

Present State of Global Smallpox Eradication¹

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Summary

in the six years during which the intensified global smallpox eradication programme has been in operation, the number of endemic countries has declined from 30 to 5 and the total estimated number of cases from 2 500 000 to 200 000. This year, with the extension of surveillance activities into remaining endemic areas, the programme enters its final phase. The goal of this phase is to interrupt smallpox transmission in the remaining endemic countries during the course of the next two smallpox seasons.

Six years ago the World Health Assembly declared the world-wide eradication of smallpox to be one of the major objectives of the Organization. It requested its member states to give the highest possible priority to the provision of necessary assistance in order to accomplish this task in the shortest possible time. It was hoped that the goal might be achieved within a 10-year period.

The response to this request by both endemic and non-endemic countries has been gratifying. In fact, sufficient progress has now been made that it was decided to embark in September 1972 on what has been termed the "final phase" of the programme. Accordingly, intensified surveillance activities are now being undertaken in all remaining endemic areas with the objective, quite simply, of reducing to zero smallpox incidence throughout the world during the next two smallpox seasons.

To some, this might seem an unduly optimistic and overly ambitious goal in light of current trends in the reported smallpox incidence. In 1972 65 000 cases have been recorded. This is twice the number of cases recorded in 1970 and 23 per cent more than were reported in 1971. It is also noted that more cases resulted from importations in 1972 than in any year since the programme began.

However, presently there is, for the first time,

some sort of surveillance activity in all endemic areas. During the past year surveillance activities have begun in the remaining 9 of 14 provinces in Ethiopia, in the southern provinces of Sudan, in western Nepal, in the remaining 3 of 4 provinces in Pakistan, in Botswana and in several states of India.

While neither the quality nor the intensity of surveillance measures in many areas are yet up to the standard required to interrupt smallpox transmission, steady progress is being made and the gap between that which is present and that which is required is narrowing.

The increase in reported cases in 1972 reflects this intensified surveillance activity and, as such, is regarded as a favourable sign. The present status of smallpox in the world is perhaps best viewed in the perspective of events of the past six years. In 1967, when the programme began, smallpox was considered to be endemic in 30 countries: in Africa — most countries south of the Sahara; in Asia — Afghanistan, India, Indonesia, Nepal and Pakistan; and in South America, one country — Brazil. Twelve additional countries reported cases believed to be importations. WHO cooperated with health authorities to plan smallpox eradication programmes in each of the endemic countries and in many countries particularly vulnerable to the introduction of smallpox owing to their geographical situation. Some programmes began in 1967, but most started in 1968 or 1969. The last, in Ethiopia, began in January 1971. In all, WHO assisted programmes in more than 50 countries.

From the beginning, the strategy of the programme emphasized surveillance as its primary component with mass vaccination a secondary feature. In the past, eradication programmes consisted almost solely of mass vaccination; with the present strategy, surveillance is the keystone.

Since 1967, both the incidence of smallpox

¹ Presented at the "Berner Kolloquium über Pockenimpfung", October 24, 1972, Berne, Switzerland.

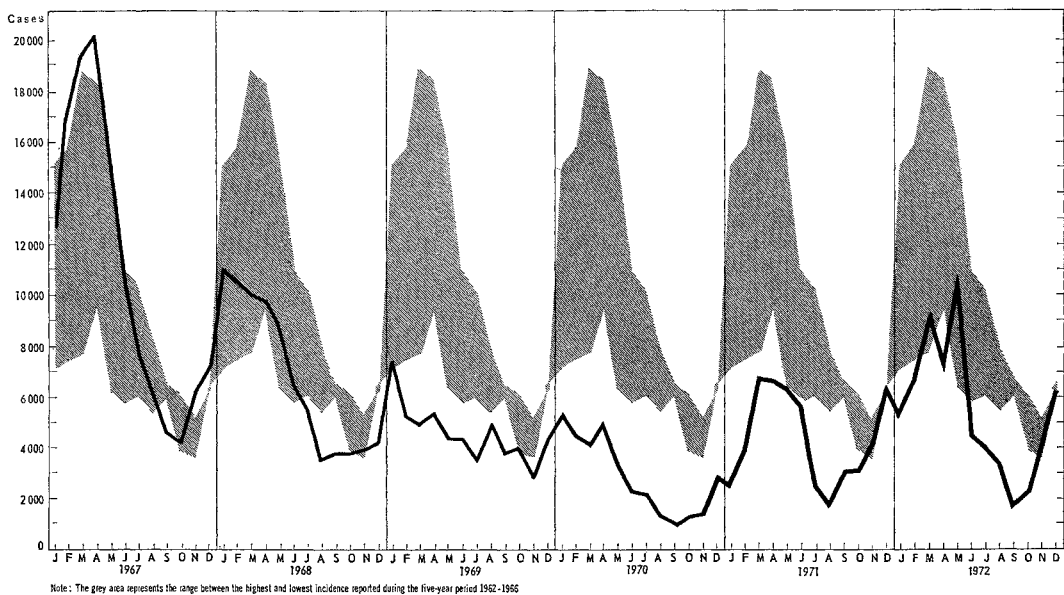


Fig. 1 World-wide numbers of reported cases of smallpox from 1967 to 1972.

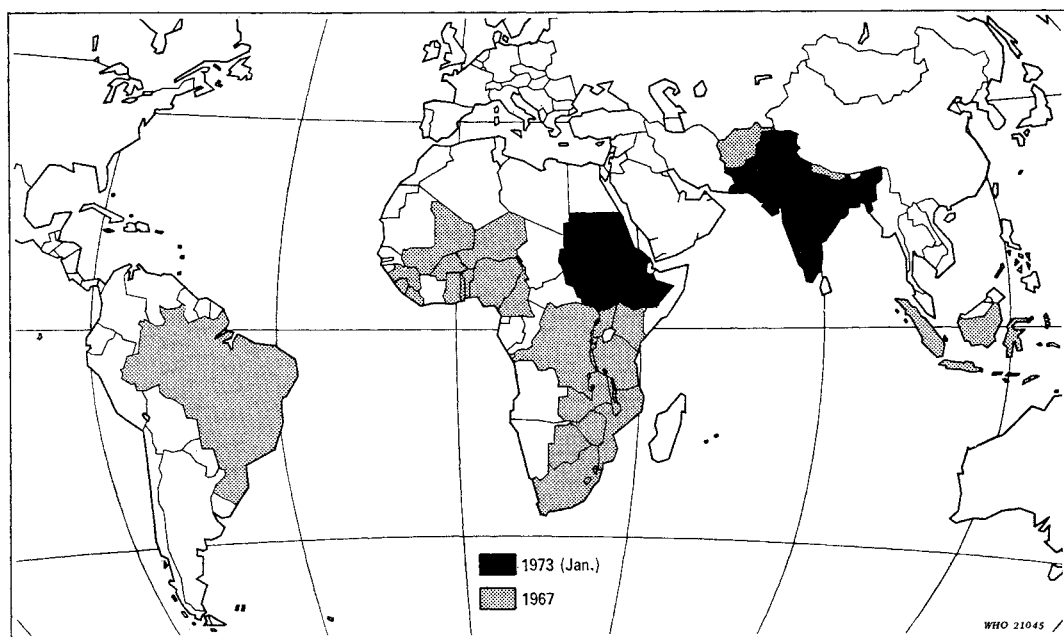


Fig. 2 Countries with continuing transmission of smallpox, 1967 and 1973.

and the number of countries reporting cases have decreased significantly. In 1967, the number of cases reported was 131 000. Surveys conducted since 1967 indicate that less than 5 per cent of all cases were then being reported: the actual number of cases that year is thus estimated to have been at least 2.5 million. Despite increasingly complete reporting, smallpox incidence declined each year until 1970, when 33 000 cases — the fewest on record — were reported. In 1972, the number of reported cases was 65 000. The completeness of reporting, however, has improved and it is now estimated that at least one-third of all cases are notified. The actual number of cases in 1972 is thus estimated to be less than 200 000 in contrast to 2.5 million cases estimated to have occurred in 1967. World-wide numbers of reported cases from 1967 to 1972 are shown in fig. 1.

The number of countries reporting smallpox decreased from 42 in 1967 to 18 this year. Of the 42 countries reporting smallpox in 1967, 30 were considered to be endemic; the remaining 12 experienced imported cases and outbreaks. In January 1973 continuing transmission is believed limited to 5 countries: in Asia — Bangladesh, India and Pakistan, and in Africa — Ethiopia and Sudan (fig. 2). Of these, Sudan is believed to be on the verge of interrupting transmission. Even in the endemic countries smallpox is confined now to provinces and districts which comprise less than half the geographical area of the country concerned. With the decrease in smallpox incidence, importation of the disease into Europe has become less frequent. During the first two years of the programme, 1967 and 1968, smallpox was imported into Europe on six different occasions but in the past four years only three importations have occurred — two in 1970 and one in 1972, the last introduction being that which occurred in Yugoslavia in April, 1972. No cases have been imported into North America since 1972.

In 1967, the smallpox endemic countries were considered for operational purposes to fall within four regions: South America, Indonesia, Africa and the mainland of Asia. It was considered unlikely that smallpox would be transmitted between any two of these regions. And, indeed, during the last five years no such transmission has been detected. Thus, when smallpox transmission is interrupted in one of the regions, it is probable that it will remain free from smallpox. Two of the four regions, South America and Indonesia, now appear to be smallpox-free.

South America

The last case in South America was detected in Brazil in April, 1971. Since this time a continuing active search for possible hidden foci has been in progress in Brazil and in neighbouring countries. None has been found. Brazil, the only country in South America to experience endemic smallpox in the past five years, has now an established surveillance unit in every state and over 5000 reporting posts which report weekly whether or not suspect cases have been detected. Every suspect case is investigated both clinically and in the laboratory by national and/or state surveillance units. It now seems reasonably certain that the western hemisphere, for the first time in 450 years, is free of smallpox.

Indonesia

In Indonesia, the second of the target areas, an eradication programme began in July 1968 in Java and Bali and was subsequently extended to include the outer islands. Surveillance and containment measures were primarily emphasized. During the first three years of the programme, between 10 000 and 18 000 cases were notified annually but, in 1971, the number decreased sharply to 2100. In 1972, only 34 cases have been reported, all of which occurred in one localized area

during January. A national search for cases has been conducted over the succeeding months and special surveillance teams are continuing this activity. No further cases have been detected so far.

Africa

Africa is the third of the target areas. In 1967, smallpox was widely endemic throughout most countries south of the Sahara and during the past six years most have conducted eradication programmes. Except in Sudan and Ethiopia, reported smallpox incidence has now decreased to zero. And while health facilities in Africa are limited in number and communications are difficult, the existing surveillance programmes in these countries are such that we feel increasingly confident in saying that, in fact, smallpox transmission has been interrupted in all but the two countries noted. Based on present progress and plans it is reasonable to anticipate that transmission in Sudan will be interrupted early this year. Ethiopia, however, presents a greater challenge, both geographically and logistically. At the same time, it is the last of the eradication programmes to have developed – now being less than two years old. But it is, by far, the most aggressive, imaginative and exciting. In the first year, 1971, over 25 000 cases, half the world's total, were reported from Ethiopia. In 1972 the incidence began to decline and already transmission appears to have been interrupted in 7 of the 14 provinces. Eradication of smallpox in Ethiopia – and in Africa itself – is expected early in 1974.

Asia

The fourth and last target area, Asia, is the most problematical. Programmes in Afghanistan and Nepal are well-advanced and cases reported in 1972 were all due to importations. However, in the three remaining endemic countries of Bangladesh, India and Pakistan,

the future is less certain. Ironically, all three have a substantially larger staff of smallpox workers, far better transportation and communication facilities, and better health facilities than in most countries where transmission has been stopped. The principal problem in India, and to a lesser degree Pakistan, is that the programmes, until recently, have relied almost completely on mass vaccination in endeavouring to stop transmission. Efforts to improve reporting have only recently been made and the surveillance programme, especially in India, is still far from optimal. Despite levels of vaccination which overall in both countries exceed 80 per cent, transmission persists as, in many areas, inadequately supervised surveillance teams ineffectually contain outbreaks. Special efforts are now being made to improve the situation and throughout Pakistan and in many states of India smallpox does appear to be coming under control. Bangladesh has experienced quite a different problem. Having implemented an effective surveillance programme and having interrupted transmission for more than a year, massive outbreaks occurred coincident with the return of refugees from India. Heroic efforts are now being made to again stop transmission.

The effect of measures taken during the past 12 months in the Asian countries will not be able to be fully appraised until several more months of the present smallpox season have elapsed. Presently available data, however, suggest that by the end of this year the disease could be confined to not more than four states in India and five districts in Bangladesh.

Zusammenfassung

In den sechs Jahren, während deren das intensivierte globale Pockenausrottungsprogramm der Weltgesundheitsorganisation im Gange war, nahm die Zahl der endemischen Länder von 30 auf 5 und die geschätzte

Gesamtzahl von Fällen von 2 500 000 auf 200 000 ab. Dieses Jahr tritt das Programm mit der Ausdehnung der Überwachungstätigkeiten in verbleibende endemische Gegenden in die Endphase ein. Das Ziel dieser Phase ist es, innerhalb der nächsten zwei Pockenjahreszeiten die Pockenübertragung in den verbleibenden endemischen Ländern zu unterbrechen.

à 5 et le nombre estimatif total de 2 500 000 à 200 000. Cette année, avec l'extension des activités de surveillance aux zones où la variole est encore endémique, le programme entre dans sa phase finale. Il s'agira d'interrompre la transmission de la variole dans les pays en cause au cours des deux prochaines saisons varioliques.

Résumé

Au cours des six années de fonctionnement du programme mondial intensifié d'éradication de la variole, le nombre des pays d'endémiques est tombé de 30

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