

الجمهورية اللبنانية
مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام

FOODBORNE AND WATERBORNE
DISEASE SURVEILLANCE
IN LEBANON

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

1986

FINAL REPORT

ON

FOODBORNE AND WATERBORNE DISEASE SURVEILLANCE

IN LEBANON

DURING THE YEAR 1980

JULY 6, 1981

TABLES

<u>Number</u>	<u>Heading</u>	<u>Page</u>
1	Typhoid cases by age and sex	6
2	" " " nationality	7
3	" " " religion	7
4	" " " area of residence	8
5	" " " hospitalization status	9
6	" " " health service	10
7	" " " month	11
8	Bacterial food poisoning cases by age and sex	16
9	" " " " " health service	17
10	" " " " " area of residence	18
11	" " " " " month	19
12	" " " " " suspected food item	20
13	" " " " " symptoms	21
14	Chemical food poisoning cases by age and sex	22
15	" " " " " month	23
16	Line listing of food-water-borne disease outbreaks	24
17	Viral Hepatitis cases by age and sex	30
18	" " " " area of residence	31
19	" " " " month	32
20	Shigellosis cases by age and sex	34
21	" " " month	35
22	" " " stool culture results	36
23	Brucellosis cases by age and sex	39
24	" " " month	40

FOODBORNE AND WATERBORNE DISEASE SURVEILLANCE
IN LEBANON DURING THE YEAR 1980

This is a final report on Foodborne and Waterborne Disease Surveillance in Lebanon during the year 1980, the U.S. AID financed surveillance project done in cooperation with the Lebanese Ministry of Health.

Introduction - Little information is available on the occurrence of the common foodborne and waterborne diseases in Lebanon. Disease reporting is rare, although it is a civic responsibility of Doctors who are obligated by law to report to the Health Department all notifiable diseases, yet they rarely do so. The result is that only meager information is available on the subject from physicians.

The purpose of this surveillance study was to collect base-line epidemiologic data on the occurrence of the common foodborne and waterborne diseases in Lebanon during the year 1980. It is hoped that surveillance will become a regular activity institutionalized in the Ministry of Health in future. This will allow rapid investigation of outbreaks, the identification and critical evaluation of disease problems and factors contributing to their occurrence, and planning for control programs.

I Procedures and Methods

Diseases under surveillance in this study included typhoid and paratyphoid fevers, food poisoning, viral hepatitis, shigellosis, brucellosis and trichinosis. Information on these diseases was obtained by monitoring some hospitals, clinics and medical laboratories in Beirut, Tripoli, Sidon and Zahleh. These institutions were visited regularly about once a week to once a month as judged necessary, and their health records examined.

The monitored hospitals included:

In Beirut - American University Medical Center

Makased General Hospital

Hotel Dieu de France Hospital

Greek Orthodox (St. Georges) Hospital

In Tripoli - Mazloom Hospital and the Moslem Hospital

In Sidon - Labaeb Medical Center and Hammood Hospital

In Zahleh - Tel Shiha Hospital and Zahleh Government Hospital

These are general hospitals with a total capacity of 1566 beds. They are provided with emergency room services and laboratory diagnostic facilities. Six medical laboratories outside these hospitals were also monitored for that purpose by examining their records and inquiring from personnel about such diseases.

Another source of data was from private medical practitioners in the four cities mentioned. A sample of 78 doctors was visited about once monthly to inquire about cases of these foodborne diseases that they had seen in their practice.

In general, cooperation of responsible persons in all these institutions was satisfactory. This was helped by letters from the Director of Preventive Health Services of the Lebanese Ministry of Health, from the Dean of the Faculty of Health Sciences at AUB, and by circulars describing the project, its objectives and the procedures to be followed. Problems of security at times hampered and delayed the smooth running of the work but did not seriously interfere with it.

The technical work of this project was conducted by one epidemiologist and two research assistants from A.U.B. They were assisted in their field-work by three employees (sanitarians) from the Ministry of Health who at the same time got some on-the-job training in collection of epidemiologic data. The collected data were coded and sent to the computer center for analysis.

II TYPHOID FEVER

During the year 1980 there were 1510 cases diagnosed as typhoid fever that were identified in the surveillance areas mentioned above. Their age and sex distribution is given in Table 1, 828 were males and 665 were females. There were 873 cases (57.8 %) between 5 and 29 years of age, and 434 (28.7 %) in the age-group 10-19 years.

Their nationality and religion are given in Tables 2 and 3 respectively. Most of them (76.8 %) were Lebanese, 43 % were Moslems and 35.4 % were Christians. Their area of residence is given in Table 4, 324 (21.5 %) resided in West Beirut. Hospitalization status is given in Table 5, 508 (33.6 %) were hospitalized and 331 (21.9 %) were seen at the emergency services of different hospitals but were not admitted to the hospital, 339 (22.5 %) were seen at physician's clinics. The distribution of cases by health-service is given in Table 6. 917 (60.8 %) were identified from the four Beirut hospitals monitored.

The occurrence of cases by month is given in Table 7, 196 cases occurred during the first six months as compared to 1314 cases during the last six months of the year. Cases started to increase in June, reached a peak with 652 cases in October and November and decreased in December.

Laboratory tests - *Salmonella typhi* was cultured from the blood of 502 (33.2 %) patients, from the bone marrow of seven and from the stools of 24 patients giving a total of 533 confirmed cases of typhoid fever. For 78 patients blood culture was negative. There was no record of blood culture for the remaining cases.

Other than the 533 culture positive cases, the blood Widal test was done on 600 cases. It was considered positive (TO = 1/80 or more) in 445 patients and negative in 155. For the remaining 377 patients the diagnosis of typhoid fever was based on clinical grounds only, and no laboratory tests were done for them.

The outcome of illness is 1212 recovered, 3 died and for 295 the outcome is unknown.

Enteric fever - There were additional 213 cases where the diagnosis was "enteric fever" collected from some hospitals and private clinics, sometimes reported orally in groups of more than one case. Little information could be obtained on most of these cases.

Paratyphoid fever - There were 70 cases of paratyphoid fever identified during 1980. 50 were males and 30 were females. Their age and sex distribution, area of residence and other variables studied do not differ significantly from those reported for typhoid fever.

Diagnosis was confirmed by blood culture in 22, in 17 patients Salmonella paratyphi B was cultured from their blood and Salmonella paratyphi A was cultured from the blood of 5 patients. The blood Widal test was positive in 53 patients.

Laboratory examination of water and ice cream

Water examination - A total of 60 samples of drinking water obtained from the various areas studied were examined bacteriologically. In each area, half of the samples were from restaurants, the others were from houses. In all the 24 samples from Beirut and 10 from Zahleh the E. coli presumptive test was negative. In one house out of ten samples from Sidon and two houses out of ten from Tripoli there were more than 240 coliform/100 ml. This was the case also in two houses out of the six samples from Burj Brajneh, (Ain Dilbi water in that suburb).

Need details on water & ice cream samples taken

Ice cream examination - A total of 11 samples of ice cream were examined at the Central Public Health Laboratory. Seven from Beirut six of which showed "absence of E. coli, Salmonella and Shigella". One sample from Beirut and two from Zahleh showed "numerous coliform organisms".

Conclusion - Of the 1510 cases of typhoid fever there were more male than female patients. More than half were in the age-group 5-29 years and one fourth of the cases in 10-19 years old. They were mostly Lebanese, about one fifth of them resided in West Beirut. One third were hospitalized and 21.9 % were seen at the emergency services although they were not emergency cases. Cases started to increase in June and July reaching the highest proportions in October and November then decreased in December. This is consistent with the seasonal occurrence that has been commonly observed in Lebanon.

Blood or stool cultures were positive for Salmonella typhi in 533 of the 1510 cases. The blood Widal test was positive in 445 patients. In 377 patients the diagnosis was clinical. Undoubtedly there were more typhoid cases that have not been identified by this surveillance.

For various reasons, as mentioned in previous reports, drinking water does not seem to be an important vehicle for transmitting typhoid fever in Lebanon. It is thought that green vegetables consumed raw after inadequate washing may be an important source of transmitting these diseases. The exact role of green vegetables in transmitting typhoid in Lebanon should be investigated. Public health education and personal preventive measures and hygiene should be taught to school children starting from primary schools for they are in the age-group most at risk.

TABLE 1
Typhoid Cases by Age and Sex, 1980

<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Percent</u>
Under 5	33	28	61	4.0
5 - 9	114	63	177	11.7
10 - 19	258	176	434	28.7
20 - 29	138	124	262	17.4
30 - 39	48	44	92	6.1
40 - 49	27	31	58	3.8
50 - 59	14	11	25	1.7
60 - 69	6	7	13	0.9
70 - 79	4	6	10	0.7
Age unknown	186	177	378	25.0
Age & Sex unknown	-	-	17	-
Total	828	665	1510	100.0

TABLE 2
Typhoid Cases by Nationality, 1980

<u>Nationality</u>	<u>Number</u>	<u>Percent</u>
Lebanese	1160	76.8
Syrians	13	0.9
Palestinians	35	2.3
Other	21	1.4
Unknown	281	18.6
Total	1510	100.0

TABLE 3
Typhoid Cases by Religion

<u>Religion</u>	<u>Number</u>	<u>Percent</u>
Moslem	649	43.0
Christian	534	35.4
Druze	11	0.7
Unknown	316	20.9
Total	1510	100.0

TABLE 4
Typhoid Cases by Area of Residence

<u>Residence</u>	<u>Number</u>	<u>Percent</u>
West Beirut	324	21.5
East Beirut	86	5.7
Burj Hamood	29	1.9
Burj Brajneh	66	4.4
Zahleh	79	5.2
Zahleh area	100	6.6
Tripoli	79	5.2
Tripoli area	41	2.7
Sidon	20	1.3
Sidon area	28	1.9
Other	200	13.2
Unknown	457	30.3
Total	1510	100.0

TABLE 5
Typhoid Cases by Hospitalization Status

	<u>Number</u>	<u>Percent</u>
Hospitalized	508	33.6
Emergency Service	331	21.9
Emergency Service and hospital	13	0.9
Outside cases (physicians)-	339	22.5
Other	60	4.0
Unknown	259	17.2
Total	<u>1510</u>	<u>100.0</u>

TABLE 6
Typhoid Cases by Health Service

<u>Health Service</u>	<u>Number of Cases</u>	<u>Percent</u>
AUMC	546	36.2
Hotel Dieu	137	9.1
Makased	146	9.7
St. George	88	5.8
Tel Shiha Hospital	159	10.5
Zahleh Government Hospital	37	2.5
Mazloom Hospital	60	4.0
Moslem Hospital	50	3.3
Labeeb Medical Center	13	0.9
Mamood Hospital	16	1.1
Burj Brajneh Center	3	0.2
Private doctors	156	10.3
Laboratories	99	6.6
Total	1510	100.0

TABLE 7
Typhoid Cases by Month, 1980

<u>Month</u>	<u>Number of cases</u>	<u>Percent</u>
January	57	3.8
February	14	0.9
March	15	1.0
April	14	0.9
May	28	1.9
June	68	4.5
July	98	6.5
August	215	14.2
September	201	13.3
October	316	20.9
November	336	22.3
December	134	8.9
Not determined	14	0.9
Total	1510	100.0

III FOOD POISONING

During the year 1980, 627 cases of food poisoning were identified in the surveillance areas mentioned. Of these 586 were presumed to be of bacterial origin and 41 were cases of chemical food-poisoning. Bacterial food poisoning occurred in 306 (52.2 %) males and 280 (47.8 %) females. Their age and sex distribution is given in Table 8. About half of them were between 10 and 29 years of age. There were 54 family outbreaks (more than one case) involving 216 (36.9 %) persons, the remaining 370 cases (63.1 %) were isolated cases.

Nationality of the affected persons included 484 (82.6 %) Lebanese, 26 (4.4 %) Palestinians and 11 (1.9 %) Syrians. For 55 of them nationality was not determined. There were 386 (62.8 %) Moslems and 157 (26.8 %) Christians.

The Health Services where cases were identified is given in Table 9. The wide differences reflected differences in turnover activity of the hospital and emergency services, as well as more complete records in some institutions.

In addition to this, 54 cases of food poisoning were reported by 12 doctors visited in their private clinics based on memory alone. There were no records for these cases and no other information was available.

Of the 586 cases only 226 (38.6 %) were hospitalized and an equal number was seen at the emergency services without being admitted to hospital.

Place of residence is given in Table 10 showing more cases in West Beirut and Zahelh areas.

The distribution of cases by month is given in Table 11. 385 cases (65.7 %) occurred during the spring-summer months April to August. This is probably related to the warm weather in these months that favors bacterial growth and fly concentrations.

Home was the place where the suspected meal was prepared for 174 cases for 53 this was in restaurants and snackbars. This could not be determined for the rest of the 359 cases.

Table 12 shows the suspected food item determined for 259 cases. Raw meat mostly the national dish (kibbeh) and raw eaten liver accounted for 110 cases (42.5 %) cooked liver and chicken for 70 (27.0 %) and cheese for 16 (6.2 %). The suspected cause was inadequate refrigeration, leaving food at room temperature or serving food the next day after cooking.

Incubation period could be determined for 163 cases. It was less than six hours in 69, 6-14 hours in 45 and over 14 hours in 49 cases.

Table 13 summarizes the symptoms for the 279 cases where this was recorded. Diarrhea was present in 80 percent of cases, vomiting and abdominal pain in 67 percent and fever in 57 percent.

Results of laboratory tests - Stool cultures were done for only 64 of these patients. Salmonella group organisms were isolated from the stools of 28 of them. Salmonella enteritidis was specified in five and Salmonella typhimurium in two, for the remaining 29 the stool culture was negative.

As regards outcome of illness, 576 recovered, two died one a 4 months old boy, the other 26 year old woman, Salmonella group was cultured from her blood and the outcomes were not determined for 8 patients.

Chemical Food Poisoning - There were 41 cases of chemical food poisoning identified in the surveillance areas during the year 1980. Of these 19 were isolated cases and 22 outbreak cases. Their age and sex distributions are given in Table 14. More than half of them (56 %) were in the age-group 5-19 years, and clustered in the summer months as noted in Table 15. In most instances the organic phosphate insecticide parathion (Demol) was the cause, contaminating sprayed fruits and other food items.

One outbreak of thallium poisoning occurred in Sidon involving eleven family members of whom the housewife died. In spite of investigation including the laboratory examination of fifteen specimens taken from that house, the cause could not be determined. Of the 41 patients with chemical food poisoning 39 recovered and 2 died.

In addition to the 41 cases mentioned above, an outbreak of insecticide poisoning was reported to the Health Department. It occurred in a village (Akroom) 50 kilometers from Tripoli, affecting 25 persons of whom 7 died. The cause was contamination of the flour and bread with the insecticide Demol as reported by the Central Public Health Laboratory. This resulted from using the same truck for transporting the insecticide and the flour to the village. There are existing laws and regulations for pesticides but the difficulty is with implementation.

Discussion - The number of food poisoning cases reported here probably represents a small part of the total number of cases that occur because many of such cases do not come to the attention of physicians or a surveillance system. The occurrence of 65 percent of cases during the period of April to August (Table 11) is consistent with expected increase during the warm season and elevated environmental temperature.

Investigation of these outbreaks to determine the vehicle and source of transmission depended on many factors among which are problems of security and events happening. The level of community sanitation and the role of food habits and culture are important. As seen from these results (Table 12) the common habit of eating raw meat and raw liver plays a big role in food poisoning in Lebanon.

Salmonella was isolated on stool cultures of some of these cases. Salmonella contaminated meat constitutes a serious public health problem, particularly in areas where meat is eaten raw.

Chicken and (Shawarma) were among other suspected risky food. Sandwiches are prepared commonly from Shawarma which is a bulk of sliced meat that is rotated in front of a fire source for several hours daily until consumed. In a previous study, chicken and (Shawarma) from various districts of Beirut were found contaminated with Clostridium perfringens type A. This type of food poisoning is often the result of cooking meat the day before it is served and failing to refrigerate it adequately overnight.

In conclusion we note that the highest proportions of food poisoning cases occur in the age-group 10 to 29 years. Its seasonal occurrence is during the summer months. The importance of salmonella food poisoning is noted. Salmonella organisms have been cultured from some outbreaks.

In most cases the place where food was mishandled and eaten was the home of the patient, (Table 16). As found in this study raw meat and raw liver consumption probably cause many cases of food poisoning, chicken and other items are also important causes. The large number of "undetermined" causes emphasize the need for more investigations. The subject of food poisoning should be emphasized to the general practitioners and to the public through publications and other mass media.

TABLE 8

Bacterial Food Poisoning Cases by Age and Sex

<u>Age Group</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Percent</u>
Under 5	29	21	50	8.6
5 - 9	31	14	45	7.7
10 - 19	80	78	158	27.0
20 - 29	59	69	128	22.5
30 - 39	38	30	68	11.6
40 - 49	26	21	47	8.0
50 - 59	17	26	43	7.3
60 - 69	13	6	19	3.3
70 - 79	8	5	13	2.2
Not Determined	5	10	15	1.9
Total	306	280	586	100.0

TABLE 9

Bacterial Food Poisoning by Health Service

<u>Health Service</u>	<u>Number</u>	<u>Percent</u>
AUMC	122	20.8
Hotel Dieu Hospital	31	5.3
Makased Hospital	68	11.6
St. George Hospital	8	1.4
Tel Shihā Hospital	17	2.9
Zahleh Government Hospital	106	18.1
Mazloom Hospital	41	7.0
Moslem Hospital	36	6.1
Labeeb Medical Center	1	0.2
Hamood Hospital	11	1.9
Households	9	1.5
Private Doctors	71	12.1
Labs	2	0.3
Other	63	10.7
Total	586	100.0

TABLE 10
Bacterial Food Poisoning by Area of Residence

<u>Area of Residence</u>	<u>Number</u>	<u>Percent</u>
West Beirut	132	22.5
East Beirut	41	7.0
Beirut suburbs	60	10.2
Zahleh area	119	25.5
Tripoli area	79	13.5
Sidon area	21	3.6
Other	36	6.1
Not determined	68	11.6
Total	586	100.0

TABLE 11
Bacterial Food Poisoning by Month

<u>Month</u>	<u>Number</u>	<u>Percent</u>
January	15	2.6
February	20	3.4
March	36	6.1
April	54	9.2
May	59	10.1
June	99	16.9
July	72	12.3
August	101	17.2
September	15	2.6
October	33	5.6
November	59	10.1
December	23	4.0
Total	586	100.0

TABLE 12

Bacterial Food Poisoning by Suspected Food Item

<u>Suspected Food Item</u>	<u>Number</u>	<u>Percent</u>
Raw meat	76	13.0
Raw liver	34	5.8
Cooked liver	28	4.8
Chicken	42	7.2
Other	63	13.4
Not determined	327	55.8
Total	586	100.0

TABLE 13

Symptoms of Cases of Bacterial Food Poisoning

<u>Symptom</u>	<u>Severe</u>		<u>Moderate or Mild</u>		<u>Absent</u>		<u>Total</u>	
	No	%	No	%	No	%	No	%
Diarrhea	56	23	138	57	50	20	244	80
Abdominal pain	31	15	112	53	67	32	210	68
Vomiting	50	19	146	57	61	32	257	76.2
Fever	70	28	75	29	107	43	252	57.5

TABLE 11

Chemical Food Poisoning Cases by Age and Sex

<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Percent</u>
Under 5	2	0	2	4.8
5 - 9	7	3	10	24.4
10 - 19	7	6	13	31.7
20 - 29	1	4	5	12.2
30 - 39	4	3	7	17.1
40 - 49	1	1	2	4.9
50 - 59	1	1	2	4.9
<u>Total</u>	<u>23</u>	<u>18</u>	<u>41</u>	<u>100.0</u>

TABLE 15
Chemical Food Poisoning Cases by Month

<u>Month</u>	<u>Number</u>	<u>Percent</u>
January	4	9.8
February	11	26.8
March	0	0
April	0	0
May	1	2.4
June	5	12.2
July	9	22.0
August	7	17.1
September	0	0
October	1	2.4
November	0	0
December	3	7.3
Total	<u>41</u>	<u>100.0</u>

LINE LISTING OF FOODBORNE DISEASE OUTBREAKS 1980

<u>Etiology</u>	<u>Residence</u>	<u>No of Cases</u>	<u>Month of Onset</u>	<u>Suspected Vehicle</u>	<u>Location where food was mishandled and eaten</u>
Bacterial					
Salmonella group (Confirmed)	Verdun	5	March	Raw liver	Home
"	Tarik el-Jadideh	7	"	Raw kibbeh	"
"	al-Mourayjeh	9	May	Raw liver	"
"	Bir-el-Abd	5	December	"	"
Salmonella (Suspected)	Anis Nousli St.	2	January	Fried chicken	Restaurant
"	Burj Hammood	3	March	Raw liver & Shawarma	Home
"	"	3	April	White cheese	"
"	Ashrafieh	5	"	Cooked spleen	"
"	Tarik el-Jadideh	3	"	Raw kibbeh	"
"	Tripoli	3	"	Cheese	"
"	Sabra	4	"	Raw liver	"
"	Shiyyah	4	"	Raw kafta	"
"	Basta	21	June	Sandwiches	Beach
"	Verdun	10	"	Raw Kibbeh	Home
"	Mazra'a	2	"	Beans	"
"	Unknown	3	"	Meat & chicken	Unknown

<u>Etiology</u>	<u>Residence</u>	<u>No of Cases</u>	<u>Month of Onset</u>	<u>Suspected Vehicle</u>	<u>Location where food was mishandled and eaten</u>
Bacterial					
Salmonella group (Suspected)	Ashrafieh	2	July	Chicken sandwich	Snakbar
"	Sidon	6	"	Moulikhyah & chicken	Home
"	Burj el-Brajneh	2	"	Raw kafta	"
"	"	2	"	Grilled steak	"
"	Unknown	4	"	Baked kibbeh	"
"	West Beirut	3	August	Chicken	"
"	Burj el-Brajneh	3	"	Potato & meat	"
"	"	3	"	Fried chicken	"
"	"	2	"	Broasted chicken	Restaurant
"	Tripoli	5	"	Chicken	Home
"	Burj el-Brajneh	3	October	Fish	"
"	Tarik el-Jadideh	2	"	Raw kibbeh	"
"	Saghbine	34	November	Raw liver & kibbeh	"
"	Hosh el-Umara'	2	December	"	Unknown
"	Zahleh	4	"	Raw meat	"

<u>Etiology</u>	<u>Residence</u>	<u>No of Cases</u>	<u>Month of Onset</u>	<u>Suspected Vehicle</u>	<u>Location where food was Mishandled and eaten</u>
Bacterial					
Staph. (suspected)	Tarik el-Jadidch	4	February	Cheese	Home
"	Zarif	2	"	Stuffed squash	"
"	Burj el-Brajneh	9	July	Chicken	"
"	Kantari	2	October	Unknown	"
Unknown					
"	Kafer Zabad	3	April	Unknown	Unknown
"	Shmlstar	4	"	"	"
"	al-Malloula	4	May	"	"
"	Haret Hrayk	3	"	Cheese and chicken	Restaurant
"	Shweifaf	3	"	Unknown	Home
"	West Beirut	3	"	"	Unknown
"	Tarik el-Jadideh	4	"	Fried liver	Home
"	Kafar Zabad	3	June	Unknown	Unknown
"	Berfayel Akkar	3	August	"	"
"	Anfah	2	"	"	"
"	Tripoli	2	"	"	"
"	Starco area	2	"	"	Home
"	al-Dilhamiyi	7	November	"	Unknown

<u>Etiology</u>	<u>Residence</u>	<u>No of Cases</u>	<u>Month of Onset</u>	<u>Suspected Vehicle</u>	<u>Location where food was mishandled and eaten</u>
Chemical					
Demol	Ras Beirut	4	January	Sprayed chocolate bars	Shop
Thallium	Sidon	11	February	Food	Home
Demol	Ashrafieh	4	July	Apple sprayed with Demol	Unknown
Insecticide or organo phosphate	Dikwanl	3	December	Unknown	"
Viral Hepatitis	Antelias	2	January	"	"
"	Burj el-Brajneh	2	February	"	"
"	Baharsaf	2	April	"	"
"	Sin el-Fil	4	September	"	"
"	Ras Beirut	2	October	"	"
"	Burj el-Brajneh	2	"	"	"
"	Tripoli	2	"	"	"
"	Zahlah	2	November	"	"
"	Hazmieh	2	"	"	"
"	Akar	2	"	"	"
"	Ain Helweh	2	"	"	"
"	Burj el-Brajneh	2	"	"	"
"	Shiyyah	2	"	"	"
"	Shwiefat	3	"	"	"

المركز الوطني للتفتيش والإدارة
مكتب تفتيش الأغذية والأغذية
مركز مشاريع ومشاركات القطاع العام

<u>Etiology</u>	<u>Residence</u>	<u>No of Cases</u>	<u>Month of Onset</u>	<u>Suspected Vehicle</u>	<u>Location where food was mishandled and eaten</u>
Brucellosis	Zahleh	2	July	Goat cheese & yogurt	Unknown
"	Wadi Shahrour	3	"	Unknown	"
"	Zarif	3	"	"	Farm or Rest.
Shigellosis	Sidon	2	October	"	Unknown
Trichinosis	Taliya	4	January	Sausages	"
"	Mazra'a	8	June	Raw pork	Home
"	Zahleh	50	June & July	Kibbeh & sausages	"
"	Deir al-Ahmar	2	July	Unknown	Unknown
"	Saghbine	6	August	Sausages	Home
"	Falougha	2	October	Raw meat & kibbeh	"

IV Viral Hepatitis

There was a total of 387 cases of viral hepatitis indentified during the year 1980 in the surveillance areas. Table 17 gives the age and sex distribution of the cases, 219 (56.6 %) of these were males and 168 (43.4 %) were females. Most 174 (45 %) were children under the age of ten years and 256 (66 %) were under the age of 29 years, reflecting the well known fact that viral hepatitis is a disease of young age. Private practitioners identified 163 (42.1 %) of cases. This is consistent with the generally mild nature of the disease usually not needing hospitalization. 100 (25.8 %) were seen at American University Medical Center and Hotel Dieu Hospitals and 48 (12.4 %) were seen at emergency services. It is a common observation here that, whatever the disease is, patients use the emergency services although their condition may not be an emergency condition.

Table 18 gives the viral hepatitis cases by area of residence. There were 14 outbreaks involving 31 children in the same families. Table 19 gives the temporal distribution; about half of the cases 182 (47.1 %) occurred during the three winter months, October, November and December. This may reflect the effect of crowded living conditions during the cold months but perhaps more so as a result of exposure in schools as children start school year in October.

Undoubtedly many cases of viral hepatitis are not recognized and no adequate laboratory tests are done on viral hepatitis cases except rarely. This results in lack of confirmation of these cases with regard to etiology, the diagnosis being mainly clinical.

TABLE 17
Viral Hepatitis Cases by Age and Sex

<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Percent</u>
Under 5	41	33	74	19.1
5 - 9	59	41	100	25.8
10 - 19	49	33	82	21.2
20 - 29	27	23	50	12.9
30 - 39	8	9	17	4.4
40 - 49	6	10	16	4.1
50 - 59	10	7	17	4.4
60 *	11	8	19	5.0
Unknown	8	4	12	3.1
Total	219	168	387	100.0

TABLE 19
Viral Hepatitis Cases by Month

<u>Month</u>	<u>Number of Cases</u>	<u>Percent</u>
January	24	6.2
February	40	10.2
March	22	5.7
April	15	3.9
May	22	5.7
June	22	5.7
July	13	3.4
August	26	6.7
September	27	7.0
October	63	16.2
November	65	16.7
December	54	14.0
Total	387	100.0

V Shigellosis

The total number of cases of shigellosis identified by this surveillance during 1980 was 204 cases. Of these 108 (52.9 %) were males and 93 (45.6 %) were females. The age-sex distribution is given in Table 20. One fourth of the cases were under ten years of age. There was no special pattern observed or clustering by place. About half of the cases were seen at the emergency services of the Beirut hospitals. Except for one outbreak involving two children all were isolated cases. The distribution of shigellosis cases by month is given in Table 21, 116 (57 %) of cases occurred during the summer months July, August, September, and October. This may be related to warm environmental temperature and the prevalence of flies as vectors of the disease.

Results of stool cultures are given in Table 22. In 98 cases (48.0 %) *Shigella paradysenteriae* Flexner was cultured from their stools. *S. sonnei* cultures from 41 cases (20.1 %) was next in frequency. For 38 (18.6 %) of cases stool cultures were not done.

TABLE 20

Shigellosis Cases by Age and Sex

<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Percent</u>
Under 5	19	20	39	19.1
5 - 9	7	6	13	6.4
10 - 19	13	9	22	10.8
20 - 29	19	8	27	13.2
30 - 39	9	13	22	10.8
40 - 49	7	7	14	6.9
50 - 59	5	4	9	4.4
60 - 69	3	2	5	2.5
70 - 79	4	2	6	2.9
Unknown	22	22	44	23.0
Total	108	93	204	100.0

TABLE 21
Shigellosis Cases by Month

<u>Month</u>	<u>Number of Cases</u>	<u>Percent</u>
January	11	5.4
February	10	4.9
March	11	5.4
April	10	4.9
May	9	4.4
June	8	3.9
July	31	15.2
August	40	19.6
September	20	9.8
October	25	12.3
November	20	9.8
December	9	4.4
Total	204	100.0

TABLE 22

Shigellosis - Stool Cultures

	<u>Number</u>	<u>Percent</u>
Positive S. Flexner	98	48.0
" S. Sonnei	41	20.1
" S. Boydii	3	1.5
" S. Dysenteriae	2	1.0
" not specified	8	3.9
" other	12	5.9
Negative	2	1.0
Not done	38	18.6
Total	<u>204</u>	<u>100.0</u>

VI Trichinosis

Although trichinosis is one of the reportable diseases in Lebanon, it is usually not reported. Outbreaks of trichinosis have occurred in some areas of the country during the past years. Some have been the subject of special reports in medical journals. Recent reports appeared in 1962 and 1970 which seem to have been epidemic years.

The total number of cases identified by this surveillance during 1980 was 86 cases. Clinical course was variable but there were no fatalities. Data on age and sex could be determined for only 30 of them. Of these 13 were men and 17 were women. 24 of them were between the ages of 15 to 44 years. Of the 86 cases 64 were diagnosed during the month of April. This temporal clustering of cases is related to the common source outbreaks occurring.

Geographic distribution - Several small outbreaks occurred in Zahleh where about 50 cases were identified. Other small outbreaks occurred in the Beka villages, Talia, Saghbine, Deir el-Ahmar and Anjar. Two cases admitted to St. Georges Hospital in Beirut came from Falougha. *T. spiralis* was demonstrated in their muscle biopsy. A common-source outbreak involving 8 persons out of 15 who were present at a birthday party in Beirut - Mar Elias. This was traced to raw minced pork eaten at that party.

One outbreak in Saghbine involved six persons of two families who prepared and consumed sausages from the meat of a wild pig which they hunted. Most of the cases identified in Zahleh had consumed raw meat dish (kibbeh) prepared from mutton adulterated with pork which was bought from local butchers. Pork products from domestic swine were incriminated.

VII Brucellosis

There were 73 cases of brucellosis identified in the surveillance areas during 1980. Their age and sex distribution is shown in Table 23. About one third (23 patients) resided in Zahleh and surrounding area of Beka the farm land supplying most of the milk in Lebanon. Distribution by month is shown in Table 24. 44 cases were diagnosed in July and August following the milk season. Six cases were confirmed by culturing *Brucella melitensis* two from bone marrow and four from blood; 59 were presumptive cases with clinical symptoms plus *Brucella* agglutination titers positive at 1/160 or higher dilution.

Food histories were obtained for 36 cases only. Of these 28 had consumed goat's milk some unboiled, or yogurt or unsalted cheese prepared from goat's milk. The other eight had no such histories.

TABLE 23
Brucellosis Cases by Age and Sex

<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
Under 5	1	0	1
5 - 9	2	2	4
10 - 19	5	4	9
20 - 29	3	8	11
30 - 39	4	4	8
40 - 49	5	1	6
50 - 59	3	3	6
60 +	0	3	3
Unknown	13	11	24
Total	36	36	72

TABLE 24
Brucellosis Cases by Month, 1980

<u>Month</u>	<u>Number of Cases</u>	<u>Percent</u>
January	4	5.5
February	2	2.8
March	3	4.2
April	2	2.8
May	5	6.9
June	4	5.5
July	23	32.0
August	21	29.2
September	1	1.4
October	5	6.9
November	1	1.4
December	1	1.4
Total	72	100.0

VIII COMMENTS

The results from this project give the first available epidemiological data on foodborne and waterborne disease surveillance in Lebanon. They provide a base-line for future comparisons, for assessing changes in disease occurrence, and for evaluating the results of preventive and control measures that may be instituted. Special effort was made to obtain valid data and to indicate areas where the information was incomplete or unknown. In order to obtain data on disease morbidity in Lebanon, every effort should be made to improve the various existing sources of these morbidity data, among which are hospital and emergency service records, physicians, and medical laboratory records. Unfortunately, some of these records were found to be incomplete and lacking such information as age, sex, and address of the patient which are necessary for investigative purposes. Disease outbreak investigation is an essential element in surveillance, and so is carrying out case - control studies for determining disease causation. It is hoped that, with more complete records, and improved security conditions this will become more possible to do in future.

Food - water - borne disease surveillance should become a routine activity of the Ministry of Health. A good start should consider trying to introduce minor yet very important changes in the registration procedures of some health services. This would save much time and effort in any data collection system. Another recommendation would be to increase the number of monitored health services laying emphasis on pre-recorded health data rather than on data based on memory alone.

Findings useful for preventive purposes have been identified by this project. Among these are observations on the young age-group that are most

at risk for typhoid fever and food poisoning. Any health education programs aimed at controlling these diseases should have these population segments as their target. The seasonal increase in typhoid fever during the autumn months has previously been observed but it is the first time that the magnitude of this increase has been documented. In the light of information gathered relating to the use of contaminated sewer water for irrigating green vegetables such as lettuce, parsley, mint, radishes etc, one way speculate on the role of these vegetables in the spread of typhoid fever. The role of imported vegetables should also be investigated.

Another significant finding was the probable incrimination of raw meat and raw liver consumption in a good number of food poisoning outbreaks. This is of great public health importance in Lebanon in view of the wide spread habit of raw meat eating as the national dish (kibbeh) in this country

The identification of trichinosis outbreaks drew attention to the dangers of deliberately adulterating beef and mutton by the butchers with pork and to its consequences.

The role of sausages prepared from domestic pork and from a wild pork hunted in Beka was emphasized. Brucellosis outbreaks drew attention to the role of goat's milk and cheese in causing some family outbreaks.

Acknowledgement. In termination, may I express my thanks and gratitude to all those who supported this project both financially and otherwise, and to all those who collaborated and cooperated in collecting these data on food-water-borne disease in Lebanon for their valuable help, hoping that similar work will continue in future.

July 6, 1981

Republic of Lebanon

Kamal T. Abou-Daoud M.D.

Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)
Project Director