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Effectiveness of a Mailed Reminder on the Immunization Levels of Infants at High Risk of Failure to Complete Immunizations

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Abstract: The Ohio Department of Health initiated a program of mailing an immunization reminder to the mothers of six-month-old children predicted to be at high risk of failure to receive vaccinations based on birth certificate information. The evaluation results indicated a 50 per cent gain in immunizations amongst children whose parents received the letter when compared with those not receiving the letter. (*Am J Public Health* 70:422-424, 1980.)

Introduction

Based on analysis of a 1977 survey of 1,003 Ohio two-year-olds immunization levels,[1] the Ohio Department of Health (ODH) found two major categories of birth certificate data, parental education and family size, to be statistically meaningful in predicting children at high risk of failing to complete an immunization series by the age of two.[2]

Using these risk factors to select high risk children, ODH initiated a mail motivation program whereby parents would receive a letter when their child was six months old. This letter, sent to the 25 per cent of all of Ohio's live, legitimate resident births classified as high risk, was intended to return potential immunization drop-outs to the health care system. The impact of the letter is assessed in this report.

Methodology

All records of live, legitimate births for March 1978, were examined and classified by computer as to high or low risk. Children were judged to be high risk if they had: 1) at least one parent with less than a high school education regardless of family size, or 2) only one parent with some college education and the family (including index child) consisted of four or more children.

A 10 per cent random sample (N = 254) was taken from the total high risk group. This sample (control group) had the sixth month motivational letter withheld. All other parents of high risk children received the letter. The letter was timed to

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be received on October 1, 1978. On November 1, 1978, a second random sample (N = 253) (experimental group) was drawn from the high risk population receiving the letter.* Both the experimental and the control group were sent a questionnaire designed to probe the immunization actions for the month of October 1978 and immunization status to date. During November, mail responses were received and verified. Telephone contact was made where possible with members of both groups who did not respond by mail.

Results

Responses to the November letter were received from 355 (70 per cent) of the parents: 179 (70.5 per cent) in the control (no letter) group and 176 (69.6 per cent) in the experimental (letter) group. A random sample of both mail and telephone responses was compared with provider records.** No inaccuracies were detected. The distribution of response revealed no significant differences in per cent of children up-to-date (3 DTP injections and 2 oral polio doses), or in per cent without any immunizations before the letter was sent. Overall, approximately 40 per cent of each group was up-to-date at the time the letter was mailed. All further analysis was directed at the 60 per cent who were not fully immunized.

Fifty-one (48.1 per cent) of the not fully immunized children whose parents were sent the letter received vaccinations in October compared with only 34 (32.4 per cent) of the not fully immunized children whose parents did not receive the letter, a significant difference. A related measure of impact, the number of children brought up-to-date, also was increased in the experimental group and approached statistical significance (Table 1).

An attempt was made to see if the letter's impact could be observed across time (Figure 1). Through the 15th of the month both groups are very similar in behavior. For the last two and one-half weeks of the month, children in the experimental group were immunized at twice the rate of the controls. This would seem to imply that the letter motivates appointment making at the beginning of the month, and appointment keeping at the end of the month. When tested, using the Wilcoxin Rank Sum test, this difference in behavior over time was found significant at the .05 level.

Extrapolation of the results of this mailing to the ongoing program in Ohio indicates that about 3,150 additional children per year would receive additional immunizations. The annualized cost for postage, envelopes, labor, and computer services for a program of 3,000 letters per month was computed to be $8,700. This yields a net cost of $2.76 per each additional child receiving immunizations.

*Sample drawn of the elementary names of those whose letters were returned from post office.

**Routinely, investigators were asked to check on two out of three of all returns. Verification was usually by phone.

TABLE 1—Action Taken during October in Relation to Motivational Letter

Action	Letter	No Letter	X2
Received Vaccine	51 (48)	34 (32)	5.43 (p .02)
Did not Receive Vaccine	55 (52)	71 (68)	
Brought Up-to-Date*	37 (35)	24 (23)	3.73 (p .06)
Not Brought Up-to-Date	69 (65)	81 (77)	
TOTAL**	106 (100)	105 (100)	

*Included in those receiving vaccine.
**Includes children who made future appointments. The totals represent children whose immunization status was not up to date as of September 30, 1978.
NOTE: Per cent is given in parentheses

Discussion

The effectiveness of mailed reminders to parents of young children has been generally found to be low unless coupled with aggressive, and thus costly, follow-up.[3, 4] Earlier studies did not select specifically for those children at particular high risk for failure to receive immunizations, thus expending efforts on many children already immunized. The application of educational and family size criteria to select a population at high risk reduced the amount of effort wasted. The criteria used were effective as evidenced by the fact that only 40 per cent of the 6-month-old children they selected were up-to-date.

The second critical difference between the present program and earlier programs is the timing of the reminder. The earlier studies sent the mailing at or before two months of age. At this age the Ohio[2] survey and an earlier study by Guyer[5] found that 90 per cent of children had made at least one visit to a caretaker. The timing of our mailing at six months came during a natural pause in the immunization schedule,[6] when dropouts could be identified and motivated to reenter the system.

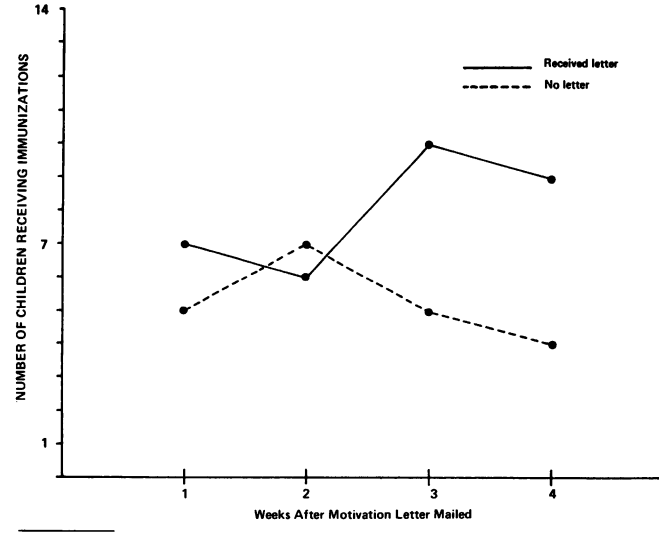

FIGURE 1—Temporal Distribution of Immunizations Received

The initial comparability of the immunization status of the control and experimental groups supports the conclusion that the increase in immunizations received and in children reentering the immunization system was a direct result of the mailed reminder. The extrapolation suggesting that over 3,000 children per year would receive at least one additional inoculation is probably a conservative estimate. Immunization seeking behavior had not returned to baseline by the end of the observation period (Figure 1) so that the effect of the mailing can be expected to continue.

This study demonstrates that a selective, properly timed motivational mailing is cost effective and favorably influences immunization seeking behavior of families with children whose immunizations are not up-to-date.

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New York University's Department of Health Education announces three international health seminars for summer 1980.

A Taiwan program for graduate students in Human Sexuality and related fields provides a cross-cultural examination of attitudes toward sexuality, marriage practices and sex roles focusing on Asian patterns. Scheduled for June 30-August 22, it is under the direction of Professor Deryck Calderwood and Ronald Moglia.

In Kenya the emphasis will be on health maintanence and health care delivery. Five weeks will be spent in Africa, from July 14-September 5, with orientation and post-session in New York.

London and Edinburgh will be sites for an interdisciplinary seminar with special emphasis on comparison of health care, education systems, and the roles of health professionals in the U.S., England, and Scotland. Orientation in New York followed by two weeks in London and one week in Edinburgh, July 23-August 7.

For further information, write to: Professor Marian V. Hamburg, Chairperson, Department of Health Education, New York University, South Building, Fifth Floor, New York, NY 10003, or telephone 212-598-3925.