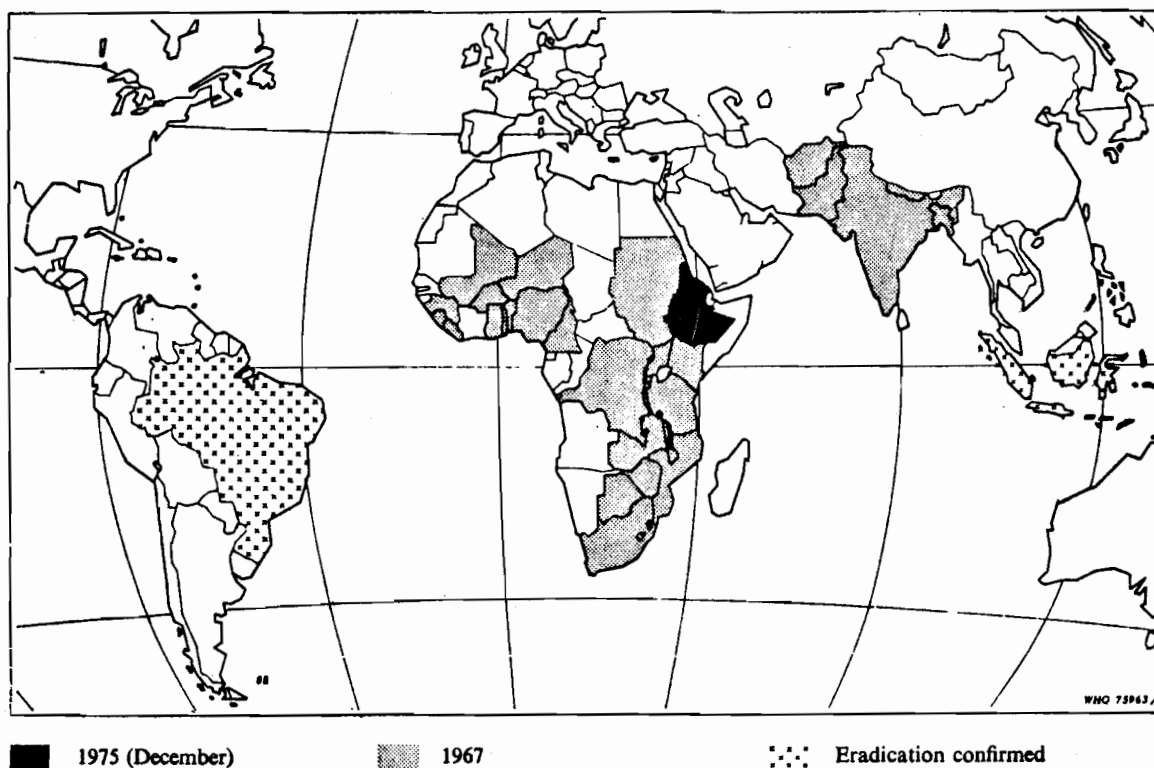


Smallpox endemic countries, 1967 and 1975



Search for killer carrier

by a Staff Correspondent



SPECIAL REPORTS

For centuries smallpox has been the scourge of mankind, and now at the end of a nine-year world-wide campaign attention focuses on the Horn of Africa where a search is going on for the man, woman or child who could be the world's last undetected victim of the disease.

A SEARCH and destroy operation is going on in Ethiopia which, if successful, could lead to a major breakthrough in the history of medicine and of mankind. The search is to find the carrier of the smallpox focus who could well be the last undetected victim or the disease in the world.

For centuries smallpox has been the scourge of mankind. Smallpox kills one victim in four and can blind and scar the survivor for life. Medical authorities say it is as old as mankind itself. It was known to the ancient Egyptians and the mummified face of Pharaoh Rameses V is said to carry the scars of the disease. Ancient Chinese

literature describes the disease, and in Rome around 312 AD the disease caused so many deaths and had such a paralysing effect on social and political life that at least one historian has said that smallpox was a contributing factor to the decline and fall of the Roman Empire.

The advent of smallpox vaccination was the opening of a great new chapter in the history of world medicine, and for years medical opinion has held that the disease could be totally eradicated from the face of the earth.

There is general agreement that smallpox can be wiped out in endemic areas if 80 per cent of the population is vaccinated

or re-vaccinated within a period of four to five years. But with modern methods of rapid travel infected persons can spread the disease from country to country, sometimes before they themselves have any symptoms. And so although vaccinations of millions of people have been going on for years it was not easy to control the re-introduction of smallpox in areas previously thought to be rid of it.

It was in 1967 that the World Health Organisation, which is responsible for the world-wide control of smallpox together with other communicable diseases, decided to try to get rid of smallpox once and for all. At that time there were 2½ million known cases in 42 countries.

By May 1974, of the 1,981 cases detected in Africa, all except 24 were reported from Ethiopia. Imported cases were reported along the Ethiopian border in Kenya (four), Somalia (eight) and the French territory of the Afars and Issas (12).

Dramatic fall

This dramatic fall was a result mainly of the increased support given to the world-wide eradication campaign by the governments of the last four countries in which the disease was known to be still widespread — Bangladesh, Ethiopia, India and Pakistan.

The total number of smallpox cases

notified world-wide to WHO for the year 1975 was 19,223, which was 90 per cent less than that reported for 1974 and the smallest number of cases recorded by the organisation for any year. During the month of December, 1974, only 202 cases were detected in Ethiopia which was believed to be the world's last country with endemic smallpox.

However, Somalia reported 14 cases last year, all among nomads who had been infected in Ethiopia's Ogaden Desert area and developed the illness after returning to Somalia. All the same, before the end of December 1975, the severe type of smallpox, *variola major*, appeared to have been eliminated.

A form of smallpox that is similar to *variola minor* and causes death among one per cent of its victims appears now to be confined primarily to four remote areas of Ethiopia, covering about 13,000 square kilometres, which is little more than one per cent of the total surface area of Ethiopia.

One major problem is that the Ethiopian variety of smallpox is very mild and is not always reported. This means that it persists in remote areas and acts as a focus for reinfection.

Intensive search

During 1975, Ethiopia reported a total of 3,880 cases of smallpox, a decrease of 12 per cent from the total reported during 1974. However, WHO experts said that reporting in 1975 was more complete than in preceding years partly because the smallpox programme staff was increased from less than 100 people to more than 500, and because additional support was provided by the government authorities. This permitted more intensive search for cases than had been possible before.

In February 1975, initial efforts were made to assess and monitor the number of infected villages in which one or more cases had occurred during the preceding six weeks — a system of appraisal previously utilised in Asia. The first assessment revealed some 60 known infected villages.

However, there were at that time large areas that were believed to be infected with smallpox but civil disorder or lack of personnel prevented any form of surveillance. In the course of the year, the number of staff increased more than fivefold and civil disorder diminished in many areas.

Surveillance was then initiated in an increasing number of areas which for many months had been inaccessible. As was suspected and feared, many additional infected villages were discovered. Most of the villages were in almost inaccessible mountainous areas of the central plateau.

Surveillance teams

Even when outbreaks were discovered, several weeks were usually required to persuade between 60 per cent and 80 per cent of contacts to accept vaccination. As a result, smallpox outbreaks persisted for

months. Not surprisingly, the number of infected villages rose steadily from 59 in February to a peak of 144 in early July.

With additional staff and transport and with added help from local government administrators, it was possible gradually to induce villagers to co-operate with the programme. Throughout most of Ethiopia, except in Eritrea and limited areas of some other provinces, surveillance teams were able to conduct a planned programme of vaccination and to search for hidden foci.

Eritrea, which has an extensive network of health centres and where widespread vaccination has been performed for many years, has been smallpox-free for more than three years. Ethiopia's endemic foci are distant from Eritrea and the movement of population to and from this area is limited.

In most of the other scattered areas where surveillance was not practicable, it was possible to carry out searches and vaccinate the population within the past two years. The experts say smallpox cases could be occurring in such areas but definitive appraisal would be possible only when they became fully accessible.

By the beginning of this year, however, there were only 202 known cases throughout Ethiopia.

But 1975 will go down in history as the year when smallpox was eradicated on the Asian continent. Only one known patient developed the rash during the year. Although it cannot yet be stated with certainty that no focus of smallpox persists in Asia, each day that passes decreases the likelihood that the focus will be found.

Rumours of cases

The eradication of the disease in Asia enabled the WHO authorities to concentrate their attention on Africa where a number of suspected cases and rumours of cases in many countries were carefully investigated by national and WHO teams.

In each instance, except in Ethiopia, the investigations definitely excluded smallpox. Most of the cases were shown to be chickenpox; some in Zaire proved to be caused by monkeypox virus, and some were cases of measles.

The WHO had hoped to announce last month that for the first time in history it had totally wiped out smallpox from the face of the earth. By August this year the doctors thought they had got the number of known infected cases down to one, a baby girl on the eastern border of Ethiopia.

However, on September 20 a case was reported from Mogadishu, capital of nearby Somalia. Previously Somalia had been clear for 12 years apart from a few imported cases. Then five more cases were found in Mogadishu.

WHO doctors and advisors launched a search and destroy campaign. And they found that the cases in Mogadishu originated from a single nomad walking 400 kilometres following the old cattle trail from Ethiopia.

So the chain was traced back to

Ethiopia, but the original smallpox focus has still not been located. So there is a desperate search going on in the two countries to find the original contact as well as to detect any other possible victims.

It can be said that mankind is on the threshold of a superb triumph. It could be that the world is witnessing the last smallpox outbreak it will ever know. Progress to date suggests that Ethiopia's last endemic foci of smallpox could be eliminated within the next few months.

However, in Ethiopia, perhaps more than in any other previously endemic area, intensive surveillance for not less than two years will be indispensable.

Before smallpox eradication can be confirmed, active surveillance must be conducted for at least two years from the date of onset of the last known case to be certain that no hidden foci remain.

Hidden foci

But from experience in the smallpox eradication programme to date, it appears, in fact, that a hidden foci is unlikely to persist for more than eight months in a country thought to be free of smallpox.

The 24-month surveillance period thus provides a margin of safety. In addition, the WHO expert committee has advised that since smallpox is readily transported from place to place, the concept of 'eradication' should be applied to only large areas; for example, Africa, South America, the Asian subcontinent, or Indonesia, which when freed of smallpox, would be unlikely to experience importations.

To date, programmes in two major geographical areas — South America and Indonesia — have been assessed by specially convened international commissions. In both instances, after a full review of the activities of the programmes in these areas and field visits for on-the-spot verification, the commissions certified that they were satisfied that smallpox had been eradicated.

Preparations are being made to convene international commissions for 15 countries in West Africa and for Pakistan and Afghanistan during 1976. The last case in West Africa occurred in June 1970 and, although cases are still occurring on the African continent, the extreme distance and minimal amount of travel between Ethiopia and West Africa make re-introduction most unlikely.

An important feature of the certification programme in West Africa is the organisation of special countrywide surveys of schoolchildren to detect facial pockmarks and, when these are found, the documentation of the year in which they were acquired.

Provisionally planned for 1977 are commissions for the remaining countries of the Asian subcontinent and for central and southern Africa. If Ethiopia's last case is detected within the next twelve months and effective surveillance can be conducted during the succeeding two years, the last international commission could be convened some time during 1979.●