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**Regional Office
for the Eastern Mediterranean**



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pour la Méditerranée orientale**

REGIONAL MEETING ON LEPROSY

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**REVIEW OF THE LEPROSY PROBLEM
IN THE EASTERN MEDITERRANEAN REGION**

(SUDAN)

by

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- A. Leprosy is endemic in the Sudan.
- B. There are small foci in all the provinces, with high prevalence in the Western and Southern Regions.
- C. There are approximately 10 000 registered cases.
- D. The only available estimate done by WHO in 1966 was 100 000 cases.
- E. The total number of newly-registered cases are about 4 200.

F. Age distribution of registered cases :

<u>Age</u> :	<u>0 - 14 years</u>	<u>15 years +</u>
<u>Cases</u> :	230	3 970

This is the age distribution of newly-registered cases. No data are available for age distribution of total cases.

- G. There are leprosy settlements where the patients are partly cared for by the Government who provides some rations. There are 13 leprosy settlements. Patients are given treatment, and some land where they carry out some agricultural activities.

The number of ambulatory treated or outpatients in the country is 6 000, i.e. 60 per cent of all registered cases.

H. Classification of registered cases :

Lepromatous : 90
Tuberculoid : 839

The patients are classified into lepromatous or non-lepromatous.

The classification is based on clinical and bacteriological findings.

Where available, only simple bacteriologically positive/negative results are carried out.

H. (Cont'd)

Diagnostic tests used

	<u>Used by</u>	<u>Planned for use by</u>	<u>Not used or planned</u>
Skin smears	Doctors	All auxiliary staff	-
Nasal smears	Doctors	-	-
Skin biopsy	Doctors	MA or MO	-
Histamine test	Dermatologist	-	-
Sweating test	-	-	-
Lepromin test *	-	Leprologist	-

* Lepromin is being provided by the World Health Organization.

J. Standard treatment applied

- 100 mg DDS/day for LL and BL cases.
- 100 mg DDS/day for indeterminate cases.

Rifampicin and Lamprene are used on a limited scale where there is trained personnel available.

Usual treatment for erythema nodosum leprosum (ENL) reactions

Aspirin is the drug used together with any antibiotics for infections if any. Lamprene 300 mg / day and Prednisolone 30 mg / day are used only on a limited scale.

K. No prophylactic treatment is prescribed to close family contacts.

L. No special survey for leprosy among children was carried out.

M. There are no facilities for routine bacteriological examination.

The facilities and equipment required include trained personnel and microscopes.

- N. No trained staff are available. Training requirements are for microscopists.
- O. There is no need for research in all aspects of the programme.
- P. Field studies and research proposals are being prepared to solve the present problems.
- (1) There is a proposal for the establishment of dapsone resistance.
 - (2) An epidemiological study to complete an already started study in the Nuba mountains.
- Q. The policy and objectives of public health education are teaching of leprosy to the medical and paramedical personnel, who in turn would propagate their knowledge to the public; also through other communications media, such as television, etc..
- Q.1 There is no special legislation in force either for or against leprosy patients.
- Q.2 There is a strong feeling against leprosy patients among most of the population and some members of the medical profession. The situation could be changed by more knowledge about leprosy.
- R. The policy adopted by the Government is leprosy control through an integrated programme. There is a Directorate for leprosy at the Ministry of Health, but the execution of the policy is by provincial authorities.
- S. As leprosy control is intended to be carried out through existing health services by existing personnel, the Government is responsible for all personnel.

T. Type of training required and categories of staff

Priority in training will be given to tutors of the different institutions and the senior supervisory staff who will be responsible for outlining the plan and requirements for leprosy control.

U. Names, addresses, and contributions by foreign agencies involved in

leprosy control in the country :

1. World Health Organization, Regional Office for the Eastern Mediterranean,
P.O.Box 1517, Alexandria, Egypt

Contribution :

- Short-term consultants (when required)
- Fellowships
- Equipment
- Transport

2. German Leprosy Relief Association, 87, Wurzburg, West Germany

Contribution :

- Construction and equipment of the National Leprosy Training Centre.
- Running of the Centre for two years.
- Leprologist, matron, physiotherapist.
- Consultant leprologist (long-term) for leprosy in Southern Region.
- Co-ordination of the donations to the leprosy control activities from ILEP to the Southern Region.

3. The Catholic Church

Contribution :

- Building of some leprosy control units in the Southern Region
- Provision of leprosy trained sisters
- Provision of transport and equipment for running of two leprosy control units in the Southern Region.

U. Cont'd)

4. Swiss Mission, Leprosy Relief Work Emmaus, Switzerland, Spitalgasses 9, 3011 Bern.

Contribution :

- Running a weekly leprosy treatment clinic in Omdurman.
- The clinic is run by trained leprosy workers (expatriate).

5. Church Leprosy Relief, British Leprosy Relief Association, 50, Fitzroy Street, London W1P 6 AL, England

Contribution :

- Running of mobile leprosy treatment in Khartoum province under supervision of a trained leprosy supervisor (expatriate).
- Provision of a Landrover to work in Khartoum Leprosy Control Unit run by the Church Leprosy Relief Association.

7. Church of Christ, Nigeria, P.O.Box 643, JOS, Plateau State, Nigeria

Contribution :

- Running of a leprosy control unit in the Nuba mountains by two trained Nigerian workers.
- Provision of transport for the workers.

Syrian Arab Republic
Ministry of Health

DEPARTMENT OF COMMUNICABLE DISEASES
DIRECTOR ADNAN BUDEIR M.D , D.P.H.

LEPROSY IN SYRIA

Leprosy exists in Syria longtime ago , the medical literature mentions that the Omayad Khalifa " Al Walid Ibn Abdul Malik " had built a leprosarium in the city of Damascus about 710 a.c.

Local transmission of the disease is evident, cases of leprosy are reported from twelve of the fourteen provinces of Syria the only two provinces where leprosy seems to be absent are Damascus and Raqqa

The existing leprosarium near Damascus was established in 1936 a. c. , the majority of patients admitted are from Syria and Lebanon , some of them came from Palestine , Katar and Afghanistan

The total number of patients found in the leprosarium when preparing this study in January 1980, Was 168 (112 Syrians , 48 Lebanese , 4 Palestinians , 2 Katarians and 2 Afghans) .

In addition to the 112 Syrian patients who are in the leprosarium , 16 are regularly seen and treated on ambulatory basis by the same physician who care for the patients in the leprosarium, another 18 patients illicitly left the leprosarium during the last two years , since then , we do not have any control on them , except on one who attends the dispensary among the 16 above mentioned patients .

Then , the total number of registered Syrian patients of leprosy is 145 , out of them 112 are hospitalized . (77%) , 16 are ambulatory treated (11%) and 17 are out of our control (12%).

** Similar number of unknown cases is estimated to exist in the country , this estimation is based essentially on the fact that the majority of cases (75%) reach the leprosarium after one to six years of the appearance of the first symptoms of leprosy, few of these cases arrive every year to the leprosarium , the following table shows the number of cases from Syria admitted every year for the last ten years :*

** Distribution of these cases by provinces is as follows: Tartous 50, Sueda 22, Lattaquieh 13, Idleb 12, Aleppo 9, Hama 9, Der'a 8, Hassakeh 7, Homs 6, Deir El-Zor 5, Koneitra 4.*

Year	No of Cases	Year	No of Cases
1970	4	1975	3
1971	6	1976	4
1972	5	1977	4
1973	6	1978	1
1974	8	1979	2

All the cases actually in the leprosarium are above 15 years of age , therefore , if we consider the age of the patients when the first symptoms of the disease appeared on them , we found that 40% of them had less than 15 years old, while only 18% were diagnosed and admitted to the leprosarium at this age group

Distribution of cases by sex shows a significant difference between males (101 cases) and females (44 cases) .

The leprosarium was originally built as an hospital , with a capacity to accomodate 60 to 80 patients , after several years , and due to the clinical and social aspects of the disease, some marriages took place between patients , private houses were built within the hospital compound to accomodate the new families and the leprosarium became a small colony

Eighty children were borne within this colony during the last 25 years , some of these children became adults and got married outside the colony , we do not have evidence of leprosy appeared in anyone of these children , further investigations and follow up are needed in order to ascertain this remark .

The services provided in the leprosarium are limited due to lack of facilities and qualified personnel .

Bacteriological diagnosis is made in the central Laboratory of the Ministry of Health , for diagnostic purpose and for the evaluation of the effectiveness of the treatment .

Skin biopsy is performed on admission , patients are adressed to the dermatological department of the medical school for this end

Lepromin test is not currently performed , its performance depends on the availability of lepromin .

Lepromin H was procured from the Central Leprosy Institute in Moscow occasionally and through personal contact .

Clinical examination made by the physician(dermatologist) who prescribes the treatment and follow the cases , specific drug used are Diazone (Dapson) and Ciba 1906 . Lamprene is not yet tried in Syria because it is not available Minor Surgery is performed locally/auxiliary personnel or by surgeon called for in the neighbouring general hospital (Douma G.H.) the problem arises when big operation or dental care are needed by patient.

The Syrian registered cases are classified as follows :

Classification	Number of cases	Under regular treatment	Under irregular treatment
LL Lepromatous	101	79	22
BL BB Borderline	7	5	2
BT TT Tuberculoid	37	29	8
Total	145	113	32

Diagnosis of Leprosy is based on : (1) clinical examination, (2) Bacteriological examination of nasal smears, and (3) skin biopsy, lepromin test is practiced occasionally , The same methodologies are used for classification and follow - up of cases .

Active cases are treated by Diazone combined with Ciba 1906 for a period of three years , then Diazone is used alone , In case an erythema nodosum leprosum reaction appears , Diazone is stopped and Ciba 1906 is used associated with Analgine or Butalgin , corticotherapy , antihistamines and I.V. Calcium , three tablets of Ciba 1906 are given daily until the reaction disappears .

Preventive treatment is prescribed to contacts but not followed regularly , Diazone is usually prescribed for a period of six months to one year , dosage differs according to age and weight.

Bacteriological control is made from time to time of children borne in the leprosarium . the result is always negative , no proper surveys had been conducted for the detection of early cases of leprosy among *contacts*

Facilities for routine bacteriological examination , particularly for nasal smears , are available but need to be extended and developed within the leprosarium. Full laboratory equipment, necessary for this examinations and for other specific examinations, are needed to be established at the leprosarium level .

Training of personnel , in the techniques used in leprosy diagnosis , particularly in the technique of skin smears , is also needed

Notification of leprosy cases is compulsory according to the law . There is no other legislation in force for or against leprosy patients .

Research can be conducted in the field of epidemiology in the field of treatment .

Generally speaking , people have certain fear from leprosy as a terrible disease ; contagious , mutilating and fatal . This feeling is going diminishing since the establishment of the leprosarium and the good results obtained from the regular treatment of patients .

Still leprosy patients are not easily admitted in the society , they are not accepted treatment by the general medical profession , particularly when they need surgical or dental care .

General awarness of the people should be orientated towards the necessity of early detection of cases , to the efficacy of the treatment when regularly followed and to the possibility for the patient if early detected and adequaltely treated to recover and go back to his normal life .

There is no special control programme of leprosy in Syria, the leprosarium is under the general supervision of the Directorate of Communicable Diseases, while administratively it depends of the Directorate of Health of Damascus province.

The following staff members are assigned to work in the leprosarium :

- 1- *four medical doctors working on part time basis .
(one Dermatologist , one Generalist , one Surgeon and one Optalmologist) .*
- 2- *one administrative director .*
- 3- *two store-keepers and one assistant store keeper*
- 4- *one accountant .*
- 5- *one clerk .*
- 6- *one typist .*
- 7- *three nurses and one dispenser .*
- 8- *five janitors .*
- 9- *one driver .*
- 10- *one cook .*
- 11- *Three gate keeper* - 12- *One barber*

There is no external assistance to leprosy control in Syria . all expenses are encountered by the government .

Lebanease patients are admitted to the leprosarium according to a bilateral agreement .

Our objective is to reduce the incidence of leprosy in Syria , in order to eliminate this disease , this will be done gradually by means of :

- 1- *early detection of cases .*
- 2- *most accurate treatment .*
- 3- *well organized follow - up of new and old cases .*
- 4- *apply of preventive measures .*

In order to reach this objective , several steps have to be achieved :

- 1- *Establishment of leprosy Institute wich should comprise:*
 - 1.1- *out - patient clinic .*
 - 1.2- *Laboratories .*
 - 1.3- *In-patient leprosarium .*
 - 1.4- *Rehabilitation activities*
 - 1.5- *Nursery .*
- 2- *Training of technical personnel :*

2.1- *Training of Doctors :* one M.D. from the Centre has to receive adequate training in the management of leprosy in order to permit him to head the work in the Institute, In addition to that , one M.D. in each province has to receive short training in leprosy control in order to get familiar with this kind of activity and to supervise the activities of the auxiliaries .

2.2 - *Training of auxiliaries :*

2.2.1.- *Sanitarians or Public Health Nurses :*

one at least from each province has to receive appropriate training in order to permit him to undertake the following activities :

- *Epidemiological investigations of new cases as soon as they are confirmed .*
- *Health Education of the people about leprosy .*
- *Special surveys as requested .*

2.2.2. - *Laboratory technicians :* they have to receive appropriate training in order to permit them to perform all tests necessary for diagnosis , classification and follow - up of cases at the central level . One laboratory technician in each province has to be given short training in order to permit him to be able to undertake simple bacteriological examination of nasal smears .

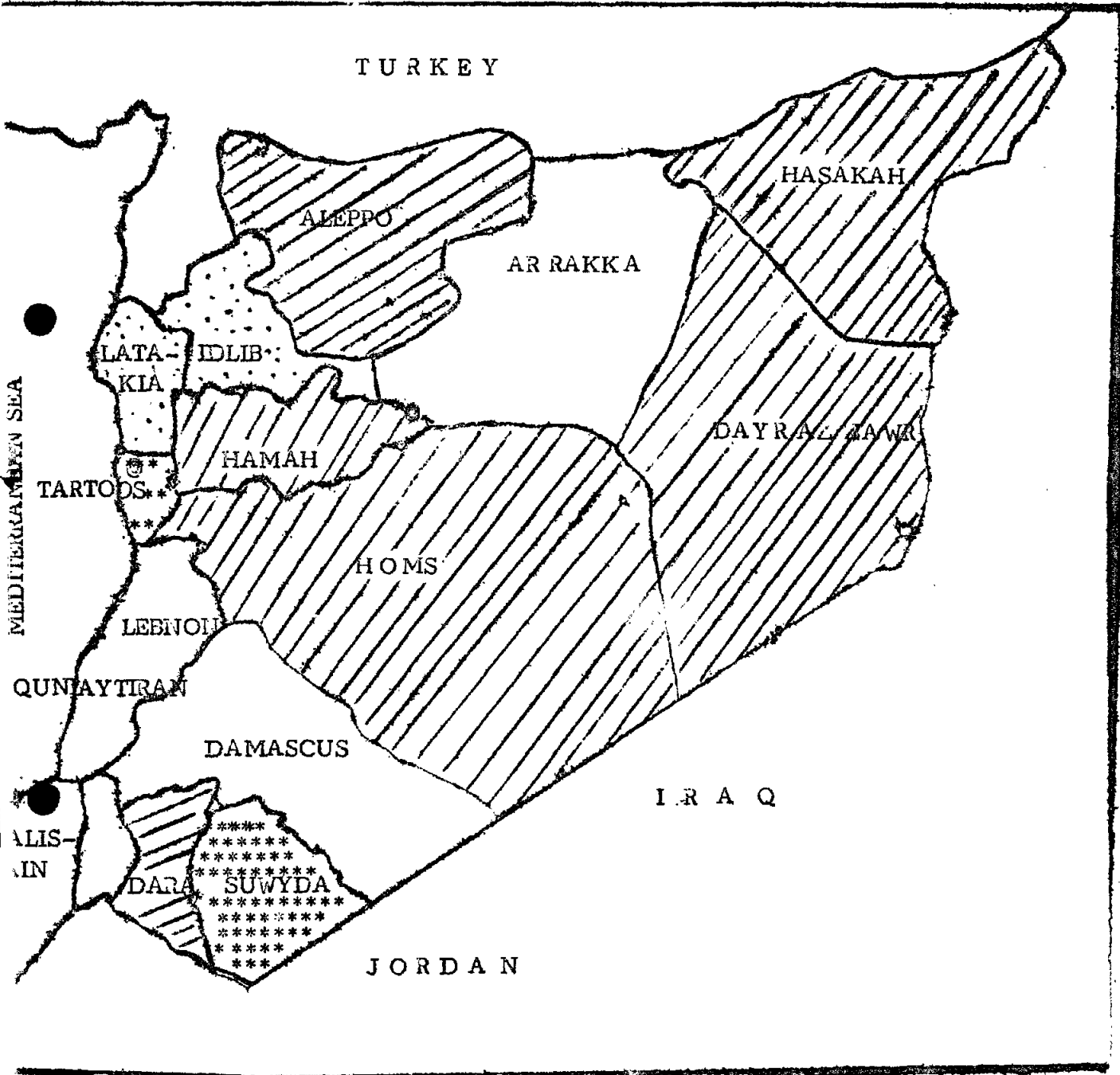
2.2.3. - *Auxiliaries for rehabilitation at the central level .*





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This report is prepared in collaboration with the Department of Epidemiology in the Ministry of Health, headed by Dr. A. Shaal, and with the Dermatologist in charge of leprosy in Syria, Dr. N. Al-DAKR. Reference is also made to the article prepared by Dr. H. SIAJ, Professor of Dermatology, Faculty of Medicine, Damascus University, and published in the proceedings of the 12th Science week (Damascus 27 Nov.-/ Dec.1971)

SYRIAN ARAB REPUBLIC

DISTRIBUTION OF LEPROSY CASES BY PROVINCES



-  Provinces where more than 20 cases of leprosy exist
-  Provinces where more than 10 cases of leprosy exist
-  Provinces where less than 10 cases of leprosy exist
-  Provinces where no case of leprosy exists

A STUDY OF LEPROSY CASES
IN
YEMEN ARAB REPUBLIC

By
Division of Epidemiology
Directorate of Preventive Medicine
Ministry of Health
Yemen Arab Republic

A STUDY OF LEPROSY CASES

IN

YEMEN ARAB REPUBLIC

The Yemen Arab Republic is located in the southwest corner of the Arabian Peninsula. It is bordered by the People's Democratic Republic of Yemen in the south, the Red Sea in the west, and Saudi Arabia in the north. The eastern boundary within the Arabian desert, Rub Al Khali, is not clearly defined.

The country extends over an area of approximately 200,000 square kilometers and can be divided into three topographical regions. The coastal lowlands, known as the Tihama, stretch the length of the country bordering the Red Sea. This hot, sandy, semi-desert plain is 30 to 60 kilometers wide and the elevation ranges from sea level to about 200 meters. To the east of the Tihama and extending from the People's Democratic Republic of Yemen in the south to Saudi Arabia in the north is the highlands. (The highlands are usually divided into two separate regions: the foothills and middle heights at altitudes of 200 meters to 1500 meters, and the central highlands ranging from 1500 meters to roughly 3000 meters. In this report these two regions have been combined.) From the highlands, the terrain slopes eastward forming the eastern semi-desert plateau which terminates in Rub Al Khali at an altitude of 1000 meters.

The Yemen Arab Republic is divided administratively into 10 governorates each of which are sub-divided into quadas. There are a total of 40 quadas in the country. Based on population projections, the mid-1979 population

of YAR is estimated to be 6.4 million, of which approximately 1.2 million reside abroad. Of the remaining 5.2 million inhabitants, 90% live in rural areas and 73% of the population is engaged in agriculture. YAR has a population density of 35 persons per square kilometer, the southern highlands being most densely settled.

The City of Light, Yemen's colony for leprosy patients, is located three kilometers south of Taiz and includes a leprosarium as well as residential quarters. In 1974 the Missionaries of Charity came to the City of Light to begin regular treatment for those suffering from leprosy.

The leprosarium has a total of 145 beds available to the more serious cases. Medicines, food, water, and supplies are jointly provided by the Ministry of Health and the Missionaries of Charity. At present five sisters manage the leprosarium with the assistance of a staff of 14, all of whom are leprosy patients. In addition, a Peace Corps Volunteer nurse has been employed and a Swedish doctor is on call for emergencies.

Minor surgery is performed in the dispensary of the leprosarium while cases for major surgery are referred to either the hospital in Jibla or the one in Taiz. However, it has been said that the hospitals do not encourage surgery for leprosy victims. Bacteriological tests are not conducted at the leprosarium on a regular basis, however they are carried out for diagnostic purposes. There is only limited physiotherapy treatment.

The village itself is comprised of family dwellings as well as individual quarters. About 75 families reside in the City of Light with their family members who are being treated for leprosy. The combined population of the leprosarium and the village is estimated at 450 of which only 240 are suffering from leprosy. Approximately an equal

number of patients receive treatment at the leprosarium dispensary but do not reside in the City of Light.

There is a primary school in the City of Light which provides education for children from kindergarten to class 4. Approximately 100 students are enrolled and there are 2 to 3 teachers provided by the Ministry of Education. If a child shows no deformities he may be sent to school for classes above grade 4 in Taiz.

In May 1979 leprosy patient data was requested and received by the Ministry of Health in Sana'a from the leprosarium. The information included the patient's name, age, sex, village, diagnosis, and duration of treatment. Following is a report based on that data.

Data was available on 240 cases of which 189 were male, or 78.7% and 51 were female, or 21.3%. Table 1 shows patient distribution according to the age group and sex. It can be seen that the largest number of patients were 35 to 39 years of age represented by 30 males, or 12.5% of all patients, and 11 females, or 4.6% of all patients, yielding a sum of 41 patients, or 17.1% of all cases. 15.9% of all male cases and 21.6% of all female cases were in this age group. An equal number of females (11) were in the age bracket of 40 to 44 years which also accounts for 21.6% of all female cases. The age group with the second highest frequency for males is 55 to 59 years with 21 cases or 11.1% of all male patients. 9% of all males were under the age of 20 years while no female cases were recorded under 20 years of age. Similarly, there were no female patients 60 years or older but 10.1% of all male patients were of this age. 70 of the 189 male patients, or 37%, were 45 years of age or older while only 12 of the 51 female cases, or 23.5%, were in the same category. 58.9% of all females were 30 years of age to less than 45 years of age but only 35.5% of all males

**TABLE 1: AGE DISTRIBUTION OF PATIENTS IN CITY OF LIGHT
BY SEX. MAY 1979.**

AGE (Years)	MALES	% OF TOTAL MALES	% OF AGE GROUP	% OF TOTAL CASES	FEMALES	% OF TOTAL FEMALES	% OF AGE GROUP	% OF TOTAL CASES	TOTAL	% OF TOTAL CASES
0-4	0	0		0	0	0		0	0	0
5-9	0	0		0	0	0		0	0	0
10-14	8	4.2	100	3.3	0	0	0	0	8	3.3
15-19	9	4.8	100	3.75	0	0	0	0	9	3.75
20-24	15	7.9	88.2	6.25	2	3.9	11.8	.8	17	7.1
25-29	20	10.6	74.1	8.3	7	13.7	25.9	2.9	27	11.25
30-34	19	10.1	70.4	7.9	8	15.7	29.6	3.3	27	11.25
35-39	30	15.9	73.2	12.5	11	21.6	26.8	4.6	41	17.1
40-44	18	9.5	62.1	7.5	11	21.6	37.9	4.6	29	12.1
45-49	18	9.5	81.8	7.5	4	7.8	18.2	1.7	22	9.2
50-54	12	6.3	80	5	3	5.9	20	1.3	15	6.25
55-59	21	11.1	80.8	8.8	5	9.8	19.2	2.1	26	10.8
60+	19	10.1	100	7.9	0	0	0	0	19	7.9
TOTAL	189	100		78.7	51	100		21.3	240	100

fell into the same age group. Frequency distribution of cases by age and sex is also represented in Figures 1 and 2.

The cumulated frequency of case distribution by age and sex is illustrated in Table 2 and Figure 3. 25% of all patients were under the age of 30 years but over the age of 10 years, 25% were 30 to less than 39 years of age, 25% were 39 to less than 50 years of age, and 25% were 50 to less than 90 years of age. Similarly, 25% of all male cases were under 29 years of age but over 10 years of age, 25% were 29 to less than 39 years of age, 25% were 39 to less than 52.5 years of age, and 25% were 52.5 to less than 90 years of age. Female cases were divided as follows: 25% were less than 33 years of age but greater than an age of 20 years; 25% were 33 years to less than 39 years of age; 25% were 39 years to less than 41 years; and 25% were 41 to less than 60 years of age.

The percentage of total cases over the age of 50 years

TABLE 2: CUMULATED FREQUENCY OF PATIENTS IN CITY OF LIGHT
BY AGE AND SEX. MAY 1979.

AGE (Years) LESS THAN	CUMUIATED FREQUENCY		
	MALE	FEMALE	TOTAL
5	0	0	0
10	0	0	0
15	8	0	8
20	17	0	17
25	32	2	34
30	52	9	61
35	71	17	88
40	101	28	129
45	119	39	158
50	137	43	180
55	149	46	195
60	170	51	221
65	181	51	232
70	184	51	235
75	187	51	238
80	188	51	239
85	188	51	239
90	189	51	240

(25%) may be noteworthy. The ratio of number of leprosy cases 50 years of age and over per 100,000 population is 10:100,000. The ratio of number of leprosy cases 10 years to less than 50 years of age per 100,000 population is 7:100,000. A higher incidence of leprosy in the 50 year and over age bracket may indicate one of two things: 1) leprosy in YAR begins at a late age; or 2) leprosy in people of the lower age groups is undiagnosed and therefore untreated. The latter is a more probable rationale in that there is less tendency for physical deformities in the early stages of leprosy. If deformities are not present people would not necessarily realize that they may be leprosy victims and therefore would not seek medical advise.

Table 3 and Figures 4, 5, and 6 describe the geographical distribution of leprosy patients in the City of Light. Table 3 tabulates the number and percentage of males and females

TABLE 3: DISTRIBUTION OF PATIENTS IN CITY OF LIGHT BY GOVERNORATE, MAY 1979.

GOVERNORATE	MALES	% OF TOTAL MALES	% OF GOVERNORATE	% OF TOTAL CASES	FEMALES	% OF TOTAL FEMALES	% OF GOVERNORATE	% OF TOTAL CASES	TOTAL	% OF TOTAL CASES
Ibb	54	28.6	79.4	22.5	14	27.45	20.6	5.8	68	28.3
Taiz	33	17.5	70.2	13.8	14	27.45	29.8	5.8	47	19.6
Dhamar	27	14.3	71.1	11.2	11	21.6	28.9	4.6	38	15.8
Sana'a	20	10.6	74.1	8.3	7	13.7	25.9	2.9	27	11.2
Hodeidah	18	9.5	94.7	7.5	1	2	5.3	.4	19	7.9
Hajja	15	7.9	100	6.2	0	0	0	0	15	6.2
Mahweet	12	6.35	85.7	5	2	3.9	14.3	.9	14	5.9
Sa'ada	5	2.65	71.4	2.1	2	3.9	28.6	.9	7	3
*PDRY	4	2.1	100	1.7	0	0	0	0	4	1.7
Beida	1	.5	100	.4	0	0	0	0	1	.4
Mareb	0	0		0	0	0		0	0	0
TOTAL	189	100		78.7	51	100		21.3	240	100

* People's Democratic Republic of Yemen is not a Governorate of YAR but another country.

from each governorate. Figure 4 illustrates the number of cases and the percentage of the total cases in each governorate. Figure 5 clarifies, by dot representation, the apportionment of patients in the City of Light. From the data collected only 216 of the total 240 cases, or 90%, could be identified by quada, or district, and is depicted in Figure 6.

The highest percentage of leprosy patients was from Ibb governorate with a 28.3% representation as seen in Table 3 and Figure 4. Female cases from Ibb and Taiz governorates had the greatest frequency, each having 14 cases, or 27.45% of the total number of female patients. The greatest number of males were from Ibb governorate with 54, or 28.6% of the 189 cases. There were no reported female cases from Hajja or Beida governorates nor from PDRY. This cannot be considered unusual in view of the low percentage of female patients. In addition no cases, male or female, were recorded from Mareb governorate which could merely be a consequence of geographical and political isolation. The number of males from each governorate far exceed the number of females from the same governorate, although it cannot be concluded that leprosy is more common in males than in females since this may be a result of cultural practices regarding women.

A further distribution of leprosy cases according to quada is portrayed in Figure 6. Ibb quada with a total of 25 cases, had the highest frequency of patients from any one quada. It may be observed from Figures 5 and 6 that the greatest number of leprosy cases originate in the quadas in close proximity to the City of Light. It cannot be concluded that leprosy is more prevalent in this area due to the limited data used in this report.

Figure 7 divides the leprosy patients according to geographical region and shows that the majority of cases come from the highlands.

Finally, the number of cases per 100,000 population is

exhibited in Figure 8. The southern highland region, comprised of Dhamar, Ibb, and Taiz has the greatest concentration of patients.

Again, until further studies are carried out it should not be inferred from Figures 7 and 8 that leprosy occurs more in inhabitants of this geographical region.

Diagnosis was divided into four leprosy types: lepromatous leprosy (L); tuberculoid leprosy (T); borderline lepromatous leprosy (BL); and borderline tuberculoid leprosy (BT). The distribution by leprosy types of the 240 cases in the City of Light is represented in Table 4 and Figure 9. Figure 9 shows that the distribution between types was almost equal, with lepromatous leprosy accounting for the highest percentage of cases at 28.75% and borderline tuberculoid leprosy had the lowest frequency at 22.5%. Sex distribution between leprosy types is tabulated in Table 4. Here it can be seen that 53.9% of all male patients had lepromatous leprosy or borderline lepromatous leprosy as against 41.2% in females. 58.8% of

TABLE 4: DISTRIBUTION OF PATIENTS IN CITY OF LIGHT ACCORDING TO LEPROSY TYPE. MAY 1979.

TYPE	MALE	% OF TOTAL MALES	FEMALE	% OF TOTAL FEMALES	TOTAL	% OF TOTAL CASES
L	56	29.6	13	25.5	69	28.75
T	50	26.5	13	25.5	63	26.25
BL	46	24.3	8	15.7	54	22.5
BT	37	19.6	17	33.3	54	22.5
TOTAL	189	100	51	100	240	100

L = lepromatous leprosy
T = tuberculoid leprosy

BL = borderline lepromatous leprosy
BT = borderline tuberculoid leprosy

all female cases were tuberculoid leprosy or borderline tuberculoid leprosy as against 46.1% in males.

65.4%, or 157 of the total 240 leprosy cases displayed

one or more deformities resulting from the disease. 10.4% had a deformity of one extremity and the remaining 55% had deformities of more than one extremity. The distribution of deformities and a deformity key is shown in Figure 10. Deformity type P2, defined as deformity of more than one extremity, accounted for 63.7% of the total 157 deformity cases. Approximately 84% of all disfigured patients displayed a deformity of more than one extremity, including eye deformity (or were categorized in type P1-2, P2, P2-3, or P3). Only 6.4% of the 157 cases were of type P3, having a deformity of more than one extremity as well as an eye deformity.

Table 5 shows that tuberculoid leprosy and borderline tuberculoid leprosy cases had a higher incidence of deformities in comparison to lepromatous leprosy and borderline lepromatous leprosy cases.

TABLE 5: NUMBER AND PERCENTAGE OF PATIENTS DISPLAYING DEFORMITIES ACCORDING TO LEPROSY TYPE. CITY OF LIGHT. MAY 1979.

TYPE	TOTAL CASES	TOTAL WITH DEFORMITY	% WITH DEFORMITY
L	69	37	53.6
T	63	49	77.8
BL	54	28	51.6
BT	54	43	79.6
TOTAL	240	157	65.4

The presence of a deformity in relation to age is listed in Table 6. The percentage of deformities in the age groups 25 years and above is high and nearly the same, ranging from 61% in the 35 to 39 year category to 86.7% in the 50 to 54 year age bracket. In comparison those patients under the age of 25 show a lower percentage of deformities.

The percentage of deformities according to duration of treatment is charted in Table 7. The percentage of disfigured

TABLE 6: NUMBER AND PERCENTAGE OF PATIENTS DISPLAYING DEFORMITIES ACCORDING TO AGE GROUP. CITY OF LIGHT. MAY 1979.

AGE GROUP	TOTAL CASES	TOTAL WITH DEFORMITY	% WITH DEFORMITY
0-4	0		
5-9	0		
10-14	8	2	25
15-19	9	3	33.3
20-24	17	8	47.1
25-29	27	18	66.6
30-34	27	19	70.4
35-39	41	25	61
40-44	29	21	72.4
45-49	22	17	77.3
50-54	15	13	86.7
55-59	26	19	73.1
60+	19	12	63.2
TOTAL	240	157	

TABLE 7: NUMBER AND PERCENTAGE OF PATIENTS DISPLAYING DEFORMITIES ACCORDING TO DURATION OF TREATMENT. CITY OF LIGHT. MAY 1979.

DURATION OF TREATMENT (in years)	TOTAL CASES	TOTAL WITH DEFORMITY	% WITH DEFORMITY
0-4	86	47	54.7
5-9	68	39	57.4
10-14	28	21	75
15-19	21	19	90.5
20-24	10	8	80
25-29	20	17	85
30-34	6	5	83.3
35-39	0	0	0
40-44	1	1	100
TOTAL	240	157	

patients is high in every category of duration of treatment which may indicate that the deformity was present when treatment was initiated. There was no information available as to

whether deformities were present at beginning of treatment therefore the effectiveness of treatment in relation to deformities can not be determined.

SUMMARY

1. Of the total 240 leprosy cases, 78.7% (189) were male and 21.3% (51) were female.
2. The largest number of patients were 35 to 39 years of age. 41 patients, or 17.1% of all cases, were in this age group.
3. 9% of all males were under the age of 20 years while no female cases were recorded under 20 years of age. Similarly, there were no female patients 60 years or older, but 10.1% of all male patients were of this age.
4. There is a higher incidence of leprosy per 100,000 population in the 50 year and over age groups as compared to the 10 to less than 50 year age groups, the ratios being 10:100,000 and 7:100,000 respectively.
5. The highest percentage of leprosy patients was from Ibb governorate with a representation of 28.3% of the total cases.
6. Ibb quada, with a total of 25 cases, had the highest frequency of patients from any one quada.
7. The greatest number of leprosy cases originate in the quadas in close proximity to the City of Light.
8. The greatest concentration of patients was found to be in the southern highland region.
9. The distribution of the 240 cases was found to be nearly equal between the four leprosy types.
10. There was a higher incidence of lepromatous leprosy and borderline lepromatous leprosy in males (53.9%) than in females (41.2%); a higher incidence of tuberculoid leprosy and borderline tuberculoid leprosy was found in females (58.8%) than in males (46.1%).
11. 65.4% of all leprosy patients displayed one or more

deformities.

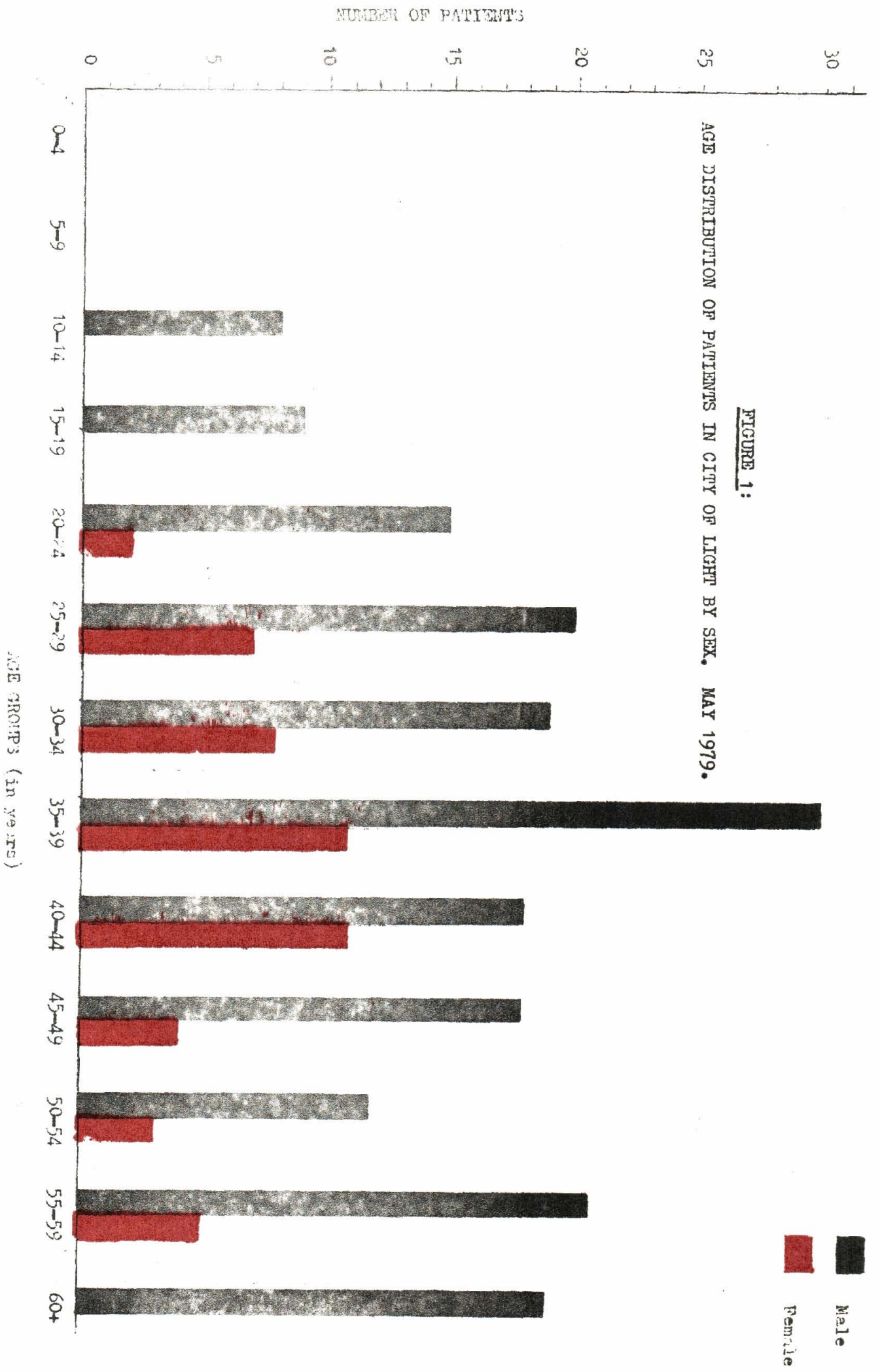
12. Tuberculoid leprosy and borderline tuberculoid leprosy cases had a higher incidence of deformities in comparison to lepromatous leprosy and borderline lepromatous leprosy cases.

13. The percentage of deformities in patients in the age groups 25 years and above is high in comparison to those in the less than 25 year age groups.

14. The percentage of deformities is high in every category of duration of treatment.

ACKNOWLEDGEMENTS

The study was conducted and the report prepared by Ms. Janice E. Hagginbothom under the supervision of the WHO Epidemiologist and the Director of Preventive Health Services. Special thanks are extended to the Missionaries of Charity in the City of Light for their cooperation in providing the data.



PERCENTAGE

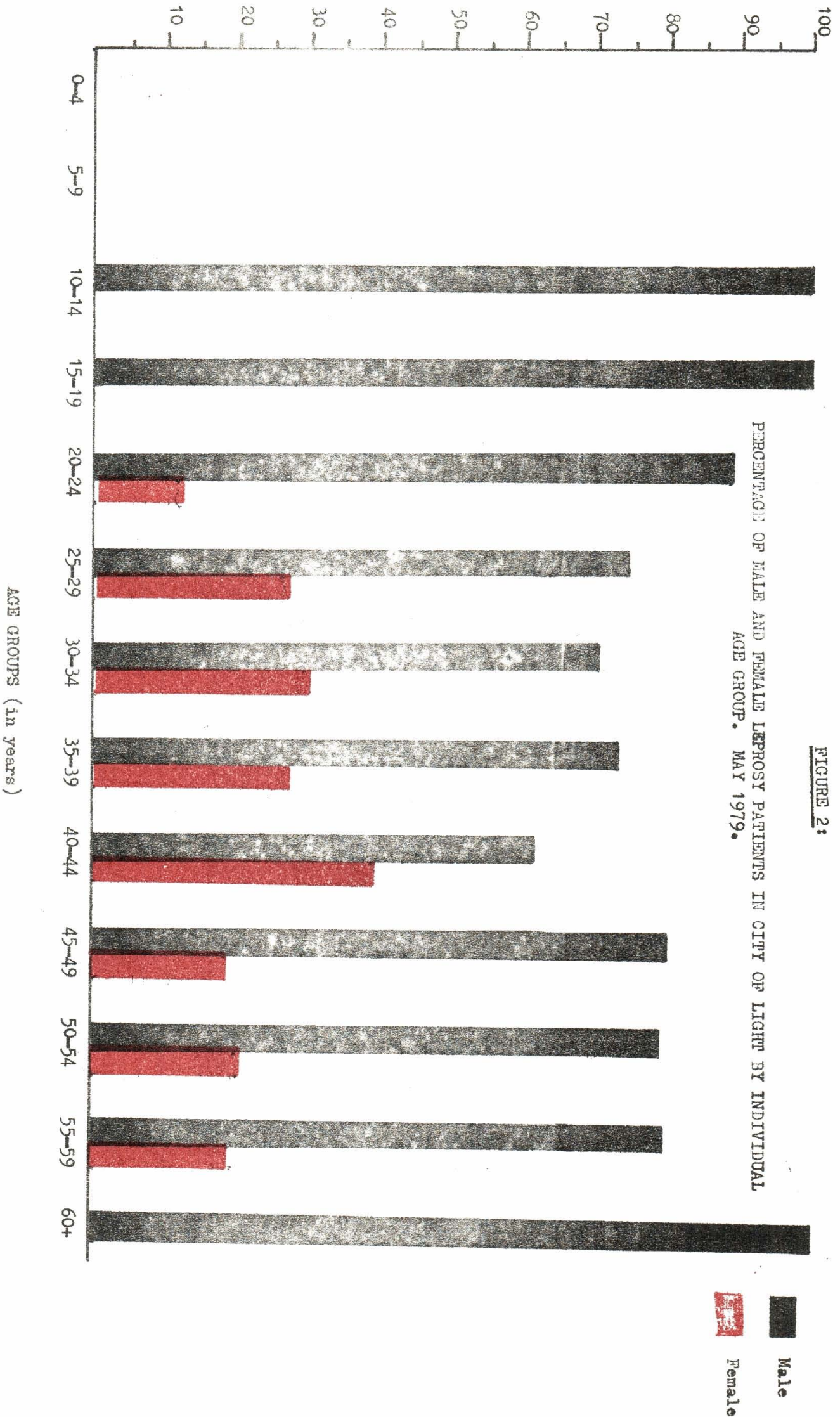
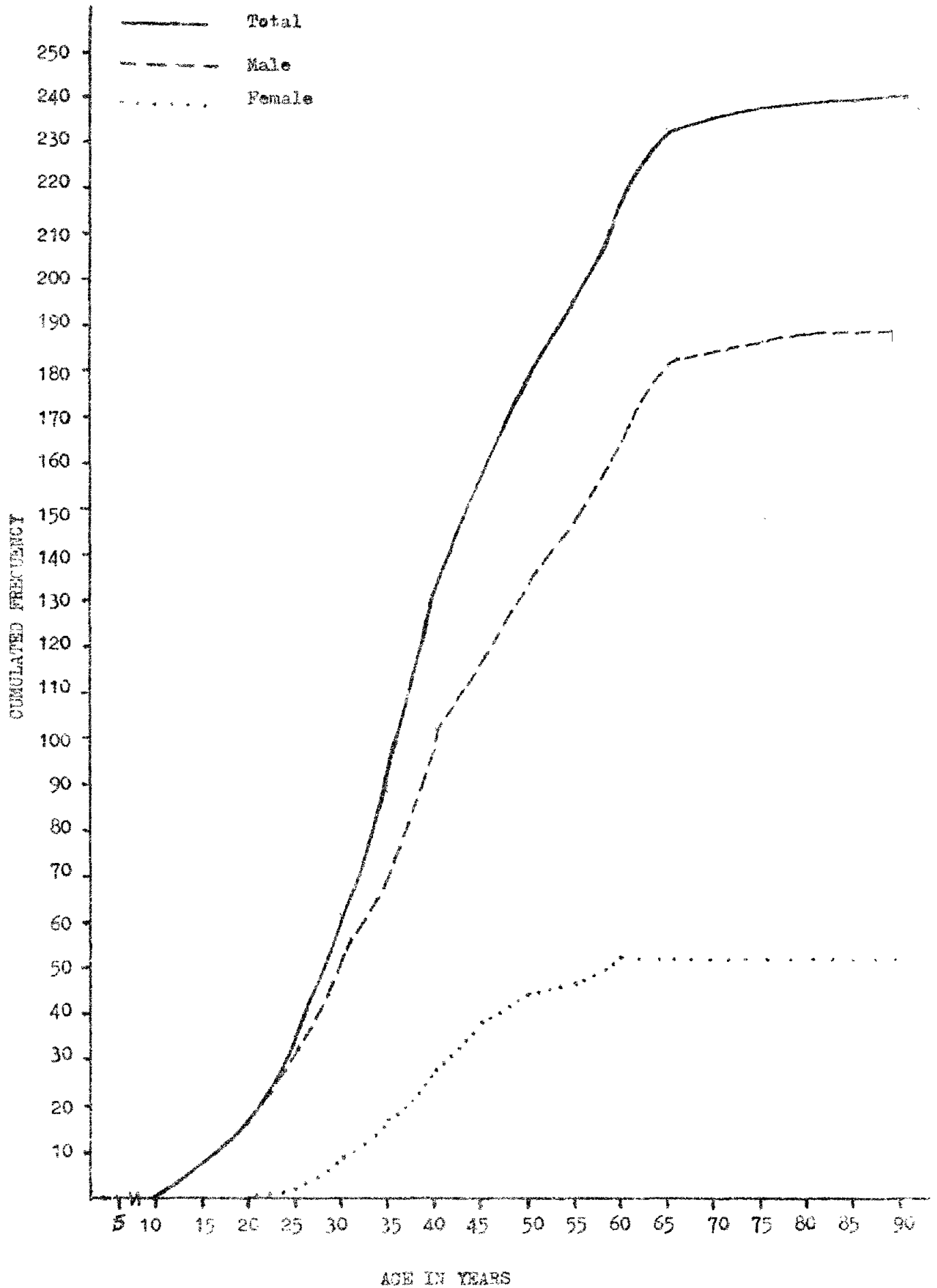


FIGURE 3: CUMULATED DISTRIBUTION OF PATIENTS IN CITY OF LIGHT BY AGE AND SEX.
MAY 1979.



SAUDI ARABIA

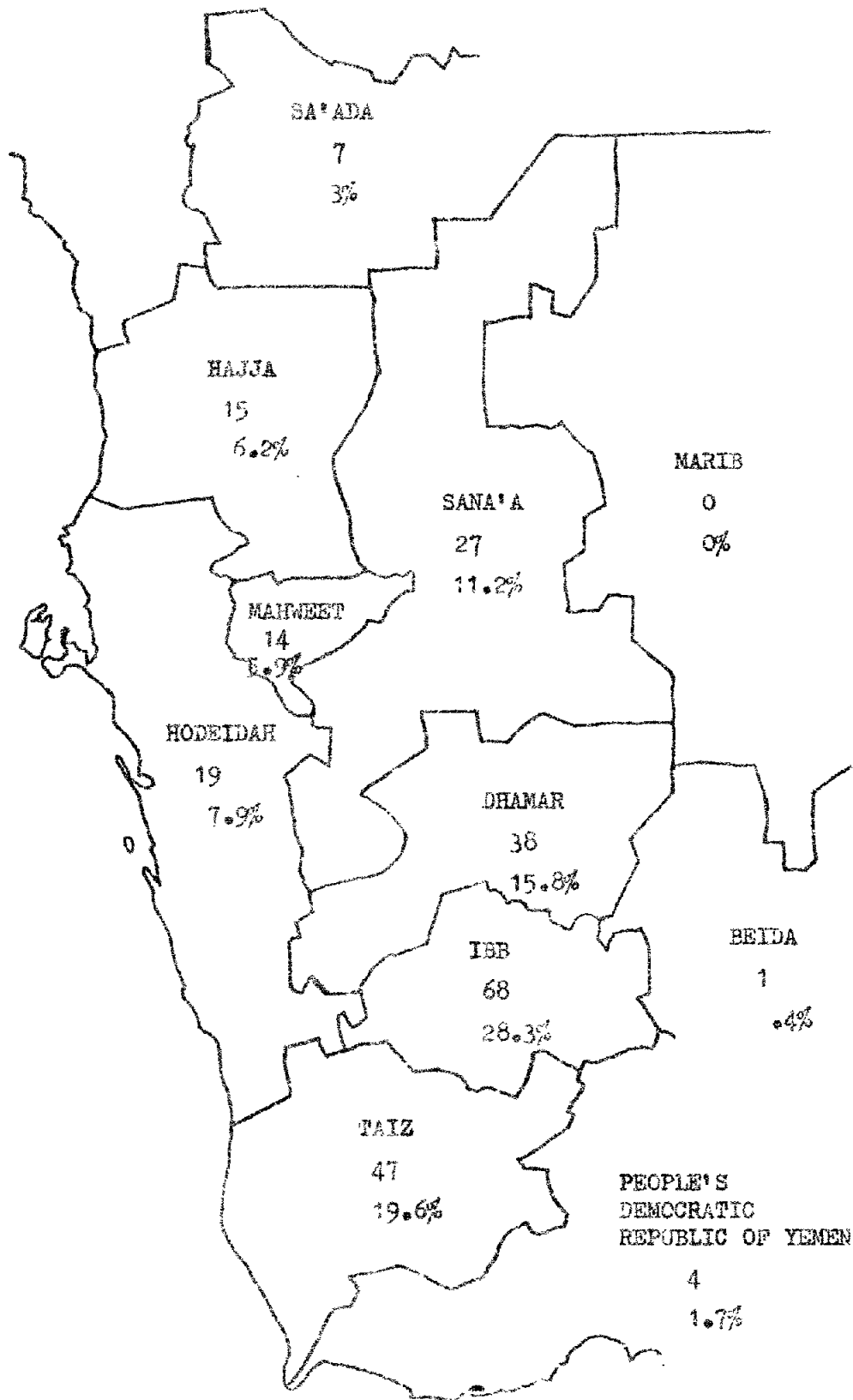


FIGURE 4: NUMBER OF LEPROSY CASES AND PERCENTAGE OF TOTAL CASES IN CITY OF LIGHT BY GOVERNORATE, MAY 1979.

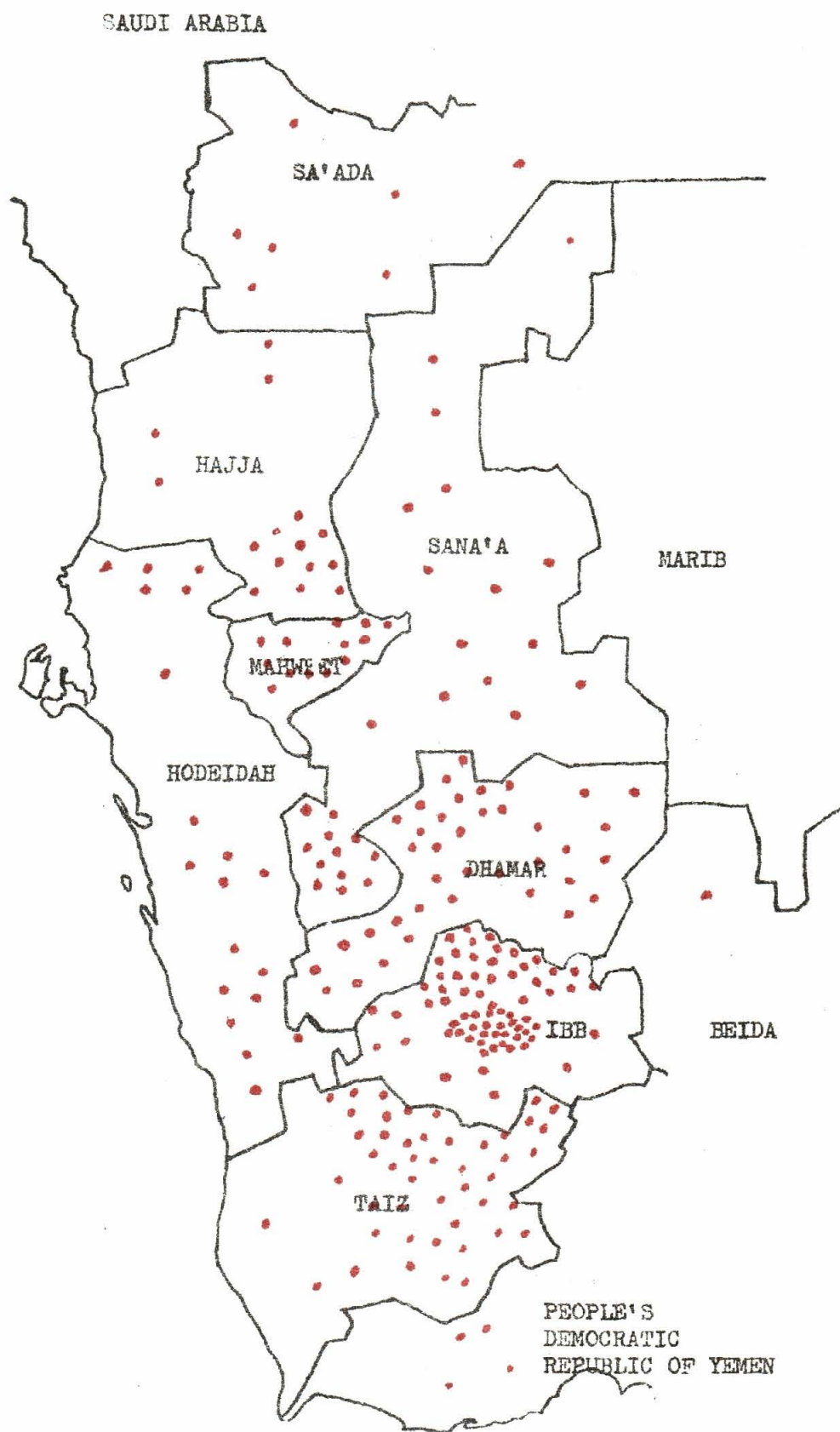


FIGURE 5: DISTRIBUTION OF LEPROSY CASES IN CITY OF LIGHT BY GOVERNORATE. Each dot represents one case of leprosy. MAY 1979.

SAUDI ARABIA

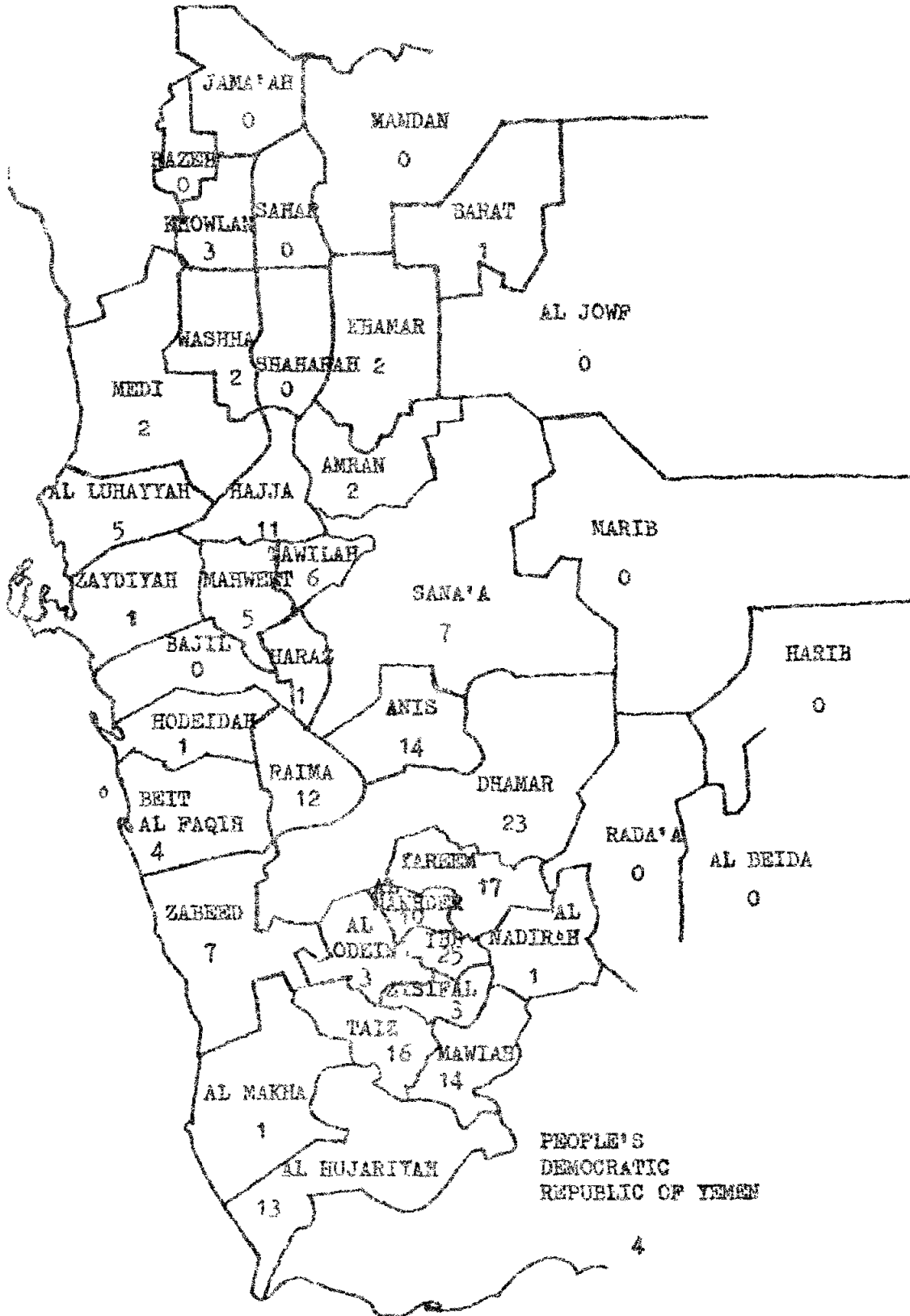


FIGURE 6: DISTRIBUTION OF LEPROSY CASES IN CITY OF LIGHT BY QUADA, MAY 1970. 24 cases could not be assigned to a quada due to incomplete information.

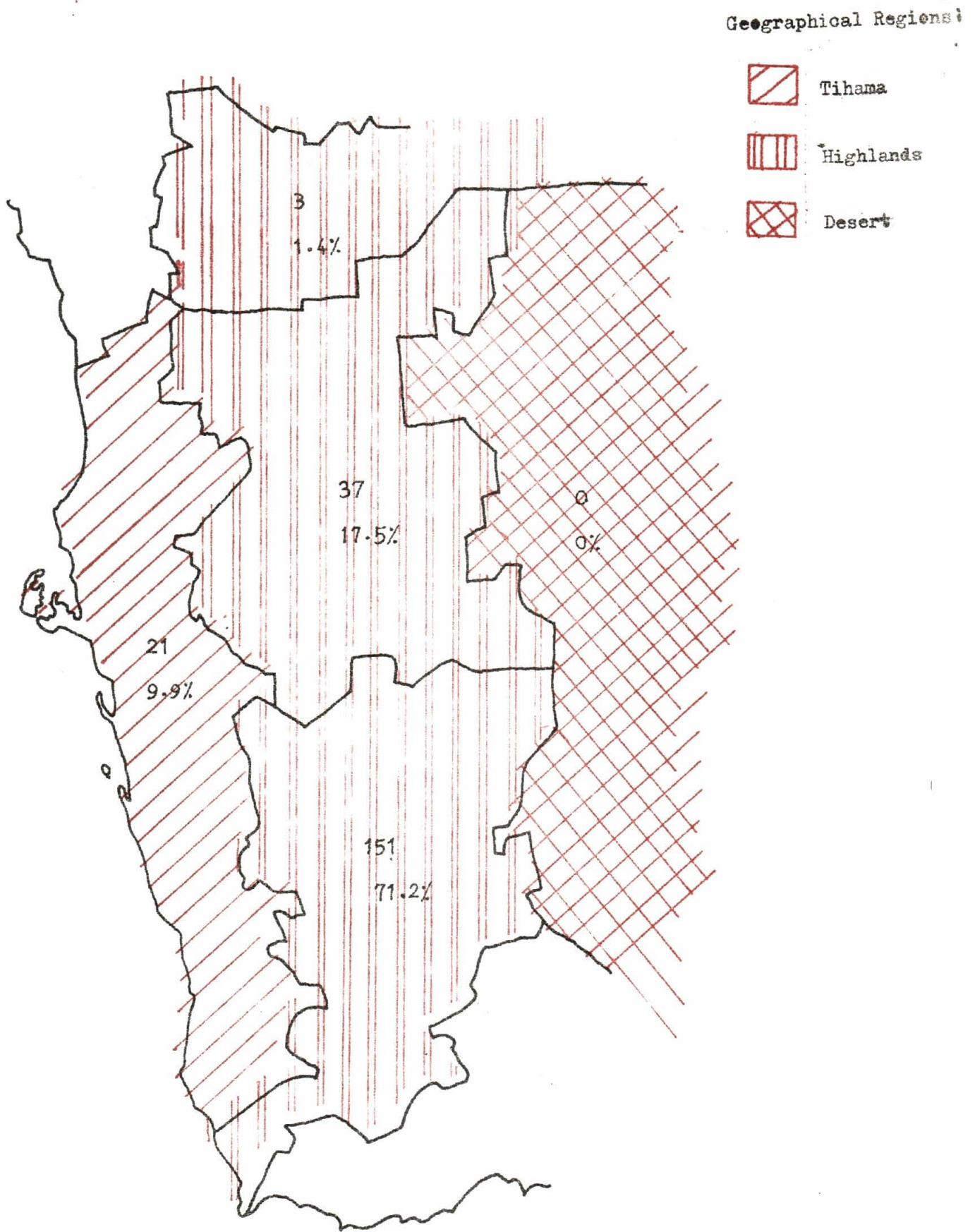


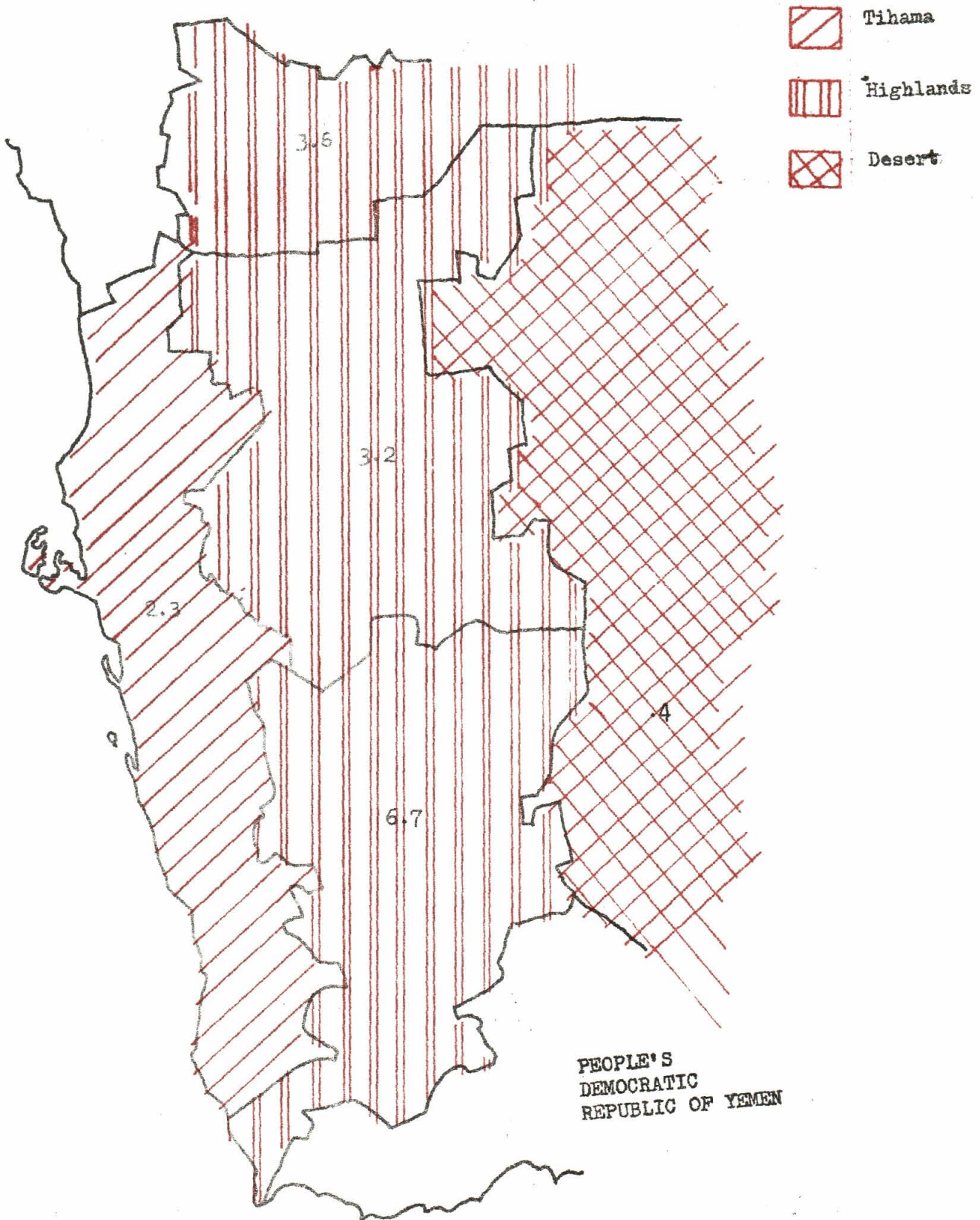
FIGURE 7: NUMBER OF LEPROSY CASES AND PERCENTAGE OF TOTAL NUMBER OF CASES IN CITY OF LIGHT BY GEOGRAPHICAL REGION.

MAY 1979.

4 cases from PDRY have been omitted and an additional 24 cases could not be included due to insufficient data.

SAUDI ARABIA

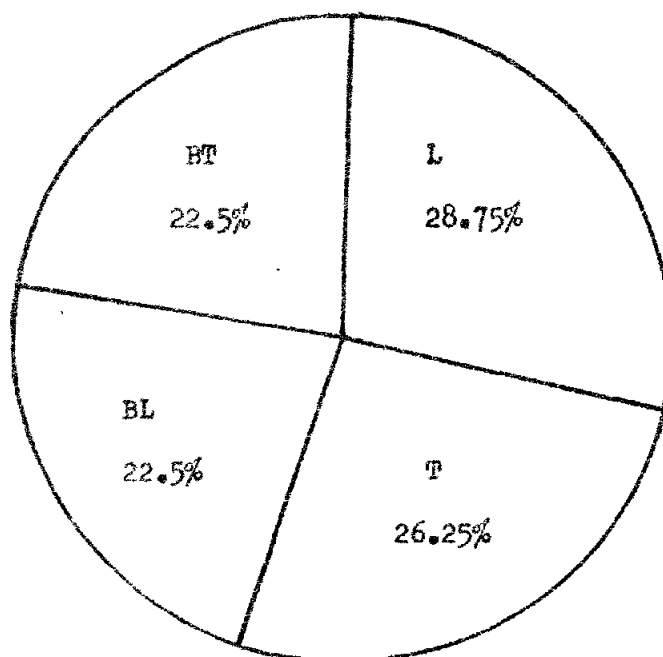
Geographical Regions



PEOPLE'S
DEMOCRATIC
REPUBLIC OF YEMEN

FIGURE 8: NUMBER OF LEPROSY CASES IN CITY OF LIGHT PER 100,000 POPULATION BY GEOGRAPHICAL REGION. MAY 1979
4 cases from PDRY have been omitted and an additional 24 cases could not be included due to incomplete information.

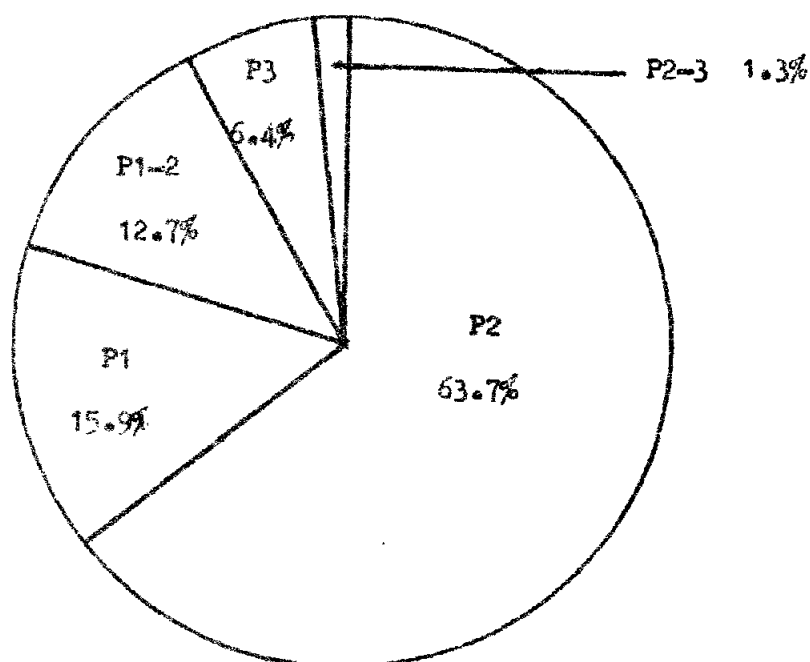
FIGURE 9: DIAGNOSIS OF LEPROSY PATIENTS IN CITY OF LIGHT. MAY 1979.



L = lepromatous leprosy
T = tuberculoid leprosy

BL = borderline lepromatous leprosy
BT = borderline tuberculoid leprosy

FIGURE 10: DEFORMITIES IN LEPROSY PATIENTS IN CITY OF LIGHT. MAY 1979.



P1 = deformity in one extremity
P1-2 = deformity in one extremity + developing second deformity
P2 = deformity in more than one extremity
P2-3 = deformity in more than one extremity + developing eye deformity
P3 = deformity in more than one extremity + eye deformity