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EXPANDED PROGRAMME ON IMMUNIZATION

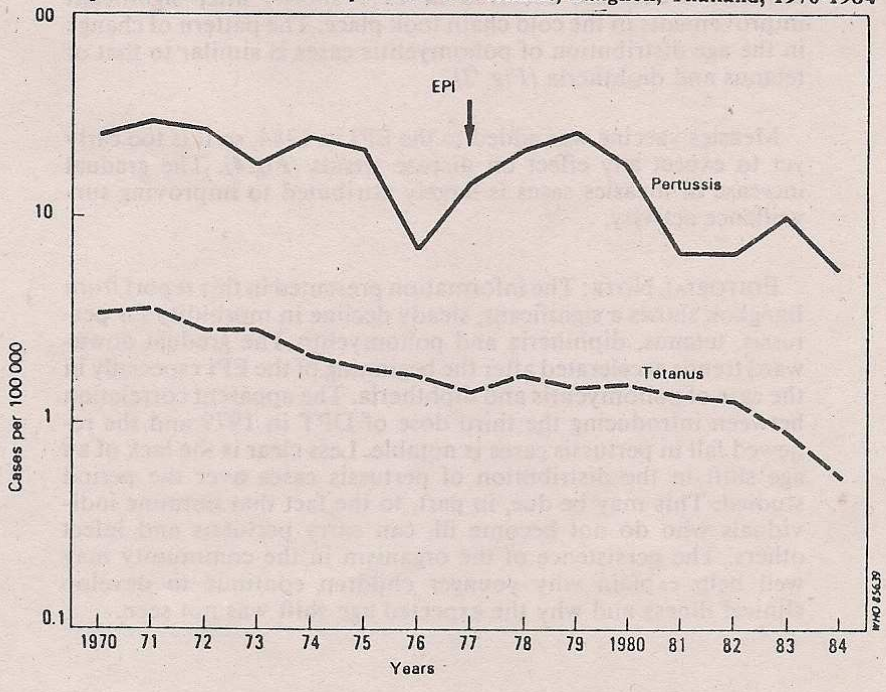
Programme impact: decreasing morbidity in Bangkok

THAILAND. – The performance of the Expanded Programme on Immunization (EPI) in Bangkok was recently reviewed as part of stepped up surveillance activities needed to assess progress. Records going back to 1955 were available for diphtheria and poliomyelitis. Pertussis and tetanus information was accessible from 1970 to 1984 and measles from 1974 to 1984. Tuberculosis data for childhood cases were not available. Information for the past decade was confirmed by reviewing selected hospital-based data.

EPI was formally launched in Thailand in 1977. However, diphtheria vaccine had been introduced in Bangkok in 1963 followed by tetanus (1964), pertussis (1967) and oral polio vaccine (OPV) in 1968. In the early 1970s, DPT was given in a two-dose schedule. Increasing numbers of pertussis cases persuaded the health authorities to add a third dose of DPT in 1979 *(Fig. 1)*. Vaccine coverage

Fig. 1

Reported incidence rates for pertussis and tetanus, Bangkok, Thailand, 1970-1984



estimates for Bangkok were made in 1979 and 1982 *(Table 1)*. In 1979, 39% of surveyed children were fully immunized (DPT 3, OPV 3, and BCG). Those fully immunized rose to 71% by 1982.

Table 1 **Results of immunization coverage surveys, children 12-23 months of age, Bangkok, Thailand, 1979 and 1982**

Year	Percentage of children immunized							
	BCG	DPT 1	DPT 2	DPT 3	OPV 1	OPV 2	OPV 3	Fully immunized
1979	82	80	74	39	81	75	64	39
1982	94	87	81	71	87	81	71	71

Morbidity

The reported data show an overall downward trend for diphtheria, pertussis, tetanus and poliomyelitis *(Fig. 1* and *2)*. Pertussis rates rose in 1977 and 1978 in spite of the two-dose DPT programme. It was not until 1979 that pertussis incidence hit its peak and began to decline. The age distribution of pertussis cases did not shift over the study period *(Fig. 3)*.

The fall in morbidity rates from tetanus is a steady, slow trend. Over the years reviewed, tetanus incidence fell from 5 cases per 100 000 to less than 1 per 100 000. The falling attack rate was accompanied by a substantial shift in age from younger to older persons *(Fig. 3)*.

Diphtheria case rates have declined by more than 10 times over the past 14 years. Both the introduction of diphtheria vaccine and the improved management associated with the EPI had apparent effects on the morbidity trends *(Fig. 2)*. The age distribution of diphtheria cases has changed over time, resulting in more older children being affected in the most recent years.

Of all the diseases reviewed, poliomyelitis had the most striking decline in morbidity. Although OPV became available in 1968, a sustained fall in case rates was not clear until after 1974. The most impressive decrease occurred in 1979 shortly after significant improvements in the cold chain took place. The pattern of change in the age distribution of poliomyelitis cases is similar to that of tetanus and diphtheria *(Fig. 3)*.

Measles vaccine was added to the EPI in 1984, so it is too early yet to expect any effect on disease trends *(Fig. 4)*. The gradual increase in measles cases is largely attributed to improving surveillance activity.

EDITORIAL NOTE: The information presented in this report from Bangkok shows a significant, steady decline in morbidity for pertussis, tetanus, diphtheria and poliomyelitis. The gradual downward trends accelerated after the beginning of the EPI especially in the case of poliomyelitis and diphtheria. The apparent correlation between introducing the third dose of DPT in 1979 and the renewed fall in pertussis cases is notable. Less clear is the lack of an age shift in the distribution of pertussis cases over the period studied. This may be due, in part, to the fact that immune individuals who do not become ill, can carry pertussis and infect others. The persistence of the organism in the community may well help explain why younger children continue to develop clinical illness and why the expected age shift was not seen.

Fig. 2

Reported incidence rates for poliomyelitis and diphtheria, Bangkok, Thailand, 1955-1984

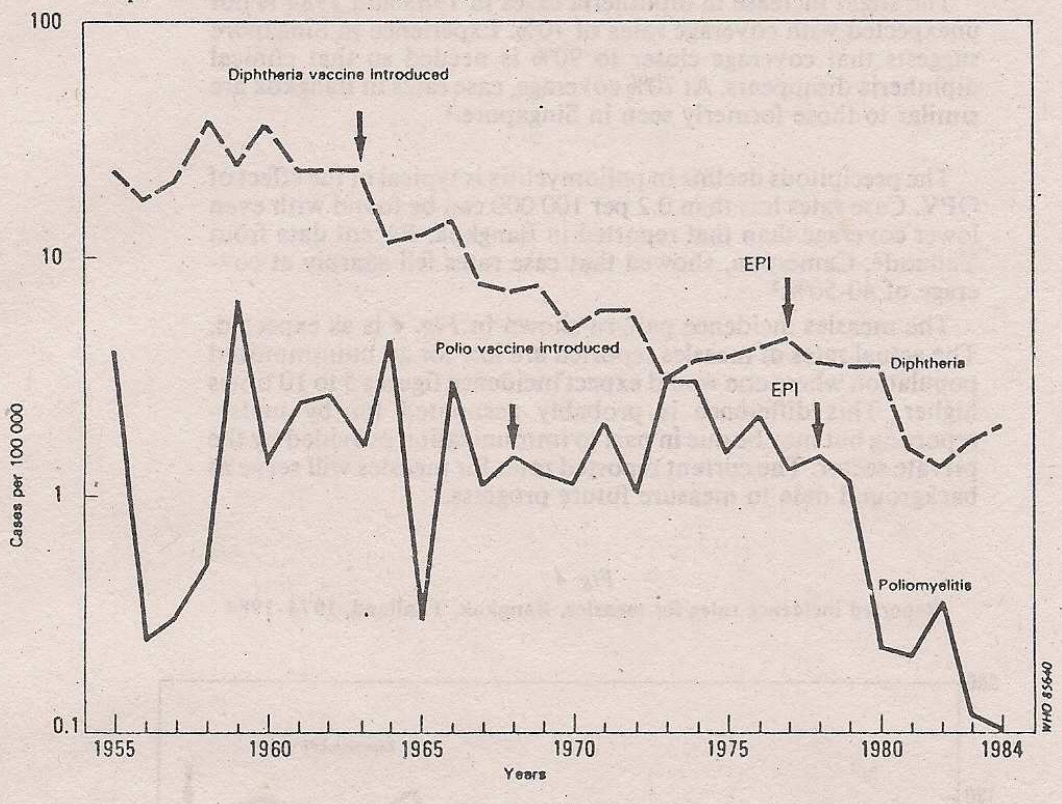
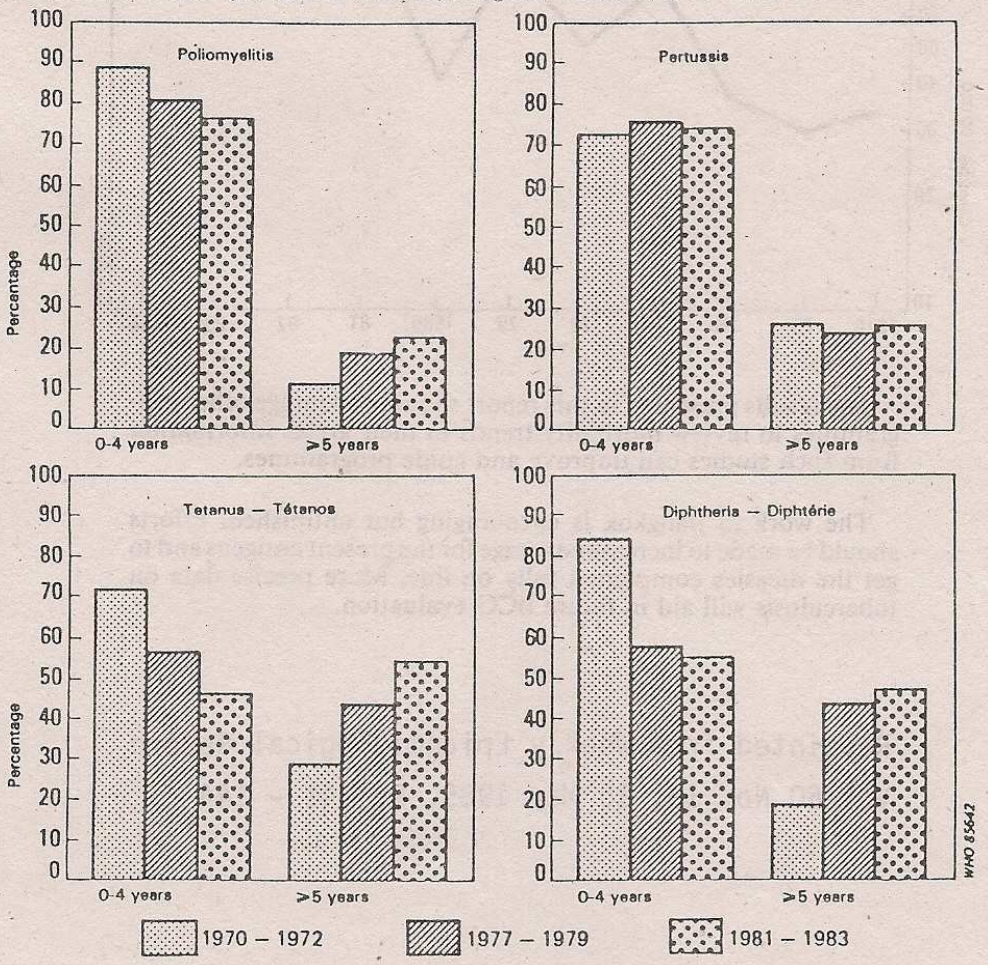


Fig. 3

Age distribution of vaccine-preventable diseases, Bangkok, Thailand, 1970-1972, 1977-1979 and 1981-1983

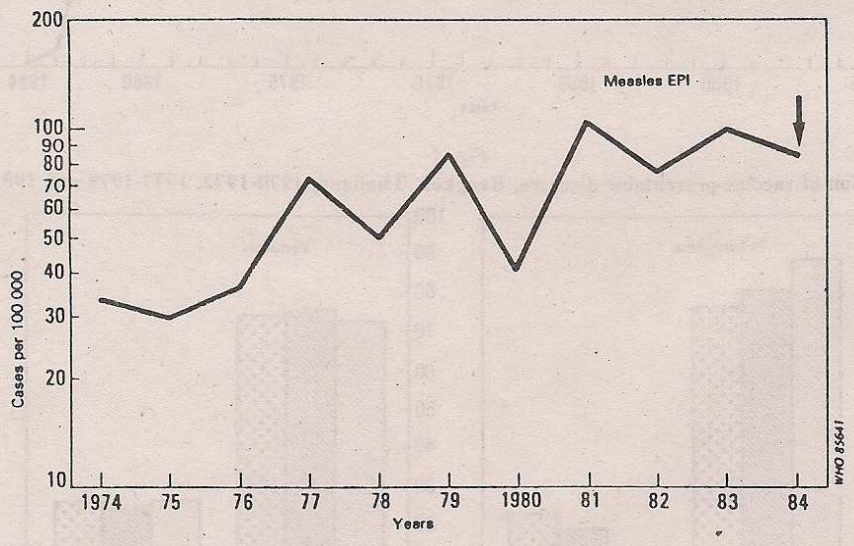


The slight increase in diphtheria cases in 1983 and 1984 is not unexpected with coverage rates of 70%. Experience in Singapore suggests that coverage closer to 90% is needed so that clinical diphtheria disappears. At 70% coverage, case rates in Bangkok are similar to those formerly seen in Singapore.[1]

The precipitous decline in poliomyelitis is typical of the effect of OPV. Case rates less than 0.2 per 100 000 can be found with even lower coverage than that reported in Bangkok. Recent data from Yaoundé, Cameroon, showed that case rates fell sharply at coverage of 40-50%.[2]

The measles incidence pattern shown in *Fig. 4* is as expected. The actual rates of measles reported are low for an unimmunized population where one would expect incidence figures 5 to 10 times higher. This difference is probably accounted for by under-reporting but may be due in part to immunization provided by the private sector. The current reported rates for measles will serve as background data to measure future progress.

Fig. 4
Reported incidence rates for measles, Bangkok, Thailand, 1974–1984



The results presented in this report should encourage other programmes to review morbidity trends in their areas. Information from such studies can improve and guide programmes.

The work in Bangkok is encouraging but unfinished. Efforts should be made to increase coverage for the present antigens and to get the measles component fully on line. More precise data on tuberculosis will aid in future BCG evaluation.

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