

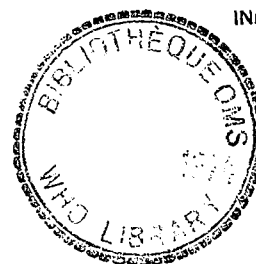


A PERSISTENT FOCUS OF SMALLPOX IN BOTSWANA

1973

by

G. T. Presthus<sup>1</sup> and J. B. Sibiya<sup>2</sup>



Introduction

In 1971, four years after its last known cases, smallpox reappeared in Botswana. The first cases were detected in areas immediately bordering South Africa, and although it was impossible to trace the source of infection of the first cases, it would seem likely that infection did come from South Africa as this was the only nearby country which was infected at that time. A total of 36 cases were recorded in Botswana in 1971, but it was felt that the actual total was much higher.

During 1972, smallpox spread widely throughout the country and, in all, 1056 cases were reported. An intensive eradication programme was begun and by November 1972 it was thought that transmission had been interrupted. However, on 7 March 1973, a 22-year old unvaccinated male was admitted to the Gaborone hospital with the provisional diagnosis of chickenpox. Smallpox Eradication Programme staff were contacted, a specimen was obtained and the diagnosis of smallpox was confirmed. With great difficulty, and only after three weeks of search, was the source determined to be a contact among persons of the Mazezuru religious sect.

Subsequently, during 1973, a total of 30 cases were identified which had occurred in three separate locations. All were among a sect known as the Mazezurus or had acquired smallpox from them. The last known cases experienced the onset of disease on 15 November 1973. The following is an account of, hopefully, the last outbreaks of smallpox in southern Africa.

The Mazezuru (or Zezuru) people

The total population of Mazezuru in Botswana is between 3500 and 5000 people, or less than 1% of the total population of the country. They live in nine different towns in closed or semi-closed communities. All live within 35 miles of the rail line which runs from Capetown to Salisbury passing through the eastern part of Botswana. (Fig. 1) Some Mazezuru are not Botswana citizens and still carry Rhodesian or South African passports from whence they came. They were forced to leave their previous homes because of their reluctance to follow government directives, submit to vaccinations, etc. They do not allow their children to go to school and are totally opposed to preventive or curative medicine. Many are vaccinated, but only after considerable difficulty or out of necessity to cross into South Africa on church or other business.

<sup>1</sup> WHO Technical Officer, Gaborone, Botswana.

<sup>2</sup> Senior Health Inspector, Republic of Botswana.

It is not uncommon for Mazezurus to travel the length of Botswana by train for a visit of a few days to friends or relatives or perhaps to sell a few things. It is of note that in April 1973, nearly the whole Mazezuru population of the town of Palapye took the train to Francistown when they heard that the Health Inspector was coming to vaccinate them against smallpox.

The Mazezuru women are readily recognized. They wear all-white clothing and are generally employed as small traders selling fruit and handicrafts at train stations and bus stops. The men often have a beard. They are very independent of other people. The women rarely answer questions without the husband present. Cooperation with the smallpox surveillance teams is poor and they have been argumentative to the point of threatening physical violence to surveillance officers.

#### Measures taken after discovery of the first case in March 1973

Following discovery on 7 March of the first known case in Botswana in over three months, strenuous efforts were made to discover the source. A house to house search was conducted in the area surrounding the patient's house. The same was done in the area where he worked and neighbours and friends were questioned at length in regard to suspect cases. The investigations were extended in ever widening circles. One surveillance team and the mobile vaccination team checked Gaberone (population 27 000) and one searched an area 40 miles from Gaberone where the patient had spent one night prior to his illness.

After three weeks of search, a tip from school children led to a Mazezuru household where people with recent pock marks were seen. Two days later an active case was found. This case, an unvaccinated 12-year-old girl, had been hidden in the house by her parents. In subsequent investigations, other cases were found which had come from Shashi, 400 km to the north of Gaberone. This focus was discovered by surveillance teams doing door to door search who found several cases among non-Mazezuru people. They had been infected by Mazezurus living nearby. Thus both foci discovered in March - April were discovered through recognition of cases in non-Mazezurus whose sources of infection were the Mazezurus.

Immediately after the Mazezurus were found to be harbouring infection, all Health Inspectors were notified by cable and asked to search Mazezuru villages in their areas for any evidence of recent smallpox. Within one week all Health Inspectors had replied that none had seen any signs of smallpox.

The leaders of the Mazezuru church were contacted and the dangers of smallpox were discussed. While the leaders did not favour vaccination, they stated that they would permit it, but they would not agree to allow anyone to go to the hospital for isolation purposes. The principal problem, however, was to find the Mazezuru children as they normally fled when they saw vaccinators coming. Later it was learned that while many leaders pretended to cooperate, actually they told the people to flee when they saw us coming.

The radio was used to alert the populace to the danger of acquiring smallpox from the Mazezurus. Their help was requested in finding other cases. Door to door search was used, and in the end was the only way results were obtained. With lack of cooperation by the Mazezurus, it was necessary to maintain a constant presence in all danger areas and to do repeated door to door searches.

In the Gaberone focus, a total of nine cases were eventually identified with onsets dating back to October 1972, at a time when smallpox was known to be endemic in Botswana (Fig. 2). Eight of the nine persons were Mazezurus. Ten additional cases were discovered in the Shashi focus, the earliest having occurred in January. The source of the earliest known case could not be identified. Four of the 10 cases were among the Mazezurus; the remaining six cases occurred in a single non-Mazezuru household.

The onset of the last cases in Gaberone occurred in March and in Shashi in April, but surveillance teams continued to search suspect and possible problem areas. Of principal concern was the rapidly growing mining area of Selibe Pikwe, whose population had increased from 5000 to 20 000 in only two years. This area, located near Shashi, has a large turnover of population, especially in the squatter village of Botshabelo (population 15 000) which is part of the Selibe Pikwe complex. In May 1973, a sample survey to assess the level of immunity in this area revealed that 4496 of the 5643 persons examined (80%) bore scars of vaccination. About 500 Mazezuru live in Botshabelo. One approach to surveillance in this area was to post surveillance officers at each of two stand pipes from which those in the village obtained their water. The Mazezurus, however, consistently came to obtain water at night in order to avoid the surveillance officers.

#### Discovery of another focus in September 1973

In September, it appeared increasingly likely that smallpox had been eliminated as almost five months had elapsed since the last known cases. Although the surveillance teams continued to search suspect areas and to vaccinate susceptibles, no cases had been found.

However, in September, a 16-year-old female arrived at the Francistown hospital with classical smallpox, and the diagnosis was confirmed by the laboratory. She was a runaway non-Mazezuru child who had left her village near Francistown to go to Selibe Pikwe. She had become pregnant, contracted smallpox and returned home. At first it was difficult to ascertain exactly where she had been during the weeks previous to onset of illness, so her home village was first checked. Nothing was found and the search concentrated on Selibe Pikwe, where she had been staying in the Mazezuru sector of Botshabelo.

After three weeks' search, two old cases were discovered in Botshabelo. The two were sisters whom the girl admitted she had seen with rash. They both had onsets in August and are assumed to have been the source of infection for the girl who came to the Francistown hospital.

A week later, after repeated house-to-house search, another old case was found, a three-year-old girl whose mother claimed had been vaccinated. Despite extensive questioning, no information could be uncovered to identify her source of infection. Her date of onset was said to be July, and it appeared as though she might have been the source of infection for the two sisters whose onsets were in August. One week later, another old case was discovered, a sister of the case seen the week before. When we had asked about other family members with rash, the answer had always been that there were none. The parents claimed that her rash started in June. This is, however, open to question, as later information revealed.

Information about other cases was never volunteered. We only found them after repeated door-to-door search. It is probable that there were at least six to 10 other old cases which we did not find. Anyone who had suffered or was suffering from smallpox was hidden when the teams came. Children were sometimes sent to another town so that they could not be questioned. Thus all Mazezuru villages were visited several times. One child who had suffered from smallpox and was old enough to answer questions herself, admitted that her mother and father told her not to answer questions.

A typical conversation with a woman found in one compound went something like this after normal greetings.

Question: Have you seen anyone with spots similar to this? (showing identification card).

Answer: No.

Question: No one?

Answer: No one ever.

Question: What about Ethel?

Answer: Oh! yes she had some.

Question: Anyone else?

Answer: No. Never anyone else.

Question: What about Rosemary?

Answer: Oh! yes she had them too.

Question: Anyone else?

Answer: No. Never anyone else.

etc.

#### Discovery of a third focus in December

Five cases were identified as a result of investigations following the September case, the onset of the last case being 14 September. Again, as time elapsed, it appeared that the last focus might have been eliminated. However, on 21 November, an eight-year-old girl was seen in Botshabelo, whose rash was so sparse that the diagnosis was not certain. Scabs were taken and sent to the WHO Reference Laboratory, and from these variola virus was isolated. Two additional cases, a brother and a sister, were subsequently found in the same family - all three children had onsets between 1 and 11 November.

The three most recent cases were discovered to be siblings of the two other girls whose illnesses were said to have occurred in June and July. No history of contact with other smallpox cases could be obtained. However, the possibility must be considered that the two sisters who were discovered only in early November and who were said to have had smallpox in June and July had actually experienced onsets in September and October respectively. Often following variola minor, virtually no trace of a scar or even depigmentation is seen once the scabs have separated and thus, it is not possible on physical examination alone to estimate a date of onset of the illness. Since so much of the information provided us was so misleading, their reported dates of onset must be viewed with scepticism.

In all, five additional cases were found after discovery of the November case. Two of these, as noted, being in Selibe Pikwe and three in Gaborone - the index case in Gaborone having been infected in Selibe Pikwe.

Search and vaccination activities have continued to date, but no further cases have been found. Neighbouring countries were informed of the outbreaks at the beginning and kept fully informed. They, too, searched for cases but found none.

#### Age, sex and vaccination status of cases

As shown in Table 1, 25 of the 30 cases were in children below 15 years of age. None had previously been vaccinated. A 21-year-old woman was the only person with a vaccination scar to develop smallpox. Consistent with previous observations of a very low case fatality rate for smallpox in Botswana, no deaths occurred among these cases.

#### Overall level of vaccination immunity

Scar surveys were conducted throughout Botswana between January and March 1973 to assess vaccination immunity. In all, 68 065 persons were examined or 11% of the country's estimated population of 630 379. These surveys revealed scars of vaccination among 76% of those 0 to 5

years; 83% among those six to 14 years and 79% of those 15 years and over. Since January 1973, vaccination activities have been intensified. Over 50 000 persons were vaccinated between January and March alone. Vaccination immunity levels in towns where Mazezuru communities are present now exceed 90%.

### Conclusion

The need for continuing surveillance following the apparent interruption of smallpox transmission in a country is well illustrated in this series of outbreaks. In these series of outbreaks in Botswana, smallpox was clearly able to persist for a long period in a very tenuous chain of transmission among a small population group, finally and apparently subsiding only at the end of the smallpox season (April to November).

The lack of cooperation by the sect primarily affected made control of the disease extremely difficult. This was further complicated by the exceptionally mild nature of the infection (variola minor), which made detection of recovered cases very difficult and, also, resulted in the disease being regarded as an illness of comparatively little consequence by the population as a whole.

Continuing surveillance is mandatory in Botswana, but if no cases are detected during the May to November 1974 smallpox season, we will be considerably more confident that transmission has been interrupted - and that Phillip Bambuta, a two-year-old resident of Gaberone who became ill on 15 November 1973, was the world's last case of variola minor.

TABLE 1. AGE, SEX AND VACCINATION STATUS OF BOTSWANA CASES - 1973

Age	Male	Female	Total	Previously vaccinated	Deaths
<1	0	1	1	0	0
1-4	4	6	10	0	0
5-14	3	11	14	0	0
15+	1	4	5	1	0
Total	8	22	30	1	0

BOTSWANA - SKETCH MAP

Fig. 1

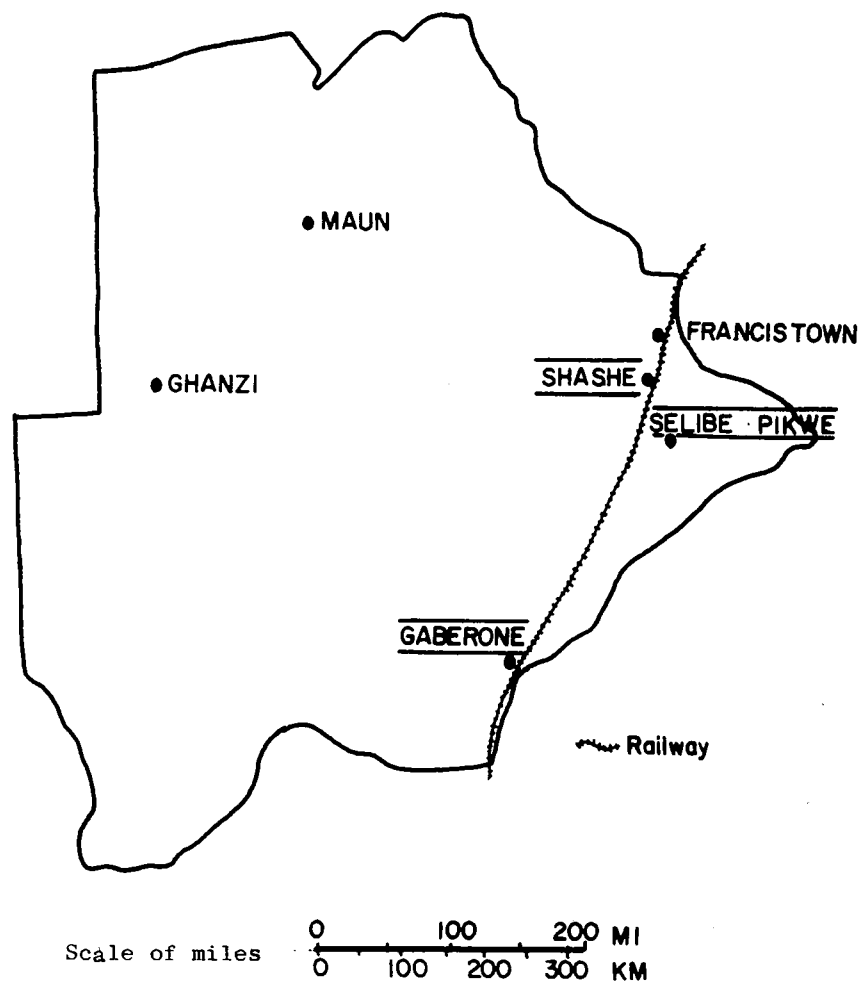


Fig. 2. BOTSWANA: smallpox cases discovered in 1973

