

## THE TWENTY YEARS AND THE TWENTY MONTHS

by

Dr R. P. Arbani<sup>1</sup>

### Introduction

Smallpox eradication, a dream of 20 years, was realized in 20 months in the province of Central Java. In this paper, we have endeavoured to analyse the factors responsible for our apparent success in interrupting smallpox transmission.

Central Java has a population of 22.8 million with an average density of 719 persons per square kilometre. It borders the provinces of East and West Java as well as the Indian Ocean and the Java Sea. The province consists of 35 administrative areas: 29 regencies and 6 municipalities.

Central Java was free of smallpox between 1939 and 1948 but the disease was re-introduced during our war of independence. Smallpox subsequently spread throughout the province and during the period 1963 to 1967, an average of 25 of the 35 areas reported cases annually. Since 1968, when Indonesia joined a world-wide eradication programme under the auspices of WHO, cases declined sharply. As of October 1970, no cases had been reported from Central Java since April 1970 (Fig. 1).

### Methods

To illustrate the developments that made eradication possible, the period before the programme started (1963 to mid-1968) is compared with the period after.

---

<sup>1</sup> Medical Officer, Smallpox Eradication Programme, Central Java (Semarang)

## Results

**Man power:** Before the start of the smallpox eradication programme, six coordinators, nurses with little epidemiological background, were responsible for smallpox control activities in the province. One supervisor in each administrative area was responsible for the vaccinators. The supervisors worked under the guidance of the coordinators. Each vaccinator was responsible for a population of about 150 000. He was supposed to make a complete round for primary vaccination every 3 months, while revaccinating all persons in his area once in three years.

Beginning with 1968 the following changes were introduced. Every vaccinator was made responsible for only about 40 000 persons. While the system of supervisors was not changed, the coordinators were replaced by four "Advance Teams", each of which was usually led by one full-time physician. The same personnel used formerly for mass vaccination were used for part-time containment teams.

**Means:** Finance and supplies were the main limiting factors before 1968. To increase mobility, WHO provided various means of transport. Locally produced freeze-dried vaccine totally replaced liquid and room-dried vaccine which had been employed previously. Our nationally-produced vaccine has been routinely evaluated by the WHO Reference Laboratory and has consistently met WHO standards. To ensure that vaccine would be available at no charge to all the population, the central government purchased and distributed all vaccine. The central government also took financial responsibility for containment teams that had previously been paid by the local governments.

**Strategy:** Between 1963 and 1967, control activities consisted primarily of mass-vaccination campaigns. Although about 25 million vaccinations were performed in the period, reported cases were higher at the end of this time than at the beginning. In 1968, the number of infected administrative areas was 26 but the number had nearly doubled in comparison to the 1963-67 average.

In 1968, the handling of vaccine became subject to stricter rules with regard to permissible time of storage without refrigeration and bifurcated needles were introduced.

By the beginning of 1969 a few administrative areas in the north-west of the province were found to constitute the principal problem. A mass campaign was organized which was aimed at children never previously vaccinated (back-log). Although more than 61 000 vaccinations were performed, transmission continued. A scar survey, conducted in June 1969 on the occasion of a WHO assessment, indicated that herd immunity in Central Java was indeed high (Table 1). However, it was surprising to find that East Java, in spite of a lower level of immunity, had already eradicated smallpox.

After this last mass campaign, we put increasing emphasis on well supervised containment activities. All Advance Teams were concentrated in the problem area in August 1969. Although in the course of the following operations only 54 000 additional vaccinations were given by the containment teams, cases decreased from 147 in August to 31 in December 1969. Since May 1970, no cases have been detected.

TABLE 1ESTIMATED NUMBER OF CHILDREN IN JAVA WITHOUT POCKMARKS  
OR VACCINATION SCAR, JUNE 1969

Area	Under 1 year			1 - 4 years			5 - 14 years		
	Est. pop. (000) 1969	Unpro- tected		Est. pop. (000) 1969	Unpro- tected		Est. pop. (000) 1969	Unpro- tected	
		No. (000)	%		No. (000)	%		No. (000)	%
1. West Java	693	499	72	3 024	1 119	37	5 123	871	17
2. Central Java	735	301	41	3 206	224	7	5 433	54	1
3. East Java	871	470	54	3 802	760	20	6 442	322	5
4. Djakarta	129	71	55	563	18	3	954	57	6
5. Jogjakarta	89	26	29	390	12	3	661	1	-

(WHO Assessment Team Report, June 1969)

FIGURE 1

CENTRAL JAVA: SMALLPOX INCIDENCE BY MONTH, 1964 - 1970

