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Unsustainability of a measles immunisation campaign — rise in measles incidence within 2 years of the campaign

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Abstract **The 1990 national mass measles immunisation campaign resulted in a marked reduction in measles incidence in Natal/KwaZulu in the first 6 months after the campaign. Data from the measles ward admissions book at Clairwood Hospital were collated for the period 1 January 1989 to 31 May 1992 to assess the sustainability of the effects of the campaign. For the first 12 months after the campaign, measles admissions were consistently low. Thereafter, the number increased steadily, rising sharply to above pre-campaign levels 21 months after the campaign. The age distribution of measles patients indicated that the initial fall in the 10 - 12-month age group had been reversed in the second year after the campaign, suggesting that the high vaccination coverage achieved for this age group during the campaign had not been maintained. Measles admissions to Clairwood Hospital indicate that the effect of the measles immunisation campaign has not been sustained and that urgent action is required to avert a possible epidemic.**

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A mass measles immunisation campaign was undertaken nationally in May and June 1990.[1] We have demonstrated that in the 6-month period immediately after the campaign the average number of measles admissions to a regional hospital declined by 64,4% from 87 to 31 per month, compared with 18 months earlier.[2] This demonstrated a marked short-term benefit of the campaign, but the duration of the benefit could not be assessed in such a short follow-up period. Therefore the number of measles admissions to Clairwood Hospital was monitored for a further 17 months (January 1991 - May 1992) beyond the first 6-month post-campaign period to determine the sustainability of the effects of the campaign.

Methods

Clairwood Hospital, a provincial referral hospital in Durban, has specifically designated 'fever' wards to which hospitals from throughout the Natal/KwaZulu region refer patients with infectious diseases such as measles. Data on measles admissions to Clairwood Hospital were obtained from the measles ward admissions book. The total number of inpatient admissions to the hospital was obtained from the admitting office. Comparisons were made between 3 periods: (*i*) an 18-month pre-campaign period (January 1989 - June 1990); (*ii*) an initial post-campaign period (July 1990 - June 1991); and (*iii*) a later post-campaign period (July 1991 - May 1992).

Results

In the initial period, i.e. the first 12 months after the campaign, measles admissions to Clairwood Hospital were consistently low, averaging 24 per month (range: 7 - 43) (Fig. 1). Thereafter, the number of admissions increased steadily and peaked in May 1992 at 148. During the first 9 months of the later period, i.e. 13 - 23 months after the campaign, the number of measles admissions did not exceed the pre-campaign average of 87 (range: 30 - 75), but in the months of April and May 1992, there were 128 and 148 admissions, respectively. These months show an increase of 475% over the initial post-campaign period.

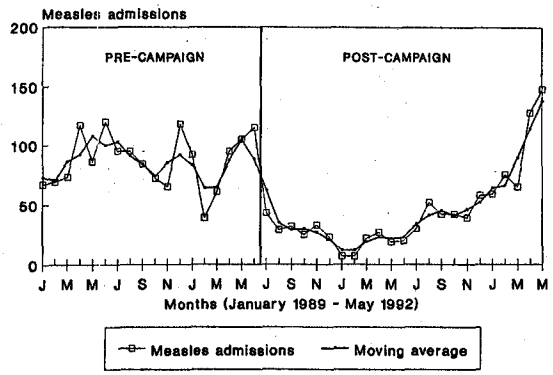

FIG. 1.
Monthly measles admissions to Clairwood Hospital (Jan 1989 - May 1992).

The measles case fatality rate declined from 5,5% (87/1 568) in the pre-campaign period to 3,1% (9/287) in the initial post-campaign period and 2,7% (20/738) in the later post-campaign period (P = NS).

The age distribution of measles admissions (Table I) indicates that in the 10 - 12-month age group, there was a decline from 18,3% in the pre-campaign period to 11,6% in the initial post-campaign period ($P < 0,01$). Thereafter, the proportion of measles admissions in this age group rose to 18,1% in the later post-campaign period ($P < 0,05$).

TABLE I.
Age distribution of measles admissions to Clairwood Hospital during the pre- and post-campaign periods (%)

		Post-campaign	
Age (mo.)	Pre-campaign (1/89 - 6/90) (N = 1 506)	Initial (7/90 - 6/91) (N = 284)	Later (7/91 - 5/92) (N = 713)
< 7	12,1	10,2	10,6
7 - 9	21,3	26,1	20,8
10 - 12*	18,3	11,6	18,1
13 - 60	39,5	42,6	40,7
> 60	8,8	9,5	9,8

*Statistically significant differences present in this age group.

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During the entire study period, there were no changes in the measles admission policy at Clairwood Hospital.

Discussion

Measles admissions to Clairwood Hospital provide an indication of trends in the incidence of measles in Natal/KwaZulu. The low incidence rate of measles immediately after the campaign lasted for approximately a year. Thereafter, there was a steady rise, with the number of measles admissions reaching pre-campaign levels 21 months after the campaign (Fig. 1). This is cause for concern, since the current rise in the incidence of measles may be evidence of a 'flare-up' phenomenon,[3] which suggests that we may now be witnessing the start of a measles epidemic.

The average number of inpatient admissions per month to Clairwood Hospital for all diagnoses over the entire period January 1989 - May 1992 did not vary significantly. Hence, the increase in measles admissions is not likely to be part of an increase in overall admissions.

Although not statistically significant, the reduction in the case fatality rate is notable. While it is not possible to ascribe this reduction to any one factor, it is unlikely that this was the result of a change in the referral pattern, since the frequency distribution of the source of the patients did not change in the first 6 months[2] or the following 17 months after the campaign. A possible contributory factor in the lower case fatality rate could be the improved medical care due to fewer patients in the measles ward.

The rise in measles admissions to Clairwood Hospital may be due to a fall in measles vaccination coverage and/or lower vaccine efficacy. Concerted efforts to collect reliable data on the vaccination status of measles patients at Clairwood Hospital have failed. Since many of these patients are referrals from other hospitals, they are often not accompanied by their parents and in most instances are not able to produce Road-to-Health cards.

Five Road-to-Health cards collected during the latter part of the study period showed that 2 patients had been vaccinated against measles while the remaining 3 had not, although they were over 9 months old. Because of the unavailability of Road-to-Health cards and the lack of comparable data for the pre-campaign period, it is not possible to ascertain whether vaccine efficacy had changed after the campaign.

Data on the number of doses of measles vaccine administered in Natal/KwaZulu showed a fivefold rise during the 2 months of the campaign and an immediate decline to pre-campaign levels in the third month after the start of the campaign.[4] This confirms that levels of vaccination coverage obtained during the campaign were not sustained.

Of note is the significant rise in the proportion of patients aged 10 - 12 months (Table I). The changes in the age distribution of measles cases suggest that high vaccination coverage was achieved in the 10 - 12-month group during the campaign, but that this was not sustained after the campaign, highlighting the urgent need to improve vaccination coverage in this age group. This is particularly important as socio-economic conditions that enhance the spread of measles, such as overcrowding[5] and the high influx rate of unvaccinated children from rural areas,[6] still prevail.

While the early effect of the measles immunisation campaign was encouraging,[2] the success of the campaign must also be judged in the light of its long-term effects. Measles admissions to Clairwood Hospital indicate that the reduction in incidence following the campaign has not been sustained. The current high incidence calls for urgent action by the health authorities.

The question arises: 'Should there be another mass measles immunisation campaign?' Scepticism about mass immunisation campaigns has been expressed.[7] If another mass campaign is undertaken, is this going to become a regular event every 12 - 21 months? A better option may be to strengthen existing health care services so that they can achieve and maintain high measles vaccination coverage. Everyone involved in health care, especially private practitioners, hospital staff and clinic nurses, can play a role in assisting in the control of measles by checking the immunisation status of every child and ensuring that unvaccinated children over the age of 8 months receive their measles vaccine.

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