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HEALTH STATUS AND CATEGORICAL DISEASE RESEARCH AND CONTROL IN EGYPT

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by
Dr. Alfred Buck
Office of Health, AID/Washington
and
Veronica Elliott
Consultant, Washington D.C.

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

INTRODUCTION 3

MORTALITY AND CAUSES OF DEATH 5
- Crude Death Rate 5
- Life Expectancy 7
- Infant Mortality 7
- Child Mortality 11
- Maternal Mortality 11
- Causes of Death 12

CAUSES OF MORBIDITY AND SPECIFIC DISEASE PROGRAMS 18
- Communicable Diseases 20
- Noncommunicable Diseases 41

RECOMMENDATIONS 46

REFERENCES 48

APPENDIX - PEOPLE INTERVIEWED BY DR A. BUCK

APPENDIX - DEPARTMENT OF SCHOOL HEALTH

EXECUTIVE SUMMARY

There is no coordinated system for the recording, compilation, analysis and publication of information about disease patterns in Egypt. The institutional fragmentation within the Ministry of Health (MOH) and the isolation of the MOH from other service providers make it barely possible to guess at the prevalence, incidence, case fatality and geographic distribution of even the most important diseases. Consequently, the morbidity burden of the Egyptian people cannot be determined, and routine surveillance of major public health hazards for planning and evaluation purposes cannot be undertaken.

Some attempts are being made to correct this situation. The Health Profile of Egypt is in its third year, but such data as have been analyzed are not generally available except in summary form. The pilot study on Disease Reporting and Analysis being conducted by the Board of Health looks promising but is in its early stages. MOH projects such as that for Strengthening Rural Health Services Delivery are contributing to improvements in record-keeping and management and may have long-run health information system benefits.

In order to develop the overview of health status and categorical disease interventions presented in this paper, interviews were conducted with officials of the various relevant departments of the MOH. These discussions were supplemented by a review of the literature, with an emphasis on the publications of Egyptian professional associations.

These somewhat haphazardly selected sources describe a health status profile with the following major characteristics:

- The fairly rapid decline in crude death rates is slowing down;

- Infant mortality, and probably maternal mortality, are higher than one would expect;

- Child mortality has reached an expected level over-all;

- Among communicable diseases, hepatitis, polio, trachoma, tuberculosis, schistosomiasis, intestinal parasites and measles are major public health problems;

- There is gross under-reporting of some important communicable diseases, particularly tetanus and venereal diseases;

- Compulsory immunization has not resulted in the protection of all children;

- Noncommunicable diseases are becoming increasingly recognized as a high priority concern;

- Occupational health problems are not yet recognized as being of national concern.

All officials of the MOH who were interviewed mentioned shortcomings in diagnostic coverage and quality, especially at the peripheral level. These involved both clinical and laboratory services. In the field of clinical diagnosis and specialty consultation the following were mentioned, by order of priority: Ophthalmology; Ear, Nose and Throat; Dermatology; Radiology; Orthopedics; and Orthodontics. The main shortcomings in the quality and coverage of diagnostic laboratory services are in diagnostic microbiology and clinical medicine.

The best information based on a nation-wide denominator is that from the school health service, covering approximately 7 million children ranging in age from 6 to 18 years. This represents about 15 percent of the general population of Egypt. School enrollment is estimated at 65 percent. The age groups of school children are also ideally suited as sentinel populations for surveillance and for epidemiologic inquires of specific public health problems, including schistosomiasis, hepatitis, poliomyelitis, tuberculosis, trachoma, intestinal parasitoses and handicaps. For some diseases, i.e., schistosomiasis and hepatitis, the upper age-bracket of Egyptian school children represents the age group where the prevalence of infection reaches its peak, and where detection of new infections and monitoring of control projects would be easiest. An Appendix to this document contains an overview of the procedures used and results obtained in school health examinations in 1980/81. Physical examinations are scheduled once every three years beginning at school entry. While the quality of the data on health now collected varies considerably from place to place, the system has great potential as the nucleus of a medical intelligence system for the following reasons: The examinations could be standardized nation-wide; the specific public health problems found in a given area could be used immediately for health education; the functioning of the screening services, the subsequent referral of patients to clinical speciality services and even disease trends could be determined without great difficulty; and changes in behavior as they relate to the etiology of disease are probably more likely to occur in children than adults. The current focus of A.I.D's health projects is narrow and is heavily concentrated on improving infant and child mortality (oral rehydration, immunizations, MCH, nutrition at weaning age, etc.). Little has been done to reach the economically active segments of the general population. Strengthening of Egypt's school health program in future projects of A.I.D. would be an effective means to reach an important part of the general population who would be susceptible to new ideas about disease prevention and control. Moreover, they themselves represent a sizable target for reaching on of A.I.D.'s goals: the improvement of the quality of life through better health.

INTRODUCTION

This paper reports on the health status of the Egyptian population, with emphasis on those disease problems which are the subject of categorical research and control efforts. The methodology used was a combination of literature analysis and interviews with key officials of MOH and with medical scientists engaged in research efforts. The authors of this paper are greatly indebted to the Health Sector Assessment Resource Coordinator for her extensive literature search, and to those who shared their knowledge and ideas during discussions with the senior author.*

In Egypt, as in many countries, both rich and poor, the most severe constraint faced by an investigation into health status is the lack of a timely, comprehensive information system. The Egyptian case is particularly frustrating because small segments of such a system exist, but they are overwhelmed by the fragmentation, incompleteness and redundancy of the system overall. Figure 1 illustrates this point by indicating the fragmentation within MOH. Those data which do exist are seldom made available to many of those who could use them, and special epidemiological studies may be carried out in order to satisfy a short-term need for data about a particular disease problem or population group. The findings of such studies may be illuminating but they can have value only in relation to that specific study's objectives, and the broader picture remains obscure.

The weakness of the health status information derives from several sources: only a small fraction of health care providers are required to report data to MOH; those data which are reported are often incomplete and probably frequently inaccurate; the various organizational units within MOH may have established separate and distinct data reporting and analysis procedures; and no simple means exist for sharing data among MOH units, or between the national, governorate and local levels of administrative authority. These problems are recognized by the MOH, as they have been by the United States-Egypt Joint Working Group on Medical Cooperation and by the Institute of Medicine study team.

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* Special thanks are offered to Dr. Salah El Din Madkour for his assistance in arranging interviews for Dr. Buck. The Appendix contains a list of people interviewed.

Figure 1

Treatment of Importaht Diseases and Health Conditions by Health Facilities of the Ministry of Health: Fragmentation of Reporting

	Epidemic Disease Control	Endemic Disease	Fever Hosp.	Chest Dis.	Skin Dis.	Eye Dis.	MCH	Prev. Instit.	Egypt Org. BP & D *	School Health	Special Project	Quarantine-able Disease	Health Council	Rural Health	General Hospitals
Malaria		X	X												X
Schistosomiasis		X								X	X		X	X	X
Filariasis		X												X	
Intestinal Paras.							X			X	X			X	
Tuberculosis			X	X		X									X
Leprosy					X	X					X				
Meningitis															
Meningococal	X		X				X	X	X	X		X		X	X
Shigellosis	X		X							X				X	X
Measles	X		X				X		X	X	X		X	X	X
Pertusis	X		X				X			X	X			X	X
Diptheria	X		X				X			X	X			X	X
Tetanus	X		X											X	X
Poliomyelitis	X		X					X	X	X	X		X	X	X
Trachoma						X	X		X	X	X			X	
Pneumonia			X	X			X		X	X	X			X	X
Rift Valley Fever	X		X						X		X				
"Diarrheal Disease"	X		X				X		X	X	X		X	X	X
Veneral Disease					X										
Hepatitis	X		X				X		X	X	X			X	X
Rheumatic Fever	X		X				X			X			X	X	X
Rheumatic HD			X				X			X					X
Strep Sore Throat	X		X				X			X				X	X
Impetigo					X		X			X				X	
Scabies					X		X			X				X	
Ringworm			X												
Accidents														X	X
CVD														X	X

* Egyptian Organization for Biological Products and Vaccines

Best Available Document

The discussion which follows captures the major trends of mortality and morbidity in Egypt. The sequence of Health Sector Assessment activity did not allow for much exchange of facts, impressions and conclusions between those team members looking at health status and those looking at health services, and so health service indicators of health status are not included to any extent. The discussion is organized into the following major sections:

Mortality and Causes of Death

Causes of Morbidity and Specific Disease Programs

Recommendations

MORTALITY AND CAUSES OF DEATH

This section presents data on the number and causes of death in Egypt. When available, age and sex variables are included in the discussion. Changes in these most basic indicators of health status over the past thirty years or so are evident from the historical data which are available. The discussion points out that problems of registration of deaths and accurate recording of cause of death mitigate against detailed analysis of these data.

CRUDE DEATH RATE

Data concerning the crude death rate in Egypt are reported in Table 1 on the following page. The data show a fairly steady decline since the 1940s. The World Bank estimates the extent of underregistration of deaths during the 1974/76 period at about 12 % (1).

Data from the Egyptian Fertility Survey for 1974-75 show over-all mortality rates to be somewhat higher in Upper Egypt 13.8, than in Lower Egypt, 12.5, and rates for Cairo, 11, and Alexandria, 9.6, are lower than the national average of 12.4 (2). The registration data for this same period show a somewhat different pattern and suggest that the mortality level in Upper Egypt is lower than that of the urban areas. As the World Bank points out, this is most likely due to higher rates of underregistration among the rural areas of Upper Egypt (3).

Table 1

CRUDE DEATH RATES AS REPORTED FOR SELECTED YEARS AND FROM VARIOUS SOURCES

YEAR	C.D.R.	SOURCE
1946	25.0	MOH, Egyptian Experience in Primary Health Care
1952	17.8	MOH, Egyptian Experience in Primary Health Care
1960	16.9	MOH, Basic Statistical Information, July 1981
1960	19	World Bank
1962	17.9	MOH, Egyptian Experience in Primary Health Care
1965	18	World Bank
1970	15.1	MOH, BASIC Statistical Information, July 1981
1970-74	16	World Bank
1972	14.5	MOH, Egyptian Experience in Primary Health Care
1975	12.1	MOH, Basic Statistical Information, July 1981
1975-79	13	World Bank
1976	11.7	MOH, Egyptian Experience in Primary Health Care
1978	10.6	MOH, Basic Statistical Information, July 1981
1980	10.8	MOH, Basic Statistical Information, July 1981

There is evidence to suggest that the decline in mortality has been faster among males than females. Before 1950 overall male mortality was higher than that among females, but this trend has been reversed in more recent years (4).

LIFE EXPECTANCY

Data describing life expectancy show that life expectancy increased by 11 years during the 1940s but by only 8 years during the 1950s. The rate of increase slowed even more in the 1960s and 1970s. MOH statistics report that in 1960 life expectancy at birth for males was 52, for females 54. In 1970 comparable figures were 50 for males and 53 for females, and in 1980 life expectancy for males was 54 years and for females 57 years (5).

INFANT MORTALITY

The Infant Mortality Rate (IMR) is an attractive indicator for comparing the health status of different population groups or of the same population over time, and development goals, in Egypt and elsewhere, are often expressed in terms of a gradual reduction of the IMR. In Egypt there is little consensus as to what the IMR actually is but there is consensus that it is probably unusually high in relation to other indicators of Egypt's development.

Table 2 presents data on the IMR in Egypt for various years and from a variety of sources. The World Bank suggests that; "the reliability of available mortality data is barely sufficient to fix either levels or trends" (6). Another research group writes; "the sad truth is that we (and everyone else) have been using faulty data on infant mortality, the values of which are simply and consistently incorrect" (7).

A recent analysis has attempted to determine the extent and nature of under-reporting of infant mortality. It has found that the data are not, in fact, consistently incorrect. Rather, the study concludes that reporting in Cairo is close to accurate, while the incidence of under-reporting in Upper Egypt is 35-40%, and in Lower Egypt 23-32%. Neither, the study concludes, has under-reporting been consistent over time. In looking at data from the 1940s, the analyst found under-reporting to have been as much as 50% in Upper Egypt, and over 35% in Lower Egypt (8). The World Bank, in comparing the results of the Egyptian Fertility Survey with registration data, concluded that about 23% of infant deaths were not registered, implying an 11% differential between the official and actual IMR (9).

Table 2

INFANT MORTALITY RATES, AS REPORTED FOR VARIOUS YEARS AND FROM VARIOUS SOURCES

YEAR	IMR	SOURCE
1946	141	MOH, Egyptian Experience in Primary Health Care
1952	127	MOH, Egyptian Experience in Primary Health Care
1960	128	World Bank Estimates
1960	109	MOH, Basic Statistical Information
1962	134	MOH, Egyptian Experience in Primary Health Care
1965	129	World Bank Estimates
1970	116	MOH, Basic Statistical Information
1970-74	119	World Bank Estimates
1972	116	MOH, Egyptian Experience in Primary Health Care
1973	98	Demographic Yearbook
1974	101	Demographic Yearbook
1974-75	119	Egyptian Fertility Survey
1975	89	MOH Strategy of Health in Egypt for the Year 2000
1975	118	Syncrisis
1975-79	110	World Bank Estimates
1976	103	ECTOR
1977	115	ECTOR
1978	116	Institute of Medicine, based on MOH interview
1978	96	ECTOR
1978	83	WHO Basic Health Indicators and CAPMAS
1979	96	ECTOR
1980	89	UNICEF, based on MOH
1980	80	MOH, based on adhoc study
1980	94	ECTOR
1981	94	ECTOR

A recent report of the Committee on Population and demography of the National Research Council estimates IMR for governorates and for three major regions of Egypt in 1946-47, 1960-1, and 1975-6. Their data are shown as Table 3. The study points out that infant mortality in Upper Egypt was consistently higher than the other regions (10)

A recent report of the Committee on Population and demography of the National Research Council estimates IMR for governorates and for three major regions of Egypt in 1946-7, 1960-1, and 1975-6. Their data are shown as Table 3. The study points out that infant mortality in Upper Egypt was consistently higher than the other regions (10).

These recent studies, and the variation in the IMR statistics presented in Table 2 raise questions about the advisability of placing much reliance on the IMR in Egypt to measure comparative health status. However, even though the rates themselves are very much open to question, the data do provide some guidance on the relative magnitude of problems affecting children up to one year of age.

The Demographic Yearbook reports IMR by age of death as being as follows: (11):

Less than one day	0.3	per 1,000 live births
One to six days	5.9	per 1,000 live births
Seven to 27 days	9.5	per 1,000 live births
28 to 364 days	85.8	per 1,000 live births

The MOH reports that the neonatal mortality rate was 18 in 1972 (12), and the Ector data include reference to a neonatal mortality rate of 24 in 1978, 23 in 1979, and 21 in 1980 (13).

An in-depth study of one village's experience recorded that 34% of the 200 adults surveyed had experienced the death of at least one child. The proportion of children dying at certain ages is shown below (14):

Less than one week	11 percent
One week to one month	10 percent
One month to one year	18 percent

Table 3

ESTIMATED INFANT MORTALITY RATES (PER THOUSAND) BY REGION AND GOVERNORATE, 1946-47, 1960-61, AND 1975-76 : EGYPT

Region and Governorate	1946-47	1960-61	1975-76	1975-76 Urban	1975-76 Rural
Cairo and Alexandria	187.3	149.1	108.7	108.7	--
Cairo	186.4	151.0	113.7	113.7	--
Alexandria	189.3	142.3	98.6	98.6	--
Lower Egypt	203.6	147.2	98.6	95.0	99.7
Damietta	134.0[a]	89.8	93.9	80.0	96.6
Dakahliya	206.2	149.5	90.8	70.8	95.7
Sharkiya	207.1	131.4	105.7	90.3	109.1
Kalioubiya	244.6	211.4	123.5	127.9	119.6
Kafr El-Sheikh	--[b]	108.2	83.1	74.0	85.5
Gharbiya	190.1	147.4	92.6	90.1	93.6
Menoufiya	228.7	174.7	110.8	94.8	113.6
Beheira	169.0	124.8	87.7	84.6	88.4
Ismailia	--[b]	--[b]	93.3	104.7	84.2
Upper Egypt	259.0	225.0	144.9	126.9	152.6
Giza	265.8	207.3	122.4	117.4	127.4
Beni Suef	284.9	263.[illegible]	156.1	135.0	162.6
Fayoum	303.4	196.6	151.8	142.8	154.2
Minia	287.9	237.9	162.2	136.5	168.5
Assiut	259.5	224.4	148.6	126.8	154.9
Sohag	228.1	219.0	134.1	122.1	137.8
Quena	237.0	237.8	153.1	128.4	160.7
Aswan	210.0	204.1	148.2	142.4	153.1
Egypt	213.4	168.4	117.5	111.0	122.8

[a] Damietta was not included in Lower Egypt in 1946-47.
[b] Not a separate governorate at that date.

Source: The Estimation of Recent Trends in Fertility and Mortality in Egypt, National Academy Press, 1982.

In looking at IMR by sex, the official data show a male IMR of 98, and a female IMR of 105 (15). However, the analysis of under-reporting of registrations concludes that male infant mortality (estimated in this analysis as 126) is in fact higher than the mortality of female infants (estimated as 110) (16). These recent data challenge the theory that the supposedly higher mortality of female infants, who would normally be expected to have a better survival rate, is the result of the lower status of females within the family.

CHILD MORTALITY

Egypt is the poorest of the middle income countries identified by the World Bank. The average child mortality rate among middle income countries is 9 per thousand. If only the poorer 15 countries in this group are considered, they have an average child mortality of 17 (17). MOH data report the child mortality rate in Egypt as being 28 around 1970, and 18 in 1977 (18). The World Bank estimates that the national child death rate was 34 in 1960 and 16 during the period 1975-9 (19). In 1974-5, the Egyptian Fertility Survey found the child death rate in rural Upper Egypt to be 36, in urban Upper Egypt 24. The corresponding figures for Lower Egypt were 17 in the rural areas, and 9 in the urban centers (20).

Assuming that these data reflect accurate registration, there appears to have been a fairly consistent decline over time in the proportion of deaths among Egyptian children aged 1 to 4 years. The data suggest that the decline in child mortality has been greater than that of infants, and that Egypt has now reached an overall level of "expected" child mortality. The marked contrast between geographic areas indicates, however, that certain population sub-groups, notably rural people in Upper Egypt, are still experiencing very high child mortality.

MATERNAL MORTALITY

The MOH reports that maternal mortality declined from 1.4 per 1,000 live births in 1952 to 0.7 in 1975, and then rose to an estimated 0.8 in 1980 (21). It is likely that these figures reflect some underreporting. Only a comparatively small proportion of births take place in facilities which are required to report to MOH and it is unlikely that health care providers at MCH Centers or traditional birth attendants would willingly report the causes of death of women under their care, if there were altenative causes which could be reported instead.

CAUSES OF DEATH

Table 4 presents data from various sources which address the percentage distribution of deaths by major causes of death for six years from 1937 to 1979. For each year except 1972, the data are broken down by sex. As footnoted, the sources do not always include the same categories of cause of death and so it is possible that diseases included in one category by one source may be included in another category by another source. However, the data do provide some indication of broad trends over time.

Figures 2 and 3 present these data graphically for males and females. Diseases of the digestive system were the leading cause of death among both sexes until the mid-1970s when the category of "other diseases" became the leading cause. Deaths caused by diseases of the circulatory system have shown the most consistent increase over the time period among both males and females. Deaths from infectious and parasitic diseases seem to have decreased quite significantly between the late 1940s and early 1970s.

Table 5 presents age-specific mortality rates for age intervals up to 35 years and for selected causes. The data are presented for the years 1972 and 1975. Figure 4 presents the differences in these data for the two years. Table 5 and Figure 4 show a significant increase in deaths in the first year of life attributable to infectious and parasitic diseases, and a dramatic decrease in deaths caused by diseases of the digestive system among infants and children up to age five. Deaths caused by diseases of the circulatory system have shown some considerable increase among all age groups, but especially among young adults.

TABLE 4

PERCENTAGE DISTRIBUTION OF DEATHS BY MAJOR CAUSE OF DEATH[1]

Years	Sex	Infectious and Parasitic	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Accidents, Poisoning & Violence	Ill Defined Conditions	Other Diseases
1937	Male	6.7	4.6	19.2	34.0	*	7.5	27.9
	Female	5.3	3.8	17.3	36.6		10.9	26.1
1947	Male	8.6	3.1	13.2	36.7	*	7.8	30.6
	Female	6.7	2.9	12.1	40.5		10.4	27.3
1960	Male	4.3	8.5	14.1	35.1	*	13.1	14.9
	Female	3.2	7.2	14.2	40.7		14.0	20.6
1970	Male	3.2	12.6	18.4	28.4	*	17.9	19.5
	Female	2.1	10.1	19.4	31.2		21.7	15.5
1972	Total	2.4	12.3	21.5	27.1	3.4	21.8	*
1979	Male	*	18.9	17.5	25.2	5.4	*	33.0
	Female	*	15.8	18.9	28.3		*	33.4

Source: Data for 1937, 1947, 1960 and 1970 from Bothaine El-Deeb, "A Study of Mortality in Egypt with Reference to Cause of Death" paper presented at the the Seminar on Mortality Trends and Differentials in Some Arab and African Countries (Cairo: Cairo Demographic Center, 1975).

Data for 1972 derived by the IOM study team from World Health Statistics Annual: Volume 1, Vital Statistics & Causes of Death, WHO, 1976.

Data for 1979 from CAPMAS reported in Basic Statisti Information of Health Services, MOH, July 1981.

1. Definition of the specified conditions may differ according to source of data and time period. This caution should be exercised in comparing the data for different years.

FIGURE 2

PERCENTAGE DISTRIBUTION OF DEATHS AMONG MALES BY MAJOR CAUSE OF DEATH

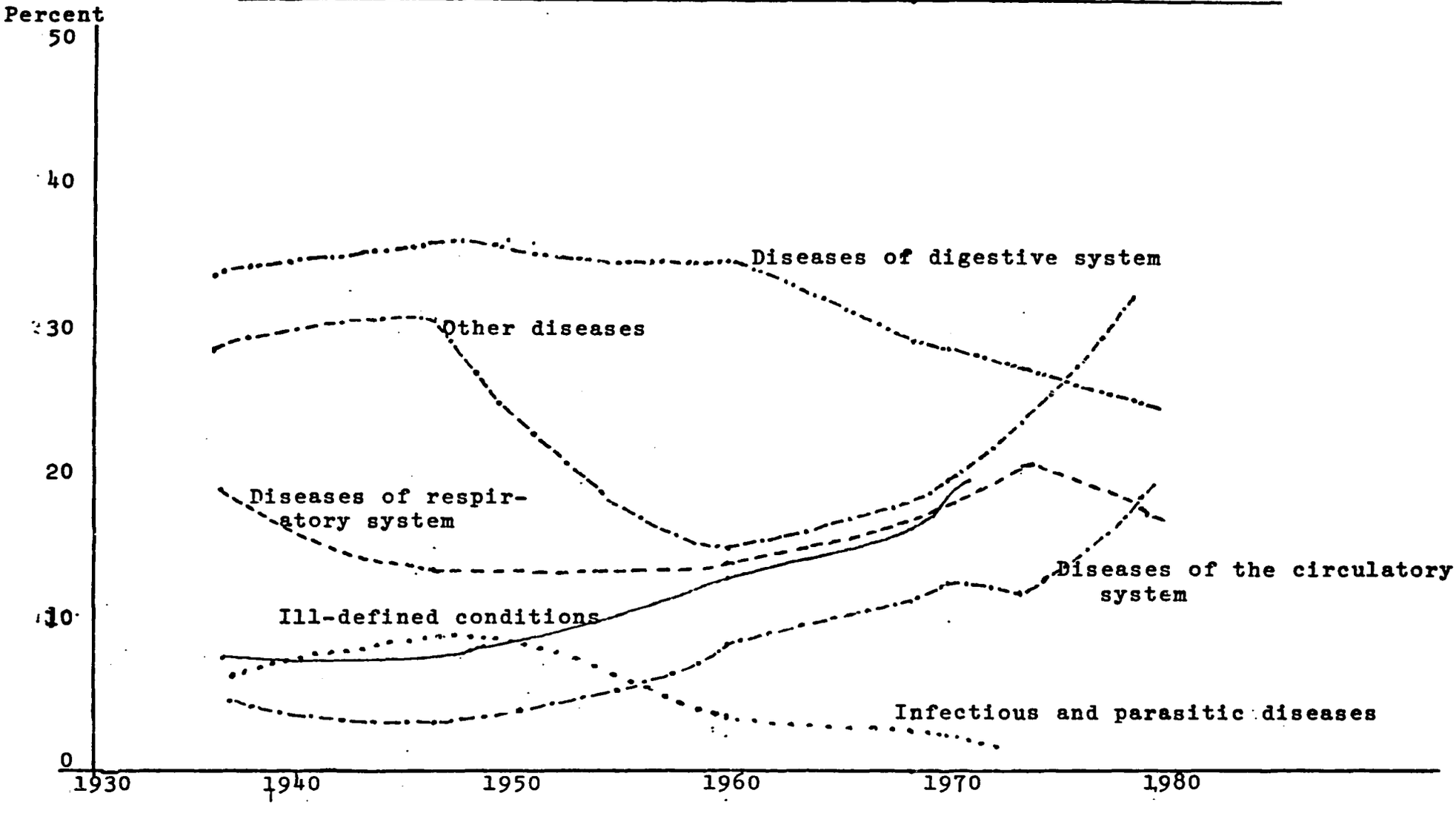


FIGURE 3

PERCENTAGE DISTRIBUTION OF DEATHS AMONG FEMALES BY MAJOR CAUSE OF DEATH

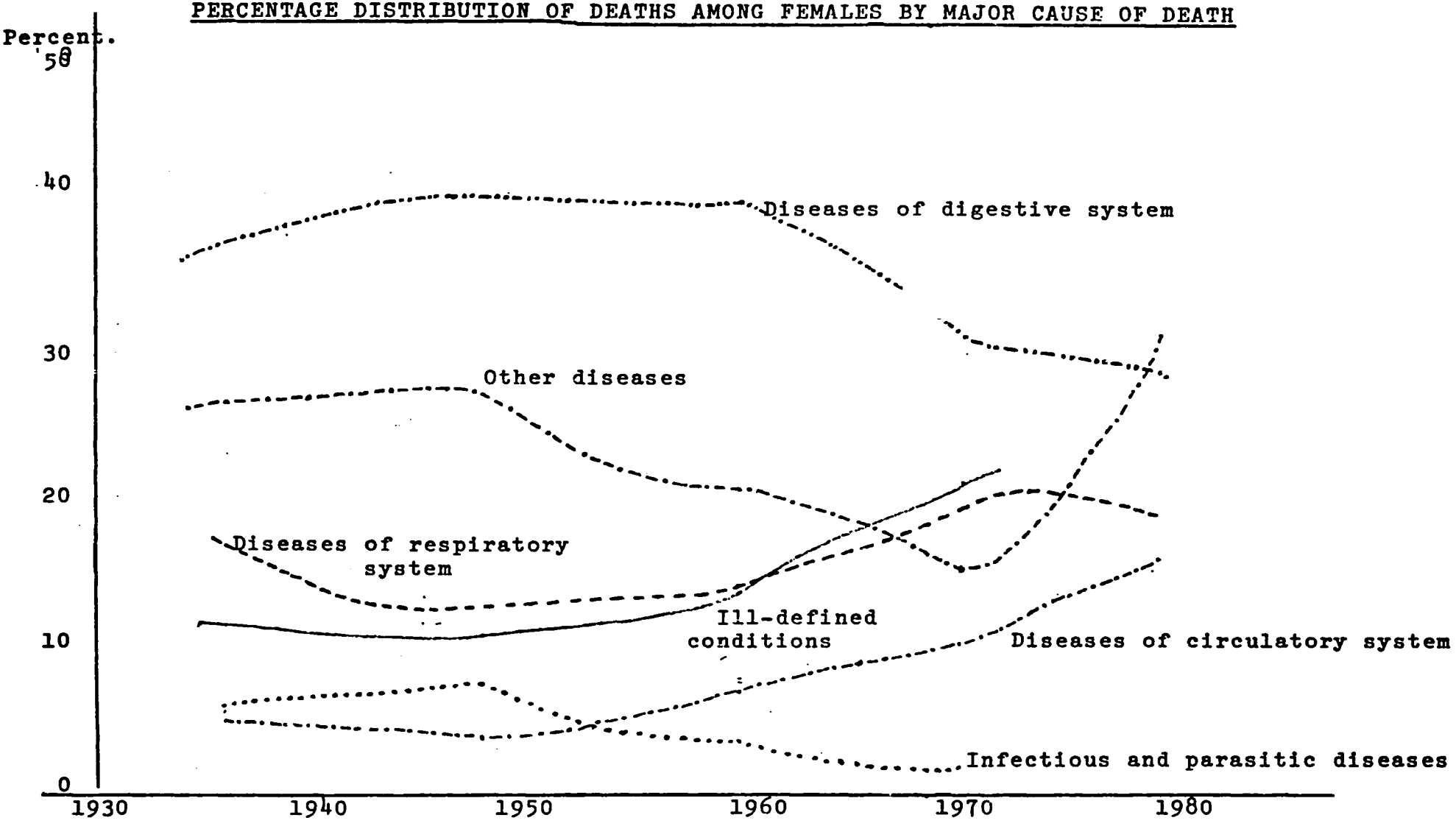


TABLE 5

Age-Specific Mortality Rates for Selected Ages
and Selected Causes 1972 and 1975

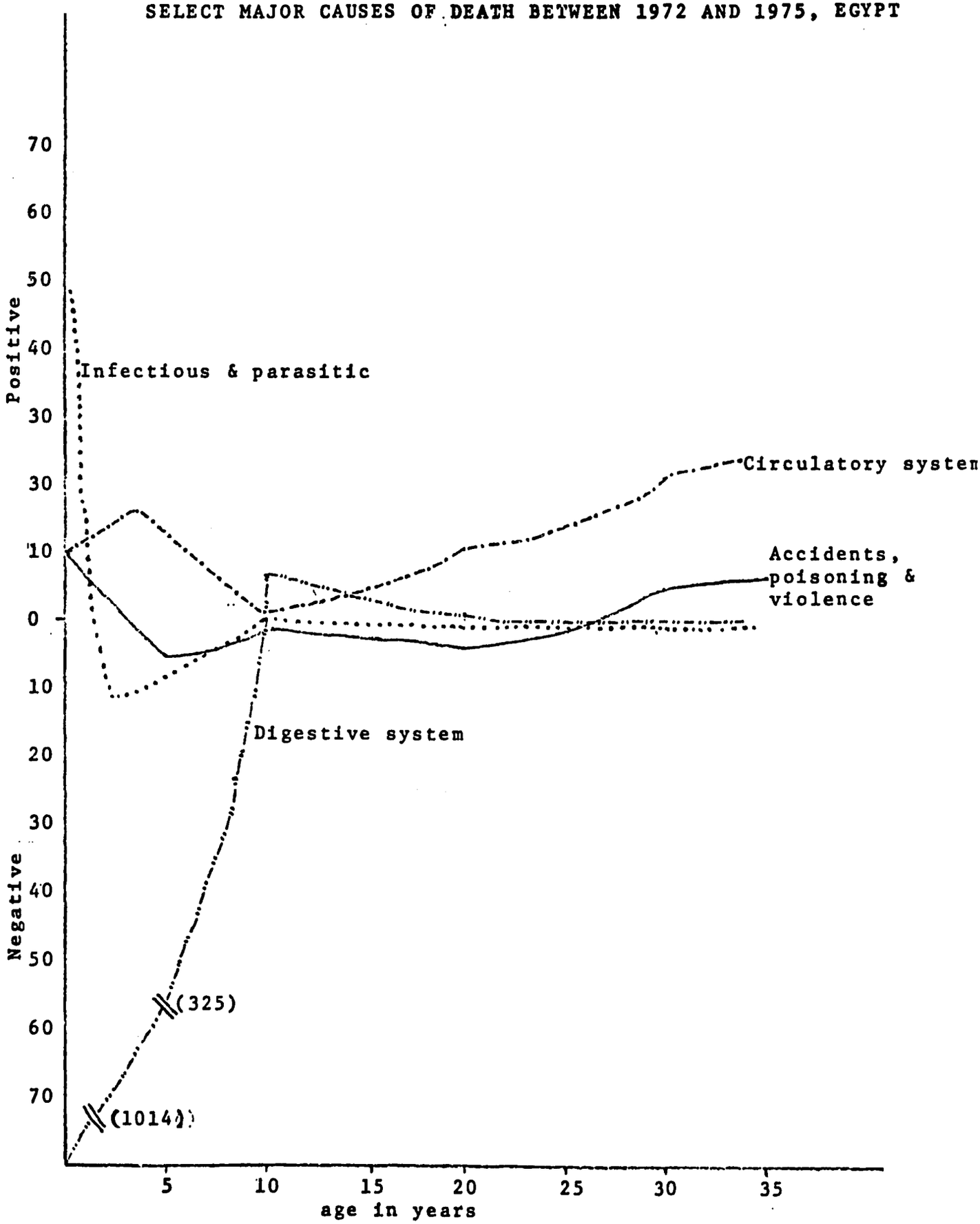
ICD "A" Diagnostic Category		Death Rates by Age Interval *				
		0	1 - 4	5 - 14	15 - 24	25 - 34
All Causes	1972	11,156	2,474	184	241	238
	1975	8,917	1,853	185	241	243
Infectious & Parasitic Diseases	1972	261	46	12	18	22
	1975	308	34	12	16	18
Diseases of the Circulatory System	1972	44	26	37	55	50
	1975	54	43	40	67	71
Diseases of Digestive System	1972	5,175	1,202	25	22	28
	1975	4,161	877	32	24	27
Accidents, Poisoning & Violence	1972	21	42	36	73	44
	1975	31	36	34	69	49

*Death rates per 100,000 population. Infant deaths per 100,000 live births.

Source: Excerpted from World Health Statistics Annual: Volume I, Vital Statistics & Causes of Death, WHO, 1976 and 1980.

FIGURE 4

DIFFERENCES* IN THE AGE-SPECIFIC DEATH RATES** FOR SELECT MAJOR CAUSES OF DEATH BETWEEN 1972 AND 1975, EGYPT



* Positive difference indicates increase between 1972 and 1975

** Based on deaths per 100,000

CAUSES OF MORBIDITY AND SPECIFIC DISEASE PROGRAMS

The MOH is organized into a number of programs concerned with specific diseases and with types of treatment facilities. Some health status information is collected and analyzed by these programs, while other information is sent directly from the governorate to the Department of Statistics at MOH. The major weakness of this fragmentation is the lack of any comprehensive disease surveillance system and of any significant epidemiologic interpretation of the data that MOH does accumulate.

The World Bank writes that "disease surveillance is neither thorough nor uniform" (22). The Subcommittee for Biomedical Research of the US-Egypt Joint Working Group on Medical Cooperation noted in 1978 that "lack of valid data regarding incidence or even presence of infectious diseases is deplored and restated" (23). The IOM study team quoted this statement and went on to state their own view that "there is a pressing need to improve countrywide disease surveillance and reporting of data on prevalence, incidence, and morbidity of infectious diseases" (24). In the final section of this paper, concerned with recommendations, the authors concur with these opinions and offer suggestions for change.

There are no nationwide data which describe age- and sex-specific morbidity by cause for the population of Egypt. Table 6 reproduces the only data on morbidity released by MOH as part of its basic statistical information. The information concerned with incidence and prevalence discussed below is taken from documents from a variety of MOH departments and other GOE organizations, from discussions with MOH officials and other knowledgeable people, from published papers, and from reports developed by other analysts.

Some major discrepancies were found in information reported by these sources and, in the absence of strong corroborating evidence, the discrepancies are reported as such.

The presentation is organized into the following sections:

- Communicable Diseases
- Non-communicable Diseases

Table 6

PERCENTAGE DISTRIBUTION OF MAJOR CAUSES OF ILLNESS IN GENERAL HOSPITALS (1977)

A. MALES

1 - Accidents, Poisoning and Violence	31.7
2 - Diseases of Digestive System	21.0
3 - Diseases of Respiratory System	10.1
4 - Diseases of Circulatory System	8.1
5 - Others	29.1
TOTAL	100.0%

B. FEMALES

1 - Deliveries and Complications of Pregnancy Childbirth and Puerparium	34.9
2 - Accidents, Poisoning and Violence	12.9
3 - Diseases of Genito-Urinary System	12.9
4 - Diseases of Digestive System	11.1
5 - Others	28.2
TOTAL	100.0%

Source: General Department of Statistics and Education, as reported in Basic Statistical Information of Health Services, MOH, July 1981.

COMMUNICABLE DISEASES

VIRAL DISEASES

The major viral communicable diseases found in Egypt include hepatitis, poliomyelitis, Rift Valley Fever, measles, tracoma and rabies. Each of these diseases is discussed below.

Hepatitis

All types of hepatitis--A, B, non-A non-B -- are known to be present in Egypt. In 1978 the Epidemic Control Department of the MOH reported to the IOM study team that the total annual occurence was estimated at more than 150 cases per 100,000 population, and the fatality rate at 1 per every 100 cases (25). The average annual number of reported cases in Cairo was reported to be 1,850 during the period 1978-80. Data describing the number of cases admitted to Fever Hospitals in 1980 (Table 7) show hepatitis to be the leading cause of admissions, with some 11,000 more cases of hepatitis admitted than for the second ranked cause.

Certainly hepatitis is one of the major causes of morbidity in Egypt. Poor sanitation (hepatitis-A), re-use of syringes and blood transfusion from donors who are hepatitis-B virus carriers are major determinants responsible for the frequent occurence of this group of diseases. However, in addition to hepatitis-A, which affects about 80% of the general population and hepatitis-B, which accounts for about 40% (combined state of antigen and antibody carriers) it is suggested that about 35% of the population have non-A, non-B type hepatitis whose etiology and mode of transmission have remained obscure. A further significant observation is that hepatitis-B antigen carriers tend to be more frequent in patients with S. mansoni infections. There is tentative evidence that the successful treatment of schistosomiasis with the new drug praziquantel will decrease the virus carrier state of these patients (26).

Poliomyelitis

At the request of the MOH, a recent WHO consultancy addressed poliomyelitis in Egypt and provides a detailed review and analysis (27). The paragraphs below summarize the report of this consultancy.

Table 7

NUMBER OF CASES ADMITTED TO FEVER HOSPITALS OF EGYPT BY DIAGNOSTIC CATEGORY, 1980 [1, 2]

Disease	Number of Cases Admitted	Rank
Hepatitis[3]	27,000	1
Enteric Fevers (typhoid, para A + B)	8,000	3
Meningococcal Meningitis	1,300	8
TB Meningitis[4]	400	12
Encephalitis	1,500	6
Measles[5]	800	9
Mumps[5]	600	10
Pertussis[5]	100	14
Chicken Pox[5]	400	13
Tetanus Neonatorum[6]	3,000	4
Pneumonia[7]	16,000	2
Malaria	500	11
Brucellosis	4	16
Erysipelas	2,000	5
Rabies[8]	1,500	7

1 Reports from 87 Fever Hospitals.
2 Private Practioners and Clinics; University Hospitals do not report.
3 80+% hepatitis A, 40% HB_{A+AB}; 30% non A-B.
4 Tuberculosis in TB hospitals, no records on bone TB.
5 Most cases treated by OPD.
6 Almost universal mortality.
7 No cause information.
8 All fatal.

Poliomyelitis cases are not sent to the fever hospitals, but to the Central Polio Hospital.

The number of officially reported cases of paralytic poliomyelitis reflect a small, unknown and often varying proportion of the true incidence. This is borne out by the fact that the official figures represent only a proportion of the acute cases actually seen at one major specialty hospital. However, the MOH is well aware that poliomyelitis is a major public health problem. Routine oral poliovirus vaccinations became required nationwide in 1968, and mass campaigns have been carried out periodically since 1976.

Prevalence surveys of paralytic poliomyelitis in 1973 and hospital surveillance data from 1963 through May 1981 suggested that the incidence rate of paralytic poliomyelitis was at least as high as 12-16 cases per 100,000 population in a presumably representative Egyptian governorate in 1975 and that this annual rate fell by 35% to 50% after the introduction of annual mass vaccination campaigns with trivalent oral poliovirus vaccine (TOPV) in 1976-1979. However, the annual rate then rose sharply again in 1980 to pre-1976 levels when no mass vaccination campaign was conducted prior to the peak 1980 summer poliomyelitis season, but the incidence rate of paralytic poliomyelitis was falling again in 1981.

Epidemiological data revealed the existence of a marked inverse correlation of paralytic poliomyelitis attack rates with socio-economic status, an unusually young age distribution of paralytic cases (16%-25% of cases were under 9 months of age) and a clear seasonality in which 53% to 69% of acute cases each year at the major treatment center of poliomyelitis in Egypt occurred June through October. Available data also showed a 3:2 predominance of acute paralytic poliomyelitis cases in males and an unusually high proportion (often 35%-43%) of type 2 poliovirus isolates among the total polioviruses isolated from acute paralytic cases each year.

A review of vaccine distribution data, official vaccination records and a small vaccine coverage survey in three areas of Cairo provided the WHO consultant with consistent evidence that the routine vaccination program in Egypt was reaching over 55% of children in 1975 with 3 or more doses of TOPV. The review also indicated that after the mass vaccination campaigns initiated since 1976, the comparable vaccination rates in children 9 months through 2 years of age would rise temporarily to over 70%. By comparing the vaccination status of poliomyelitis patients with that of other Egyptian children in 1975 and 1981, it was concluded that the risk of paralytic poliomyelitis in Egypt was lower by an estimated 65% to 87% in those with a history of 3 or more doses of TOPV compared to

those with fewer doses. Further, receipt of more doses of TOPV beyond the initial 3 doses continued to sharply reduce the risk of paralytic disease.

The overall epidemiological review of poliomyelitis in Egypt by WHO led to five major recommendations:

(1) A revised routine vaccination schedule that provided for as many as six doses of TOPV by 24 months of age, including two doses of TOPV by three months of age instead of the previous 0 doses, and four doses by six months of age instead of the previous two doses.

(2) The continuation of annual mass vaccination campaigns for at least the next two years and the scheduling of these closer to the time of the usual peak summer incidence of disease.

(3) More effort in maintaining and improving the cold chain, including the appointment and training of a full-time national director of the Expanded Programme of Immunization and additional managerial and supervisory staff.

(4) The collection of more complete and better surveillance data including prevalence surveys of paralytic poliomyelitis, active sentinel hospital surveillance and the conduct of formal vaccine coverage surveys; and

(5) The initiation of a multi-year surveillance study of poliomyelitis in comparable populations that would and would not incorporate two doses of high potency inactivated poliomyelitis vaccine in their routine vaccination schedule.

Rift Valley Fever

Rift Valley Fever was discovered first in Egypt in 1977. At that time there was an epidemic in the Sharkiya Governorate. The epidemiologic situation based on virus isolation and diagnostic serology for the years 1978 to 1980 is summarized in Table 8.

Rift Valley Fever, which is an acute viral disease of domestic animals, affects human beings only infrequently under normal circumstances. An outbreak of Rift Valley Fever involved several governorates of Egypt during 1977 and 1978. At the onset of the epidemic there were an estimated 18,000 cases with 596 deaths (3.3%). The disease in man is flu-like and may be complicated by hermorrhagic manifestations including involvement of the eye. The

Table 8

Rift Valley Fever Cases Isolated During the Years 1978-1980
Among the Governorates in Egypt

Governorates	1978			1979			1980
	No. of samples	Virus isolated	Serology ve	No. of samples	Virus isolated	Serology ve +	
Cairo	1	--	1	--	--	--	
Alexandria	1	--	1	--	--	--	
Suez	7	--	7	5	--	5	
Matruh	2	--	2	--	--	--	
Sharqiya	143	28	115	19	1	18	
Dakhaliya	12	3	9	138	--	138	
Gharbiya	13	--	13	--	--	--	
Assiut	9	--	9	--	--	--	
Menoufiya	--	--	--	1	--	1	
Aswan	7	--	7	--	--	--	
Total	195	31	164	163	1	162	

No. +ve cases among Humans

Taken from an article by Dr. A. El Akaad, Undersecretary, MOH, published in The Journal of the Egyptian Public Health Association, Vol. LVI, No. 5,6, 1981

epidemic in 1977 was proceeded in 1976 by an epizootic among domestic animals, especially of sheep which caused a considerable number of deaths and abortions in the infected animals. At present the rapid and wide spread of the disease suggests that it is vector borne and that the vector in Egypt is the mosquito Culex pipiens. However, as the virus was also isolated from the stools and throat washings of patients during the acute stage of the disease, there is also the possibility that the Rift Valley Fever may be spread by other means than transmission by arthropod vectors.

The control measures taken by the GOE include isolation of patients, vector control by application of pecticides and source reduction, as well as quarantine measures for imported animals. The Organization for Biological Products and Vaccines has developed an effective animal vaccine against Rift Valley Fever which is well-tolerated and has shown protection against the infection in animals.

There have been no new cases of the disease in 1981. Strict surveillance continues in the previously affected areas and, domestic animals have been vaccinated. It is suspected that in addition to domestic animals (sheep, cattle and camels) rodents may also serve as a virus reservoir because recent studies have indicated that rodents may have serologic anti-bodies and harbor the Rift Valley Fever virus.

Egyptian authorities have suggested that people at great risk of acquiring the infection, such as laboratory workers and veterinarians, should be immunized with the new vaccine. Human vaccine for human application is presently available only from the USA, but it is hoped that local vaccine production will be developed in the near future.

Research on Rift Valley Fever is continuing at the Virus Institute of the Egyptian Organization for Biological Products and Vaccines. However, the major portion of research on Rift Valley Fever supported by the U.S. National Institutes of Health has been transferred to Ain Shams University in Cairo.

Measles

The IOM study team, based on information provided to them by the MOH, reported that measles accounted for nearly two-thirds of the deaths categorized as being caused by infections and parasitic diseases in the age group one to four years (28). Vaccination

against measles was made compulsory in Egypt in 1977. The 1980 data describing cause of admission to the 87 Fever Hospitals presented in Table 7, report 800 cases admitted for measles.

Trachoma

It is estimated that the prevalence of blindness in Egypt is 2.5% among females and 1.9% among males. Two conditions account for 80% of the blindness in Egypt: corneal opacity, which is preventable, and cataract, which is easily curable. The major cause of blindness from opacities of the cornea and scarring of the eyelids is trachoma. Reduction of blindness caused by trachoma depends on improved public health programs, especially for better primary health care for acute eye infections. The causative agent of trachoma, Chlamydia trachomatitis belongs to group of agents that are responsible for a wide variety of different diseases. Among this group of agents there are some that are typically found in the classicial, ocular infections of trachoma (types A, B and C). Others are frequently associated with sexually transmitted infections causing a variety of lesions and symptoms. A survey in three Egyptian villages has indicated that there is a major extraocular reservoir for the agent with isolation from the throat, rectum and other sites.

Chlamydia is responsible for a high proprotion of infections in patients who have uretheral discharge. It is also a cause of inflammation of the cervix uteri and complications that may lead to sterility. Four percent of 160 women in the third trimester of pregnancy in Alexandria were found to have infections with C. trachomatitis. A sizable proportion of newborn children (34%) under the age of 2 years were found to have the trachoma-like agents in their eyes.

Rabies

The IOM team, based on information provided by MOH, estimated 2,000 cases of rabies a year in Egypt, all of which were fatal. They pointed out
that about 50,000 courses of the antirabies vaccine, produced at the Aqousa Virus Center from goat brain, were dispensed each year, but that this vaccine was highly antigenic and associated with three or four cases of encephalitis each year. The team reported that the Virus Center was planning to change to imported tissue-culture vaccine (29).

Another source states that the annual number of reported human rabies deaths during the period 1958-66 exceeded 30 only twice. The number of people who were bitten and took post exposure treatment during this same period averaged 24,011 a year, with a peak of 39,031 in 1966. Of these people reporting for treatment, 80-90 percent were bitten by dogs and 5-10 percent by cats (30). Table 7 reports the number of rabies cases admitted to the Fever Hospitals in 1980 as being 1,500.

The Veterinary Medicine Department of NAMRU-3 performed rabies diagnosis on a total of 145 dogs between 1975 and mid-1981. All the dogs had been identified as being potential rabies carriers, and all were from the Cairo area. The Department reported that 43% of these dogs were found to be rabid (31).

A study of 40 human cases of rabies who died after being admitted to either Abbassia or Embaba Fever Hospitals between 1972 and 1976, reported that 35 people gave a history of an animal bite. However, although a large network of Rabies Control Centers exists, only eight of these people considered taking vaccine. Of those who did begin vaccine treatment, two discontinued after two or three injections and six (all males) received 18-21 injections of the fermi type antirabies vaccine. Symptoms appeared anything from seven to 130 days post vaccination for those who had received the vaccine (32).

BACTERIAL DISEASES

The major bacterial communicable diseases found in Egypt are: tuberculosis, meningcoccal meningitis, typhoid and paratyphoid, streptococcal disease and rheumatic fever, leprosy and venereal diseases.

Tuberculosis

The MOH choses to assign patients with tuberculosis (TB) meningitis to the Fever Hospitals, those with pulmonary TB to the Chest Hospitals, Clinics and Dispensaries, and those with all other extrapulmonary forms of the disease to the General Hospitals. As a result, the data concerning TB in public sector hospitals are reported to the MOH through three different channels and there are no provisions for compiling these data into an epidemiologic profile of TB as a health status problem.

Table 7 is presented earlier in this paper and reports data from the 87 Fever Hospitals. TB meningitis accounts for 400 cases in these hospitals in 1980, and is ranked twelfth among the causes of admission.

The Department of Chest Diseases maintains a network of 100 Chest Dispensaries at the district level. Each is supposed to be staffed by personnel which should include a chest disease specialist, between 5 to 8 nurses, a laboratory technician, and a number of clerks and aids. For 1980, the Department received reports for 7,000 new cases of TB (33). Estimates by the Egyptian Academy of Science and Research place the number of cases from the same year at between 30,000 to 40,000. This would give an estimated annual incidence rate of roughly 1 per 1,000 population. The IOM study team reported a mortality rate of between 7 and 8 per 100,000 population, and a prevalence of positive chest X-ray findings of 2 per 1,000 (34). The Academy has estimated that BCG vaccination coverage in children at birth is only about 30% and that the contribution of the school health service to the vaccination average has been insignificant. A study reported in 1977 found that 55% of more than one thousand children aged less than two years had not been vaccinated. The proportion of children attending a private clinic who had been vaccinated was not significantly different from that of children attending a public clinic (35).

Upon detection of a new case of TB by the MOH house visits for contact infections are scheduled. Actually many of these routine visits are not made by the nurses of the Chest Clinics and are more of a symbolic than epidemiologically effective nature. There are no public health nurses who could carry out combined services in the same families or in the same community for different diseases or health problems. Diagnosis of TB is based on chest roentgenograms. Each of the Chest Clinics has small laboratory for microscopic examination of sputum examinations for acid-fast bacilli in sputum specimens. The Chest Clinics also send sputa to one of 25 major laboratories in the country that are capable of making bacteriologic cultures for the diagnosis of Mycobacterium tuberculosis, including tests of resistance of the isolates to the common drugs for treatment of TB, namely streptomycin, isoniacide, ethambutol, PAS and, if needed, rimfampicin. It is estimated that between 10% and 16% of the cultures sent to the laboratories have primary resistance to one or more of these drugs and that 30% show secondary resistance (36). Many patients with TB are treated in university and private hospitals or on an ambulatory basis by private physicians. All of these are lost for surveillance by the MOH and its services. As has

been discussed in relation to other diseases elsewhere in this report, reliable epidemiological data for use of health administrators can be obtained only through special investigations and surveys which, as a rule, are expensive, time-consuming and cumbersome.

Meningococcal Meningitis

The 87 MOH Fever Hospitals report admitting 1,300 cases of meningococcal meningitis during 1980 (Table 7). This disease ranked eighth among the causes of admission to these facilities.

Typhoid and Paratyphoid Fevers

The IOM study team, reported an estimated annual incidence of typhoid and paratyphoid fevers of 50 per 100,000 population (37). A study conducted in Alexandria found an incidence of 150 per 100,000 (38). 75% of reported cases are said to be S. Typhi, 20% paratyphoid A and the remainder other types. These diseases are apparently much more frequent among children in the 5 to 15 age group and are more likely to occur during the summer months.

Streptococcal Disease and Rheumatic Fever

Estimates made available to the IOM study team suggested that streptococcal disease and rheumatic fever occur with an annual frequency of 5 to 6 cases per 1,000 children aged 6 to 15 years (39). More recent data from the program to examine school children for rheumatic heart conditions, anticipated by the IOM team, report that 7.9 per 10.000 school children examined in 1980-1 had this condition (40). The Appendix contains an overview of th procedures used and results found by the school health survey.

A study of more than 600 cases of rheumatic heart disease among children aged 6 to 20 years found that only about three-quarters of the boys and one-half of the girls were still enrolled in school, suggesting that the school health program may be missing a significant number of infected children (41). The actual incidence of this condition may be significantly higher than estimated, especially among children from large families living in crowded households.

Tetanus

Tetanus, particularly neonatal tetanus, is probably one of the most importent under-reported diseases in Egypt. Table 7 shows a

total of 3,000 cases of neonatal tetanus admitted to the 87 Fever Hospitals in 1980. It is likely, however, that the total incidence of neonatal tetanus is many times this figure and that the disease contributes in a very significant way to the high rate of infant mortality in Egypt. Tetanus may well also be a major contributing factor in the rate of maternal mortality, which is known itself to be underreported.

Leprosy

The Department of Skin Diseases and Venereal Diseases within MOH has jurisdiction over the prevention and control of leprosy. The MOH keeps a central registry of all reported leprosy cases and there are at present 35,000 cases of leprosy on record, of which about one-third are diagnosed as lepromatous leprosy cases. The MOH operates two major leprosaria. The one in Abu Zabaal is the largest of its kind in the Middle East with a capacity of 1,200 beds and a current inpatient population of leprosy patients of about 900. The statistical information published by MOH for 1981 reports a total of 11 outpatient leprosy facilities and three inpatient facilities with a total of 1,789 beds (43). Most of the new cases of leprosy are found in Upper Egypt, with a concentration of cases in the Assiut area. Clinically, leprosy in Egypt is characterized by a relatively high rate of blinding eye complications. In addition to passive surveillance the Department carries out case finding surveys as well as family and contact studies of open cases. A large-scale population survey for skin diseases, especially for case finding for leprosy, is currently underway in Gharbiya governorate.

Although laboratory evidence of drug resistance to the standard sulfones used for the treatment of leprosy by advanced laboratory techniques (mouse, foot pad method) are lacking in Egypt, there is clinical evidence of resistance to dapsone (DDS). The frequency of DDS resistance is estimated as about 600 out of 35,000 or 1.7%. This estimate is, of course, too low as many of the 35,000 registered cases are inactive, thus inflating the denominator.

A recent clinical trial of 20 lepromatous leprosy cases with rifampicine and lamprene who have been under controlled treatment with DDS in the leprosorium for periods ranging from 1 to 20 years and who comprise age groups between 11 to 50 years showed the following results: complete cure in 9 cases, considerable improvement in 13, and complications of treatment in the remaining 4 (44).

Other Skin Diseases

Priority of the work of the Department of Skin Diseases is given to the prevention and treatment of the highly contagious skin diseases and conditions such as scabies, skin mycoses, impetigo, and pediculosis. These are mainly found in schools and military compounds. There is a shortage of qualified dermatologists in the country to staff the 16 specialized skin clinics of the Department in the different governorates of Egypt. This shortage has caused a bottleneck in the flow of referral of patients from the rural health services to the special skin clinics for expert advice and treatment. While the common contagious skin infections are treated by general practitioners, the relatively high prevalence of such conditions as allergic skin diseases, fungal infections, psoriasis, lupus erythematosis, skin tumors and vitiligo requires treatment and consultation by qualified dermatologists. In some areas of Upper and Middle Egypt the traditional treatment of illness by "burns" and "tatoos" is still practised.

Venereal Diseases

Venereal diseases (VD) are grossly underreported in Egypt. Because of the strong cultural taboos of this group of diseases, almost all cases with VD go unreported, are seen by private physicians and treated with medication from the pharmacies. These cases are treated without proper diagnostic work-up. While it is suspected that the large influx of tourists and the changes in life style have led to considerable increases of gonorrhea in the big cities of the Delta, especially in Cairo and Alexandria, not even crude estimates of its frequency are presently available. The adoption of the practice of examining available blood samples for screening tests of syphilis could provide a simple and direct means of monitoring the frequency of treponemal infections in blood donors, hospital patients, survey populations, high school children and students, and military personnel. The Rapid Plasma Card Reagin test requires only finger blood samples and can be read at any local Rural Health Center.

There is not only reluctance to seek specific treatment for VD among people who have VD, but there is also resistance among physicians to become identified with this specialty. Hence, the entire field of VD control requires a realistic new approach to commence a program that considers all of the constraints that now hinder its development.

PARASITIC DISEASES

The major parasitic communicable diseases found in Egypt are schistosomiasis, malaria, and filariasis. Other parasitic infections are also present. The paragraphs below report data concerned with these causes of morbidity.

Schistosomiasis

Among the "categorical" diseases in Egypt, schistosomiasis is probably the most important infection. Vertical multidisciplinary disease control programs have been carried out on a large scale for more than 30 years. Both the urinary form of the disease caused by *Schistosoma hematobium* and the intestinal liver form of schistosomiasis, caused by *S. mansoni*, are endemic in Egypt. Attempts to control the disease by reducing the population of its intermediate snail hosts date back to 1925.

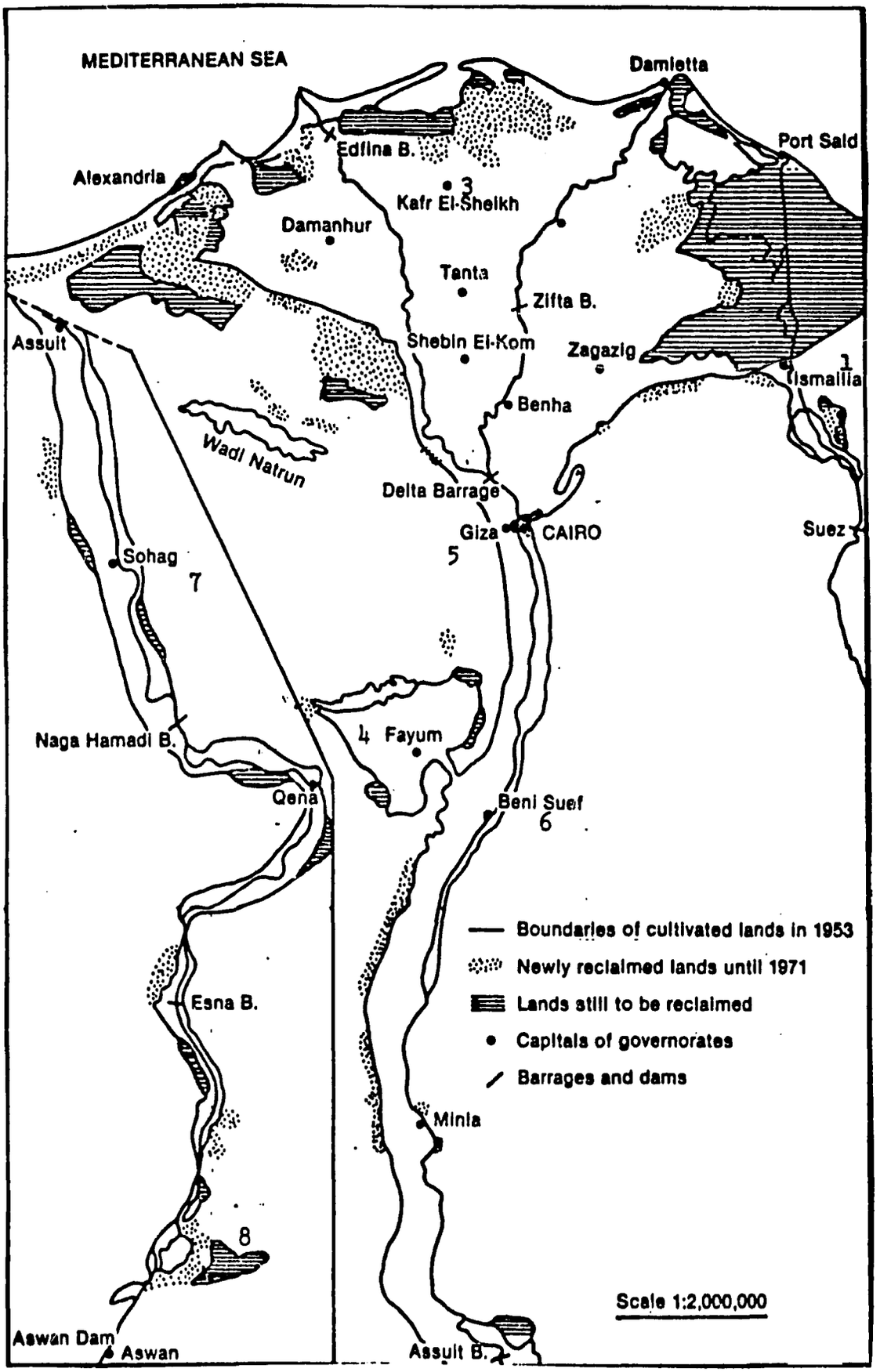
Ever since that time there have been numerous projects of research dealing with various aspects of the complex transmission cycle of the two forms of schistosomiasis, its clinical manifestations, late complications, pathology, chemotherapy, snail control, ecology and bionomics of snail hosts, environmental engineering and of certain behaviorial aspects which affect water contact of rural populations with the infective larvae of schistosomes in canals, lakes, ponds, and rivers.

With the advent of better chemotherapeutic agents and molluscicides suitable for mass application, schistosomiasis control in Egypt has culminated in the present multipronged approach to disease control which uses combined methods: area-wide mollusciciding, mass chemotherapy, health education, passive surveillance, active case detection in schools and systematic epidemiologic surveys of cluster or random samples of the general population. One of the latter, employing rigid quality control of diagnosis and careful follow-up studies, is now in progress, in the province of Kalyoubiya.

The magnitude of the present schistosomiasis program in Egypt is reflected by Figure 5 and Table 9, which are based on information presented at the 1980 meeting of the American Society for Tropical Medicine and Hygiene in Atlanta by Dr. A. B. Mobarak, First Undersecretary of State for Health, MOH. The paper is scheduled for publication in the next issue of the American Journal of Tropical Medicine and Hygiene 1982.

FIGURE 5

Schistosomiasis Control in Egypt by Zone



Key: Zone 1 Suez Canal
2 Sinai
3 Nile Delta
4 Fayum
5 Giza
6 Middle Egypt
7 Upper Egypt
8 High Dam lake area

TABLE 9

EPIDEMIOLOGIC, DEMOGRAPHIC AND ENVIRONMENTAL CHARACTERISTICS IN 8 SCHISTOSOMIASIS CONTROL ZONES OF EGYPT [1]

Characteristic	Zone 1 Suez Canal	2 Sinai	3 Nile Delta	4 Fayum	5 Giza	6 Middle Egypt	7 Upper Egypt
Total Population	808,510	200,000	15,755,952	1,200,000	2,419,247	4,020,484	5,089,734
Percent Rural	26.7%	-	73.7%	79.2%	43.0%	73.5%	76.8%
No. Villages	34	12	2,468	111	113	648	674
Rural Health Units	28	8	1,212	94	113	343	524
Cultivated (Fedans	230,000	-	3,790,072	400,000	231,483	1,095,572	1,120,970
Schistosomiasis							
- S Mansoni (%)	5.0	- ?	increasing	0 ?	0.7	-	
- S. Hematobium	25.0	- ?	decreasing	7%	14.6	16.3	29.0
Irrigation	one source	3 sources	abundant	open	prennial	prennial	prennial
Waterways in Km.		-	-	30,000	17,520	64,240	94,297
Drainage	available	-	tile	+	tile	drainage	implemented
Land Reclamation	ongoing	-	ongoing	+	17,140	+	+
Snail Control Units	42	-	751	-	-	-	-

Source:

A critical appraisal of existing and ongoing research and control projects of schistosomiasis in Egypt reveals that there are still considerable discrepancies in data sources when trying to obtain realistic estimates of the magnitude of the problems using basic epidemiologic criteria. With the establishment of the Theodor Bilharz Institute in Cairo in 1979 under the umbrella of the National Academy of Scientific Research and Technology, it was hoped that coordination of the many research projects carried out by many different institutions of Egypt would take place and, through it, a flexible reassessment of priorities would be achieved. Unfortunately, this has not yet been the case. While there is close cooperation between academic institutions and the MOH in some areas, research in schistosomiasis has remained grossly fragmented as a whole.

Considerable progress has been made in reducing the incidence and prevalence of schistosomiasis in Fayoum, Kalyoubiya and in Middle Egypt, but there are other areas where the frequency of the disease has risen again. Major changes in the ecology, brought about by the Aswan High Dam, have had considerable direct and indirect effects on the geographic distribution and prevalence of schistosomiasis. Increases are found mainly in the newly developed irrigated areas of Middle and Upper Egypt. On the whole, there has been a decrease aof S. hematobium in infections at the expense of those caused by S.mansoni. These changes in the type of the disease are reflected by a corresponding decrease of the snail population of Bulinus truncatus and an increase of breeding sites of Biomphalaria alexandrina, the intermediate host of S. mansoni. While these differences undoubtedly explain the changes in transmission dynamics for the two diseases, there remain many unknown factors that need to be resolved. Among these is the fact that in the largest irrigated area of farmland in the world (the Gizera-Rahad-Menagil sustem of the Blue Nile in the Sudan), where heavy pesticide use on cotton has been comparable to practices in Egypt, both types of snails have continued to show high population densities but the incidence and prevalence of S. hematobium has also declined.

Surveillance of schistosomiasis in Egypt can benefit considerably from improved methods of routine examination of stool and urine specimens of all school children. The present methodologically haphazard way of laboratory examinations may miss as many as 50% of the infections in the community. On the other hand, the age-specific prevalence of infection in the sentinel population of school children, ranging in age between 6 and 18 years, constitutes an ideal and sensitive indicator for monitoring levels of endemecity of schistosomiasis.

Malaria

A survey made in 1936 found malaria to be widespread in the Nile Valley, very high in the Siwa Oasis and in the Suez Canal Zone, while Upper Egypt showed only a small amount of infection. The study concluded that changes in the system of irrigation would be necessary if the malaria problem were to be improved (45).

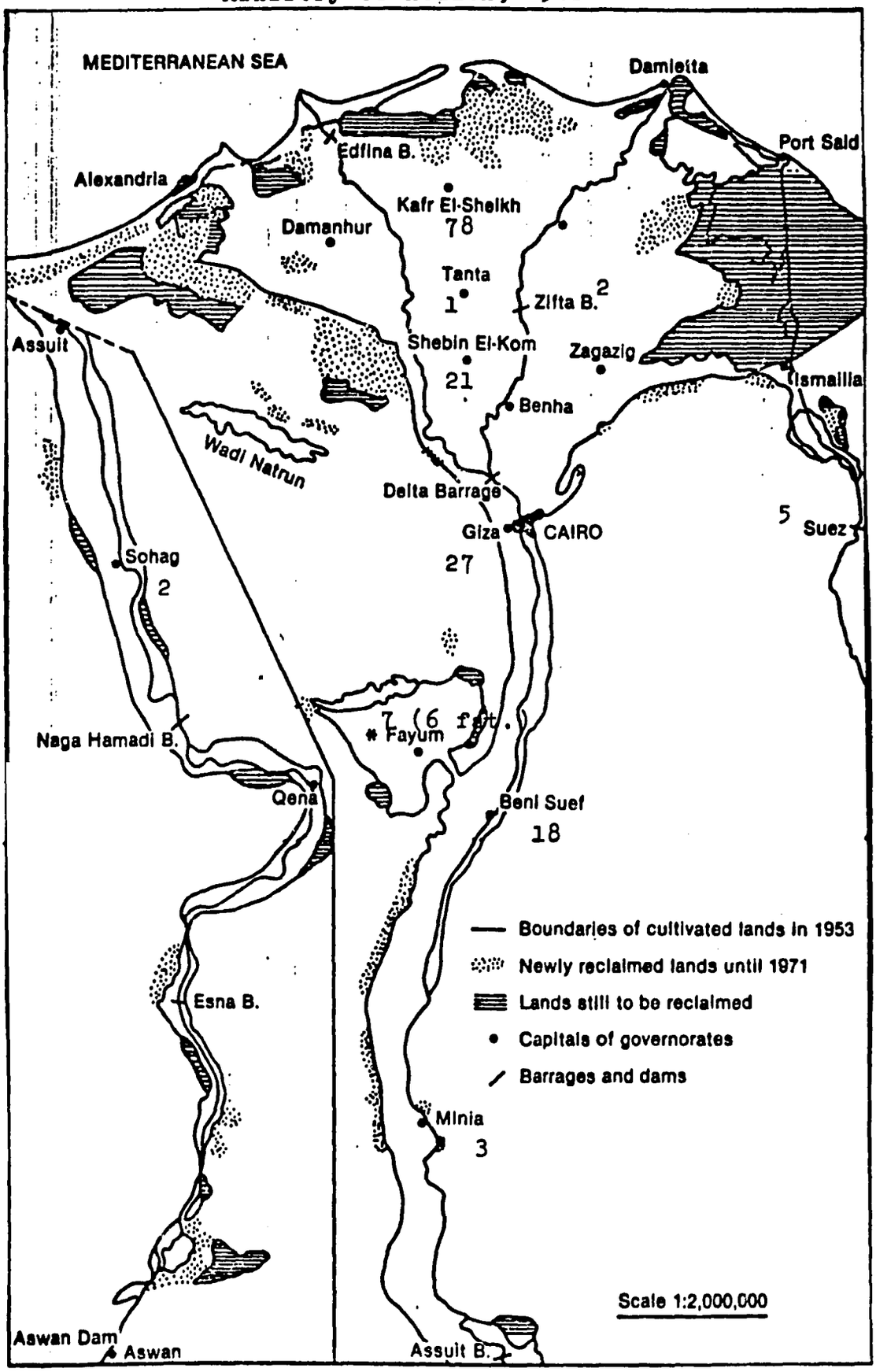
In 1964 there were 16,181 new cases of malaria reported, with infection rates averaging 1% to 5% in Upper Egypt and 3% to 10% in the Delta. By 1973-74 the incidence had dropped to approximately 10,000 cases a year (46). As shown in Figure 6, the total number of cases reported to the MOH were 822 in 1977; 738 in 1978, 433 in 1979; and 370 in 1980 (47). The diagnosis of all cases was based on the finding of malaria parasites in microscopic examinations of blood slides. While the majority of malaria cases in Egypt is due to infections with Plasmodium vivax (benign, tertiary malaria), there is a small focus of malignant malaria caused by P. falciparum in Fayoum with 41 reported cases in 1979. Unfortunately, the reports of malaria cases to the MOH do not include specific information on each patient, such as age, sex, residence, travel history, and treatment records, as would be needed for epidemiologic analysis. These data are said to be kept at the level of the Office of the Medical Directorate in each governorate. However, in one governorate a request to see such data was met with the assertion that malaria cases with clinical manifestations were sent to the local Fever Hospitals where all records on malaria and other diseases were kept and forwarded annually to the Department of Statistics and Preventive Medicine at the MOH.

According to statistics which comprise the routinely reported diagnosis of malaria from all Fever Hospitals in Egypt, there were a total of 500 clinical cases of malaria in 1980 (48). Hence, the number of patients treated for what was clinically diagnosed as malaria exceeds the total number of parasitologically recognized malaria infections, with and without clinical symptoms, by 130 cases. Moreover, malaria patients seen in the teaching hospitals or in private clinics or treated by private physicians do not enter into the national health statistics because they are not reported. There is, at present, no way of estimating the true incidence of malaria infections in Egypt. However, on the basis of all of the available evidence it can be concluded that the risk of malaria infection in Egypt is generally low but that the incidence of the infection has been grossly under-reported.

FIGURE 6 -37-

Reported Cases of Parasitologically Confirmed Malaria

Ministry of Health, 1981*



* 6 cases in Fayum are P. falciparum, the remainder are P. vivax.

The main vector of malaria in Egypt is Anopheles pharaoensis and, in the South, An. arabicus. It is said that vector control by residual spraying of houses with pesticides and source reduction through control of mosquito larvae has not yet encountered problems of resistance. The southern border to the Sudan, where a major outbreak of tropical malaria occurred after World War II, is under surveillance by both the Egyptian and Sudanese Public Health and Military Medicine authorities.

Filariasis

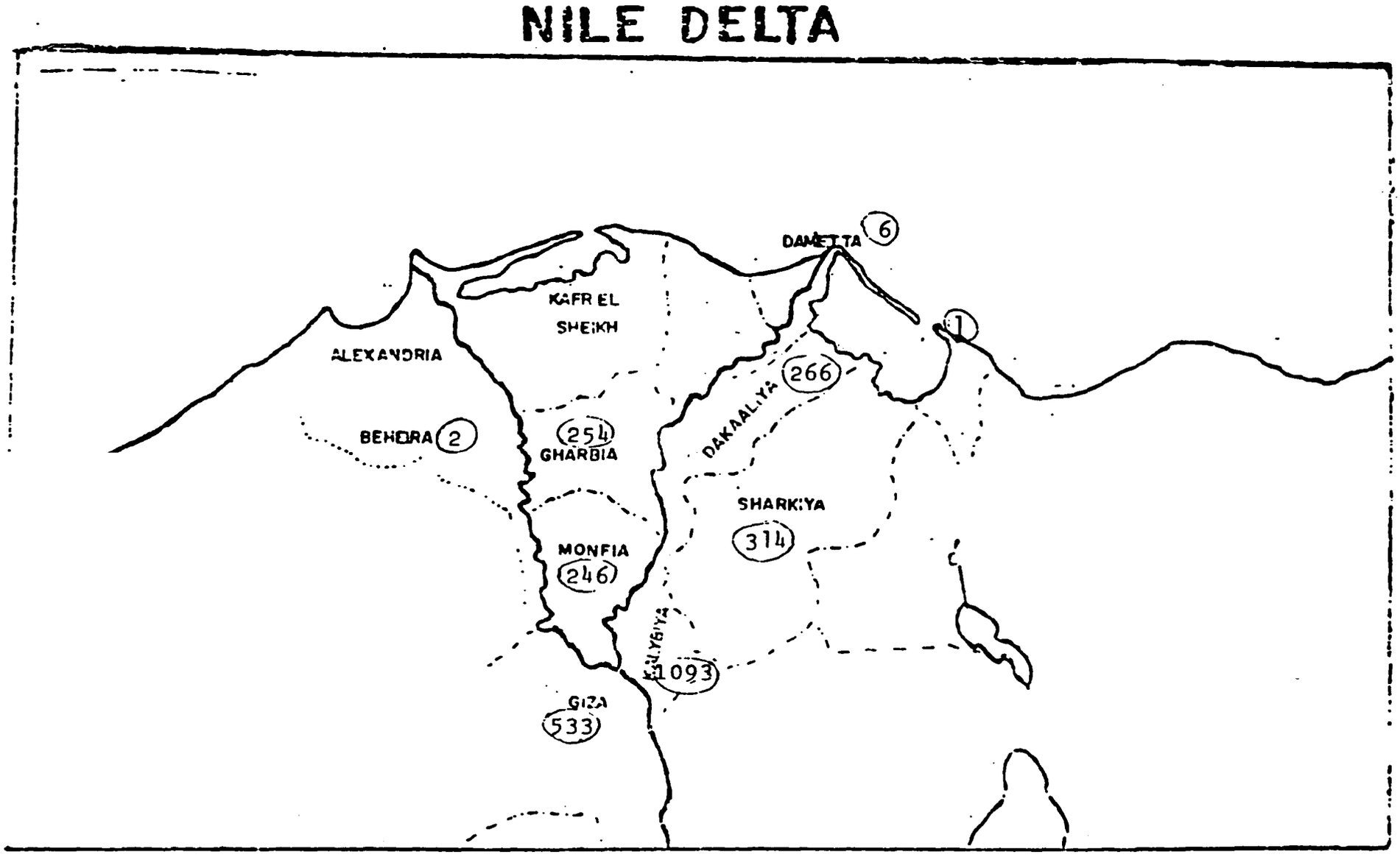
The prevalence of filariasis in Egypt was generally considered to be low. However, based on the results of recent surveys in 13 Governorates where routine examinations of finger blood samples (20 cmm) have been carried out, major foci of endemic filariasis were detected in the Governorates of Kalyoubia, Shargiya, Giza, Menoufiya, Gharbiya, and Dakhaliya. In addition to these endemic areas, sporadic cases were found in Damietta and Beheria. The disease is caused exclusively by the filarial worm Wuchereria bancrofti and occurs in Egypt in the periodic, nocturnal form. The infection is transmitted by mosquitos of the species Culex, which prefer urban habitats and breed in sites such as wastewater and latrines. Cases of filariasis diagnosed in the teaching hospitals of the universities in Egypt and in private clinics and practices are not included in the health statistics prepared by the Division of Endemic Diseases of the MOH. Clinical cases of filariasis, including lymphangitis, filarial fevers, hydrocele and elephantiasis occur in the Massawa District of Kalyoubiya. At present there is a total of 438 advanced clinical cases on record with the Endemic Disease Department of the MOH. Survey figures showing crude prevalence ratios in the endemic areas of the Nile Delta are shown in Figure 7 (49). The geographical distribution of filariasis in the endemic areas of Egypt is essentially focal. More detailed information is needed to pinpoint the communities where heavy transmission occurs.

At present, the control of filariasis is based on routine treatment. All cases found to have microfilariae in routinely taken blood smears are given diethylcarbamazine (hetrazan) in dose regimens recommended by WHO, i.e., about 6 mg/kgs given in repeated courses with follow-up examination for two years.

Experiences made in other parts of the world where filariasis is endemic indicate that a large proportion of infections go undetected by the presently used diagnostic method of blood

FIGURE 7

GEOGRAPHIC DISTRIBUTION OF LYMPHATIC FILARIASIS IN EGYPT



(000) Number of persons with microfilariae of W. bancrofti in fingerblood samples

examination in Egypt. Routine application of a concentration technique for screening of random samples of the population using 1 ml of venous blood in either the millipore or nuclepore filter concentration technique can be expected to detect most of the ultra-low density carriers of microfilariae of W bancrofti, especially in children. It has been shown that these low density carriers are capable of transmitting the infection to mosquitoes which bite them. It is recommended that in areas of relatively high endemicity random samples of the negative population be reexamined by a filter concentration technique. Further, because of the high frequency of non-participants, lack of standardized diagnostic methods and, most of all, the taking of blood samples during the day rather than at night (10 pm to 2 am) when microfilarial densities are highest, it must be assumed that the microfilarial rates are too low. No information on the age and sex of the infected persons was available at the MOH.

Other Parasitic Diseases

Although nation-wide age-specific data on the prevalence of infestations with intestinal nematodes and protozoa are not available, there is some useful evidence available from the school health examinations and from government hospitals, rural health centers, and from schistosomiasis surveys. Data presented in the Appendix shows that 72% of the children examined in the school health examinations had one or more intestinal parasites (50). Infestations with roundworm, Ascaris lumbricoides are prevalent at high ratios (40-50%). Cairo laboratories reported a total of 1720 positive cases of hookworm for 1979. Infestations with T trichuria and Strongyloides do occur in Egypt. Cysts classified as those of Entameba histolytica are found frequently in stool samples but no further distinction between E. histolytica and E. hartmanni has been made. The frequencies of amebic dysentary and of extraintestinal amebic manifestations, especially liver abscess, are not listed in the official records. It is a pity that the diagnostic information that could be available from the teaching hospitals of Egypt with their superior diagnostic facilities is not now included in the health statistics of the MOH.

The widespread use of the molluscicide Bayluscide ® (niclosamide) which is generically identical with the drug of choice for tapeworm (Yomesam ®) invites speculation about whether this intestinal parasite may have been eradicated or become resistant to niclosamide, especially in those endemic areas of Egypt where the population is exposed to water treated regularly with this substance.

NON-COMMUNICABLE DISEASES

Non-communicable disease problems in Egypt include cardiovascular diseases, cancer, accidents,and mental health problems. This section of the paper reports on these problems. The presentation is limited in part because the data available is very limited, and in part because it was decided to place emphasis on the communicable diseases which still account for the majority of mortality and morbidity in Egypt.

Cardiovascular Diseases

The major cardiovascular diseases in Egypt are currently hypertension, rheumatic fever, with its sequel, rheumatic heart disease, and ischaemic (coronary) heart disease. A WHO consultant visited Egypt during February, 1981, to contribute to the development of epidemiology and control of these diseases. The paragraphs below are taken in part from the report of this consultant (51).

Mortality related to cardiovascular diseases remained relatively stable in Egypt until the mid 1950s when it was 93 per 100,000 population. Since then a fairly consistent and marked rise has taken place, with the mortality rate from these diseases in 1975 being 208 per 100,000. (These figures are shown in relation to other causes of death over time in Tables 4 & 5 and Figures 2, 3 and 4 earlier in this paper).

Unpublished data from 1977 suggest that hypertensive heart disease was the cause of 9743 deaths, and a contributing factor in a further 3183 deaths due to cerebrovascular disease. During the same time period, rheumatic heart disease was the cause of 6487 deaths and ischaemic (coronary) heart disease was the cause of 5711 deaths. This ranking may well be an accurate reflection of the relative importance of these cardiovascular diseases, but the numbers must be called into doubt by the fact that more deaths than all of the above together were listed under "Other forms of heart diseases" (27896 deaths).

Morbidity data describing cardiovascular diseases is largely lacking. As the WHO consultant states: "Statistical information is, however, too fragmentary to allow a quantitative assessment of the epidemiologic situation." Some indication of the morbidity caused by these diseases is provided by admission data for 1979 at Cairo Unversity Hospitals, where cardiovascular diseases made up 5.6% of all patients treated.

The prevalence of rheumatic heart disease among children aged 6 to 12 is approximately 3 per 1,000, suggesting that, among one thousand children at age 12, six will have the disease. The WHO consultant points out that, with a million Egyptian children reaching this age each year, some 6,000 of them can be expected to have rheumatic heart disease, although only some 15% of these will be severe cases.

Pilot studies of hypertension cited by the WHO consultant reveal that up to 16% of rural men of 40 years of age and older, and 22% of Cairo city bus drivers may have the disease. Another study of 2318 men aged between 40 and 60 showed a prevalence of 6.8% among urban dwellers, 4.8% among recent city immigrants, 3.3% among commuters and 2.3% among rural dwellers (52). It would be expected that the risk of hypertension would be high in Egypt, due, in part, to an unusually high dietary salt intake.

The prevalence of ischaemic heart disease has been found to be related to socio-economic differences in Egypt. A study of electrocardiographic criteria of ischaemic heart disease found these abnormalities present in 3.7% of whitecollar urban men aged 40 or over, 1.6% of urban manual workers, 1.3% of farmers and 1% of an oasis community (53).

The study of 2318 men discussed above showed a prevalence of ischaemic heart disease of 2.9% among urban dwellers, 1.7% among recent migrants, 1.1% among commuters and 1.5% among rural dwellers (54). The WHO consultant pointed out that other cardiovascular diseases in Egypt may well include chronic cor pulmonale which is contributed to by renal hypertension and pulmonary schistosomiasis caused by urinary tract schistosomiasts. Cardiomyopathies and endocardial fibrosis do exist in Egypt, but seem to be infrequent. Congenital heart disease might be expected to be a significant problem resulting from the high consanguinity rate of marriages.

Cancer

No nation-wide morbidity data on cancer seem to be available. The Cancer Institute is likely to have some incidence and prevalence data but this source was not investigated as part of the work for this paper, due to the time constraints.

Accidents

Tables 10 and 11 present data about the number of reported accidents and their causes for each governorate in 1977 which have been published by CAPMAS. Not surprisingly, the data show a greater proportion of accidents occuring in Cairo than in any other governorate. The most frequent cause of accidents is traffic, followed by work-related causes. The Health Sector Assessment paper concerned with Emergency Medical Services presents additional data on accidents.

Mental Health

The mental health of the Egyptian people is not discussed very much in the literature which was reviewed, nor was it emphasized by any of the MOH officials interviewed. Anecdotal information suggests that mental health problems exist at all levels of society and that, when problems are recognized, they may be treated by any combination of traditional medicine, self-care, and public or private health services. The MOH reports a mental health total of 11,812 inpatients and 311,695 outpatients during 1980 (55).

A study sponsored by the WHO in 1978 looked into the drug dependency program in Egypt (56). The investigator reported that cannabis use is endemic, but confined to males, few of whom request treatment. At the Ataba Clinic in 1970 only 2 percent of 1,540 patients sought treatment because of cannabis dependence. At the three social rehabilitation clubs run by voluntary agencies, 13 percent of the 1,025 patients seen between 1975 and 1978 were dependent on cannabis.

Dependency on opium was roughly estimated during the mid 1970s as being between 25,000 and 30,000 persons nationwide (57). Some increase in the number of persons seeking treatment for opium dependency at the Ataba Clinic was observed during the period 1974-1978, although the annual number of new cases did not rise above 200 during this period. Three social rehabilitation clubs saw 348 cases of opium dependence during the period 1975-8 and a further 427 cases of dependence on opium and other drugs. The investigator tentatively concludes that opium dependency seems unlikely to show any dramatic change. He points out that in Egypt the drug is orally injested rather than smoked, which reduces the physical dependence and hence withdrawal symptoms are well tolerated.

TABLE 10

NUMBER OF REPORTED ACCIDENTS AND EMERGENCY CENTERS BY GOVERNORATES 1977

Governorate	No. of Accidents	Percentage of National Total	No. of Emergency Centers
Cairo	171,951	17.6	37
Alexandria	54,397	5.6	9
Port Said	15,387	1.6	3
Suez	22,861	2.3	10
Sub-total	264,596	27.1	59
Damietta	11,988	1.2	5
Dakhaliya	82,706	8.5	11
Sharqiya	41,404	4.3	11
Kalyoubiya	15,697	1.6	8
Kafr El Sheikh	20,938	4.1	8
Ghabiya	40,301	3.2	8
Menoufiya	31,370	11.5	8
Beheira	112,221	11.5	11
Ismailia	26,451	2.7	5
Sub-total	383,076	37.1	75
Giza	37,801	3.9	16
Beni Suef	51,072	5.2	8
Fayoum	15,237	1.6	7
Minia	100,340	10.3	14
Assiut	41,932	4.3	10
Sohag	31,921	3.3	15
Quena	26,249	2.7	10
Aswan	21,412	2.2	4
Sub-total	325,964		84
TOTAL	973,636		218

Source: Statistics of General Medical Emergencies in 1977, CAPMAS, January 1981.

TABLE 11

SELECTED CAUSES OF REPORTED ACCIDENTS BY GOVERNORATE, 1977

Governorate	Traffic		Fall From High Places		Fall From Building		Work Related		Suicide Attempt		Poison/Electric Shock		Total
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
Cairo	43,074	50	13,465	16	3,571	4	17,758	21	1,710	2	6,027	7	85,605
Alexandria	3,832	35	4,564	42	61	1	2,381	22	82	1	71	1	10,991
Port Said	198	25	123	15	1	-	406	51	57	7	17	2	802
Suez	5,443	55	41	-	6	-	4,177	45	2	-	144	1	9,813
Sub-total	52,547	49	18,193	17	3,639	3	24,722	23	1,851	2	6,259	6	107,211
Damietta	1,158	44	708	27	14	-	162	6	117	4	458	18	2,617
Dakhaliya	13,510	12	3,389	13	404	1	8,834	33	232	1	435	2	26,804
Sharqiya	3,241	41	1,737	22	175	2	1,806	29	377	5	568	7	7,904
Kalyoubiya	5,004	67	394	5	53	1	1,607	21	255	3	127	2	7,440
Kafr El Sheikh	1,154	17	495	7	5	-	4,868	69	420	6	36	-	6,978
Gharbiya	4,071	47	1,116	13	254	3	2,051	24	896	10	260	3	8,648
Menoufiya	4,064	29	1,207	9	221	1	176	1	289	2	7,871	57	13,828
Beheira	2,061	16	3,750	29	98	1	6,464	50	189	1	316	2	12,878
Ismailia	175	47	144	38	-	-	16	4	37	10	4	1	376
Sub-total	34,438	39	12,940	15	1,224	1	26,984	30	2,812	3	10,075	11	88,473
Giza	3,089	26	5,262	44	203	2	3,191	27	80	1	85	1	11,910
Beni Suef	3,351	21	1,289	8	229	1	10,218	65	256	2	309	2	15,652
Fayoum	1,893	32	341	6	154	3	632	11	54	1	401	7	5,863
Minia	20,412	57	3,506	10	463	1	10,076	28	160	-	1,405	4	36,022
Assiut	3,432	36	3,786	37	264	2	2,020	20	228	2	499	5	10,229
Sohag	2,569	31	2,133	26	230	3	2,891	35	24	-	345	4	8,197
Quena	1,346	11	4,988	39	788	6	4,252	37	-	-	1,278	10	12,652
Aswan	872	53	114	7	15	1	576	35	17	1	66	4	1,660
Sub-total	36,964	37	21,419	21	2,346	2	33,856	34	819	1	4,388	4	99,792
TOTAL Number	123,949		52,552		7,209		85,562		5,482		20,722		295,476
Percent of Tota	42		18		2		29		2		7		

Source: Statistics of General Medical Emergencies in 1977, CAPMAS, January 1981.

The increasing abuse of synthetic psychoactive drugs is of particular concern. The 1974 study found only the occasional abuse of amphetamines and barbituates. A review of the situation in 1978, however, emphasized a marked increase in this kind of drug abuse and dependence. The proportion of dependent persons using synthetic psychoactive drugs among new patients at the Ataba Clinic increased from 12.5 percent in 1974 to 39.5 percent in 1977. The biggest increases were seen among persons under age 20. There is also evidence that there is an increasing tendency to use drugs by injection (58).

RECOMMENDATIONS

Based on the review of the literature and the discussions held in Cairo during February, 1982, the following recommendations are made about health status, epidemiology and categorical disease research and control in Egypt

1. To assess the full potentials of the present system of data collection, flow, processing, retrieval, analysis and epidemiologic interpretation, it is recommended that the MOH establish a small, efficient unit for medical intelligence. The immediate function of this unit would be the active collection of information from all presently available data sources at the various levels of the health delivery system. This service should run for perhaps one year. At the end of that time there should be a thorough appraisal of all aspects of disease surveillance as regards the most important public health problems, including communicable and noncommunicable diseases. This assessment could be assisted by the participation of a small number of experienced international experts.

2. In the Directorate of Health of each governorate there should be at least one fully-qualified epidemiologist. USAID should consider assisting the GOE to obtain post-graduate training of suitable candidates in schools of public health in the U.S.

3. Careful consideration should be given to continuing medical education with regard to basic epidemiological skills and understanding of quantitative aspects of health and disease.

4. The medical institutions of the Egyptian government, such as the Ministries of Health, Education, Defense, and Internal Affairs, should all report hospital diagnoses by age, sex, and residence to the Director General of the Department of Statistics of the MOH.

5. The proposed assessment of the utilization of medical records in Egypt should be done in close cooperation with similar efforts now being carried out by the Board of Health.

6. Simple and economical diagnostic laboratory tests related to essential health needs should be field-tested and, after appropriate adjustments, be included as routine procedures at the peripheral level. Such tests should include examinations for blood protein, and sugar in urine to detect symptomatic urinary schistosomiasis, kidney disease and diabetes. Dip sticks or filter paper strips for those purposes could be manufactured locally. The frequent diagnosis of anemia made at all levels of the services should be based on simple laboratory procedures rather than on clinical impressions alone. The VDPL or CARD-RPR test for treponematoses using finger blood samples should be made available on a large scale.

7. The capacity for the examination of specimens for diagnostic microbiology, serology and clinical chemistry should be increased in the existing public health laboratories at district and governorate level. These improvements must involve the logistics of specimen collection and shipment from peripheral health unit to the reference laboratory.

8. The systematic, broad based strengthening of the school health services in Egypt should become part of the further development of the primary health care system. The medical component of the school health program should be in conjunction with much needed efforts in the field of water and sanitation in order to improve sanitary conditions in the schools. This combination would allow health education to become an enterprise of credibility, rather than a hypothetical subject as it has been practiced up to now.

9. Efforts should be made to bring about some integration of the now independent specialized services at the periphery, such as Fever Hospitals, Chest Hospitals, General Hospitals, and School Health Programs.

10. Support should be made available for special projects of applied field research that have immediate benefits for the public health program. The projects include the testing of the different types of polio vaccines in clinical trials, the efficacy of BCG, the association between hepatitis-B antigen carrier state and S. mansoni infection, the importance of chlamydial infections as an extraocular disease, the possible importance of leptospirosis in the differential diagnosis of jaundice and hepatitis, and ways and means to implement a surveillance program for venereal disease.

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APPENDIX

PEOPLE INTERVIEWED BY DR. A. BUCK

- Dr. Abdel Moneim M. Fouad, Dir. Gen. of Statistics Dept. MOH.
- Dr. Aziz El-Kholy, U.S. of State for Health, Member of the Board of Health, Dir. Gen. of Biomedical Research Center for Infections Diseases.
- Dr. A.B. Mubarak, First Under Secretary of State for Health, MOH.
- Dr. Alia Ayoub, Dir. Gen. of School Health, MOH.
- Dr. Sasia S. Ibrahim, Gen. Dir. Institute of Poliomylitis and Physical Medicine.
- Dr. Roushi Mubarak, Director of Skin Diseases and V.D., MOH.
- Dr. Said Tawfik, Under Secretary of State, Director of Health, Alexandria.
- Dr. Shel Kholezi, Director General of Quarantinable Diseases, MOH.
- Dr. Osman Sameri, Director of Enteric Diseases, MOH.
- Dr. Lotfy El Sayaad, Dir. Gen. of Maternal & Child Health, MOH.
- Dr. M. El-Alamy, Director Schistomiasis Research Project, Kalyoubiya.
- Dr. L. Finalde Delfini, Malaria Advisor, WHO/EMRO, Alexandria.
- Dr. M.H. Whdan, Regional Advisor Egpidemiology, WHO/EMRO, Alexandria.
- Dr. Ibrahim Farag, Dir. Gen. of Fever Hospitals, MOH.
- Prof. Mahmoud El-Miniawy, Prof. obstetrics and Gynaecology, Cairo University.
- Dr. O.A. Zaghloul Imam, Director of Egyptian Organization for Biological Products and Vaccines, Agouza-Giza.

- Dr. Housni Fouad, Director General Malaria Control, MOH.
- Dr. Zohair Nooman Hassan, Dean of the Ismailia Medical School.
- Dr. Harry Hoostrael, Chief Medical Zoology NAMRU III.
- Dr. Hamdy El-Sayed, President of Egyptian Medical Syndicate.
- Gen. Hussein Mohamed Shafti El Nahal, Dir. of Military Medical Establishment.
- Prof. Hamam Hamam Bekheit, Prof. Epidemiology and Prevention Medicine, Assuit.
- Dr. Salah Eldin Madkour, Dir. Gen. of Epidemic Control Dept. MOH
- Captain C-Watten, Com. Officer NAMRU III.
- Dr. Hassan, Prof. Community Medicine of School Health, MOH.
- Prof. Mohyi-Eldin Said, Prof. of Ophthalmology, Alexandria.

APPENDIX

DEPARTMENT OF SCHOOL HEALTH*

Examination Schedule:

Every child is scheduled for health examinations, at first at the time of admission to the school system and, thereafter, at three-year intervals. In all areas microscopic stool and urine examinations for schistosomiasis and other parasites are carried out periodically. School enrollment at the first grade level covers approximately 60% of the eligible population of children. After school entry there is a progressive drop-out rate which, for cultural reasons, is much higher for girls than for boys.

Target:

All of the 7 million school children presently enrolled in the Egyptian schools have undergone physical examinations and routine laboratory tests at least once at school entry. They range in age from 6 to 18 years.

Full-time "school nurses" or school health assistants with limited training are found in each school, one for about 1,500 pupils. Physicians of the Department of Education (School Health Doctors) as well as of rural health clinics or health centers are responsible for examination of about 10,000 children each. The examination procedures carried out by the school health assistants are limited to the taking of body weight and height and, if Snellen Eye Charts are available, to the measurement of visual acuity. The nurse also provides some immunizations under the EPI Program under the supervision of a physician. The school physician performs a brief physical examination of each child, including a crude hearing test. In these examinations, special emphasis is placed on the detection of throat infections, abnormalities of the heart, chronic disabilities and handicaps, and contagious skin conditions. The capacity of examinations is approximately 50 children per day. Tests for color blindness and standard hearing tests using audiometry are not yet included in the current examination schedule. Special targets of the routine examination include detection of schistosomiasis in urine and stool specimens, anemia, malnutrition, handicaps, sore throats, rheumatic fever, scabies, impetigo and skin mycoses.

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*This appendix is included in order to describe more fully the very promising school health program which is referred to earlier in various sections of this paper.

The routine examinations also include dental examinations. All pupils found to have physical or mental abnormalities, chronic disabilities and handicaps are referred to the school health clinic in the urban areas or to the rural health clinics elsewhere in the country.

Major Health Problems Found in School Children

1. Anemia and malnutrition
2. Intestinal parasites and schistosomiasis
3. Streptococcal infections
4. Handicaps

	Number of Cases	Rates per 10,000 Children
a. Myopics	15,000	21.4
b. Hearing loses	573	0.82
c. Serious sequelae from poliomyelitis	2,403	3.43
d. Mentally retarded or disturbed children	1,305	1.86
e. Other major physical handicaps	300	0.43
f. Speech problems	492	0.70
Total rate of handicap:	10,000	28.64/10,000*

Services Provided Free of Charge by School Health Services during 1980/81:

200,000	dental treatments
1,346	eye glasses for myopics
126	hearing aids
1,700	orthopedic supports for children having suffered from poliomyelitis
113	artificial limbs

The magnitude of the major problems indentified by the school health services are listed in Figure A-1 and Tables A-1 and A-2.

Deficiencies:

Deficiencies of the School Health Service of Egypt as recognized by the Director of the Department of School Health are the following, by priority:

1. Most schools are presently overcrowded and understaffed by well-qualified teachers. Classes are held irregularly and in, at least, two shifts.

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* Occurrence of combined types of disability are unknown.

FIGURE A - 1

Frequency of Specified Groups of Health Conditions as Determined by Routine Physical Examinations and Laboratory Tests of 1,030,000 School Children at the Time of Admission, 1980/81

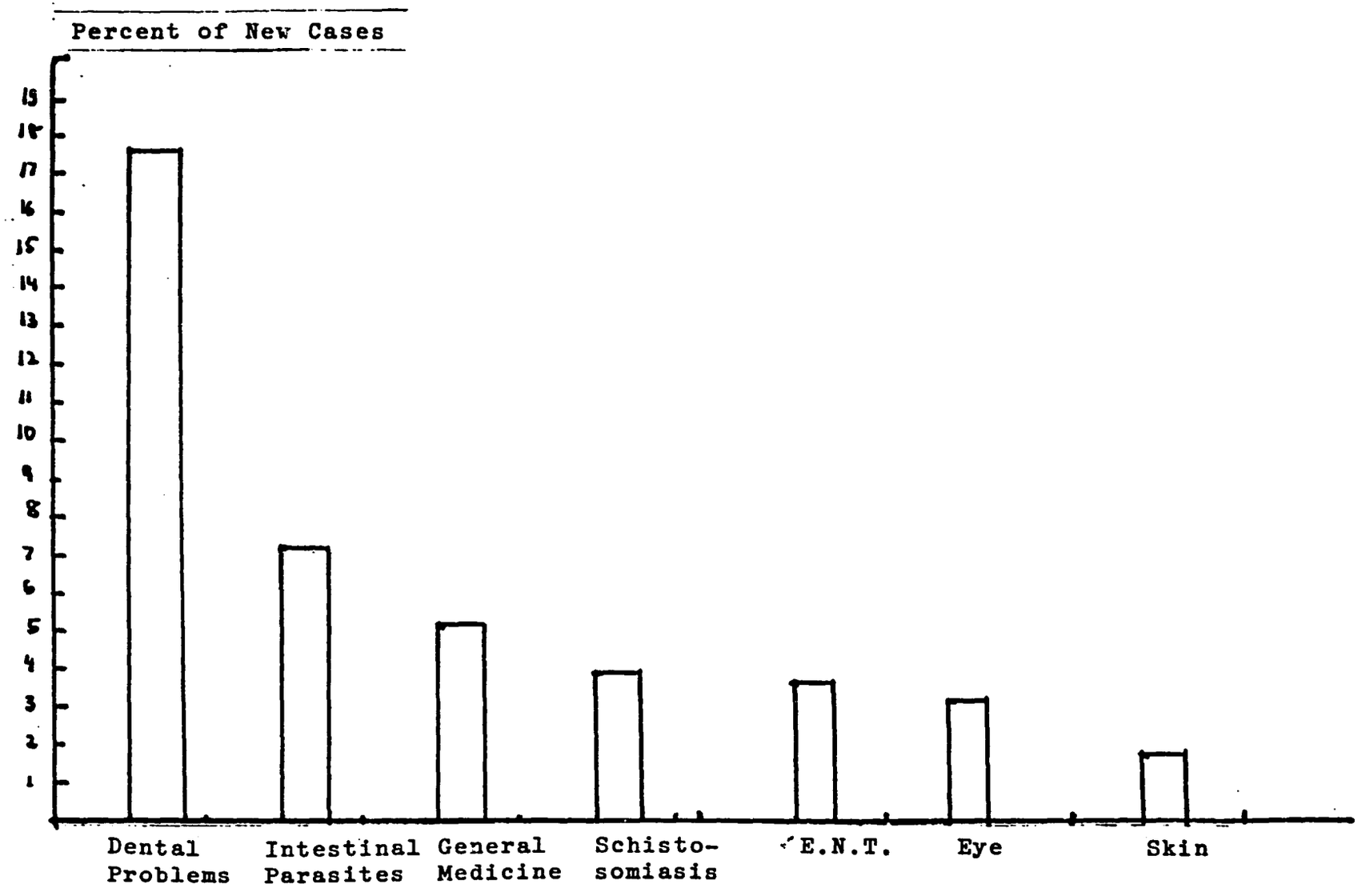

Table A - 1

CRUDE PREVALENCE OF ABNORMALITIES FOUND IN SCHOOL CHILDREN BY PHYSICAL EXAMINATION (School Entrance) AND BY ROUTINE LABORATORY TESTS, 1980/81

	RESULTS OF PHYSICAL EXAMINATIONS:							RESULTS OF LABORATORY EXAMINATIONS	
	"Normal"	Internal Medicine	Ophthalmology	E.N.T.	Skin [1]	Dental	All Cases	Schisto-somiasis	Intestinal Parasites
Number of Children Examined 1,030,372	652,045	52,330	91,674	35,964	17,117	181,184	378,327*	39,703	74,625
Percent of Total	63.3	5.1	8.9	3.5	1.7	17.6	36.7	3.9	7.2

* There is a discrepancy in the denominator for all cases of 58 persons (0.05%).

1 Of all children with skin diseases 1,669, or 10% were diagnosed as ringworm.

Table A - 4

FREQUENCY OF HANDICAPS AS DETERMINED IN ROUTINE SCHOOL HEALTH EXAMINATIONS 1980/1981

Total No. Total Examined	Heart Diseases and Abnormalities: "Functional Disorders"	Heart Diseases and Abnormalities: Rheumatic	Heart Diseases and Abnormalities: Congenital	EYE: Myopia and other Errors of Refraction	Hearing Problems	Speech Problems	Mental Problems	Other Physical Handicaps	Cases [1]
2,825,775	790	2,231	961	15,158	573	492	1,305	307	21,817
Cases per 10,000 School Children	2.8	7.9	3.5	53.6	2.0	1.7	4.6	1.1	77.2

[1] Disregarding combinations

2. Sanitary facilities in most schools are deplorable.

3. Lack or inadequacy of laboratory services and of trained technicians are found in most rural areas.

4. Follow-up, including treatment of children with illness or incapacitation detected during the school health survey are insufficient or ineffective.

5. The currently practiced methods for testing of hearing losses is of poor quality and is not standardized.

6. No screening tests are available for juvenile diabetes and color blindness.

7. Anemia is one of the most frequently found abnormalities of school children. However, its presence is based on clinical impressions and not on the now available, cheap and simple laboratory tests for hemoglobin or hematocrit.

8. There is a shortage of specialist services in ophthalmology, ENT and dermatology with waiting times up to 9 months for eye glass prescriptions. No delays have been encountered in referrals for suspected heart diseases.

While the school health system provides a reasonable, nationwide denominator for epidemiologic analysis and morbidity statistics, the present record system is cumbersome, incomplete and of varying quality. The School Health Forms with their odd size, heavy weight and cumbersome organization for data entry cause problems to the recorder of the information and to the data processor. Moreover, filing of these forms becomes a logistic problem. Generally, file cabinets are not available in the schools. Data on the age and sex of the children are not recorded. The only information forwarded to the Director of School Health at the Directorate of Health in the Governorates is the number of children found to have one of the conditions included in the physical and/or laboratory examination protocols, plus the total number of children in the grades. Not even subtotal figures by sex are presently available. The diagnostic data are filed neatly in school notebooks, one each for a specific diagnostic category.

From this it becomes clear that much of the available information is wasted for further consideration and analysis by epidemiologists, health administators and biostatisticians.

The School Health System provides a nationwide network of facilities, covering, by design, all of the age groups of school children between 6 and 16 years of age. With modifications, it could be used for surveillance, health education, and socio-anthropologic studies to determine features of school children's characteristics.