WORLD HEALTH ORGANIZATION
ORGANISATION MONDIALE DE LA SANTÉ

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SMALLPOX ERADICATION PROGRAMME

# Report on a Visit to Southern Rhodesia

10-30 January 1978

by

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WHO Consultants



CONTENTS

## CONCLUSIONS

1. We have found no evidence of smallpox transmission inside Rhodesia or of importations into Rhodesia since the last reported outbreak in 1970.

2. It is our opinion that, because the health units are numerous, geographically well-distributed and staffed with well-trained and alert personnel, any case of smallpox that might have occurred after 1970 would have been detected. (Facilities for laboratory diagnosis, including electron microscopy, were available and many specimens were tested between 1970 and 1977, all with negative results.)

## RECOMMENDATIONS

In order to document more completely the success of smallpox eradication activities in Rhodesia, the following activities were recommended:

1. Additional pockmarks surveys to be carried out in the population groups 0-6 and 7-15 years of age.

2. Additional chickenpox specimens to be collected and forwarded to WHO for laboratory testing. Suspect smallpox cases, which include severe forms of chickenpox and other cases of "fever with rash" should have specimens taken and continue to be thoroughly investigated.

3. Primary vaccination, especially of children, should be continued until worldwide smallpox eradication is certified. Lyophilized vaccine, conforming to WHO standards, should be used.

A SMALLPOX CASE IN SOUTHERN RHODESIA, MARCH 1965

# VISIT REPORT

## PART A: COUNTRY SUMMARY

### INTRODUCTION

#### The country

Rhodesia is situated in the highlands in the central portion of Southern Africa. Its population is estimated to be 6 740 000 (Table 1). It is bounded on the east by Mozambique, on the north across the Zambesi River by Zambia, on the west by Botswana and on the south by South Africa (Fig. 1). The country is divided into five provinces, Mashonaland in the north-east, Matabeleland in the west, Victoria in the south-east, Midlands in the centre and Manicaland, a narrow province along the eastern border. The roads between major centres are excellent and the network of secondary and tertiary roads is extensive; railway and aeroplane communications exist between the majority of main towns. Telephone lines connect most parts of the country with the provincial capitals and Salisbury.

TABLE 1. POPULATION OF RHODESIA BY PROVINCE 1969 AND 1977

| Province | Population | |
|---|---|---|
| | 1969 | 1977 |
| Mashonaland | 1 875 700 | 2 479 190 |
| Matabeleland | 969 220 | 1 281 060 |
| Manicaland | 773 480 | 1 022 340 |
| Midlands | 743 760 | 983 060 |
| Victoria | 734 120 | 970 320 |
| Total residents | 5 096 280 | 6 735 970 |
| Travellers | 3 331 | 4 030 |
| Total | 5 099 611 | 6 740 000 |

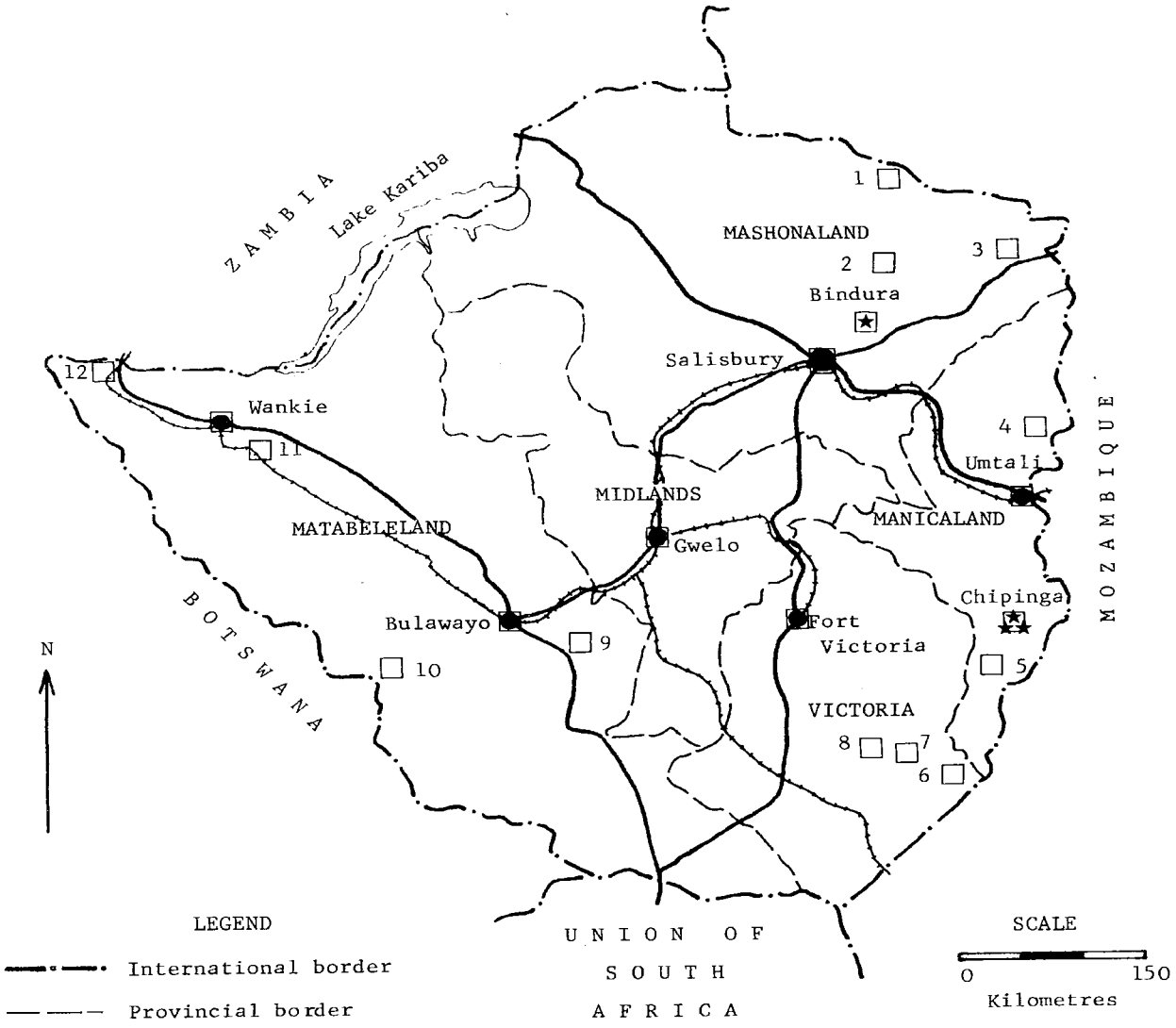
The border areas are, in the main, African Tribal Trust Lands (T.T.L.).[1] A considerable portion of the African population is concentrated in the T.T.L.s, the highest density being in the eastern section of the country (Fig. 2). From 1970, when the last case of smallpox was reported, until about 1975, these areas were readily accessible and health services were being steadily expanded to reach the most remote regions. The hostilities of recent years have resulted in a considerable reduction of health services in these areas, some of which have become virtually inaccessible.

#### History of smallpox in Rhodesia

Like other African countries, Rhodesia has long suffered from smallpox. A review of the number of reported cases and deaths from 1947 to 1978 brings out several interesting points (Table 2). The period between 1947 and 1951 appears to have been characterized by large outbreaks, with the maximum number of reported cases reaching 1823 in 1948. Furthermore, this period is marked by a high case fatality rate of approximately 15%.

[1] Tribal Trust Lands - Hereditary lands belonging to tribal chiefs who distribute the land amongst their tribesmen.

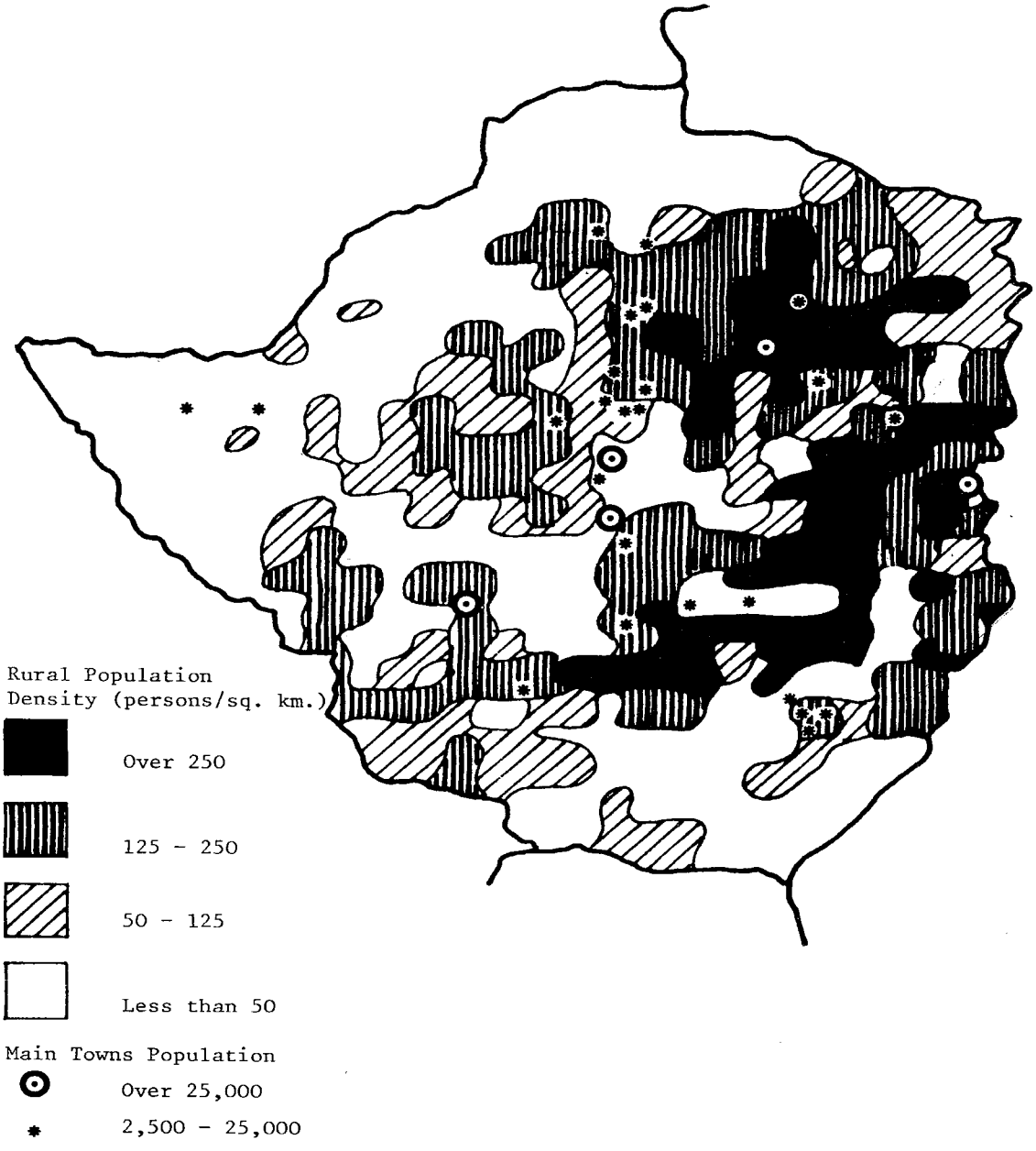
FIG. 1. RHODESIA: GENERAL INFORMATION AND LOCATIONS VISITED BY CONSULTANTS




Key to numbered locations

1. Mkumbura
2. Mutumba-Madziva T.T.L.
3. Dendera
4. Hauna, Ruda P.V.'s
5. Pfidza, Rebai, Chikore P.V.'s
6. Tshovani
7. Chiredzi and Hippo Valley Estate
8. Triangle Estate
9. Essexvale
10. Plumtree
11. Dett
12. Victoria Falls Village

FIG. 2. RHODESIA: AFRICAN POPULATION DISTRIBUTION[1]




[1] Pattern based on Government of Rhodesia map, 1969
Densities estimated based on 1977 population.

From 1952 onward there were no years in which the number of reported cases reached the high levels reported earlier. The highest number was reached in 1964 with 194 reported cases. The number then fell to lower levels until in 1970 it reached six and subsequently has remained at the zero level. After 1952 the case fatality rate was generally low and in most years was less than 5%.

A comparison of the reported incidence in Rhodesia with that of its four neighbouring countries is presented in Table 3. The large outbreaks of 1963 and 1964 in Zambia were not associated with outbreaks of comparable size in Rhodesia. In the outbreak of 1972 in Botswana 1059 cases occurred, some near the western border of Rhodesia. However, no cases were reported in Rhodesia at the time.

Zambia reported its last endemic outbreak in 1968 (although there were two importations from Zaire in 1970), Mozambique in 1969, Rhodesia in 1970, South Africa in 1971 and Botswana in 1973.

TABLE 2. REPORTED SMALLPOX CASES, DEATHS AND CASE FATALITY RATES 1945-1978[a]

| Year | Cases | Deaths | CFR % | Year | Cases | Deaths | CFR % |
|---|---|---|---|---|---|---|---|
| 1945 | 33 | 0 | 0 | 1959 | 133 | 0 | 0 |
| 1946 | 181 | 1 | 0.6 | 1960 | 12 | 0 | 0 |
| 1947 | 685 | 117 | 17.1 | 1961 | 3 | 0 | 0 |
| 1948 | 1 823 | 428 | 23.5 | 1962 | 15 | 0 | 0 |
| 1949 | 861 | 60 | 7.0 | 1963 | 38 | 5 | 13.2 |
| 1950 | 1 034 | 223 | 21.6 | 1964 | 194 | 15 | 7.7 |
| 1951 | 1 270 | 105 | 8.3 | 1965 | 39 | 3 | 7.7 |
| 1952 | 87 | 13 | 14.9 | 1966 | 35 | 0 | 0 |
| 1953 | 11 | 0 | 0 | 1967 | 30 | 1 | 3.3 |
| 1954 | 0 | 0 | - | 1968 | 10 | 1 | 10.0 |
| 1955 | 0 | 0 | - | 1969 | 26 | 2 | 3.8 |
| 1956 | 150 | 3 | 2.0 | 1970 | 6 | 0 | 0 |
| 1957 | 33 | 1 | 3.0 | 1971-78 | 0 | 0 | - |
| 1958 | 88 | 1 | 1.1 | | | | |

[a] Source: Government of Rhodesia Ministry of Health Annual Report.

Last outbreaks 1970

Manicaland and Mashonaland are the provinces which reported smallpox in 1970; none have been reported since that time. Four one-case outbreaks from Manicaland appear in the annual report, but data was available on only three. The fourth case was "denotified" on the basis of negative complement fixation test. All three outbreaks occurred in the Chipinga area of southern Manicaland and no connexions could be established between the three. Of the three cases, one was clearly of Rhodesian origin, one was equivocal and one appeared to have its source in Mozambique. These cases are of interest because they raise the question whether importation of smallpox from Mozambique continued for some time after eradication was reported there early in 1969. (See further information on these outbreaks in the Manicaland Provincial report).

One of the last outbreaks reported in 1970 occurred in Mashonaland province. Two children who are said to have come from Mozambique to Gutu town in Victoria province and from there to Mashonaland province, developed a rash in Bindura town, approximately 50 km north of Salisbury. No records concerning this outbreak are available, with the exception of the results of specimens collected which were positive for variola by electron microscope and CF test and negative by immunodiffusion (inoculation of CAM was not done). (See further information on this outbreak in the Mashonaland Provincial report.)

TABLE 3. REPORTED SMALLPOX CASES, RHODESIA AND SURROUNDING COUNTRIES 1960-1978[a]

| Year | Country | | | | |
|---|---|---|---|---|---|
| | Rhodesia[b] | Botswana | South Africa | Mozambique | Zambia |
| 1960 | 12 | 31 | 65 | 14 | 350 |
| 1961 | 3 | 36 | 8 | 91 | 233 |
| 1962 | 15 | 8 | 103 | 69 | 210 |
| 1963 | 38 | 2 | 254 | 102 | 1 881 |
| 1964 | 200 | 175 | 197 | 243 | 2 214 |
| 1965 | 40 | 0 | 190 | 115 | 528 |
| 1966 | 33 | 0 | 256 | 19 | 63 |
| 1967 | 26 | 1 | 43 | 104 | 47 |
| 1968 | 12 | 0 | 81 | 145 | 33 |
| 1969 | 25 | 0 | 246 | 11 | 0 |
| 1970 | 6 | 0 | 117 | 0 | 2 |
| 1971 | 0 | 27 | 7 | 0 | 0 |
| 1972 | 0 | 1 059 | 1 | 0 | 0 |
| 1973 | 0 | 36 | 0 | 0 | 0 |
| 1974 | 0 | 0 | 0 | 0 | 0 |
| 1975 | 0 | 0 | 0 | 0 | 0 |
| 1976 | 0 | 0 | 0 | 0 | 0 |
| 1977 | 0 | 0 | 0 | 0 | 0 |
| 1978 | 0 | 0 | 0 | 0 | 0 |

[a] From WHO records.

[b] There is a small but insignificant difference between these figures and those of Table 2.

General plan for consultants' activities

The initial few days were spent in Salisbury meeting with the staff of the Ministry of Health, discussing the smallpox eradication programme and arranging the consultants' field visits and the collection of the data requested by WHO on the forms sent to countries awaiting certification. During this period information was obtained on the health structure and smallpox programme of the Municipality of Salisbury.

Visits were arranged to each of the five provinces. Priority was placed on remote and border areas and on those sections of the country where there was evidence that endemic transmission had continued until 1970. Through a combination of regular and chartered air flights and motor transport it was possible to arrange visits to the priority areas. Dr Grasset spent the first week in Victoria province, with a brief visit to Midlands province, which had reported no smallpox since 1964. Her second week was spent in Mashonaland. Dr Meiklejohn spent his first week in Matabeleland and his second week in Manicaland province. During these visits information was sought about smallpox and chickenpox; facial pockmark and vaccination scar surveys were conducted on a large scale, and arrangements were made for further pockmarks and chickenpox surveys and for the collection of chickenpox specimens during the next few weeks.

REPORT ON THE SMALLPOX ERADICATION PROGRAMME

1. Organization

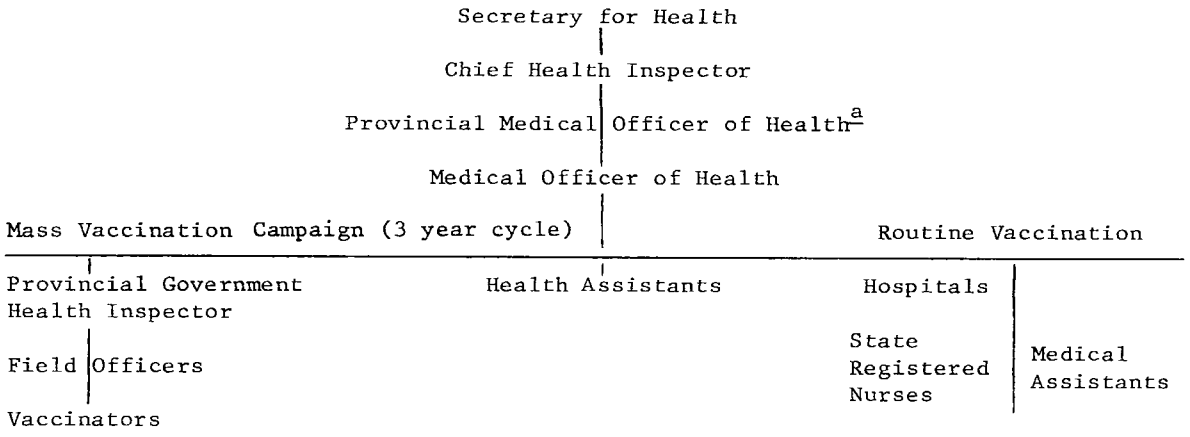
Basic Demography of Rhodesia

Population (estimated 1977): 6 740 000
Area: 390 757 $km^2$
Population density: 17.25 persons/$km^2$

Officer in charge of programme

Dr E. Burnett Smith
Secretary for Health

FIG. 3. ORGANIZATIONAL STRUCTURE EMPLOYED




[a] Responsibilities include communicable diseases.

TABLE 4. NUMBER OF FIXED AND MOBILE REPORTING UNITS BY PROVINCE

| Province | Hospitals | | | | | | Rural Clinics | Mobile Units |
|---|---|---|---|---|---|---|---|---|
| | General | District | Inf. Dis. | Mission | Industrial | Rural | | |
| Matabeleland | 11 | 9 | 1 | 19 | 4 | 12 | 44 | 5 |
| Midlands | 7 | 5 | 1 | 13 | 4 | 11 | 65 | 4 |
| Manicaland | 6 | 4 | 1 | 17 | - | 7 | 22 | - |
| Victoria | 3 | 2 | - | 9 | 2 | 8 | 38 | 1 |
| Mashonaland | 16 | 10 | 1 | 25 | 13 | 14 | 16 | 98 |
| Total | 43 | 30 | 4 | 83 | 23 | 52 | 185 | 108 |

Vaccination programme

The vaccination programme is directed by the Provincial Medical Officer of Health of each of the five provinces. Vaccination is carried out by mobile field teams, two to three per province, which travel from one district to another so as to reach all population groups every three years, vaccinating all persons contacted without regard to age or vaccination status. Schools are systematically visited, and BCG and polio vaccines are also administered by these teams, measles vaccination being included when possible.

The teams, headed by field officers, are each made up of approximately five staff, previously trained in the vaccination methodology. Assessment teams visit certain areas where vaccination has been recently carried out, assessing the percentage of successful takes and revaccinating those who have had an unsuccessful take.

Local rural council health assistants and orderlies, under the responsibility of the district health inspectors, also carry out primary vaccinations (PV's) and revaccinations (RV's) in the Tribal Trust Lands.

During the absence of the teams, public health nurses or health assistants throughout the year carry out vaccinations, mostly primary, during regular visits to a variety of urban and rural health centres and clinics.

Smallpox vaccination is normally given from six months of age onwards, with some variation from province to province.

Assessment of vaccination coverage by scar surveys has not been done in the past.

Vaccination of the population living in the major cities is the responsibility of the municipal health department.

When suspect cases were detected, comprehensive vaccination campaigns were mounted in the area concerned even though the area may have been vaccinated during the preceding three years.

TABLE 5a. SMALLPOX VACCINATIONS PERFORMED 1954-1976

| Year | Vaccinations | Year | Vaccinations |
|---|---|---|---|
| 1954 | 575 382 | 1966 | 1 109 997 |
| 1955 | 845 580 | 1967 | 1 173 216 |
| 1956 | 937 393 | 1968 | 1 144 930 |
| 1957 | 665 964 | 1969 | 977 073[a] |
| 1958 | 963 892 | 1970 | 1 198 282 |
| 1959 | 1 216 898 | 1971 | 1 399 552 |
| 1960 | 900 831 | 1972 | 1 401 168 |
| 1961 | 719 555 | 1973 | 1 119 614 |
| 1962 | 913 628 | 1974 | 984 617 |
| 1963 | 654 367 | 1975 | 1 365 164 |
| 1964 | 2 495 112 | 1976 | 935 511 |
| 1965 | 1 371 600 | | |

[a] Mashonaland figures excluded.

TABLE 5b. PRIMARY VACCINATION SUCCESS RATES 1960-1976[a]

| Year | Number primary vaccinations "read" | "Take" rate % | Year | Number primary vaccinations "read" | "Take" rate % |
|---|---|---|---|---|---|
| 1960 | 28 029 | 87.9 | 1969 | - | - |
| 1961 | 34 910 | 88.2 | 1970 | 3 924 | 94.4 |
| 1962 | 54 751 | 82.9 | 1971 | 8 846 | 91.1 |
| 1963 | 49 394 | 77.6 | 1972 | 5 766 | 88.6 |
| 1964 | 42 210 | 74.1 | 1973 | 13 854 | 92.2 |
| 1965 | 36 412 | 87.5 | 1974 | 10 846 | 88.3 |
| 1966 | 37 574 | 87.5 | 1975 | 13 929 | 86.1 |
| 1967 | - | - | 1976 | - | - |
| 1968 | 3 494 | 80.9 | | | |

[a] Compiled from available provincial figures. All provinces are not represented in every year.

Type of vaccine utilized

| | | | Lyophilized | Used since at least |
|---|---|---|---|---|
| 1. | Multi dose Mass campaigns | Institut Vaccinal du Dr Pourquier 19 rue Saint Louis, Montpellier France | Yes | 1970 |
| 2. | Single dose | State Vaccine Institute South Africa | No | 1967 |

Mode of administration: Multipressure

3. Surveillance and reporting system

3.1 Reporting to national level

There are 27 diseases, including smallpox, which are notifiable. Information from all units in each province is consolidated monthly and forwarded to the Ministry of Health, Salisbury (Annex A.1, form 1).

These forms were found to be sent regularly.

TABLE 6. SMALLPOX CASES AND DEATHS BY PROVINCE, 1966-1978

| Year | Province | | | | | Total cases | Total deaths |
|---|---|---|---|---|---|---|---|
| | Manicaland | Mashonaland | Midlands | Victoria | Matabeleland | | |
| 1966 | 18 | 0 | 0 | 17 | 0 | 35 | 0 |
| 1967 | 2 | 3 | 0 | 25 | 0 | 30 | 1 |
| 1968 | 0 | 0 | 0 | 10 | 0 | 10 | 1 |
| 1969 | 19 | 0 | 0 | 14 | 0 | 33 | 2 |
| 1970 | 4 | 2 | 0 | 0 | 0 | 6 | 0 |
| 1971-1978 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

3.2 Reporting to provincial level

TABLE 7. NUMBER OF REPORTING UNITS BY PROVINCE, 1976

| Province | Hospitals | Clinics | Mobile units | Total |
|---|---|---|---|---|
| Mashonaland | 79 | 16 | 98 | 193 |
| Matabeleland | 56 | 44 | 5 | 105 |
| Midlands | 41 | 65 | 4 | 110 |
| Manicaland | 35 | 22 | 0 | 57 |
| Victoria | 24 | 38 | 1 | 63 |
| Total | 235 | 185 | 108 | 528 |

Regularity of reporting

Weekly reports and routine "nil" reports are not sent; however, suspect cases of the 27 notifiable diseases, including smallpox, are immediately reported to the Provincial Health Officer and to the Central Ministry of Health by cable or telephone. A "Notification of Infectious Disease" form (Annex A.1, form 2) is filled and despatched by post.

Suspected smallpox cases

Suspected cases of smallpox are seen immediately by a senior health inspector or medical officer. Until 1969 diagnosis was based essentially on clinical findings. Thereafter, in all cases where the diagnosis appeared to be smallpox or remained in doubt specimens were taken for laboratory diagnosis.

Notice of the availability of laboratory diagnosis of smallpox was sent out by the Secretary for Health on 20 March 1970 (Annex A.2). These tests included (i) electron microscopy, (ii) inoculation of CAM, (iii) immunodiffusion, and (iv) complement-fixation. Preliminary results were published in the Central African Medical Journal in April 1972 by R. Swanepoel and J. G. Cruickshank of the Department of Microbiology, University of Rhodesia (Annex A.3). Results of tests on 37 specimens tested between 1969 and 1977 are shown in Annex A.4.

Chickenpox reporting

Although chickenpox is a notifiable disease under the Public Health Act and is usually reported to the Provincial Medical Officer of Health, chickenpox cases are not systematically reported to the Ministry of Health, Salisbury, as is the case with smallpox.

SUMMARY OF FIELD VISITS

Visits were made to all five provinces and to the two major cities. The sites visited included the locations of the last four outbreaks of 1970. Among the 21 communities visited were 11 protected villages,[1] in Mashonaland, Manicaland and Victoria, which were situated near the Mozambique border. In all 18 462 persons were seen.

Pockmarks were not seen on any of 8605 children aged 0-6 years and on only one child aged between 7 and 15. This child, seven or eight years of age, gave a story of having an illness resembling smallpox in 1970, before the last reported outbreak. Thirty-four of 6186 adults (0.5% had pockmarks). Most of these were more than 35 years old and had had the disease during their childhood (Table 9).

TABLE 9. RESULTS OF FACIAL POCKMARK SURVEYS IN 21 LOCALITIES

| Province | 0-6 | | 7-15 | | Adult | |
|---|---|---|---|---|---|---|
| | Number seen | Number positive | Number seen | Number positive | Number seen | Number positive |
| Matabeleland | 1 937 | 0 | 721 | 0 | 711 | 7 |
| Manicaland | 819 | 0 | 215 | 0 | 204 | 4 |
| Midlands | 923 | 0 | 424 | 0 | 794 | 2 |
| Victoria | 1 923 | 0 | 1 061 | 0 | 1 521 | 4 |
| Mashonaland | 3 018 | 0 | 1 245 | 1 | 2 965 | 17 |
| Total | 8 610 | 0 | 3 666 | 1 | 6 186 | 34(0.5%) |

Vaccination scar surveys showed generally good to excellent coverage among the 16 551 persons surveyed (Table 10). In some provinces vaccination during the first year of life was carried out and coverage in this age-group was as high as 60%. In the 1-6 age-group the percentage with scars varied from 61 to 88%. In the 7-15 age-group the rates were between 89 and 94%, with the exception of a single village (see Mashonaland report). In adults the percentage of persons with scars varied from 85 to 99%. Information from previous records of vaccinations performed and primary vaccination "take" rates is shown in Table 11. Except during the 1962-64 period, which was the earliest period for which records were available, the "take" rates were consistently above 85%.

Chickenpox was rare during the period in which field visits were conducted (cases were found in only one locality) though it had been common earlier. The urban infectious diseases hospitals admit some chickenpox patients throughout the year.

There was a remarkable lack of knowledge about smallpox among people less than 25 years of age. Almost without exception they failed to recognize the smallpox pictures on the recognition cards and stated they had never seen or known of the presence of the disease. A large proportion of older persons, on the other hand, knew about smallpox and had been aware of smallpox during their childhood. This suggested that smallpox had been widespread up until the early 1950s but had been an uncommon disease since that time.

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[1] Protected village

Collection of dwellings, surrounded by a fence, which are inhabited by the members of different kraals of a region. The population of the protected villages varies from approximately 1000 to 6000 persons, coming from an area having an average radius of 50 km. These villages are administered by the government; they have been formed since 1975 and the majority are near the borders of the neighbouring countries.

Kraal

An agglomeration of dwellings usually belonging to members of one family.

TABLE 10. RESULTS OF VACCINATION SCAR SURVEYS

| Province | <1 | | 1-6 | | 7-15 | | Adult | |
|---|---|---|---|---|---|---|---|---|
| | No. seen | % with scar | No. seen | % with scar | No. seen | % with scar | No. seen | % with scar |
| Matabeleland | 404 | 60 | 1 523 | 87 | 721 | 92 | 711 | 85 |
| Manicaland | 200 | 60 | 619 | 88 | 215 | 90 | 204 | 99 |
| Mashonaland | 765 | 7 | 2 305 | 70 | 1 245 | 92 | 1 059 | 93 |
| Victoria | 402 | 7 | 1 516 | 61 | 1 061 | 94 | 1 512 | 91 |
| Midlands | 336 | 53 | 587 | 79 | 424 | 89 | 794 | 97 |
| Total | 2 055 | 30.3 | 6 550 | 74.4 | 3 666 | 92.1 | 4 280 | 91.8 |

RECOMMENDATIONS FOR ADDITIONAL DATA AND SPECIMENS

At the end of our visit we discussed with the Secretary and his staff the recommendation to collect more data for future pockmark and chickenpox surveys. The additional following plans were developed for implementation during the next six weeks; results will be forwarded to the Smallpox Eradication unit, WHO, Geneva by 1 April 1978.

Facial pockmark surveys

These should include several thousand children 0-6 years and several thousand children 7-15 years in each of the provinces and in the two municipalities of Salisbury and Bulawayo:

The younger group will be examined in child health clinics by public health nurses. The clinics chosen will be well distributed over the area of the province.

The older group will be primary schoolchildren, again with wide geographical spread.

When there is any doubt, and especially when pockmarks are seen in the age-group 0-7, cases will be seen by a medical officer or other experienced person and data obtained on a special form given to health authorities.

During these operations, smallpox pictures will be shown and inquiries made about smallpox and chickenpox. The proforma contains a column to indicate the number of chickenpox cases discovered.

Chickenpox scab collections

Scabs will be collected, if possible, from at least 10 cases of chickenpox in each province or city, with no more than one specimen from each outbreak. Special efforts to collect specimens will be made if there are unusually severe or fatal cases, and in cases who present no smallpox vaccination scar.

DISCUSSION AND EVALUATION

Health structure and personnel

The health services are extensive, well planned and supported by excellent communications. In 1977 there were 10 009 budgeted positions in the Ministry of Health. Approximately three-fourths are held by Africans and one-fourth by Europeans. The positions are distributed among

the four divisions as follows: Curative - 8824; Preventive - 638; Administrative - 395; and Research - 193. There is one medical school at the University of Rhodesia in Salisbury, where approximately 60 students are African. There are programmes for the training of nurses, health inspectors, health assistants, medical assistants (a new programme) and many other types of health personnel. The country has been well supplied with European physicians and nurses. Many of the former have had training in public health and tropical medicine. The governmental health programme has been designed to dovetail with the extensive network of 83 mission hospitals.

The calibre and motivation of most of the professionals we met at all levels was impressive. With very few exceptions they were aware of current medical practices and were eager to learn more. They are now carrying on under extremely difficult circumstances, often at the risk of personal injury or extinction.

Surveillance capability

Smallpox stands at the top of the written list of notifiable diseases in Rhodesia (Annex A.1, form 1) but the country never had a separate smallpox programme. There were no mobile surveillance teams except for the vaccination campaigns based on a three-year cycle, no systematic search operations, apart from those carried out when an outbreak was reported, no routine "nil" reports. Reliance was placed rather on the extensive and well distributed network of health units and on the alertness of staff in high-risk areas. This approach, by 1970, appeared to have been successful in detecting almost all outbreaks promptly and, perhaps in association with the elimination of cases and importations from other neighbouring countries, in interrupting transmission.

This health structure has remained intact for five or six years after 1970 and presumably retained or increased its coverage and effectiveness. The instability in some border areas now raises questions about its sensitivity in rapidly detecting outbreaks, if there should be an importation, but this should not be a problem if the neighbouring countries are, in fact, free of smallpox.

ACKNOWLEDGEMENTS

The writers are grateful for the assistance and cooperation of the Honourable Mr R. Cronje, Minister of Health, Dr E. Burnett Smith, Secretary of Health, Dr J. S. B. Preece, Deputy Secretary of Health, the Provincial and Acting Provincial Medical Officers of Health, the Municipal Officers of Health and the Provincial Health Inspectors. The efforts made by all the medical and paramedical staff who helped in the surveys and collection of data are appreciated. Special thanks are due to the Chief Health Inspector, Mr J. M. Johnston, who daily assisted the writers during their visit, and who, after their departure, organized and coordinated further pockmark surveys, the collection of specimens and the despatch of vaccine samples.

ANNEX A.1

MINISTRY OF HEALTH

Form 1

RHODESIA

Bulletin of Diseases Notified During Month Ended . . . . . 19 . .

PROVINCE VICTORIA

| Disease | Cases during month | | | Deaths during month | | |
|---|---|---|---|---|---|---|
| | E | A/C | A | E | A/C | A |
| 1. Smallpox | | | | | | |
| 2. Pulmonary Tuberculosis | | | | | | |
| 3. Non-Pulmonary Tuberculosis | | | | | | |
| 4. Silicosis with Active Tuberculosis | | | | | | |
| 5. Silicosis without Active Tuberculosis | | | | | | |
| 6. Encephalitis | | | | | | |
| 7. Poliomyelitis | | | | | | |
| 8. Scarlet Fever | | | | | | |
| 9. Brucellosis | | | | | | |
| 10. Trypanosomiasis | | | | | | |
| 11. Rabies | | | | | | |
| 12. Tick Typhus | | | | | | |
| 13. Tetanus | | | | | | |
| 14. Leprosy | | | | | | |
| 15. Erysipelas | | | | | | |
| 16. Puerperal Septicaemia | | | | | | |
| 17. Cerebrospinal Meningitis | | | | | | |
| 18. Meningitis Other Organisms | | | | | | |
| 19. Diphtheria | | | | | | |
| 20. Typhoid Fever | | | | | | |
| 21. Paratyphoid Fever | | | | | | |
| 22. Infectious Hepatitis | | | | | | |
| 23. Trachoma | | | | | | |
| 24. Anthrax | | | | | | |
| 25. Malaria | | | | | | |
| 26. Bacillary Dysentery | | | | | | |
| 27. Cholera | | | | | | |

N.B. E = EUROPEAN; A/C = ASIAN/COLOURED; A = AFRICAN

Signed

Date

Annex A.1

Form 2

G.P. & S. 37077—450-100B. **ORIGINAL COPY** Z. 867 (P.H.)
HEALTH FORM NO. 2

# NOTIFICATION OF INFECTIOUS DISEASE

SECTION 18 OF PUBLIC HEALTH ACT [*CHAPTER 167*]

To the District Commissioner Town Clerk Secretary, Town Management Board
..... or ..... or .....

I hereby notify you that the under-mentioned person $\frac{\text{is suffering}}{\text{has died}}$ from †.....

.....

Sputum state (Tuberculosis) .....

Full names .....

Age ..... Sex ..... Race .....

Full address .....
(Please give full details) .....

Chief ..... Kraal Head ..... District .....

Date of onset of illness ..... Date of death .....

Where employed or what school attended .....

Probable place and source of infection .....

Probable date of infection .....

Hospital or institution where patient admitted .....

Date ....., 19..... Signature .....

†Insert name of disease.
*N.B.*—A separate form must be completed for each case. See cover for list of notifiable diseases and duties of medical practitioners.

Surname in capitals .....
*Medical Practitioner*

ANNEX A.2

Reference: C/6/5/35

Ministry of Health
P.O. Box 8204
Causeway, Salisbury
Rhodesia

20th March 1970

The Provincial Medical Officer of Health
(Manicaland)
P.O. Box 323
UMTALI

SMALLPOX DIAGNOSIS

The Department of Medical Microbiology of the University College of Rhodesia has very kindly offered to help in the diagnosis of smallpox, and attached is a paper from the Department of Medical Microbiology explaining the diagnostic techniques, and what they are able to do to help.

Pending the production locally of a suitable container, none of these samples should be sent up by public transport or through the post, but there is no objection to them being brought in by hand to the Department of Microbiology, preferably by an officer of some seniority who can ensure that there is no danger to the general public during transport.

Cool packaging is to be preferred, but no great damage will be done if transport to the Laboratory is fairly rapid and no cooling available.

(Signed) T. R. Greener

for: Secretary for Health

ANNEX A.3

# SMALLPOX IN RHODESIA AND THE USE OF THE ELECTRON MICROSCOPE IN THE DIAGNOSIS OF THIS AND OTHER DISEASES[1]

by

R. Swanepoel and J. G. Cruickshank

The following short extracts from the above document illustrate Rhodesia's response to WHO's requests concerning testing of specimens for smallpox.

"Until 1969 the diagnosis of smallpox in this country was largely clinical, but since then the communicable diseases section of WHO has expressed a wish to obtain isolates for comparison with others from elsewhere. Consequently a few specimens have been submitted to the virus laboratory at the University for examination and virus isolation. Some of these specimens have been from clinically diagnosed smallpox while others are from cases thought unlikely to be smallpox but in which laboratory confirmation would be desirable."

"A further reason for laboratory confirmation is the necessity for Rhodesia to play its part in the general world surveillance of this disease. Eradication is in sight and it is important to locate outbreaks rapidly and to identify accurately the type of virus involved; variola major or minor (Official Records, WHO 1970).

## SPECIMENS TESTED IN RHODESIA AND FOUND SMALLPOX-POSITIVE SINCE 1969

| Specimens | | | | Tests/Results | | | |
|---|---|---|---|---|---|---|---|
| Date received | Specimen | Clinical diagnosis | Origin | Immuno-diffusion for variola | Electron microscopy* | Growth in eggs | Complement fixation** |
| 13.9.69 | Vesicle fluid | Molluscum contagiosum? | Sby. ex Umtali | Positive | ND | ND | NA |
| 10.11.69 | Vesicle fluid | Chickenpox/ Smallpox? | Nuanetsi | Positive | ND | ND | NA |
| 10.11.69 | Pustule smear | Smallpox? | Chibi | NA | ND | Variola | NA |
| 22.12.70 | Pustule fluid and serum | Smallpox? | Sby. ex Bindura | Negative | Variola | ND | Negative |

* ND = Not done.

** NA = Not applicable.

[1] From the Central African Journal of Medicine, vol. 18, No. 4, April 1972, pp. 68-73.

ANNEX A.4

RESULTS OF LABORATORY TESTS ON SUSPECTED SMALLPOX CASES 1969-1977

| No. | Year | Clinical/Diagnosis | Age | Sex | Location | Result |
|---|---|---|---|---|---|---|
| 1 | 1969 | Molluscum Contagiosum | | | Manicaland | Variola |
| 2 | 1969 | Smallpox? | | | Salisbury | Negative |
| 3 | 1969 | Smallpox? | | | Victoria | Variola |
| 4 | 1969 | Smallpox? | | | Victoria | Variola |
| 5 | 1970 | Chickenpox | | | Bulawayo | Negative |
| 6 | 1970 | Smallpox? | | | Matabeleland | Negative |
| 7 | 1970 | Smallpox? | | | Victoria | Herpes |
| 8 | 1970 | Smallpox? | | | Victoria | Negative |
| 9 | 1970 | Smallpox? | | | Bulawayo | Negative |
| 10 | 1970 | Smallpox? | | | Bulawayo | Herpes |
| 11 | 1970 | Smallpox? | | | Midlands | Herpes |
| 12 | 1970 | Smallpox? | | | Mashonaland | Variola |
| 13 | 1971 | Smallpox? | | | Manicaland | Negative |
| 14 | 1971 | Smallpox? | | | Manicaland | Herpes |
| 15 | 1972 | Smallpox? | 20 | F | Matabeleland | Negative |
| 16 | 1972 | General Vaccinia | 25 | F | Salisbury | Negative |
| 17 | 1972 | Vesicles | 43 | M | Salisbury | Herpes |
| 18 | 1972 | Smallpox? | child | M | Victoria | Negative |
| 19 | 1972 | Smallpox? | 4 | F | Victoria | Negative |
| 20 | 1972 | Smallpox? | 14 | F | Mashonaland | Negative |
| 21 | 1973 | Smallpox? | 8/12 | F | Victoria | Negative |
| 22 | 1973 | Smallpox? | adult | M | Salisbury | Negative |
| 23 | 1973 | Smallpox? | 21 | F | Bulawayo | Negative |
| 24 | 1975 | Smallpox? | 2 | F | Salisbury | Herpes |
| 25 | 1975 | Smallpox? | adult | M | Midlands | Herpes |
| 26 | 1976 | Vesicles | 60 | F | Salisbury | Negative |
| 27 | 1976 | Smallpox? | | M | Salisbury | Negative |
| 28 | 1976 | Chickenpox? | | F | Salisbury | Negative |
| 29 | 1976 | Vesicles | 10/12 | F | Salisbury | Herpes |
| 30 | 1976 | Vesicles | | | Salisbury | Herpes |
| 31 | 1976 | Herpes | 18 | F | Salisbury | Negative |
| 32 | 1976 | Molluscum Contagiosum | 10 | F | Bulawayo | ORF |
| 33 | 1976 | Cowpox | 51 | M | Salisbury | Negative |
| 34 | 1976 | Vaccinia | | | Salisbury | Negative |
| 35 | 1977 | Smallpox? | 14 | M | Mashonaland | Negative |
| 36 | 1977 | Vesicles | 20 | M | Victoria | Herpes |
| 37 | 1977 | Chickenpox? | 59 | M | Salisbury | Herpes |

## PART B: REPORTS ON FIELD VISITS

### MATABELELAND PROVINCE

#### Description of province

Matabeleland occupies the western portion of Rhodesia. On the north it is bordered by the Zambezi River and Lake Kariba, on the west by Botswana and on the south by South Africa. On the east it adjoins the provinces of Mashonaland, Midlands and Victoria. Its estimated population is 1 281 060. Bulawayo, the capital, is the only large city (population 340 000).

The province is traversed by an excellent surfaced road running north-west from Beitbridge on the southern border to Victoria Falls and another which runs north-east from Plumtree on the Botswana border to Gwelo in Midlands province. Both these roads pass through Bulawayo. The network of secondary and tertiary roads is extensive. A railroad enters the province from Botswana at Plumtree and passes through Bulawayo to Victoria Falls where a bridge across the Zambezi River connects it with the Zambian railway system. Telephonic communications connect most parts of the province to Bulawayo.

#### Last outbreaks

The last reported cases occurred in 1965 and the original records were not available. The annual report for 1965 contains the following information:

"Only three cases were reported during the year. These were reported from the Plumtree district in January. They were from a family from Hingwe who had shortly visited relations in neighbouring Bechuanaland (now Botswana). This area had been well vaccinated previously, but this family and adjoining kraals were revisited and 1086 people were vaccinated. No secondary cases occurred."

It is of interest that Botswana reported no cases in 1965. Because 13 years had passed between 1965 and 1978 no attempt was made to trace outbreaks which occurred in 1964 or earlier.

In the 1969 report it is noted that a number of suspected cases were examined, but no definite cases occurred. "A smallpox outbreak was reported in the Wanezi area of Nuanetsi (Victoria province) and steps were taken to prevent spread into this Province (i.e. Matabeleland). Road blocks were set up on two roads communicating with the danger area and the population along the provincial border was vaccinated by a mobile team. A total of 13 055 vaccinations were carried out." (Details of this outbreak are contained in the section on Victoria province.)

#### Health structure

The network of health units is extensive and widely distributed over the province (Fig. 1 and Annex B.1).

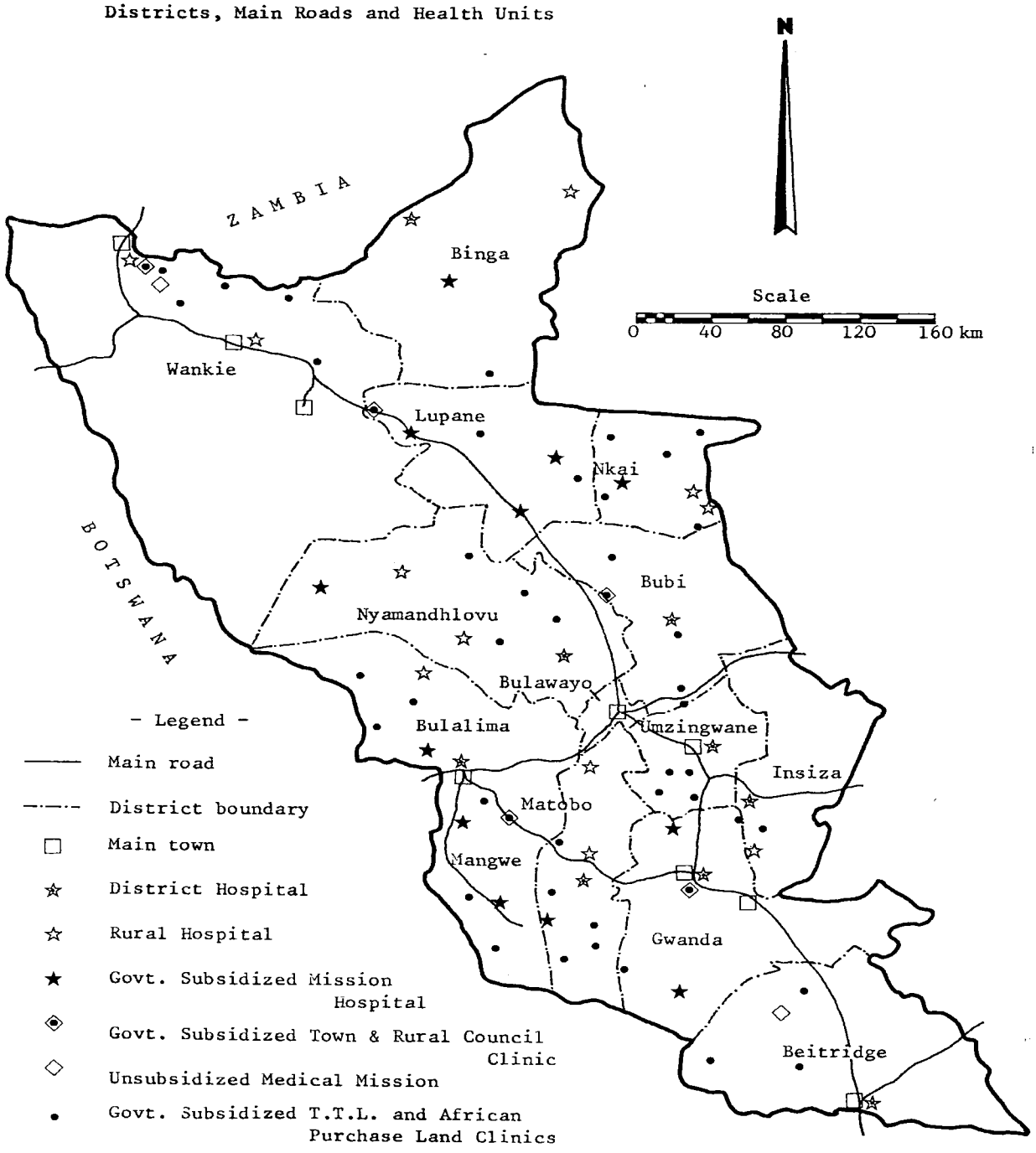
#### Vaccination programme

The total number of vaccinations and the number of primary vaccinations is shown in Annex B.2. The large number of vaccinations done in 1972, which includes 132 525 primary vaccinations, is related to the concern about importations from Botswana. Since 1974 the number has, for a variety of reasons, dropped sharply far more than in the other provinces. Reasons given were shortage of vaccine and absence of smallpox in the region.

FIG. 1

MATABELELAND PROVINCE

Districts, Main Roads and Health Units



Municipality - Bulawayo

Communicable diseases in the City of Bulawayo are the responsibility of the Municipal Officer of Health. He receives reports from all hospitals, from multiple clinics and from the visiting public health nurses.[1] He is also in charge of the Infectious Diseases Hospital.

At the present time there are eight maternal and child health clinics, each headed by a public health nurse and an extensive visiting nurse programme which aims to visit each part of the city on a weekly basis. This programme has been expanded to meet the needs of a large influx of population from the rural areas.

Chickenpox is considered a disease requiring isolation and patients are admitted to and kept in the Infectious Diseases Hospital until the last scab is gone.

Data acquired during field visits

Visits were made to five rural clinics and a total of 3304 persons were seen. These were located in (1) Essexvale, 27 km south of Bulawayo (143), (2) Plumtree, 100 km west of Bulawayo on the Botswana border (350), (3) Dett, a railway town to the north (490), (4) Wankie, a coal mining community near Victoria Falls (1895) and (5) Victoria Falls village on the Zambian border (426). All persons were examined for pockmarks and for vaccination scars and most adults and clinic staff were questioned about rumours of smallpox and about chickenpox.

Pockmarks

No pockmarks were seen in 1937 children less than seven years old or in 721 between 7 and 15 years of age. Pockmarks were seen on 7 of 711 mothers, usually older ones. All of them gave a history of smallpox, often associated with smallpox in siblings or in neighbours. Three of the seven had had smallpox while living in Zambia. All stated they had been small when they had the disease.

Only one of the seven had pockmarks which would be noticeable when passing on the street. In that case there were multiple pigmented spots which were readily visible. The others had 5-10 small pitted scars which could be seen only in good light.

In summary, the incidence of pockmarks was 1% in adult females (less if the Zambians were excluded) and nil in children under 15 years of age.

Vaccination scar surveys

The results of vaccination scar surveys from the four smaller rural clinics have been combined and are shown in the following table (Fig. 2) together with the results of the survey done at the Wankie Coal Company.

Both surveys show very high coverage. The percentages of 81% and 91% in the one to six year age-group is surprising in view of the small number of primary vaccinations reported since 1973. It would have been helpful to conduct surveys in more remote areas, but this was not possible. The low rate in adults at the Wankie Coal Company also was unexpected in view of the high rates of younger persons and remains unexplained.

Chickenpox

Inquiries were made at each visit of mothers and clinic staffs about chickenpox and the answers were invariably the same. There had been much chickenpox several months back, but almost none in recent months. No one had heard of a chickenpox death. Only at Victoria Falls

[1] If further information is required the 1976 Annual Report of the Medical Officer of Health, Bulawayo is available from the Smallpox Eradication unit, WHO headquarters, Geneva.

were acute cases of chickenpox seen. There, two families, with a total of six children, were seen in the early or convalescent stage of the disease. Scabs were collected from one of these children, a vaccinated, eight-year-old male, with a typical chickenpox rash.

FIG. 2. RESULTS OF VACCINATION SCAR SURVEYS
MATABELELAND PROVINCE

| Locality | Age | No. seen | No. with vaccination scars | % with vaccination scars |
|---|---|---|---|---|
| 4 rural townships (population 600-4000) | <1 | 183 | 57 | 31 |
| | 1-6 | 720 | 586 | 81 |
| | 7-15 | 323 | 314 | 97 |
| | Adult | 248 | 248 | 100 |
| Total | | 1 474 | 1 205 | 82 |
| Wankie Coal Company (population 20 000) | 1 | 221 | 186 | 84 |
| | 1-6 | 813 | 742 | 91 |
| | 7-15 | 398 | 352 | 88 |
| | Adult | 463 | 353 | 76 |
| Total | | 1 895 | 1 633 | 86 |

In the Bulawayo Infectious Disease Hospital information was obtained that 114 cases had been admitted during the past year. A review of the hospital register showed that 20 patients had been admitted between 1 November 1977 and 15 January 1978. There were relatively few young children in this group. Six persons were over 20 years of age. No deaths had been observed in the hospital. Vaccination data were not obtained. The single patient in the hospital, a 21-year-old unvaccinated male, was too early in his course for scabs to be obtained and arrangements were made for them to be collected later.

Information about smallpox

During the first two rural visits it became obvious that virtually none of the mothers, when shown the folder of smallpox pictures, gave any sign of recognition. In each place one of approximately 50 questioned said they knew the disease and stated where it occurred. This was perhaps not surprising in view of the fact that recognition cards have not been used in Rhodesia and smallpox has not occurred for many years.

This was further investigated during the last three visits with the intent of finding whether the residents of Matabeleland were different from those of other provinces or other countries which had more recently had large smallpox outbreaks. With the help of a very talented public health nurse, who was fluent in six languages, the mothers seen at Wankie and at Victoria Falls were questioned in a more systematic way. They were shown the pictures in the smallpox folder and asked (1) if they knew what it was, and (2) if they knew whether they had ever seen the disease in their family or village or had heard of its occurrence in their area. If the answer to the second question was affirmative, details were sought on the location, date and associated cases or deaths.

Almost none of the women under 25 years of age (estimated) recognized the pictures and none had seen smallpox. Those who did came entirely from the relatively small group of older mothers. They gave relatively convincing stories of illness in their family, village or nearby areas. Included in this group were all seven of the persons with pockmarks.

FIG. 3. RECOGNITION OF SMALLPOX CARDS, MATABELELAND PROVINCE

| Original home | Failed to recognize smallpox pictures | Recognized pictures and knew of disease |
|---|---|---|
| Matabeleland | 68 | 4 |
| Other provinces | 28 | 4 |
| Zambia | 15 | 8 |
| Other countries | 16 | 3 |
| Total | 127 | 19 |

The observations suggest that useful information can be obtained by this type of questioning by a skilled and tactful interpreter. The memory of smallpox in older people appeared to be clear and the failure of younger persons to recognize the disease provides evidence that there has been no smallpox in the areas where the individuals lived during their lifetime. The very low percentage in Matabeleland is consistent with reports that no smallpox had occurred since 1965 and that large outbreaks had not occurred for some years prior to that time. The higher figure among Zambian persons may reflect the large outbreaks which occurred in that country during the 1950s.

MANICALAND PROVINCE

Description of province

Manicaland is situated on the eastern edge of Rhodesia. The province is long from north to south and, in most parts, narrow from east to west. Its whole eastern border adjoins Mozambique. On the west it adjoins Mashonaland in the north and Victoria in the south. Along the eastern border the province is hilly or mountainous, falling away in the west to the Sabi Valley. Umtali, the capital, with a population of about 70,000 is the only city. The provincial population is 1 022 340.

The highway system makes access to the valleys reasonably good, but many areas at higher elevation are not readily accessible. The main highway passes from west to east from Salisbury to Beira in Mozambique. A railway follows the same route. Until recently this was a major route connecting Rhodesia to the sea. A second major communication route to Mozambique leads through Chipinga in the south. In the past there was much interchange between the related peoples who live on the two sides of the border, and a considerable volume of migratory workers coming from Mozambique to Rhodesia.

Last outbreaks

Manicaland, with four reported cases, was one of the two provinces which reported smallpox in 1970. None have been reported since that time. Four cases appear in the annual report with data available on only three. The fourth was "denotified" on the basis of negative complement-fixation test. All three occurred in the Chipinga area of southern Manicaland and no connexions could be established between the three. The information on these three one-case outbreaks is as follows:

Case 1. The patient, age, sex and vaccination status unknown, was reported on 13 August 1970 as a case of smallpox from the Chipinga Hospital. The patient was reported by cable as a possible importation from Mozambique, but left the hospital before this could be confirmed.

Case 2. Tangai Nduna, a 38-year-old male was admitted to the Chipinga Hospital on 18 November 1970. Because he had recently arrived from Mozambique he was reported as an importation, from Kraal Nduma District, Espungaberra. His illness was mild and no specimens were taken. The hospital records at Chipinga were not available. A review of correspondence in the file of the Provincial Medical Officer of Health, Umtali, leaves the source of his illness in doubt. It is stated that he left Chief Nyakusera Kraal in Nduma District, Espungaberra in Mozambique on 29 October 1970, coming to Chipinga town. On 30 October 1970 he went on to Tanganda Halt near the Sabi River. His rash began on 15 November, and he was admitted to the hospital on 18 November 1970. He had a vaccination scar.

In the containment action, all patients and staff at the hospital were vaccinated along with the community of Tanganda Halt.

Case 3. Simon Mughaduzi, a 10-month-old infant, unvaccinated, was admitted to Chipinga Hospital on 25 November 1970 with smallpox. Rash had appeared on 24 November 1970. He had lived on the experimental farm near Chipinga for several months and no known contacts were uncovered.

In the containment action the family, all persons at the experimental farm and a nearby Roads Department station, were vaccinated. Chipinga town was not included because the vaccination programme there had just been completed.

These cases are of interest because they raise the question whether importation of smallpox from Mozambique continued for some time after eradication was reported there early in 1969. Of the three cases one was clearly of Rhodesian origin, one was equivocal and one appeared to have had its source in Mozambique. The files which were reviewed contained copies of cabled inquiries from the World Health Organization, Geneva, but no information was provided about subsequent findings.

Health structure

The network of health units is well distributed over the province (Fig. 4 and Annex B.1). The number of hospitals is large for the size of the province and the majority are mission-operated. At the time when smallpox ceased to be reported all were staffed by mission physicians.

Vaccination programme

Vaccination coverage, particularly primary vaccination, had been well maintained (Annex B.2). The primary take rate was consistently reported to be maintained between 93% and 97% in recent years. One reason for this was the continuing concern, expressed often in other parts of Rhodesia, about the possibility of continuing importation from Mozambique. Until the border was closed, vaccinations were carried out on all incoming persons. The number of primary vaccinations appeared to match closely with the estimated number of births in the last two years.

Municipality - Umtali

The records of the Infectious Disease Hospital in Umtali provided further information on how outbreaks had been handled in the past. A meticulously kept admission register provided information on smallpox admissions back to the early 1950s and copies of the notifications with investigations back to the early 1960s. The Senior Sister, who had been stationed there for a number of years told us that 1965 was the last big year and for that reason a summary was prepared from the available data (Annex B.3).

The 13 cases included here fall into six outbreaks and those with multiple cases fall within one family. Three of the six outbreaks were traced to Mozambique and a fourth is said to have come from a kraal near the border. Information on vaccination status was not recorded. There were only two adults among the 13 patients and 10 of the 13 were eight years old or less in age. The interval between onset and date of written notification was often relatively long. I was informed that verbal notification had been far more rapid.

There was a lengthy correspondence about the difficulty of vaccinating Apostolics, who vigorously objected and in whom many outbreaks had occurred. They have frequent large meetings of 3000-4000 people. The decision was made that, if they were to have meetings, they must be vaccinated. This was accomplished and appears to have removed most of the problems.

Data acquired during field visits

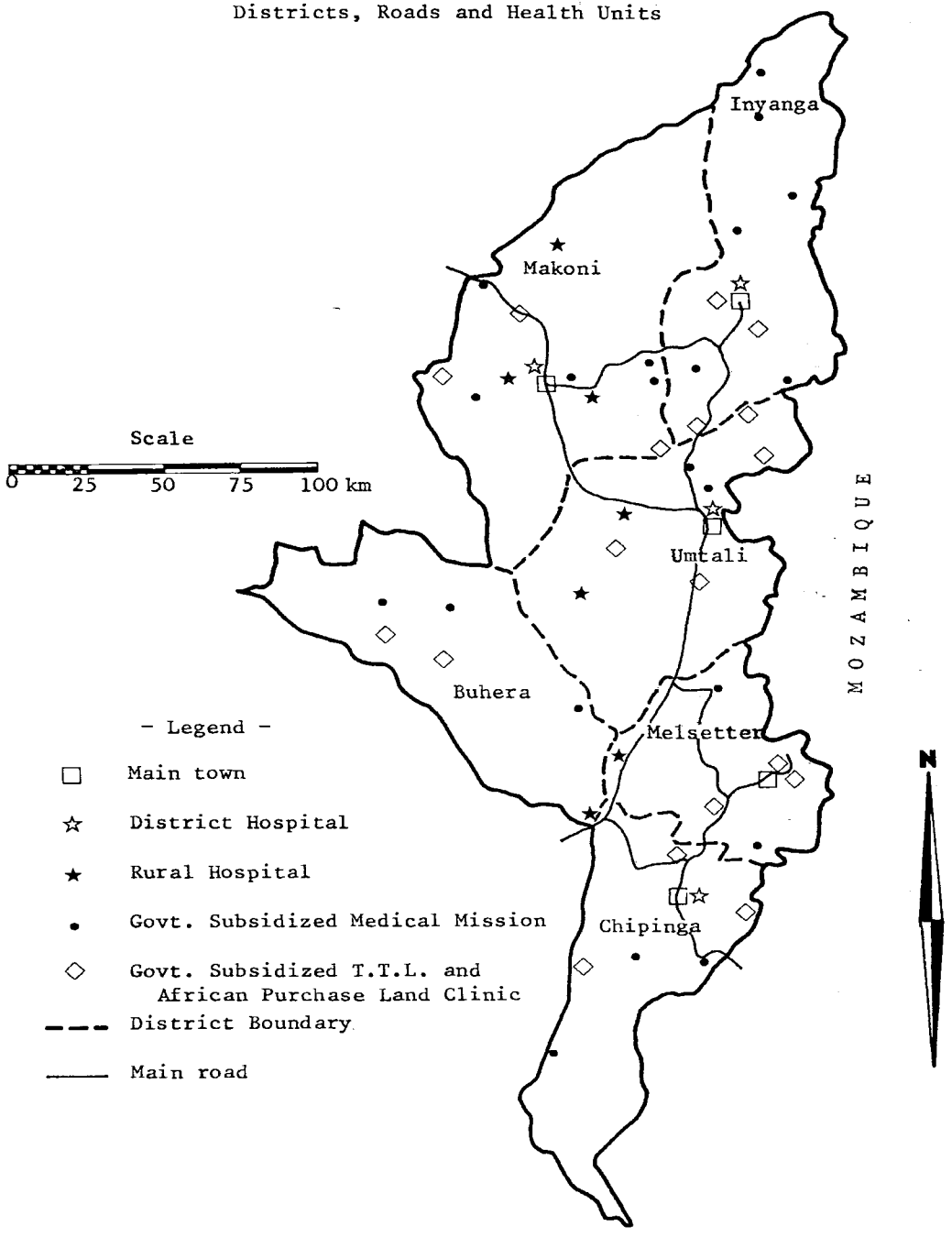
Visits were made to five protected villages. Three of these were in the southern part of the province near Chikore, some 35 km south of Chipinga. These were the protected villages of Pfidza (1400), Rebai (1500) and Chikore (2000). The other two were north of Umtali in the Holdenby area, namely Hauna (1122) and Ruda (2561). In both instances the villages were close to the Mozambique border (10-20 km).

Pockmarks

Pockmarks were seen on four of 1238 persons examined. All were over 38 years of age. One aged 78, gave a convincing history of having had smallpox in 1902. All had been residents of the Chipinga area when they had smallpox.

FIG. 4

MANICALAND PROVINCE
Districts, Roads and Health Units



Vaccination scar surveys

Vaccination scar surveys were done in the five villages and results have been combined in the following table.

FIG. 5. RESULTS OF VACCINATION SCAR SURVEY, MANICALAND PROVINCE

| Age | No. seen | No. with vaccination scars | % with vaccination scars |
|---|---|---|---|
| 0-1 | 200 | 120 | 60 |
| 1-6 | 619 | 546 | 88 |
| 7-14 | 215 | 194 | 90 |
| Adult | 204 | 202 | 99 |
| Total | 1 238 | 1 062 | 86 |

Chickenpox

No cases of chickenpox were seen. In the villages it was stated that there had been many cases in June 1977, but few since. The Chipinga Hospital had admitted no cases, but the records of the Infectious Disease Hospital in Umtali showed that 72 cases had been admitted during 1977. There had been no deaths and, in fact, it appeared that no one we contacted, including villagers or health personnel, had ever heard of a death from chickenpox.

Recognition of smallpox

Mothers and other older persons were shown the smallpox folder and asked if they knew the disease and whether they had ever seen it.

FIG. 6. RECOGNITION OF SMALLPOX CARDS AND KNOWLEDGE OF SMALLPOX, MANICALAND PROVINCE

| | Holdenby No. | Chikore No. |
|---|---|---|
| Did not recognize picture nor had seen or known smallpox | 79 | 41 |
| Had seen or known of smallpox in own or nearby village | 12 | 13 |
| Had had smallpox | 4 | 2 |
| Total number questioned | 95 | 56 |

The proportion of persons who had seen or known smallpox is considerably higher than was found in Matabeleland. The unexpectedly high figure in the Chikore villages suggests a high prevalence in the distant past. All knowledgeable persons were over 35 - no one under that age claimed to have seen cases.

MIDLANDS PROVINCE

Description of province

Midlands occupies the central portion of Rhodesia, being surrounded by the four other provinces, and having no common borders with other countries. The province is divided into eight districts.

With the exception of the far eastern, western and southern areas of the province, there are good communications available between the capital, Gwelo and the district towns. Railway and aeroplane communications exist between Gwelo and the two main towns, Shabani in the south and Que Que in the north, as well as between Gwelo and the other provincial capitals. A network of secondary roads is found throughout the province.

Last outbreaks

No records are available on the last outbreak which occurred in 1963.

Health structure

Numerous health centres are distributed throughout the province (Fig. 7). Medical facilities and manpower in these centres, i.e. number of beds, physicians, state registered nurses, etc. are listed in Annex B.1.

Vaccination programme

Two mobile teams consisting of a field officer and four vaccinators vaccinate the population of two districts each year (four-year cycle). Polio, measles, BCG and smallpox vaccine is administered by these teams. The technique used is multiple pressure (five storkes with lyophilized vaccine and 20 with liquid vaccine). Vaccination of children is begun at three months.

The vaccine, both liquid and lyophilized, is kept in Gwelo and in rural towns in the freezer compartment of ordinary (+4°C) refrigerators. The mobile team jeeps are equipped with gas refrigerators which maintain a temperature of about +4°C; the freezer compartment of these refrigerators is used to store measles and polio vaccine and, when possible, smallpox vaccine.

Total number of vaccinations and primary vaccinations from 1970-1977 is shown in Annex B.2. Vaccination coverage assessment by scar surveys is not done, and the success rate of primary vaccinations has not been determined since 1971.

Municipality of Gwelo

The Infectious Diseases Hospital receives all cases of notifiable, and certain non-notifiable infectious diseases, including chickenpox cases (six chickenpox cases were admitted to the I.D. Hospital in 1977, aged two to 39 years; there were no deaths).

Data acquired during field visits

A visit was made to the Monomatapa Clinic, Gwelo. The population of the African township of Gwelo is estimated as 70 000. Two clinics are available for the patients of the township: (1) The Monomatapa Clinic; and (2) Mkoba Clinic. All outpatients of these two clinics were examined for three successive days for pockmarks and for vaccination scars, and the staff and outpatients above seven-years-of-age were questioned about rumours of smallpox/chickenpox cases and deaths. The information obtained in these two clinics has been combined.

FIG. 7

MIDLANDS PROVINCE

Districts, Roads and Health Units

Pockmarks

No pockmarks were seen in 923 children less than seven years old or in 424 children between seven and 14 years. Pockmarks were seen in only two of the 794 adults examined, aged 78 and 40 years. Results are shown below:

Vaccination scar survey

The same persons were examined for vaccination scars. Results are shown below.

FIG. 8. RESULTS OF VACCINATION SCAR SURVEYS, MIDLANDS PROVINCE

| Age | No. seen | No. with scars | % with scars |
|---|---|---|---|
| 0-1 | 336 | 177 | 52.7 |
| 1-7 | 587 | 464 | 79.0 |
| 7-14 | 424 | 377 | 88.9 |
| Adult | 794 | 766 | 96.4 |
| Total | 2 141 | 1 784 | 83.3 |

Only a minority of adults recognized smallpox when shown the recognition card.

Chickenpox

No information was obtained about active chickenpox cases. However, during the past three months, 230 chickenpox cases had been seen in the Municipal Clinic (of a total of 26 000 outpatients).

MASHONALAND PROVINCE

Description of province

Mashonaland has the highest population of the country, estimated at 2 679 190 (978 720 in the north, 1 500 470 in the south). Salisbury, the provincial and national capital, had in mid-June 1976 an estimated population of 567 900 (Africans 430 000, Europeans 126 000, Coloureds 7300, Asians 4600).

The province occupies the northern portion of Rhodesia. It shares common borders with Mozambique in the north-east and is bordered in the north-west by the Zambezi River and Lake Kariba which lie between the province and Zambia. Mashonaland shares a small border in the west with Matabeleland. The large Zambezi Parks and Wildlife Land are situated along the entire southern banks of the Zambezi River with the exception of the small Dande T.T.L. On the south-east, Mashonaland adjoins the province of Midlands and in the south-west, the province of Manicaland.

The province is divided into 19 districts.

Seven surfaced roads link Salisbury with the main towns of the province and with the provincial capitals of the three neighbouring provinces. Railway communications are available in the south between Salisbury, Umtali and Gwelo and in the north, to the provincial towns of Bindura and Sinoia. Apart from the surfaced road from Salisbury to the Mozambique border, going through Mudzi district there are secondary and tertiary roads available in the Tribal Trust Lands which are situated all along the Mozambique border.

Last outbreak

Only two smallpox cases were reported in Mashonaland (in 1970) in the last 10 years. These were two of the last six cases reported in the country.

1970 outbreak

From the admission register of the Infectious Diseases Hospital, Salisbury, and information from the Chief Health Inspector, Ministry of Health, it appears that the following sequence of events occurred.

Two children, Mufaro and Sheila Machawira, came from Gutu District in Victoria province to Bindura Police Camp where their father was employed. They travelled with their mother by bus, via Salisbury.

They became ill in Bindura and were sent to the Infectious Diseases Hospital in Salisbury on 22 December. As the records at the I.D. Hospital were not available, the date of their departure from Gutu and the date of appearance of rash is not known; however, it was reported that the children had been in Mozambique two weeks prior to the onset of rash. Specimens collected from these patients on 22 December 1970 (pustular fluid and serum) were positive for variola by electron microscopy and CF test and negative by immunodiffusion (growth on CAM not done). No further cases were detected in Bindura. The Police Camp and all the contacts were vaccinated.

A visit was made to Bindura but the Machawira family could not be located. The father was no longer employed by the Bindura police, and no further information was obtained on the spot. For logistic reasons it was not possible to conduct pockmark surveys in the area.

Health structure

A number of hospitals (central, provincial, mission, district, rural, industrial, mine, private) and many clinics are spread throughout the province (Fig. 9 and Annex B.2).

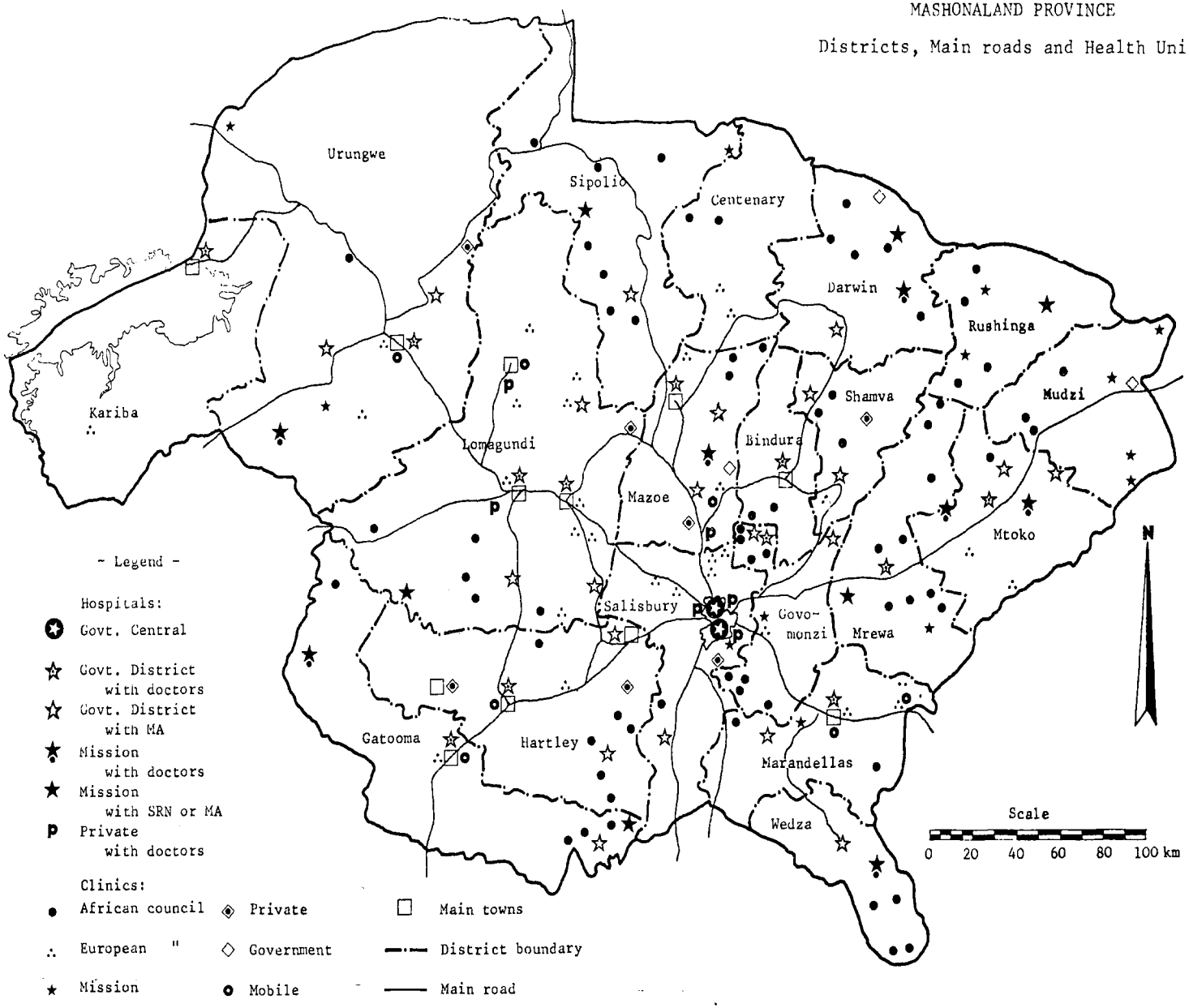
Municipality Salisbury

Communicable diseases in the city of Salisbury are the responsibility of the Municipal Officer of Health. He receives reports from the numerous hospitals, clinics and health centres in the city[1] which have a large number of personnel; 11 medical officers, 25 health inspectors, 263 nursing staff, 15 administrative and clerical staff and 266 persons occupying miscellaneous posts. There are two Infectious Diseases Hospitals, the Wilkins I.D.H. for Europeans and the Beatrice Road I.D.H. for Africans. A small number of chickenpox cases have been admitted to these two I.D. hospitals in recent years (in 1976 three cases to the Wilkins I.D.H. and 11 cases to the Beatrice Road I.D.H.). No chickenpox death has been recorded in the last seven years. No case was hospitalized at the time of our visit. There is presently an important influx of rural population into the city, to whom medical facilities are made available; the pockmark, vaccination scar and chickenpox survey which was begun in January in the municipal clinics therefore gives information about children from other areas of the province and country.

[1] If further information is required the 1976 Annual Report of the City Health Department, Salisbury, is available from the Smallpox Eradication unit, WHO headquarters, Geneva.

MASHONALAND PROVINCE

Districts, Main roads and Health Units



Vaccination programme

In this province, in addition to the mobile teams and health centre vaccinators, orderlies are stationed daily at all major bus stops to vaccinate travellers.

Children are supposed to be vaccinated from the age of six months but in some areas the majority receive vaccination at 12 months or older. The total vaccinations performed 1967-1976 are shown in Annex B.2.

Data acquired during field visits

Visits were made to three different districts and a total of 7278 persons were seen.

1. District of Shamva, where two protected villages (Mutumba PV5 and PV6) in Madziwa T.T.L., 130 km north of Salisbury, were visited (population 2073 and 1776).

2. District of Darwin, where two villages near Mkumbura town, approximately 200 km north of Salisbury, and 1 km from the Mozambique border, were visited (population 1300 and 1175).

3. District of Mudzi, where a protected village, Dendera, 200 km north-east of Salisbury and 15 km from the Mozambique border, was visited (population 5024, excluding children under two-years-of-age, from census made in October 1977).

All persons were examined for pockmarks and for vaccination scars, and those above seven years, and the health staff, were questioned about smallpox and chickenpox cases and deaths.

Pockmarks

No pockmarks were seen in 3018 children less than seven years old, or in the 1245 children of the 7-14 year age-group, with the exception of one child between seven and eight years old.

This child, from village Gomo, Darwin district, had suffered, according to his mother, from fever and rash in mid-1970 a few weeks after having stayed on a farm near Bindura town (where two of the last six cases reported in Rhodesia had occurred in December 1970). He presented 22, well-defined pocks on his face and a few superficial ones on his arms and legs. He had no vaccination scar although he had been vaccinated in his infancy (before his stay in Bindura). He had been hospitalized in Bindura Hospital for approximately one week; the mother had been told the diagnosis was chickenpox; no records are available at the Bindura Hospital.

Pockmarks were seen in 17 of 2965 persons aged 14 and above. Ten of these persons came from the villages near Mkumbura which lies 1 km from the Mozambique border. Four of these 10 persons had contracted the disease in Mozambique as a child; they were all males, aged 55 to 80 years, and they stated that many cases and deaths had occurred in the villages where they had contracted smallpox. Most of the others, from 27 to 50 years, had contracted smallpox in Rhodesia, in the same district where they were presently living or in a neighbouring district. The majority had contracted the disease in their infancy and had been told that other cases had occurred in their family or other persons from the villages where they had contracted smallpox. None of the 17 had a vaccination scar.

Another village (Keep 1) in Madziwa T.T.L. was visited by the local health staff, which had previously assisted in the survey carried out in that area. Four hundred and forty-five children in the 7-14 year age-group were examined at school and 302 mothers with their 576 small children below seven years were examined at the local well-baby clinic. No chickenpox cases were found nor children with pockmarks. The results of vaccination scar-assessment are shown below:

FIG. 10. RESULTS OF VACCINATION SCAR SURVEYS, MADZIWA T.T.L.

| Age | No. seen | No. with vaccination scars | % with vaccination scars | No. with facial pockmarks |
|---|---|---|---|---|
| 0-1 | 58 | 0 | 0 | 0 |
| 1-6 | 518 | 335 | 64.7 | 0 |
| 7-14 | 445 | 427 | 96.0 | 0 |
| Adult | 302 | 248 | 82.1 | 0 |
| Total | 1 273 | 1 010 | 79.3 | 0 |

Chickenpox

No active chickenpox cases were detected.

FIG. 11. RESULTS OF VACCINATION SCAR SURVEYS, MASHONALAND PROVINCE

| Village (total population) | Age group | No. seen | No. with vaccination scars | % with vaccination scars |
|---|---|---|---|---|
| Mutumba PV5 | 0-1 | 64 | 2 | 3.1 |
| Madziwa T.T.L. | 1-6 | 438 | 310 | 70.8 |
| Shamva District | 7-14 | 205 | 197 | 96.1 |
| (2073) | Adult | 409 | 386 | 94.4 |
| | Total | 1 116 | 895 | 81.8 |
| PV6 | 0-1 | 112 | 1 | 0.9 |
| Madziwa T.T.L. | 1-6 | 375 | 277 | 73.9 |
| Shamva District | 7-14 | 135 | 132 | 97.8 |
| (1776) | Adult | 650 | 600 | 92.3 |
| | Total | 1 272 | 1 010 | 79.4 |
| Village 1 | 0-1 | 121 | 4 | 3.3 |
| near Mkumbura | 1-6 | 309 | 224 | 72.5 |
| Mt. Darwin District | 7-14 | 85 | 82 | 96.5 |
| (1175) | Adult | 417 | Not done* | |
| | Total | 932 | 0-14 310 | 0-14 74.5 |
| Village 2 | 0-1 | 125 | 7 | 5.6 |
| near Mkumbura | 1-6 | 352 | 152 | 43.2 |
| Mt. Darwin District | 7-14 | 228 | 157 | 68.9 |
| (1175) | Adult | 393 | Not done* | |
| | Total | 1 098 | 0-14 316 | 0-14 44.8 |
| Dendera | 0-1 | 291 | 38 | 13.1 |
| Mudzi District | 1-6 | 831 | 642 | 77.2 |
| (5024) | 7-14 | 592 | 578 | 97.6 |
| | Adult | 1 096 | Not done* | |
| | Total | 2 810 | 0-14 1 258 | 0-14 73.4 |

*Examined only for pockmarks

VICTORIA PROVINCE

Description of province

The province is situated in the south-eastern region of the country and borders Mozambique in the south. It has boundaries with three other provinces, i.e. in the east with Manicaland province, in the north-west with Midlands and in the south-west with Matabeleland.

The province is divided into seven districts.

From Fort Victoria City, provincial capital, four main roads lead to the surrounding provinces and to the towns of the districts - Chiredzi, Nuanetsi, etc. Railway and aeroplane communications are available between Fort Victoria and Salisbury and aeroplane communications between Fort Victoria and Chiredzi. Numerous secondary roads establish car communication between the towns and villages of the province.

Health structure

Health facilities are numerous and well distributed (Fig. 12 and Annex B.1). The Provincial Medical Officer of Health is assisted by a variety of staff: one Medical Officer of Health; eight Health Nurses; three Health Inspectors; 54 Health Assistants; eight Health Orderlies; three Leprosy Scouts (for case finding); six general hands; as well as further staff in baby clinics, hospitals, etc.

Last outbreaks reported from the province - 1969

Nyashuru Rural Hospital, Matibi Tribal Trust Land, Nuanetsi District (seven cases; two deaths)

A health assistant reported a suspect smallpox case in the Nyashuru Hospital on 9 November 1969. The Provincial Medical Officer of Health visited the area, and examined the patients in the hospital. Details concerning this outbreak are as follows:

An unvaccinated woman, Sarah Johannes Mupota, was admitted to the maternity ward of the hospital on 19 October, to wait for delivery - she developed a rash on 2 November and was severely ill. The patient had come from Chibi District, Chihamuru Kraal, Gororo, 20 km from the Nyashuru Hospital where she had been in contact with her mother in the above-mentioned kraal. The mother had at that time presented a smallpox-like rash. A smear of pustular fluid, collected on 9 November, was found to be positive for variola by CAM inoculation at the Department of Microbiology, University of Rhodesia, Salisbury. No other cases were detected in Chibi, and the source of infection of the mother was not determined.

Another pregnant woman, Emma Nyari, from Gudu Kraal, Chief Marawire (approximately 30 km from Matibi Hospital) was admitted to the maternity ward of the hospital on 30 October 1969. On 31 October, she developed a rash. She had been vaccinated in her childhood and presented a mild attack of smallpox. During the investigation it was stated by the P.M.O.H. that Emma Nyari was visited before her illness by a person with smallpox coming from Mozambique, who visited the kraal. There were no cases in the kraal where she came from.

Emma Nyari's premature child, born at Gudu Kraal on 29 October, was also admitted to the hospital with his mother on 30 October. The child developed a rash on 8 November, i.e. 11 days after the birth.

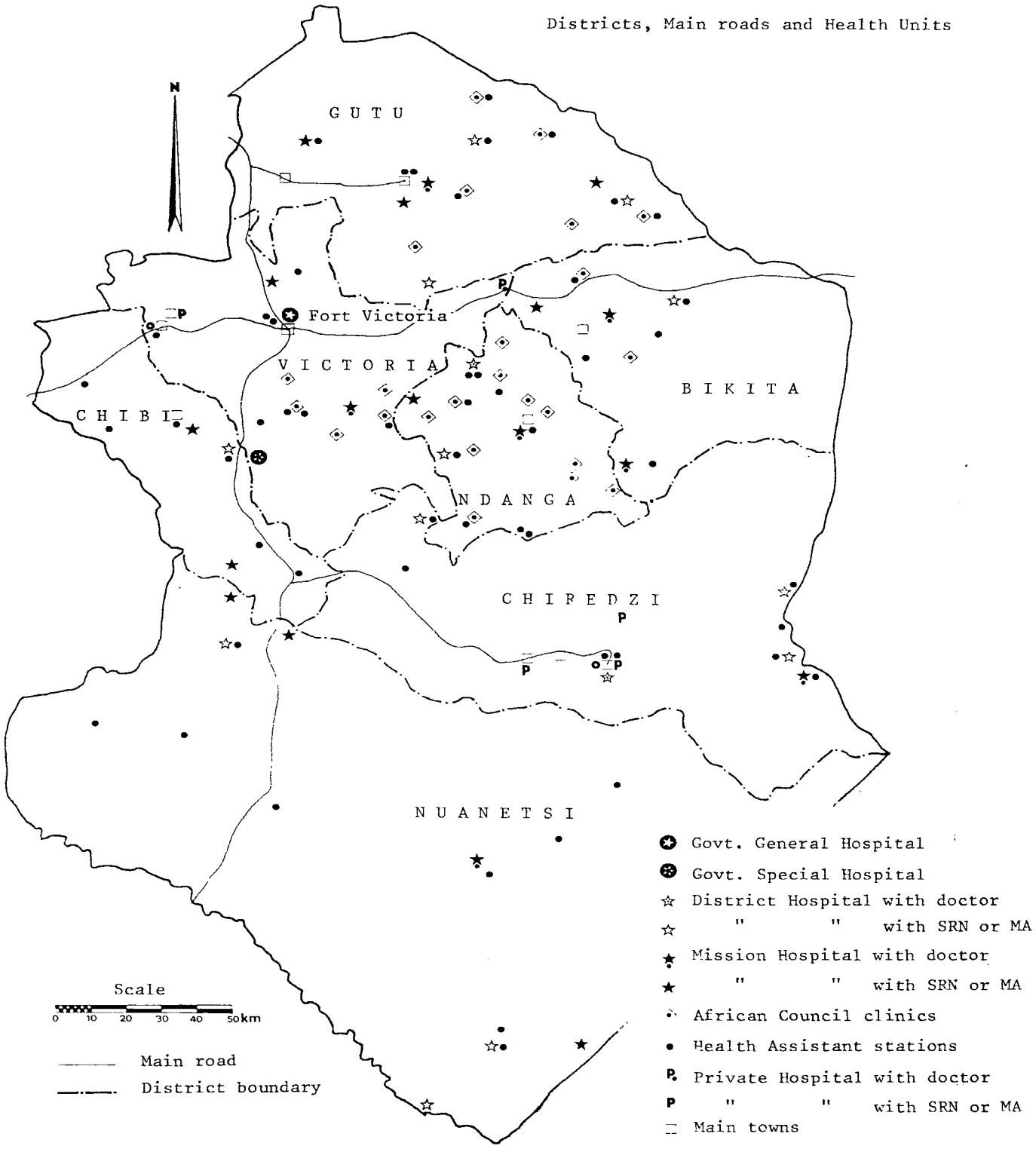
Other persons who later developed rash in the Matibi maternity ward were:

Wanyanya Gubo, male, delivered prematurely at home at Kraal Zvikure, Chief Neshuru, on 3 November, and admitted the same day. Rash commenced 13 November. Died 19 November.

FIG. 12

VICTORIA PROVINCE

Districts, Main roads and Health Units



Triplets (date of admission not stated) from Masingai Kraal, Chief Neshuro:

(a) Boyi Etus Shoko, 2-1/2 month male; rash developed 12 November;

(b) Tombi Etus Shoko, 2-1/2 month male. Date of appearance of rash - 12 November. Died 19 November;

(c) Boyi Shoko, 2-1/2 month male. Date of appearance of rash 16 November.

Maranda Tribal Trust Land, Nuanetsi District (seven cases)

The Medical Superintendent of Mhene Mission Hospital, Belingwe District, Midlands province reported 10 cases of smallpox seen in Wanezi extension (section 8 of Liebigs ranch) and seven in Mazetese clinic (both in Maranda Tribal Trust Land, Nuanetsi District, which has borders with Belingwe District).

The first case in the area (date not available) was seen by the Provincial Medical Officer of Health, Midlands. A tentative diagnosis of chickenpox was first made, but the case was reported later to the Provincial Medical Officer of Health, Victoria, on 30 November 1969 as suspect smallpox as the vaccination carried out on this patient did not take.

The following details concerning the seven cases at Mazetese clinic are available - five of the seven cases came from the same kraal, Mapuranka:

1. Tombana Matutu, 10 years, female, African. Kraal Mapuranka District. Chief Maranda. School Mulelezi. Admitted Mazetese clinic 4 November 1969.

2. Robi Makesa, five years, female, African. Kraal Mapuranka District. Chief Maranda. School Mulelezi. Admitted Mazetese clinic 4 November 1969.

3. Eliya Makesa, three years, male African. Kraal Mapuranka District. Chief Maranda. School Mulelezi. Admitted Mazetese clinic 4 November 1969.

4. Sara Maphosa, 29 years, female, African. Kraal Mapuranka District. Chief Maranda. School Mulelezi. Admitted Mazetese clinic 3 November 1969.

5. Agnes Matutu, 18 years, female, African. Kraal Mapuranka District. Chief Maranda. School Mulelezi. Admitted Mazetese clinic 3 November 1969.

The two other cases were from Maranda in Kraals Mafudze and Abani.

6. Kosina Shoko, three months, female, African. Kraal Abani District. Chief Maranda. School Mulelezi. Admitted Mazetese clinic 4 November 1969.

7. Bangayi Ndhlovu, one year, male, African. Kraal Mafudze District. Chief Maranda. School Mangwerume. Admitted Mazetese clinic 3 November 1969.

The three kraals were in the neighbourhood of the clinic. The seven cases were unvaccinated Apostolics.

Pustular/vesicular fluid from one of the patients, Agnes Matutu, from Mapuranka Kraal, collected by the Provincial Medical Officer of Health on 9 November was examined at the Department of Microbiology, University of Rhodesia, Salisbury, and was found to be positive for variola by immunodiffusion test (not tested by electron microscopy or growth on CAM).

The six other patients when examined on 9 November had a few scabs left and a few shallow scars. It appears the clinical diagnosis was difficult to make, but as four of the six came from the same kraal as the laboratory proven case, these were considered as probable smallpox.

No information is available concerning the 10 suspect cases in Wanezi extension reported by the Medical Superintendent of Mnene Hospital.

Seventeen more "old" suspect cases and 10 other rash cases in Maranda were reported by a senior health assistant.

The cases were examined by the Provincial Medical Officer of Health, Victoria, and were diagnosed as mild chickenpox.

Measures taken

1. The cases were isolated with one staff member attending them, and all contacts were vaccinated.

2. The two hospitals which harboured smallpox cases were closed to inpatients; the staff and the patients who were in the hospital at the time the cases were hospitalized were vaccinated. Gas refrigerators were installed in the hospitals for the storage of vaccine, and all outpatients were vaccinated.

3. After a mass vaccination campaign of the areas surrounding the hospitals and kraals of the different patients and suspect cases, systematic vaccination of the population of Chibi, Nuanetsi and Victoria Districts was carried out until the vaccination of the affected areas was completed. All persons coming into and from the areas by bus were vaccinated and also passengers at the railway depot, Fort Victoria.

There were 28 025 primary vaccinations and 132 417 revaccinations given in Victoria, Chibi and Nuanetsi Districts following the report of these cases. Special measures were taken to ensure the vaccination of the Apostolics, some of whom received their first vaccination at the age of 30 to 40 years.

Outbreaks of 1966-1968

Details are included in Annex B.4.

Vaccination programme

Mass vaccination is carried out by three mobile teams, each consisting of a team leader plus five vaccinators.

Each team is divided into two sub-teams, one consisting of a team leader and three vaccinators and the other of two vaccinators alone. An additional staff member provided with a motor bike is continuously on duty, for the transportation of vaccine, etc. to the teams.

In general, the teams vaccinate each year the population of two districts thus covering the population of the entire province by the end of three years. However, when outbreaks of smallpox or suspected smallpox occurred, the teams were diverted to assist the local authorities in the containment of that area.

The four-man team first visits a district, going from kraal to kraal, administering smallpox, polio and measles vaccine. This team is followed up a month later by the two-man team which checks, when possible, the primary vaccination takes and revaccinates those who have an unsuccessful vaccination.

During the absence of the teams, staff of the different health centres throughout the province perform vaccinations, mostly primary. In some areas, e.g. Mucheke Township, Fort Victoria, children are vaccinated on an individual basis when attending a clinic, and the take is checked at the time of the next attendance. In other areas, e.g. Estate compounds, children from different compounds are gathered monthly at a clinic, and are checked the month following vaccination. (See clinic forms, Annex B.5.) Children are obliged by law to be vaccinated before attending school. Each school is visited once every three years by the mobile teams, and during the children's attendance in first and second grade classes, their vaccination scar is regularly checked by the school nurses. Vaccinations performed are detailed in Annex B.2.

Administration of vaccine

Multipressure technique by means of a triangular-shaped needle. The well-baby clinic in Fort Victoria utilizes a bifurcated needle, for multipressure administration, but this is not the usual mode of administration.

Storage of vaccine and cold chain

The vaccine periodically is sent from Salisbury to Fort Victoria in boxes containing dry ice. In Fort Victoria, and most of the rural towns, deep freezers are available. The jeeps of the mobile teams are provided with small gas refrigerators which maintain a temperature of 2-4°C. The staff of the health centres in the hot areas such as Chiredzi are provided with "kylite" fibreglass covered boxes, filled with ice and freeze packs, for the transportation of the vaccine.

Chickenpox

The Provincial Medical Officer of Health of Victoria province receives from all health centres, with the exception of Health Assistant Stations, a monthly report on chickenpox cases and deaths.

FIG. 13. CHICKENPOX CASES AND DEATHS, VICTORIA 1970-1976

| Year | Total | Districts | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Bikita | Chibi | Chiredzi | Gutu | Nuanetzi | Victoria | Zaka |
| 1976 | 428 | 22 | 14 | 111 | 64 | 24 | 159 | 34 |
| 1975 | 393 | 93 | 103 | 197 | 0 | 0 | 0 | 0 |
| 1974 | 338 | 18 | 11 | 142/2* | 32 | 17 | 79 | 39 |
| 1973 | 212 | 26/1* | 1 | 83/1* | 37 | 22 | 32 | 11 |
| 1972 | 169 | 9 | 13 | 30 | 30 | 20 | 12 | 55 |
| 1971 | 269 | 31 | 21 | 80 | 19 | 47 | 46 | 17 |
| 1970 | 1 466 | 205 | 131 | 191 | 385 | 373 | 146 | 35 |

The only records kept concerning the chickenpox deaths were as follows.

One child, Magoba Beta, Bikita, died with generalized herpete-form eruption in Mashoko Hospital in July 1973.

Smears taken from the vesicles were reported by the University Laboratory, Salisbury, as showing that the virus belonged to the herpes group and was most likely to have been generalized herpes secondary to severe debility, although it could have been chickenpox. No pocks grew on CAM.

The child had a well marked vaccination scar from primary vaccination in 1971 and had an unsuccessful revaccination in 1972.

Concerning the death which occurred in 1974 in Chiredzi District, this case was seen by the Provincial Medical Officer of Health of Victoria who recalled the following facts. The patient was an adult woman who was very ill, with a high pyrexia on the second and third day of illness. She developed her rash on the day after she became ill. She had two well-marked vaccination scars. The Provincial Medical Officer of Health stated that, as there were numerous cases of chickenpox at the time, and there was no reason to suspect smallpox, specimens were not taken.

Data acquired during field visits

Visits were made to five areas and a total of 4496 persons were seen. The areas visited were:

1. Hippo Valley Estates - a cane sugar and citrus estate on the outskirts of Chiredzi, 120 km south of Salisbury, population 12 500.

2. African Township of Chiredzi town - population 6000.

3. Tshovani - 30 km east of Chiredzi, in the Sangwe T.T.L., a few kilometres from the Mozambique border, population 1600.

4. Triangle Estate - a cotton and cane estate, 25 km west of Chiredzi, population 35 000.

5. Fort Victoria - Well-Baby Clinic of African Mucheke Township, population 5100.

All persons were examined for pockmarks and for vaccination scars. Health staff and all over seven years were questioned in groups of 50 about rumours of smallpox/chickenpox cases and deaths.

Pockmarks (Fig. 14)

No pockmarks were seen in 1923 children under seven years of age or in 1061 children between the age of seven and 14. Among the 1512 adults examined, pockmarks were seen in four unvaccinated women between 30 and 72 years of age, from Triangle and Hippo Valley Estates. They had all contracted smallpox in their infancy and two had lost their sight in one eye as a complication of the disease. They had contracted the disease in Chiredzi District and two of them had a member of their family who had also suffered from the disease. The older woman of 75 years had her face pitted throughout by smallpox (and was blind in one eye), whilst the others had from 17 to 45 pockmarks on the face.

Information on smallpox

Many adults over 25 years of age recognized smallpox lesions on the recognition card or folder, whilst children made no differentiation between chickenpox and smallpox lesions. There was no rumour of smallpox in Rhodesia or Mozambique.

Chickenpox

No case was seen, but a number of children gave a history of chickenpox contracted a few months before and some of these presented superficial marks on their faces and bodies.

FIG. 14. RESULTS OF VACCINATION SCAR SURVEYS, VICTORIA PROVINCE

| Locality (total population) | Age-group | No. examined | No. with vaccination scars | % with vaccination scars |
|---|---|---|---|---|
| Hippo Valley Estate (Chiredzi) (12 500) | 0-6* | 203 | 81 | 39.9 |
| | 0-1 | 150 | 7 | 4.7 |
| | 1-6 | 528 | 236 | 44.7 |
| | 7-14 | 208 | 191 | 91.8 |
| | Adult | 638 | 544 | 85.2 |
| | Total | 1 727 | 1 059 | 61.3 |
| Chiredzi African Township (6000) | 0-1 | 61 | 2 | 3.3 |
| | 1-6 | 198 | 139 | 70.2 |
| | 7-14 | 314 | 296 | 94.3 |
| | Adult | 236 | 225 | 95.3 |
| | Total | 809 | 662 | 81.8 |
| Tshovani Village (1600) | 0-1 | 30 | 1 | 3.3 |
| | 1-6 | 178 | 85 | 47.8 |
| | 7-14 | 92 | 80 | 87.0 |
| | Adult | 109 | 105 | 96.3 |
| | Total | 409 | 271 | 66.3 |
| Triangle Estate (35 000) | 0-1 | 105 | 8 | 7.6 |
| | 1-6 | 448 | 357 | 79.7 |
| | 7-14 | 296 | 273 | 92.2 |
| | Adult | 376 | 359 | 95.5 |
| | Total | 1 225 | 997 | 81.4 |
| Muckeke African Township Fort Victoria (51 000) | 0-1 | 56 | 12 | 21.4 |
| | 1-6 | 169 | 115 | 68.0 |
| | 7-14 | 151 | 127 | 84.1 |
| | Adult | 153 | 144 | 94.1 |
| | Total | 529 | 398 | 75.2 |

* During the first survey children aged 0-6 were grouped together; however, as it was apparent that very few under one year of age had been vaccinated, the children were later divided into two groups, 0-1 year and 1-6 years.

A number of children in the 1-6 year age-group who did not have a vaccination scar had, according to their mothers, been vaccinated at a clinic where liquid vaccine is utilized.

ANNEX B.1

# MEDICAL INSTITUTIONS AND FACILITIES IN RHODESIA

## 1. Matabeleland province, 31 December 1976

Central hospitals

Bulawayo
Mpilo
Richard Morrks

Maternity hospitals

Lady Rodwell
Mpilo

District hospitals

Antelope
Beit Bridge
Binga
Essexvale
Filabusi
Gwanda
Inyati
Nyamandhlovu
Plumtree

Rural hospitals

Avoca
Dagamella
Kezi
Lady Mary Baring
Lukosi
Lady Stanley
Luveve
Matobo
Nkai
Siabuwa
Sipepa
Tjolotjo

Health centres

Victoria Falls

Medical officers of health (municipal)

Bulawayo

Other facilities - urban clinics

Industrial hospitals - 1

Mine hospitals - 3

Private hospitals and other facilities - 6

Provincial medical officer of health (Matabeleland)

Government subsidized medical missions

Dombodema
Embakwe
Fatima
Kariyangwe
Manama

Mbuma
Mtshabezi
Phumula
St Annes
St Josephs
St Lukes
St Pauls
Wanezi

Other medical missions (unaided)

Gungwe
Majini
Mavorovondo
Sacred Heart
Sashe
Zezani

Government subsidized town and rural council clinics

| | |
|---|---|
| Bubi R/C | 1 mobile service |
| Bulalima Mangwe R/C | 1 mobile service<br>Dingumuzi Clinic |
| Bulawayo/Essexvale R/C | 1 mobile service<br>Habane African Township Clinic |
| Gwaai River R/C | Gwaai River Mobile Service<br>Dett Township Clinic |
| Gwanda R/C | 1 mobile service |
| Victoria Falls Town | Victoria Falls Clinic |

Government subsidized Tribal Trust Land and African purchase area council clinics - 43

Annex B.1

2. Manicaland province, 31 October 1977

| | Beds | |
|---|---|---|
| | European | African |
| **General hospitals** | | |
| Umtali General Hospital | 92 | 103 |
| Rusape General Hospital | 14 | 211 |
| **District hospitals** | | |
| Sakubva District Hospital | | 100 |
| Inyanga District Hospital | | 120 |
| Chipinga District Hospital | 12 | 132 |
| African Infectious Diseases, Sakubva | | 86 |
| European Infectious Diseases, Umtali | 20 | |
| **Rural hospitals** | | |
| Odzi Rural Hospital | | 49 |
| Maranke Rural Hospital | | 60 |
| Nyanyadzi Rural Hospital | | 36 |
| Birchenough Bridge Rural Hospital | | 33 |
| Weya Rural Hospital | | 40 |
| Nedewedza Rural Hospital | | 25 |
| Makoni Rural Hospital | | 40 |
| **Government clinics** | | |
| Melsetter Clinic | | |
| **Mission hospitals** | | |
| St Joseph's Sanatorium, X 3050 Paulington Umtali | | 100 |
| Chikore Mission Hospital, P.O. Craigmore | | 44 |
| Mt Selinda Mission Hospital, P.B.2, Mt Selinda | | 185 |
| Elim Mission Hospital, P.B.7, Inyanga | | 60 |
| Avila Mission Hospital, P.B.9, Inyanga | | 36 |
| Mt Melleray, P.B.8, Inyanga | | 46 |
| Bonda Hospital, St David's Mission, P.B. 7187, Umtali | | 200 |
| St Barbara's Mission Hospital, P.B. 8048, Rusape | | 40 |
| Triarshill Mission Hospital, P.B. 8012, Rusape | | 42 |
| St Therese Mission Hospital, P.B. 8832, Rusape | | 30 |
| Queen of Peace Mission Hospital, P.O. Buhera (Queen of Peace) | | 40 |
| St Augustine's Mission Hospital, P.O. Penhalonga | | 27 |
| Old Umtali Mission Hospital, P.B. P7024, Umtali | | 92 |
| Monte Cassino Mission Hospital, P.O. Macheke | | 22 |
| St Andrews Mission Hospital, P.B. 7035, Umtali | | 30 |
| Nyashanu, Buhera, P.B. Buhera | | 20 |

Annex B.1

Council clinics

Headlands, Makoni Rural Council, P.O. Box 17, Rusape - 1 mobile
Dowa Clinic, Dowa African Council, P.O. Bwangwadza
Rowa, Bazeley Bridge, Rowa/Chinyauwhera Council, P.B. 07301, Umtali
Mt Jenya, Guta, Zongoro: Mtasa S. Council, P.B. J7197, Umtali
Mtasa N. Clinic; Mutasa No. Council, P. Bag 94-G Penhalonga
Zumbare Clinic, Mukuni Council, P.B. 2013, Odzi
Rampanapasi Clinic, Chitunge Council, P.O. Buhera

Community board clinics

Chibuwe Clinic, P.O. Chibuwe
Viriri Clinic, P.O. Buhera
Kumbudza Clinic, P.O. Watsomba

Mission clinics

St Rita's Clinic, P.B. 8001, Rusape
St Columba's Clinic, Honde
St Michael's Clinic, P.O. Rusape
Dandadzi Clinic, c/o Regina Coeli Mission Hospital, P. Bag 4, Juliasdale

Industrial clinics

Gwendingwe Estate, Melsetter
Charter Estate, Melsetter
Tilbury Estate, Melsetter
New Year's Gift Estate, Chipinga
Ratelshoek Estate, Chipinga
Stapleford Porest, Odzani
I.T.C. Inyanga
Rhod. Tea Estates, Inyanga

Protected villages

Ruda
Hauna
Sigambe
Sachisuku
Zindi
Rumbisi
Mandea
Mutema
Rimbi

Village health workers - 13

Annex B.1

3a. Midlands province, 31 December 1976

General hospitals

Enkeldoorn
Gwelo

Maternity hospitals

Birchenough

District hospitals

Belingwe
Gokwe
Selukwe
Shabani
Umvuma

Rural hospitals

Chilimanzi
Chingombe
Chinyika
Dzamabande
Jeka
Loreto
Lundi
Navira
Range
Sadza
Umgesi

Medical officers of health (municipal)

Gwelo

Other facilities

Gwelo Infectious Diseases Hospital
Child Welfare Clinic
Red X Clinic
Que Que

Industrial hospitals - 2

Mine hospitals - 2

Private hospitals and other facilities - 2

Provincial medical officer of health (Midlands)

Government subsidized medical missions

Mnene
Mtora
Musume
Muvonde
St Theresas Chilamanzi
Zhombe: Masase

Other medical missions (unaided)

Chingezi
Holy Cross
Lower Gwelo
Mazetese
Mpandashango
Nyashanu
Serima

Government subsidized town and rural council clinics

| | |
|---|---|
| Belingwe R/C | 1 mobile service |
| Charter/Chilimanzi R/C | Lalapanzi Clinic<br>Chivu Township Clinic |
| Gwelo/Selukwe R/C | Makusha, Selukwe Clinic |
| Que Que R/C | 3 mobile services |
| Redcliff Town | Rutendo Clinic |
| Vungu/Upper Ngesi R/C | Somabula Clinic |

Government subsidized Tribal Trust Land and African purchase area council clinics - 57

Annex B.1

3b. Midlands province, 3 March 1975

| District | Name | Location | Beds | Staff | | Theatre | X-ray | Lab. | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Drs | SRNs | | | | |
| Gokwe | Gokwe | Gokwe | 86 | - | 3 | + | + | + | District |
| | Kana | Kana T.T.L. | 42 | - | 1 | + | - | + | Mission |
| | Chereya | Gokwe T.T.L. | 35 | - | 1 | + | - | + | Mission |
| | Mtora | Sebungwe T.T.L. | 30 | - | 2 | + | - | + | Mission |
| Que Que | Que Que | Que Que | 135 | 2 | 28 | + | + | + | District |
| | Loretto | Zhombe T.T.L. | 80 | - | 1 | - | - | + | Rural |
| | Torwood | Risco, Que Que | 80 | 1 | 2 | + | + | + | Industrial |
| | Zhombe | Zhombe T.T.L. | 12 | - | 1 | - | - | + | Mission |
| Gwelo | Gwelo | Gwelo | 225 | 7 | 43 | + | + | + | General |
| | Birchenough | Gwelo | 18 | 7 | 8 | + | - | + | Maternity |
| | Shangani | Shangani | 46 | - | - | + | + | + | Rural |
| | St Patricks | Adj.Q.Q. T.T.L. | 50 | - | 1 | + | + | + | Mission |
| | Lower Gwelo | L.G. T.T.L. | 2 | - | - | - | - | - | Mission Clinic |
| Chilimanzi | Umvuma | Umvuma | 116 | 1 | - | + | + | + | District |
| | Chilimanzi | Chil. T.T.L. | 70 | - | - | + | - | + | Rural |
| | Holy Cross | Chil. T.T.L. | 18 | - | - | + | - | + | Mission |
| | St Theresas | Chil. T.T.L. | 200 | 1 | 7 | + | + | + | Mission |
| | Driefontein | S.E. of Umvuma | 340 | 1 | 5 | - | + | + | Mission |
| | Muvonde | S.E. of Umvuma | 133 | 1 | 3 | + | + | + | Mission |
| Selukwe | Selukwe | Selukwe | 107 | 2 | 2 | + | + | + | District |
| | Dzwamabande | Selukwe T.T.L. | 36 | - | - | - | - | - | Rural |
| | Rhod. Chrome | Selukwe | 71 | 3 | 2 | + | + | + | Industrial |
| Charter | Enkeldoorn | Enkeldoorn | 78 | 1 | 10 | + | + | + | District |
| | The Range | The Range | 35 | - | - | + | - | + | Rural |
| | Sadza | Sabi N. T.T.L. | 25 | - | - | + | - | + | Rural |
| | Narira | Narira T.T.L. | 32 | - | - | + | - | + | Rural |
| Shabani | Shabani | Shabani | 133 | 1 | 11 | + | + | + | District |
| | Lundi | Lundi T.T.L. | 78 | - | - | - | - | - | Rural |
| | Shabani Mine | Shabani | 300 | 4 | 3 | + | + | + | Mine |
| Belingwe | Belingwe | Belingwe | 45 | 1 | 1 | + | + | + | District |
| | Jeka | Belingwe T.T.L. | 40 | - | - | - | - | + | Rural |
| | Mnene | Belingwe I.C.A. | 252 | 3 | 12 | + | + | + | Mission |
| | Masase | Belingwe T.T.L. | 98 | - | 3 | + | - | + | Mission |
| | Masume | Belingwe T.T.L. | 113 | - | 5 | + | + | + | Mission |

Annex B.1

## 4. Mashonaland province, 31 December 1976

### Central hospitals

Andrew Fleming
Harari
Princess Margaret

### General hospitals

Bindura
Gatooma
Marandellas
Sinoia

### Maternity hospitals

Lady Cancellor
Harari
Queen Mary

### Provincial medical officer of health (Mashonaland)

### Government subsidized medical missions

All Souls
Chidamoyo
Chitsungo
Gunderson Horness
Howard Institute
Mary Mount
Monte Cassino
Mount St Marys
Nyadiri
St Alberts
St Pauls
St Ruperts

### Other medical missions (unaided)

Chikukwa
Chikwizo
Chindenga
Chishawasha
Chitimbe
Dendera
Dindi
Epworth
Mashambankaka
Nyabuka
St Martins
St Michaels
Sanyati Baptist

### District hospitals

Banket
Concession
Hartley
Kariba
Karoi
Makumbi, Chindamora Tribal Trust Land
Mount Darwin
Mrewa
Mtoko
Unvukwes

### Rural hospitals

Beatrice
Chikwakwa
Chiota
Darwendale
Madziwa
Makosa
Miami
Mondoro
Nyamazuwi
Raffingora
Rosa
Shamva
Urungwe
Wedza

### Government subsidized town and rural council clinics

| | |
|---|---|
| Ayrshire R/C | Vivelkia Clinic<br>Feoch Clinic<br>Mariwanu Clinic<br>Mobile service |
| Banket/Trelawney R/C | Kuwadzana Clinic<br>Trelawney Clinic<br>Kutama Clinic<br>Tobacco Research Clinic<br>Montgomery Clinic |
| Bindura R/C | Chipadze Clinic |
| Bromley/Ruwa R/C | Cranborne Clinic |
| Gatooma R/C | 3 mobile clinics |
| Hartley R/C | 3 mobile clinics |
| Karoi R/C | Tengwe Clinic<br>Karoi Clinic<br>2 mobile services |
| Macheka R/C | Macheke Clinic<br>Virginia Clinic<br>Waterloo Clinic |
| Marandellas R/C | Inyagui Clinic<br>plus 9 satellite visiting points |

Annex B.1

Government subsidized Tribal Trust Land and African purchase area council clinics - 80

Medical officers of health (municipal)

| | |
|---|---|
| Gatooma | Rimuka Maternity Hospital |
| Hartley | - |
| Marandellas | - |
| Salisbury | Salisbury Infectious Diseases Hospital and Chest Clinic |
| Sinoia | - |

Other facilities

Confinement Centres - Harari and Mabvuku
Child welfare clinics
Outpatient Clinic - Hatfield
Highfield Clinic
} Salisbury

Industrial hospitals - 2

Mine hospitals - 11

Private hospital and other facilities - 23

Government subsidized town and rural council clinics (continued)

| | |
|---|---|
| Mazoe R/C | 1 mobile service<br>Tsungubvi Clinic<br>Balgownie Clinic |
| Mtoko South R/C | Hoyuya Clinic<br>Mayo Clinic<br>Bel Broughton Clinic<br>Mtoko European Clinic |
| Norton/Selous R/C | Norton Hospital<br>Selous Clinic<br>Selous mobile service<br>Norton mobile service |
| Salisbury West R/C | Glen Forrest Clinic<br>Nyabira Clinic<br>Christon Bank Clinic |
| Shamva R/C | Wadzani Clinic |
| Umboe R/C | Doma Clinic<br>Umboe Clinic<br>1 mobile service |
| Umvukwes R/C | Gatu Clinic<br>Centenary Clinic<br>Waller Eryl Clinic |

5. Victoria province, 31 December 1976

General hospitals

Fort Victoria

Maternity hospitals

Fort Victoria

District hospitals

Chiredzi
Ndanga

Rural hospitals

Bikita
Chibi
Chichidza
Chikuku
Chitando
Gutu
Jean
Matibi

Health centres

Shabani

Medical officers of health (municipal)

Fort Victoria

Industrial hospitals - 2

Mine hospitals - 4

Private hospitals and other facilities - 1

Provincial medical officer of health (Victoria province)

Government subsidized medical missions

Morganster
Mukaro
Musiso
Silveira

Other medical missions (unaided)

Bondalfi
Chibi Clinic
Gakomere
Jichidza Clinic
Zimuto Clinic

Government subsidized town and rural council clinics

Chiredzi R/C 2 infant welfare clinics

Victoria R/C 1 mobile clinic

Government subsidized Tribal Trust Land and African purchase area council clinics - 35

ANNEX B.2

1. Total vaccinations given by province, 1967-1976

| | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 |
|---|---|---|---|---|---|---|---|---|---|---|
| Matabeleland | 144 657 | 110 921 | 130 456 | 165 993 | 165 020 | 282 708 | 134 743 | 11 762 | 18 975 | 38 512 |
| Mashonaland | 238 168 | 290 752 | | 254 246 | 307 885 | 337 325 | 224 770 | 163 664 | 237 947 | 137 862 |
| Midlands | 187 332 | 35 586 | 92 238 | 155 002 | 247 242 | 89 557 | 57 564 | 160 768 | 139 339 | 114 349 |
| Manicaland | 281 247 | 373 936 | 344 933 | 350 344 | 356 065 | 332 520 | 285 927 | 256 619 | 479 104 | 291 371 |
| Victoria | 145 166 | 139 630 | 208 749 | 161 523 | 188 384 | 116 162 | 160 887 | 136 416 | 258 908 | 102 865 |
| Urban areas | 176 646 | 194 105 | 200 697 | 111 174 | 134 956 | 242 896 | 255 723 | 255 388 | 230 891 | 250 552 |
| Other | | | | | | | | | | |
| Total | 1 173 216 | 1 144 930 | 977 073* | 1 198 282 | 1 399 552 | 1 401 168 | 1 119 614 | 984 617 | 1 365 164 | 935 511 |

* Mashonaland excluded.

Annex B.2

2. Vaccinations in Matabeleland, 1967-1976

| Year | Total | Primary vaccinations | Revaccinations |
|---|---|---|---|
| 1967 | 144 657 | 29 901 | 114 756 |
| 1968 | 110 921 | 27 708 | 83 213 |
| 1969 | 130 456 | 27 549 | 102 907 |
| 1970 | 165 993 | 35 253 | 130 740 |
| 1971 | 165 020 | 29 756 | 135 264 |
| 1972 | 282 708 | 132 525 | 150 183 |
| 1973 | 134 743 | 5 662 | 129 081 |
| 1974 | 11 762 | 8 598 | 3 164 |
| 1975 | 18 975 | 10 377 | 6 218 |
| 1976 | 38 512 | 13 054 | 25 458 |

3. Vaccinations in Manicaland, 1967-1976

| Year | Total | Primary vaccinations | Revaccinations |
|---|---|---|---|
| 1967 | 281 247 | - | - |
| 1968 | 373 936 | - | - |
| 1969 | 344 933 | - | - |
| 1970 | 350 344 | - | - |
| 1971 | 356 065 | - | - |
| 1972 | 332 520 | - | - |
| 1973 | 285 927 | 14 961 | 270 966 |
| 1974 | 256 619 | 20 543 | 236 076 |
| 1975 | 479 104 | 48 838 | 430 266 |
| 1976 | 291 371 | 35 127 | 261 244 |

Annex B.2

4. Vaccinations in Midlands, 1967-1977

| Year | Total | Primary vaccinations | Revaccinations |
|---|---|---|---|
| 1967 | 187 332 | - | - |
| 1968 | 35 586 | 7 155 | 28 431 |
| 1969 | 92 238 | 16 731 | 75 507 |
| 1970 | 155 002 | 28 320 | 126 682 |
| 1971 | 247 242 | 38 214 | 209 028 |
| 1972 | 89 557 | 12 628 | 76 929 |
| 1973 | 57 564 | 12 762 | 44 802 |
| 1974 | 160 768 | 30 157 | 130 611 |
| 1975 | 139 399 | 16 480 | 122 919 |
| 1976 | 114 349 | 13 348 | 101 001 |
| 1977 | 166 188 | 13 982 | 152 206 |

5. Vaccinations in Mashonaland, 1967-1976

| Year | Total | Primary vaccinations | Revaccinations |
|---|---|---|---|
| 1967 | 238 168 | - | - |
| 1968 | 290 752 | - | - |
| 1969 | - | - | - |
| 1970 | 254 246[a] | - | - |
| 1971 | 296 305[a] | 80 342 | 215 963 |
| 1972 | 321 149 | 77 557 | 243 592 |
| 1973 | 224 770 | 86 402 | 138 368 |
| 1974 | 163 664 | 50 027 | 113 637 |
| 1975 | 237 947 | 41 968 | 195 979 |
| 1976 | 137 862 | 21 279 | 116 583 |

a Figures supplied by provincial authorities for these years shown insignificant differences with those provided by the central authorities as in Annex B.2.1

Annex B.2

6. Vaccinations in Victoria province

(a) Total vaccinations, 1967-1975

| Year | Total | PV | RV | No. PV controlled | Primary takes | |
|---|---|---|---|---|---|---|
| | | | | | No. | % |
| 1975 | 258 908 | 51 536 | 207 372 | 11 694 | 9 934 | 85 |
| 1974 | 136 416 | 36 350 | 100 066 | 8 374 | 7 385 | 88 |
| 1973 | 160 887 | 41 901 | 118 986 | 11 100 | 10 363 | 93 |
| 1972 | 116 162 | 23 466 | 92 696 | 5 777 | 5 527 | 96 |
| 1971 | 188 384 | 57 249 | 131 135 | 8 846 | 8 055 | 92 |
| 1970 | 161 523 | 42 245 | 119 278 | 3 924 | 3 706 | 94 |
| 1969 | 208 749 | 47 450 | 161 299 | | | |
| 1968 | 139 630 | 21 120 | 118 510 | 3 494 | 2 828 | 82 |
| 1967 | 145 166 | | | | | |

(b) Vaccinations carried out by mobile teams, 1976 (by district)

| District | 0-1 year | | 2-4 years | | 5-14 years | | 15 years | | Total | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PV | RV | PV | RV | PV | RV | PV | RV | PV | RV | |
| Nuanetsi | 1 003 | - | 786 | 1 382 | 270 | 3 715 | 27 | 3 715 | 2 116 | 9 688 | 11 804 |
| Chibi | 5 213 | - | 7 533 | 9 112 | 1 769 | 31 026 | 304 | 23 465 | 14 819 | 63 603 | 78 422 |
| Victoria | 546 | - | 564 | 809 | 164 | 2 494 | 10 | 7 989 | 1 284 | 11 292 | 12 576 |
| Chiredzi | - | - | - | - | 13 | 50 | - | - | 13 | 50 | 63 |
| Total | 6 792 | - | 8 883 | 11 303 | 2 216 | 38 161 | 341 | 35 169 | 18 232 | 84 633 | 102 865 |

Annex B.2

(c) Routine vaccinations carried out in health centres, 1976

| | |
|---|---|
| Public health nurses | 3 154 |
| African council clinics | 811 |
| Hospitals and well-baby clinics | 663 |
| Mines | 45 |
| Mission well-baby clinics and hospitals | 1 911 |
| Rural councils | 5 484 |
| Totals according to district: | |
| Bikita | 1 188 |
| Chibi | 948 |
| Chiredzi | 3 824 |
| Gutu | 1 752 |
| Nuanetsi | 248 |
| Victoria | 3 529 |
| Zaka | 575 |
| Total | 12 068 |
| Grand total for province | 114 933 |

ANNEX B.3

UMTALI INFECTIOUS DISEASES HOSPITAL, MANICALAND

SMALLPOX CASES, 1965

| Name | Age | Sex | Race | Onset | Notified | Remarks |
|---|---|---|---|---|---|---|
| Eva Dzingwe | 25 | F | A | 13.1.65 | 15.1.65 | Symptoms appeared two weeks after returning from Portuguese East Africa where she had been nursing her mother with same disease. |
| Haareki Nybunga | 3 | F | A | 9.7.65 | 15.7.65 | Visited by friends from Portuguese East Africa within the last three weeks who may have transmitted disease. |
| Musaemwa Nybunga | 5 | F | A | 9.7.65 | 15.7.65 Died 19.7.65 | |
| Miriam Mukande | 21 | F | A | 10.7.65 | 22.7.65 | c/o Mr Syme, Deysbrook Farm, Melsetter. No. 2 wife of Nyabunga, father of two cases of smallpox notified last week. |
| Cipiwe Manyengawana | 1-1/2 | F | A | 29.7.65 | 6.8.65 | Mother of child reports neighbours' children in kraal are recovering from disease. |
| Elizah Joko | 4 | F | A | 16.8.65 | 22.8.65 | 148 Chineta, Sakubva. |
| Bisent Diyoko | 3 | M | A | 29.8.65 | 2.9.65 | 148 Chineta, Sakubva. |
| Shika Diyoko | 4 | F | A | 29.8.65 | 2.9.65 Died 6.9.65 | Sister of Elizah who was notified as smallpox last week. |
| Mboyi Chokoyo | 1 | F | A | 20.10.65 | 27.10.65 | Patient's kraal is near Portuguese East African border (Inyanga North). |
| Chiwonesa Naiti | 8 | F | A | 8.11.65 | 23.11.65 | Contracted disease whilst en route to Hot Springs from Portuguese East Africa. During journey on foot slept in various villages in Portuguese East Africa and Cashel Matambara area. |
| Grace Naiti | 7 | F | A | 8.11.65 | 23.11.65 | |
| Museki Naiti | 12 | M | A | 2.11.65 | 23.11.65 | |

SMALLPOX CASE, 1966

| | | | | | | |
|---|---|---|---|---|---|---|
| Chiokochi | 1-1/2 | M | A | 1.5.66 | 4.5.66 | Dzingire's kraal, Mvusha Reserve, Matambara (near Rusita Mission, Melsetter). |

ANNEX B.4

# VICTORIA PROVINCE: SMALLPOX OUTBREAKS 1966-1968

The original records were not available. The annual reports for these years contain the following information:

## 1966

From the Provincial Annual Report

"This year a 4 year old record was broken when a case came into a remote part of the province on the banks of the Sabi River. It appears that the first case, a woman, had entered the country from Portuguese East Africa, was taken ill and went for treatment to Sangwe Clinic. The nature of her illness was not at first realised during which time she infected 12 other hospital patients.

A mass vaccination was staged along the lines of communication for whose part I would like to pay tribute to the Medical Staff of Triangle and Hippo Valley Estates who dealt with all persons in their area at very high speeds.

The new freeze dried vaccine at one time threatened to endanger the whole campaign. In some cases local reactions were very severe, with deep and widespread indolent ulcers frequently seen. There were no neurological complications fortunately and one case of generalised vaccinia. Alteration of vaccination technique to four pressures only over an area the size of a match-head seemed to produce a more orthodox vaccination scar.

As a result of the measures taken and the high vaccination state among the community, no further spread of the outbreak took place. We have had a chickenpox outbreak for the past two months, so excursions and alarms on alleged smallpox are frequent. The fire brigade action undertaken did not interfere with our routine smallpox vaccinations and during the year a total of 170 280 vaccinations were carried out either as part of the emergency campaign, the routine campaign or at well-baby clinics."

## 1967

From the Provincial Annual Report

"The outbreaks reported last year went on sporadically for the whole of 1967. A total of 25 cases, although most unsatisfactory in view of our previous records, does indicate that the general vaccination level was high enough to prevent an explosive outbreak . . . There is a considerable amount of doubt about certain of the diagnoses, bearing in mind that we suffered a concurrent wave of chickenpox, e.g. I have yet to see a case of smallpox with a maximum temperature of 99°F or a case which had two excellent vaccination scars and three undoubted chickenpox cases in the same family."

From the Annual Report of the Secretary of Health

"Thirty cases of smallpox and one death were notified during the year. The continuance of smallpox in this country in spite of a very high level of vaccination is entirely due to the immigration by Africans from neighbouring countries usually along unauthorised routes. Every effort is made to vaccinate all entrants to the country through the normal ports of entry and the officials responsible for the recruitment of labour are co-operative in this respect, but there is a constant stream of illegal immigration by Africans seeking work in Rhodesia. Unfortunately, the labour is welcomed by the farming and mining communities and as a result, unvaccinated Africans incubating smallpox sometimes accompanied by women and children actually suffering from the disease but hidden away, continue to enter the country and cause limited outbreaks. The vast majority of the 30 cases occurred in the Victoria Province following an outbreak reported in that Province last year which originated from an unvaccinated African from Portuguese East Africa."

Annex B.4

1968

From the Provincial Annual Report

"One case was notified by Dr Major from Hippo Valley Estates. Considered to be chickenpox by District Medical Officer, Chiredzi, and Provincial Government Health Inspector. I saw the case two days later when the scabs were already drying and separating. The patient had been twice unsuccessfully vaccinated.

One case notified by Dr Kuhn as being smallpox. Notification was by post and by the time we received the notification she had absconded from Matibi Rural Hospital as she had no food. Patient was traced and found to have chickenpox.

Dr Hurd notified a case from Chikombedzi Mission. The Provincial Government Health Inspector considered the case to be chickenpox.

In all the above cases vaccination of all contacts and adjacent areas was carried out.

A team was stationed at Hippo Valley Estate but only 11 351 people were vaccinated. The organization was done by the Personnel Officer. There are an estimated 19 000 employees and dependants on the Estate.

Smallpox cases were reported from Nuanetsi to the Provincial Medical Officer of Health (Midlands) during October. This Province was not notified until 30 October. A separate report has been forwarded to the Secretary for Health."

From the Annual Report of the Secretary for Health

"It is rewarding to note that for the first time ever we had smallpox in only one Province and then only ten cases . . . The ten cases we saw were a local outbreak in the Victoria Province. All the cases were related to one imported case. This achievement says a great deal for the level of vaccination in the community and must be very gratifying for the Provincial Medical Officers of Health who over the years have pursued the Ministry's Policy of vaccinating regularly the entire population. However gratifying this is we must not relax this policy as the danger of further imported cases is always present."

| NEXT VISIT | NEXT VISIT |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

IMMUNIZATION SCHEDULE

| AGE | IMMUNIZATION |
|---|---|
| Birth or first visit | B.C.G. and polio |
| 2 months | Triple antigen and polio |
| 4 months | Triple antigen and polio |
| 6 months | Triple antigen and polio |
| 9 months | Measles |
| 12 months | Smallpox |
| 18 months | Triple antigen and polio |
| 5 years | Double antigen, polio and B.C.G. |

Triple antigen diphtheria, pertussis and tetanus.

Double antigen diphtheria and tetanus

NOTES

Printed by the Government Printer, Salisbury

MINISTRY of HEALTH

| CLINIC | No. |
|---|---|
| | |

# HEALTH CARD

| CHILD'S NAME | | |
|---|---|---|
| DATE OF BIRTH | M. or F. | NUMBER OF CHILDREN |
| | | |
| MOTHER | | |
| FATHER | | |
| ADDRESS | | |
| PLACE OF BIRTH | | |

IMPORTANT

This is your baby's card. Bring it every time you attend any clinic or hospital
Keep it clean and safe in the envelope

Annex B.5

| Date | Clinic comments or diagnosis |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

| Immunization | Dates injections given | Appointments |
|---|---|---|
| B C G | | |
| Smallpox | | |
| Diphtheria<br>Tetanus<br>Whooping Cough | 1<br>2.<br>3. | |
| Poliomyelitis | 1.<br>2.<br>3. | |
| Measles | | |

* * *