WORLD HEALTH ORGANIZATION
ORGANISATION MONDIALE DE LA SANTÉ

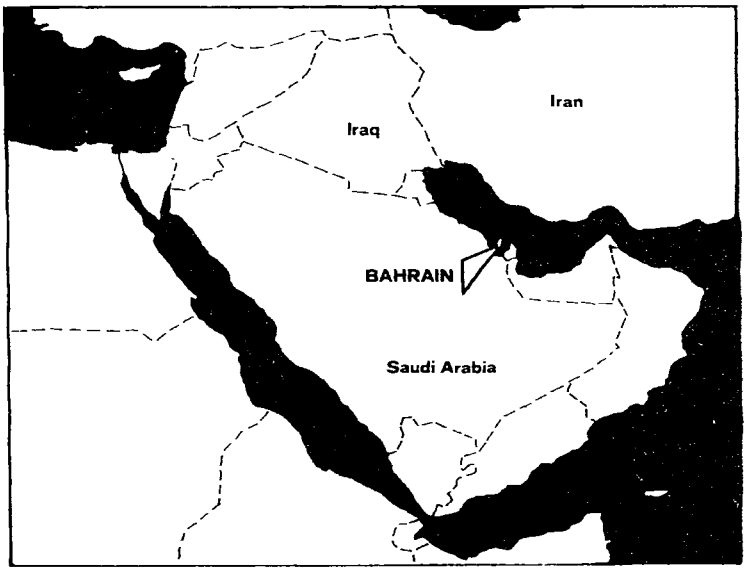
WHO/SE/78.115
Global Commission WP/78.34

ENGLISH ONLY

# REPORT TO THE GLOBAL COMMISSION FOR CERTIFICATION OF SMALLPOX ERADICATION



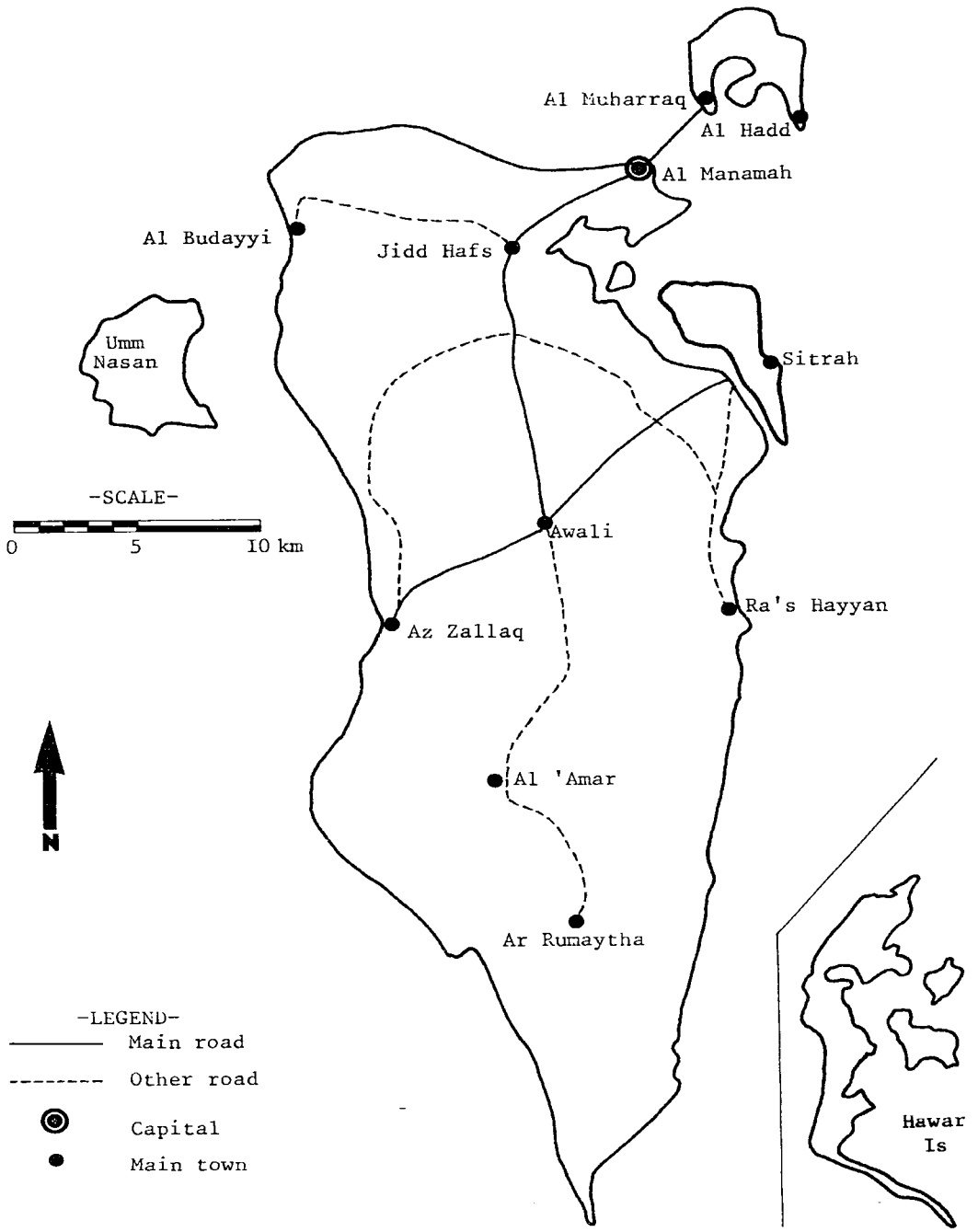
# BAHRAIN




## MINISTRY OF HEALTH
## BAHRAIN

## WORLD HEALTH ORGANIZATION

MAP OF BAHRAIN SHOWING THE MAIN ISLANDS



## 1. BACKGROUND INFORMATION

### 1.1 Geography

The Bahrain islands form an archipelago in the Arabian Gulf, between the Qatar peninsula and the mainland of Saudi Arabia. Their total area is about 650 $km^2$. Bahrain ('Two Seas'), the largest island, is 50 km long and 16 km wide. Muharraq, a small island to the north-east, is connected with Bahrain by a causeway, nearly 2.5 km long, carrying a motor road. Other islands are Sitra, to the east, Umm Ah-Nassen to the west, Jidda, also to the west, the Hawar group off Qatar and several islets, some uninhabited. The islands are low lying, the highest ground being a hill in the centre of Bahrain, 150 m high.

### 1.2 Climate

The climate is cool and temperate from December to the end of March, becoming very hot and humid during the summer months. In August and September temperatures can rise to 44°C.

### 1.3 Population

The population recorded in the 1971 census was 216 815. The population of Bahrain now totals about 300 000, of whom three-quarters are Bahrainis, and the balance are expatriates from the Middle East, Asia and Europe (Tables 1 and 2). The majority of the people are Moslem Arabs.

### 1.4 Government

Bahrain is an independent sovereign state ruled by an Amir through an appointed cabinet. The country is divided into five rural areas administered by municipalities, reporting to a central municipal council.

Table 1

Distribution of Population by Age, Nationality and Sex. (1976 Estimate)

| Age Group | Bahraini | | Non-Bahraini | | Total | |
|---|---|---|---|---|---|---|
| | Number | Percent. of Total Population | Number | Percent. of Total Population | Number | Male to Female Ratio [a] |
| 0-4 | 34 800 | 12.4 | 7 170 | 2.5 | 41 970 | 1.02 |
| 5-9 | 33 480 | 11.9 | 8 050 | 2.9 | 41 530 | 1.02 |
| 10-14 | 31 220 | 11.1 | 6 390 | 2.3 | 37 610 | 1.10 |
| 15-24 | 46 690 | 16.6 | 20 180 | 7.2 | 66 870 | 1.42 |
| 25+ | 66 990 | 23.8 | 26 660 | 9.3 | 93 590 | 1.47 |
| Total | 213 180 | 75.8 | 68 390 | 24.2 | 281 570 | 1.21 |

[a] Number of males per female. For all age groups the ratio is 1.00 for Bahrainis and 1.43 for non-Bahrainis.

Table 2

Distribution of Population by Region[a]
(1971 Census)

| Region [b] | Population | Percentage of Total |
|---|---|---|
| Manama | 89 399 | 41.5 |
| Muharraq | 49 540 | 22.9 |
| Jid Hafs | 19 521 | 9.0 |
| Northern | 10 614 | 4.9 |
| Western | 8 689 | 4.0 |
| Central | 14 228 | 6.6 |
| Sitra | 11 323 | 5.2 |
| Rifa'a | 12 633 | 5.9 |
| Total | 215 947 | 100.0 |

[a] Distribution by sex and nationality is similar to that shown in Table 1 for all regions, except Manama where there is a larger than average proportion of non-Bahraini males.

[b] Refer to Figure 2.

## 1.5 Education

There were, in 1976/77, 114 state schools for boys and girls with 2 696 teachers and 61 201 pupils. In addition there are 7 private schools.

Education is compulsory through the primary level; adult education is encouraged. Today more than a quarter of the population is enrolled in schools and the education appropriation is one of the largest single items in the state budget - in 1975 as much as 27% of the total expenditure.

Table 3

Number of Classes and Students by Educational Category

1976

| | Classes | Students |
|---|---|---|
| Primary | 1 099 | 41 751 |
| Intermediate | 236 | 8 533 |
| Secondary (General) | 215 | 7 154 |
| Technical, Commercial | 61 | 1 665 |
| Higher (incl. Teacher Training Colleges) | 12 | 281 |
| Religious | 8 | 113 |
| Total | 1 631 | 59 497 |

Source: Statistical Bureau, Ministry of Finance and National Economy, Bahrain Government

1.6 Transport and Communications

Roads are good and there is a national bus system. Muharraq Airport is just over three miles from the centre of Manama, the capital town, and is the destination of one of the Concorde services from London. The port of Mina Sultan is being further developed. There were, in September 1976, over 35 000 telephones. There is a state-operated radio station and television.

2. HEALTH SERVICES

2.1 General

The Health Services of Bahrain are the longest established in the Arabian Gulf region. The American Mission Hospital, with 110 beds, and the Victoria Memorial Hospital, with 10 beds, opened at the turn of the century. The Bahrainian Government took its first step towards a comprehensive health system for all its people in 1925, with the appointment of a physician to a pearl-divers' seaborne clinic and a dispensary on Muharraq island.

At the time, smallpox was endemic; malaria and trachoma were the main causes of death and blindness; amoebic dysentery, anaemia, tuberculosis and venereal disease were prevalent. Over the past 52 years the steady growth of Bahrain's health services for both preventive and curative care has resulted in the eradication of smallpox, a negligible incidence of trachoma and malaria and other communicable diseases and one of the lowest maternity mortality rates of any country in the area. That health is a major concern of the Bahrainian Government is demonstrated by the fact that during the past 15 years the annual expenditures of the Ministry have increased eleven-fold. In 1977, 5.5% of public expenditure was for health.

2.2 Public Health Structure

The central authority for the country's health administration is the Ministry of Health, headed by a Minister and assisted by two under-secretaries (Figure 1). Today the Ministry of Health's facilities include the Salmaniya Medical Centre, three

specialized hospitals for chest, psychiatry and maternity care, 13 comprehensive health centres, and four school clinics. Its Public Health service carries out programmes for communicable disease control, environmental health and health education (Figure 2).

Treatment at all the health centres and hospitals is free of charge. In addition to this state-financed health system, private facilities are available: the American Mission Hospital, the Awali Hospital for BAPCO employees and their families, and a few clinics. A military hospital for the Bahrain Defence Force is in operation. There are also 35 physicians on the islands who have their own private practice.

Fig. 1: Ministry of Health Administrative Structure

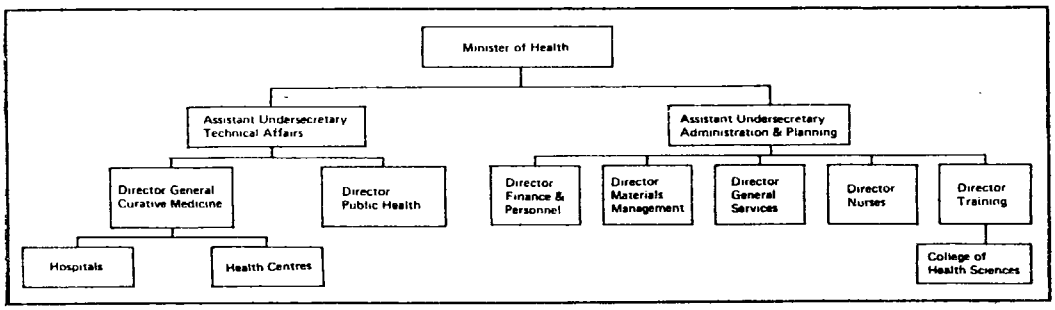


Fig. 2: Bahrain - Health Units and Regions

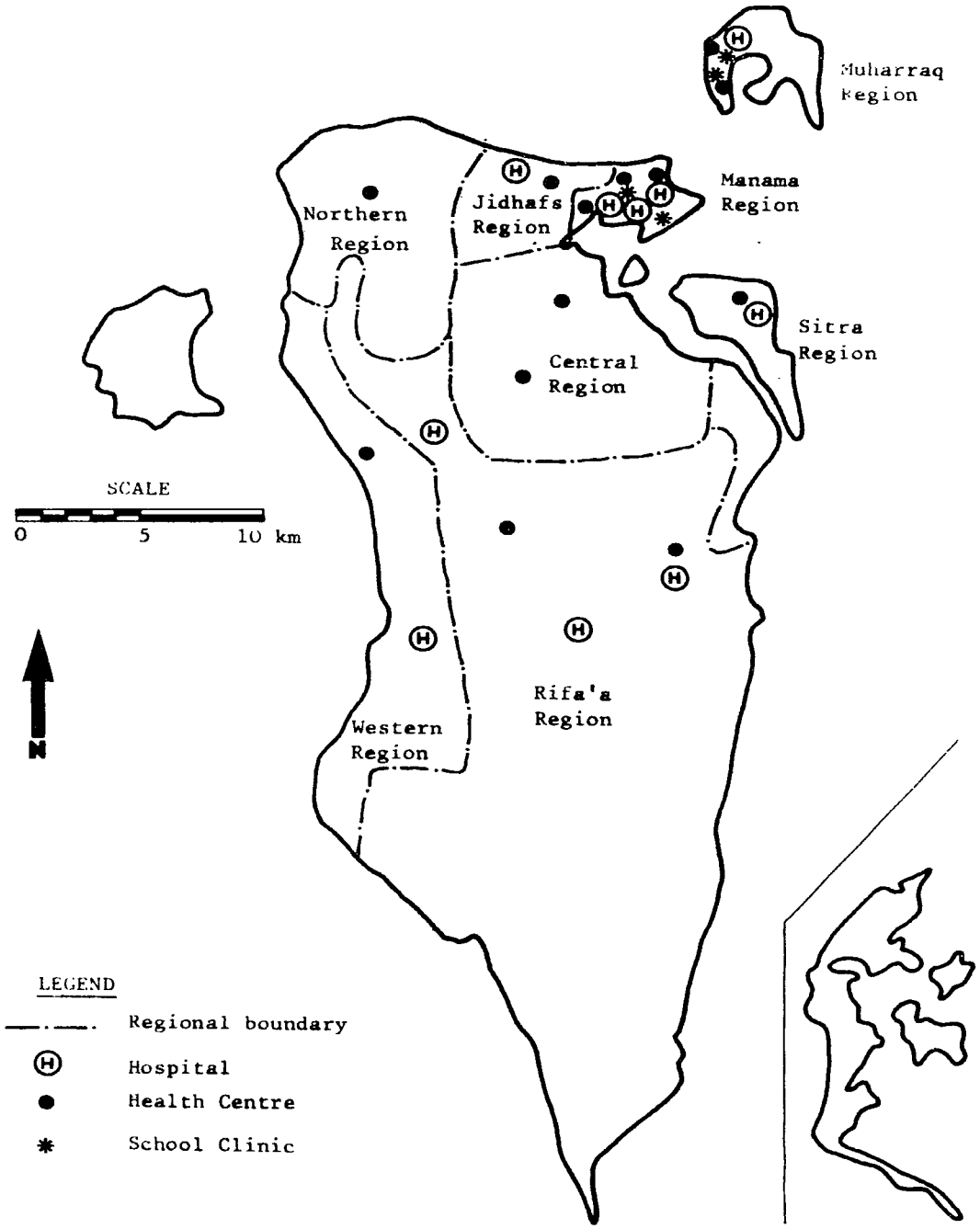
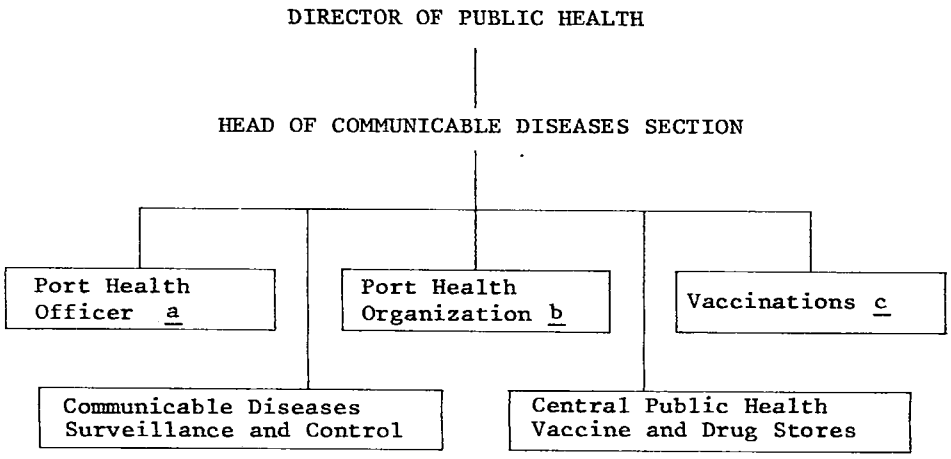


Fig. 3: Public Health Administration




Sanitary staff include 31 public health inspectors, staff nurses and other related staff.

a Medical treatment for crew and passengers of ships and aircraft arriving in Bahrain. Also other public health duties.

b Public health inspectors who conduct inspections of vessels and aircraft, vaccinations, surveillance of arriving passengers, control of imported foods and general hygiene measures at ports and airports

c For international travel requirements and for routine vaccination.

## 2.3 Health Manpower Development

Bahrain has an established education system that can provide an adequate supply of candidates at the intermediate and secondary level to fill the training programmes offered by the Ministry of Health. Vocational training programmes have also been a tradition of the Government for almost 20 years, most of them in the Ministry of Health.

Since the first school for nurses opened in 1959, the Ministry's nursing school programmes have resulted over the years in a dedication to the profession unusual to the area; three of the first graduating class of five serve in top staff positions today. Training courses for other paramedicals have also existed for several years. And it has always been the Ministry's policy to support out-of-country education for Bahraini nationals; in 1976, a total of 114 Ministry personnel in all categories were sent abroad for training, 42 of them women.

The official Government aim for "Bahrainization" of the work force at all levels within 15 to 20 years creates the necessity for more sophisticated training at the higher professional levels because it is at these higher levels that foreigners are concentrated. In 1976 only 30% of doctors and dentists and 16% of registered nurses were Bahraini. In all other categories of health workers the proportion of non-Bahrainis was minimal.

At present, however, it is the middle-level personnel that is critically needed for the expansion of Bahrain's health services, and it is at this level that the Ministry of Health is concentrating its major effort. Thus, the College of Health Sciences was founded in 1976. When the College is in full operation, some 200 students will be graduated each year, equipped with the knowledge and skills necessary for effective operation of the Ministry's Medical Centre, health centres and Public Health programmes. The distribution of health manpower is shown in Table 4.

Table 4

Health Ministry Manpower, by Facility and Category, 1976

| Category of Staff | Employed in: | | | Total |
|---|---|---|---|---|
| | Curative Medicine & Ministry Admin. | Health Centres | Public Health Dept. | |
| Consultants and Residents | 109 | 44 | 12 | 165 |
| Dentists | 2 | 4 | 3 | 9 |
| Nurses, registered | 453 | 53 | 4 | 510 |
| Nurses, practical and auxiliary | 320 | 79 | 18 | 417 |
| Pharmacists and pharm. technicians | 27 | 45 | 1 | 73 |
| Laboratory technicians | 72 | 4 | 9 | 85 |
| Physiotherapy technicians | 15 | | | 15 |
| X-ray technicians | 35 | | | 35 |
| Operating-room technicians | 18 | | | 18 |
| Orthopaedic technicians | 4 | | | 4 |
| Other technicians | 23 | | | 23 |
| Ambulance attendants | 6 | | | 6 |
| Statistician clerks | | | 4 | 4 |
| Occupational hygienist | | | 1 | 1 |
| Health educators | | | 4 | 4 |
| Public health inspectors and observers | | | 103 | 103 |
| Administration | 228 | 50 | 27 | 305 |
| Maintenance and drivers | 740 | 111 | 239 | 1 090 |
| TOTALS | 2 052 | 390 | 425 | 2 867 |

## 2.4 Communicable Disease Control

There are no inaccessible or remote communities in Bahrain. No inhabitant of Bahrain should take more than an hour to reach the nearest Health Centre. The vast majority of the people are health conscious, and, when a person is ill with an eruptive fever, either members of his family or neighbours (out of fear of infectivity) can be relied upon to bring this to the notice of the Health Centre doctors and/or the Public Health authorities.

Notification of all common communicable diseases as per lists of notifiable diseases for weekly and daily returns is the responsibility of each physician, whether government or private, seeing such cases. Notification by telephone of diseases subject to the International Health Regulations is asked for in addition to notification in writing. Once notifications are received at the Directorate of Public Health, Communicable Diseases Section, surveillance of reported cases of all important communicable diseases is undertaken and control measures set in motion. Public Health Inspectors from the Communicable Diseases Section, assisted by Public Health Inspectors from other Sections as necessary, under the direction of the Head of Communicable Diseases Section, have this responsibility. As mentioned earlier, no household or location is considered remote in terms of distances and time involved in reaching them.

Detailed records are kept at the Directorate of Public Health for all reported cases of selected communicable diseases. These include all the diseases subject to the International Health Regulations (Annex 1 and Table 5).

Table 5

Cases of Rash Diseases Notified by Year 1973-1977[a]

| Disease | 1973 | 1974 | 1975 | 1976 | 1977 |
|---|---|---|---|---|---|
| Smallpox | 0 | 0 | 0 | 0 | 0 |
| Chickenpox | 1 979 | 2 431 | 2 362 | 2 256 | 2 476 |
| Measles | 3 093 | 3 874 | 1 009 | 4 661 | 1 263 |
| Rubella | 6 | 437 | 14 | 15 | 22 |

[a] Included in a list of 40 notifiable diseases.

## 2.5 Port Health Services

Health Inspectors are posted round-the-clock at the International Airport and at the seaports for surveillance of disease and inspection of perishable foodstuffs as they are unloaded from planes and ships. Surveillance of Haj pilgrims has been a responsibility of the Public Health Directorate since 1944 (Figure 3).

## 2.6 School Health Programmes

Four School Clinics, two in Manama and two in Muharraq, are staffed with six physicians and three dentists, working in close collaboration with the Health Centres.

## 2.7 Health Education

This unit, headed by a physician, reaches out particularly to the outlying villages with cooperation of the Ministry of Labour and Social Affairs, the Red Crescent, women's societies and clubs. Educational materials include films, booklets, posters, T.V. and radio programmes, and newspaper articles.

## 3. EPIDEMIOLOGY OF SMALLPOX IN BAHRAIN

### 3.1 Smallpox Incidence Trends

The following extracts from the various annual reports submitted by the Ministry in the past give an indication of the trends of smallpox incidence in the country.

Year 1938/1939

"Smallpox is endemic in the island. Cases rarely present themselves at the dispensaries for treatment during the active stage, but the sequelae are all too apparent throughout the island: in the schools approximately 17% of boys showed scarring from smallpox. A fairly high proportion of cases of blindness result from this cause.

Vaccination against smallpox is available at the clinics but it is rarely requested, except by the more intelligent or as the result of the passport regulations of other countries.

Compulsory vaccination would eradicate this disease almost entirely, but would presumably arouse the opposition which seems invariably to accompany the introduction of this reform into any country."

Year 1939/1940

"No case of smallpox was reported in Bahrain throughout the year. Many vaccinations of civilian adults and children were done at the dispensaries and schools. Boys and girls found unvaccinated at the school inspections were subsequently vaccinated with the consent of their parents."

Summary Report for the years 1925-1940

"No major epidemics of smallpox, but the disease is annually endemic and vaccination becoming slowly accepted. Original vaccinator, an Arab Hakim of the East Coast of Bahrain who inoculated straight from the cow, as Jenner did in England. Scarring from smallpox noted in 22% of town schools and 50% in villages."

Year 1943

"Smallpox negligible."

Year 1944

"A small outbreak of smallpox."

Year 1945

"Smallpox reached its lowest annual figure of 14."

Year 1949

"Sharp outburst of smallpox in Hoora, from Saudi Arabia. 22 000 vaccinated, and 81 cases admitted to Quarantine Island with 5 deaths only."

Year 1956/1957

"Smallpox, after 6 years, infected Damistan and Maqsha villages, spreading to Manama, where it was halted. Total of 68 cases with 12 deaths, mostly babies and children."

Year 1958

"B.I. "Dumra" carrying a Pakistani smallpox case, caused all 254 Bahrain disembarking passengers to be quarantined. No infection resulted."

Table 6

Reported Smallpox Cases and Deaths 1941-1978

| Year | Cases | Deaths |
|---|---|---|
| 1941 | 193 | * |
| 1942 | 119 | * |
| 1943 | 43 | * |
| 1944 | | |
| 1945 | 14 | * |
| 1946 | 21 | * |
| 1947 | 1 | * |
| 1948 | 0 | * |
| 1949 | 81 | 5 |
| 1950 | 13 | - |
| 1951 | - | - |
| 1952 | - | - |
| 1953 | - | - |
| 1954 | - | - |
| 1955 | 1 | - |
| 1956 | 62 | 10 |
| 1957 | 6 | 2 |
| 1958 to 1978 | - | - |

* Data not available.

3.2 The Last Smallpox Outbreaks

The last known cases of smallpox in the country were the result of two outbreaks during the year 1956/1957. The details of the outbreak were as follows:

The first outbreak began about the middle of October 1956. The first case , in Dumistan, was a young child who had been on a visit to Iraq with his parents and developed symptoms 7 days after his return to Bahrain. The patient showed no signs of vaccination, made an uneventful recovery and there was no spread of the disease in the area. A few weeks later, 8 cases were reported from Maqsha and once again investigation showed that the original case had contracted the infection in Iraq and had arrived in Bahrain during the pre-eruptive stage of the disease, so escaping detection by the Port Health Inspectors. The

outbreak spread from Maqsha to the surrounding villages and to the main district of Manama but it went no further and eventually died out in the middle of January 1957. The total number of cases was 68 with 12 deaths. Most of the patients were babies and children in the 8 - 12 years age group, and twice as many males as females were affected. None of the cases had been vaccinated. With the exception of three non-locals, domiciliary medical treatment was provided as parents refused to allow the patients to be removed to hospital. This arrangement was unsatisfactory from an epidemiological as well as a medical point of view. The high vaccination state of the community which had been built up over the past few years prevented the outbreak from assuming more serious proportions. It was estimated that 85% of the population had been protected in this way but when the outbreak started over 50 000 revaccinations were carried out as a further precautionary measure.

## 4. SMALLPOX VACCINATION

### 4.1 Vaccination Activity

Mass vaccination concentrating mainly on children under 5 years of age has been in practice since 1950. Intensive vaccination campaigns at times of incidence of smallpox in Bahrain or in neighbouring countries has helped to reinforce the immunity of the population; it is estimated that 85 to 95 per cent of the population is protected.

Every year during the cooler months (October to May) vaccinators go out to all the villages and towns in Bahrain to vaccinate all children who do not have marks of previous vaccination. The school medical service ensures systematic vaccination of all school children.

During the 1956-57 outbreak, most of the cases were being treated in their homes, with strict isolation practically impossible to enforce. The sheet anchor in the prevention of spread of the disease was the thorough vaccination of the population.

Vaccination is not compulsory in Bahrain. But as a good proportion of the people travel abroad not infrequently and since smallpox vaccination has been required by most countries, revaccination at 3 year intervals has resulted for many.

Freeze dried vaccine and bifurcated needles have been used for all vaccinations since 1966.

### 4.2 Vaccination Data

The number of smallpox vaccinations performed by the Ministry personnel from 1967 to 1977 and during the first six months of 1978 are shown in Tables 7 and 8.

Table 7

Smallpox Vaccinations Performed, 1967-1977

| Year | Primary | Revaccination | Total |
|---|---|---|---|
| 1967 | 6 194 | 129 076 | 135 270 |
| 1968 | 1 337 | 64 363 | 65 700 |
| 1969 | 4 766 | 78 507 | 83 273 |
| 1970 | 5 742 | 71 725 | 77 467 |
| 1971 | 4 766 | 85 828 | 90 594 |
| 1972 | 6 954 | 100 722 | 107 676 |
| 1973 | 6 510 | 83 956 | 90 466 |
| 1974 | 6 072 | 83 927 | 89 999 |
| 1975 | 8 595 | 95 970 | 104 565 |
| 1976 | 6 604 | 80 868 | 87 472 |
| 1977 | 7 708 | 94 574 | 102 282 |

Table 8

Smallpox Vaccinations Performed by Month, 1978

| Month | Primary Vaccination | Revaccination | Total |
|---|---|---|---|
| January | 557 | 2 069 | 2 626 |
| February | 607 | 2 854 | 3 461 |
| March | 707 | 3 490 | 4 197 |
| April | 741 | 2 851 | 3 592 |
| May | 880 | 4 184 | 5 064 |
| June | 717 | 5 475 | 6 192 |
| July | 669 | 4 640 | 5 309 |
| | 4 878 | 25 563 | 30 441 |

## 5. SPECIAL OPERATIONS CARRIED OUT FOR CERTIFICATION OF SMALLPOX ERADICATION JANUARY - JULY 1978

### 5.1 General

In order to satisfy the Global Commission members that the country is free of smallpox the Ministry of Health undertook to carry out a plan of action as specified by WHO, for a period of six months, and present the data required. The plan of action spelled out the following activities:

(1) Chickenpox surveillance

(a) This involved notification of all chickenpox cases with epidemiological details.

(b) Epidemiological investigations of chickenpox outbreaks if associated with death.

(c) Specimens for laboratory examination from the following cases:

chickenpox cases with no visible scar of smallpox vaccination;

serious chickenpox cases in adults;

chickenpox cases where rash is present in palm of hands and/or sole of feet;

chickenpox cases in an outbreak associated with death.

(2) Facial Scar Survey

Where indicated and specially in vulnerable areas, the facial scar survey is to be carried out preferably in children under 10 years of age. All children with at least five facial scars are to be investigated specially.

(3) The proper epidemiological investigation of any rumour of smallpox reported.

5.2 Notification of Chickenpox Cases

Although chickenpox has all along been a notifiable disease, cases have been specially reported in epidemiological detail since January 1978, as required. A total of 3 154 chickenpox cases were thus examined up to July 1978. These cases, by areas of occurrence and according to age, sex and previous smallpox vaccination status, are shown in Tables 9 and 10.

Table 9

Notified Chickenpox Cases by District and Month, January to July 1978

| Districts | January | February | March | April | May | June | July | Total |
|---|---|---|---|---|---|---|---|---|
| Manama | 13 | 166 | 216 | 227 | 337 | 156 | 67 | 1 182 |
| Muharraq | 4 | 67 | 101 | 174 | 241 | 76 | 48 | 711 |
| Jidhafs Region | 1 | 24 | 36 | 45 | 76 | 30 | 13 | 225 |
| Northern Region | 3 | 11 | 20 | 14 | 19 | 11 | 2 | 80 |
| Western Region | - | - | 5 | 3 | 6 | 1 | - | 15 |
| Middle Region | 41 | 61 | 55 | 38 | 19 | 16 | - | 230 |
| Sitra Region | - | 97 | 138 | 2 | 71 | 16 | 4 | 328 |
| Rifa'a Region | 1 | 30 | 78 | 67 | 85 | 33 | 2 | 296 |
| Not specified | 87 | - | - | - | - | - | - | 87 |
| Total | 150 | 456 | 649 | 570 | 854 | 339 | 136 | 3 154 |

Table 10

Notified Chickenpox Cases by Age, Sex and Vaccination Status[a]

1 January - 31 July 1978

| Age Group | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | Vaccinated | Un-Vaccinated | Total | Vaccinated | Un-Vaccinated | Total |
| 0 | 16 | 44 | 60 | 17 | 41 | 58 |
| 1 - 4 | 330 | 107 | 437 | 322 | 114 | 436 |
| 5 - 14 | 932 | 95 | 1 027 | 822 | 93 | 915 |
| 15 - 24 | 37 | 0 | 37 | 12 | 0 | 12 |
| 25+ | 68 | 1 | 69 | 16 | 0 | 16 |
| Total | 1 383 | 247 | 1 630 | 1 189 | 248 | 1 437 |

[a] Of total 3 154 cases reported, age and vaccination status was not specified for 44 males and 43 females.

5.3 Laboratory Data

Since January 1978, specimens from chickenpox cases of the specified categories were collected and sent to WHO for examination. During the six month period, 50 such specimens were examined. All were found to be smallpox negative.

The details of the specimens collected are shown in Tables 11 and 12 and Annex 2.

Table 11

Results of Laboratory Testing of Specimens Collected March - August 1978

| Region of Collection | Number of Specimens | Results - Number of Specimens Positive for: | |
|---|---|---|---|
| | | Herpes Varicella (by EM) | Variola Virus |
| Muharraq | 14 | 5 | 0 |
| Manama | 26 | 7 | 0 |
| Northern | 1 | 0 | 0 |
| Western | 1 | 1 | 0 |
| Central | 2 | 1 | 0 |
| Jidhafs | 3 | 1 | 0 |
| Sitra | 3 | 1 | 0 |
| Total | 50 | 16 | 0 |

Table 12

Distribution of Patients from whom Laboratory Specimens were collected by Age Group and Vaccination Status

| Age Group | Vaccinated | Unvaccinated | Total |
|---|---|---|---|
| 0 - 4 | 1 | 13 | 14 |
| 5 - 9 | 9 | 7 | 16 |
| 10 - 14 | 3 | - | 3 |
| 15+ | 16 | 1 | 17 |
| Total | 29 | 21 | 50 |

5.4 Facial Scar Survey

The School Health Physicians, the Health Centre doctors and the central team of sanitarians and vaccinators participated in this country-wide survey. Altogether 23 169 children under 10 years were examined. Seven children were said to have some scarring of the face. But epidemiological investigations revealed that six of them were recent chickenpox cases with minimal and superficial scarring, whereas the one with more than five deep pitted scars was confirmed to have had smallpox in 1969, when the child was 10 months old in Karachi (Pakistan). For details see Table 13.

Table 13

Smallpox Facial Pockmark Survey, January - July 1978

| Regions | Primary Student Population (6 to 12 years) 1976 - 1977 | No. of Children Examined Under 10 years | No. found with Facial Pockmarks [a] | No. with Smallpox Vaccination Scar |
|---|---|---|---|---|
| Manama | 14 211 | 8 472 | 1 [b] | 7 499 |
| Muharraq | 10 418 | 2 257 | 0 | 2 207 |
| Jidhafs Region | 4 563 | 2 294 | 0 | 1 835 |
| Northern Region | 2 830 | 5 605 | 0 | 5 181 |
| Western Region | 1 806 | 571 | 0 | 553 |
| Middle Region | 3 813 | 2 087 | 0 | 1 826 |
| Sitra Region | 2 301 | 156 | 0 | 151 |
| Rifa'a Region | 2 648 | 4 193 | 0 | 3 917 |
| Total | 42 590 | 25 635 | 1 | 23 169 |

[a] Seven children were initially reported as being pockmarked; however 6 were found to have the scars of chickenpox rather than true facial pockmarks of smallpox.

[b] Omani child who contracted smallpox in Pakistan in 1969 when he was 10 months old.

5.5 Rumour of Smallpox

During the period under survey, no case was reported or even suspected as smallpox.

6. CONCLUSION

The last known outbreak of smallpox in the country was in 1956/1957. A good surveillance system exists. All the population has easy access to medical units. Chickenpox has been a notifiable disease all along; there has not been even a suspect case of smallpox for years. This success was achieved mainly by mass vaccination of the population. It appears that smallpox has indeed been eradicated from the country.

ANNEX 1

COMMUNICABLE DISEASE REPORTING FORMS

## STATE OF BAHRAIN

### DIRECTORATE OF PUBLIC HEALTH

Details of all new cases of the following diseases should be reported within 24 hours of diagnosis, provisional or confirmed. In case the diagnosis is not certain, please mark?

In the case of the diseases underlined, immediate notification by telephone is required, to be followed up by the Notifiable Diseases Daily Return.

Diseases:

1. Anthrax
2. Brucellosis
3. Cerebro-spinal fever (Meningococcal infections)
4. CHOLERA
5. Diphtheria
6. Food Poisoning (Infection and intoxication) other than simple Gastro-Enteritis.
7. Infectious Hepatitis
8. Leprosy
9. Malaria
10. PLAGUE
11. Poliomeylitis Acute
12. Rabies
13. Relapsing Fever ..... (tick-borne / louse-borne)
14. SMALLPOX
15. Typhoid
16. Para-typhoid
17. Tetanus
18. Typhus ..... (louse-borne / flea-borne)
19. Other Rickettsial Diseases (please specify)
20. YELLOW FEVER
21. Tuberculosis - pulmonary
22. Tuberculosis - non-pulmonary

## STATE OF BAHRAIN

### DIRECTORATE OF PUBLIC HEALTH

### NOTIFIABLE DISEASES — DAILY RETURN

From : .....

Date of Return: .....

To: The Department of Communicable Diseases Control, Directorate of Public Health..

| Name | Age | Sex | Full Address Office / Residence | Diagnosis | Date of Onset |
|---|---|---|---|---|---|
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Please follow the instructions on the cover page in filling these returns.

ANNEX 1

# STATE OF BAHRAIN

**MINISTRY OF HEALTH**

**DIRECTORATE OF PUBLIC HEALTH**

NOTIFIABLE DISEASES — WEEKLY RETURN

Return for the week ending Saturday: _____

From: _____

To: The Department of Communicable Diseases Control, Directorate of Public Health

| Diseases | Cases | Deaths | Diseases | Cases | Deaths |
|---|---|---|---|---|---|
| Typhoid Fever | | | Yellow Fever | | |
| Paratyphoid Fevers | | | Viral Hepatitis | | |
| Other Salmonella Infections | | | Typhus | | |
| Cholera | | | Influenza | | |
| Brucellosis | | | Tuberculosis of respiratory system | | |
| Bacillary Dysentery | | | Tuberculosis, other forms | | |
| Amoebiasis | | | Syphilis & its sequelae All cases (new & old) | | |
| Scarlet Fever | | | | | |
| Streptococcal sore-throat | | | out of which new cases | | |
| Diphtheria | | | out of which Congenital Syphilis | | |
| Whooping Cough | | | Gonococcal infection | | |
| Meningococcal infections | | | Food poisoning (infection and intoxication) | | |
| Other Meningitis (Please specify) | | | | | |
| Plague | | | Erysipelas | | |
| Relapsing Fever | | | Leprosy — all cases: | | |
| Acute Poliomyelitis | | | out of which new cases only | | |
| out of which paralytic form | | | Tetanus | | |
| Acute infectious encephalitis | | | Anthrax | | |
| Smallpox | | | Trachoma (active) | | |
| Measles | | | Malaria B.T. | | |
| Rubella | | | Malaria M.T. | | |
| Chickenpox | | | Rheumatic fever | | |
| Mumps | | | | | |

| Disease | Name | Age | Sex | Full Address Office / Residence |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

Please follow the instructions on the cover page in filling these returns.

ANNEX 2

## RESULTS OF LABORATORY TESTING OF SPECIMENS FROM CHICKENPOX CASES

| SERIAL NO. | PATIENT | AGE | SEX | REGION | VACCINATION SCAR | LABORATORY RESULTS: HERPES VARICELLA (BY EM) | LABORATORY RESULTS: VARIOLA VIRUS ISOLATION |
|---|---|---|---|---|---|---|---|
| 1 | Aziz Hassan Salim | 16 yrs | M | Muharraq | Present | + | - |
| 2 | Ali Mattooq | 4 yrs | M | Sitra Region | Not Present | - | - |
| 3 | Fouzia Mattooq | 9 yrs | F | Sitra Region | Not Present | + | - |
| 4 | S.Moh'd S. Hassan | 3 yrs | M | Manama | Present | + | - |
| 5 | Hessa A. Wahab | 7 yrs | F | Manama | Not Present | - | - |
| 6 | Zakarya Adam Maki | 1 3/12yrs | M | Muharra | Not present | + | - |
| 7 | T.R. Rajendran | 23 yrs | M | Muharraq | Present | - | - |
| 8 | Aysha Ahmed Haji | 16 yrs | F | Manama | Present | - | - |
| 9 | Zainab A.Rasool Mokd | 1 yr | F | Middle Region | Not Present | - | - |
| 10 | Mariam Moh'd Radi | 5/12 months | F | Sitra Region | Not Present | - | - |
| 11 | M.F. Chacko | 24 yrs | M | Manama | Present | + | - |
| 12 | Ann Jones | 8 yrs | F | Manama | Present | - | - |
| 13 | Moh'd Ghuloom Abbas | 7 yrs | M | Manama | Not Present | - | - |
| 14 | K.M. Sathya | 27 yrs | M | Middle Region | Present | + | - |
| 15 | Zainab Behzad Ali | 2 yrs | F | Muharraq | Not Present | - | - |
| 16 | A. Rahim Moh'd Sharif | 5 yrs | M | Manama | Not Present | - | - |
| 17 | Ebrahim Moh'd Ali | 8 yrs | M | Jidhafs Region | Present | + | - |
| 18 | Nahid Yousif Kohaji | 13 yrs | F | Manama | Present | - | - |
| 19 | Ramiah Subbiah | 32 yrs | M | Manama | Present | - | - |
| 20 | Soaad Moh'd Salem | 6 yrs | F | Muharraq | Not Present | - | - |
| 21 | Fathia Hassan Isa | 5 yrs | F | Jidhafs Region | Not Present | - | - |
| 22 | Muna A.Nabi Ghazwan | 1½ yrs | F | Manama | Not Present | - | - |
| 23 | Najat Ebrahim | 14 yrs | F | Manama | Present | - | - |
| 24 | Asaad Ahmed Mohsin | 6 yrs | M | Manama | Present | + | - |
| 25 | Adnan Mahmood Mohsin | 9 yrs | M | Manama | Present | - | - |
| 26 | Delicia Gunawaredera | 29 yrs | M | Muharraq | Present | + | - |
| 27 | Khalid Saleh Jamal | 6 yrs | M | Manama | Present | - | - |
| 28 | Qadir Hassan Abdulla | 5/12 months | M | Manama | Not Present | - | - |
| 29 | Ghasan Ebrahim Ahmed | 7 yrs | M | Muharraq | Present | - | - |
| 30 | Ahlam Habib Saleh | 2½ yrs | F | Manama | Not Present | - | - |
| 31 | Azad Saeed Saif | 7 yrs | M | Manama | Present | - | - |
| 32 | Fathima S. Ameen | 12 yrs | F | Jidhafs Region | Present | - | - |
| 33 | Zahra Abdulla Ali | 2½ yrs | F | Northern Region | Not Present | - | - |
| 34 | T.E. Bert | 38 yrs | M | Manama | Present | - | - |
| 35 | P.C. Thomas | 44 yrs | M | Muharraq | Present | + | - |
| 36 | Wassem Ebrahim Abdulla | 7/12 mhs | M | Muharraq | Not Present | - | - |

ANNEX 2

RESULTS OF LABORATORY TESTING OF SPECIMENS FROM CHICKENPOX CASES (contd.)

| SERIAL NO. | PATIENT | AGE | SEX | REGION | VACCINATION SCAR | LABORATORY RESULTS: HERPES VARICELLA (BY EM) | LABORATORY RESULTS: VARIOLA VIRUS ISOLATION |
|---|---|---|---|---|---|---|---|
| 37 | Abou Balan | 38 yrs | M | Western Region | Present | + | - |
| 38 | Arif Mohd Yusuf | 5 yrs | M | Manama | Not Present | - | - |
| 39 | Saber Ali Taher | 8/12months | M | Manama | Not Present | - | - |
| 40 | Ebrahim Ali Ahmed | 15 yrs | M | Manama | Present | + | - |
| 41 | Nirmala Perira | 24 yrs | F | Manama | Present | + | - |
| 42 | Sadanandan Purushoman | 38 yrs | M | Manama | Present | + | - |
| 43 | Backet Harzouk | 4 yrs | M | Muharraq | Not Present | + | - |
| 44 | G.S. Rao | 38 yrs | M | Manama | Present | - | - |
| 45 | Appu Velayudhan | 38 yrs | M | Muharraq | Present | - | - |
| 46 | Bahya Yousif | 3/12 yrs | F | Manama | Not Present | - | - |
| 47 | Sultan Moh'd Hilal | 8 yrs | M | Muharraq | Present | - | - |
| 48 | Lebna A. Aziz | 6 yrs | F | Muharraq | Present | - | - |
| 49 | A.K. Kumar | 45 yrs | M | Manama | Present | + | - |
| 50 | Hassan Kalifa | 7/12 mohs | M | Muharraq | Not Present | - | - |