomach cancer	28	27	6	61
II.A.4. Colon and rectum cancers	70	60	27	157
II.A.5. Liver cancer	13	3	1	17
II.A.6. Pancreas cancer	23	12	13	48
II.A.7. Trachea, bronchus and lung cancers	154	136	30	320
II.A.8. Melanoma and other skin cancers	3	13	5	21
II.A.9. Breast cancer	137	112	56	305
II.A.10. Cervix uteri cancer	40	15	4	59
II.A.11. Corpus uteri cancer	22	6	3	31
II.A.12. Ovary cancer	18	27	4	49
II.A.13. Prostate cancer	67	52	44	163
II.A.14. Bladder cancer	92	67	15	174
II.A.15. Lymphomas and multiple myeloma	112	189	15	316
II.A.16. Leukaemia	104	235	11	350
II.B. Other neoplasms	572	206	214	992
II.C. Diabetes mellitus	1004	392	183	1579
II.D. Endocrine disorders	1566	684	354	2604
II.E. Neuro-psychiatric conditions	1074	596	204	1874
II.E.1. Unipolar major depression	34	34	34	34
II.E.2. Bipolar disorder	34	0	0	34
II.E.3. Schizophrenia	13	12	0	25
II.E.4. Epilepsy	150	48	18	216
II.E.5. Alcohol use	15	10	5	30

II.M.8. Down syndrome	18	27	3	48
II.M.9. Congenital heart anomalies	363	69	114	546
II.M.10. Spina bifida	25	1	0	26
II.N. Oral conditions	45	0	24	69
II.N.1. Dental caries	0	0	0	0
II.N.2. Periodontal disease	5	0	3	8
II.N.3. Edentulism		0		0
	688	52	4	744
III. Injuries	587	52	4	643
III.A. Unintentional injuries	163	20	2	185
III.A.1. Road traffic accidents	25	2	1	28
III.A.2. Poisonings	272	22	0	294
III.A.3. Falls	1	0	0	1
III.A.4. Fires	1	0	0	1
III.A.5. Drownings	127	7	0	134
III.A.6. Other unintentional injuries	93	0	0	93
III.B. Intentional injuries	51	0	0	51
III.B.1. Self-inflicted injuries	13	0	0	13
III.B.2. Violence	28	0	0	28
III.B.3. War				
TOTAL	71969	44858	23418	140245

Note1: The data from St. Georges hospital referring to the injuries was not available.;

Note2: The Psychiatric cases of St. Georges hospital are incomplete.;

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Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(CPSRS)