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## Effectiveness of Influenza Immunization Postcard Reminders Among Seniors Vaccinated the Previous Year

### Introduction

Each Fall since 1993, the Kaiser Permanente Northeast Division (KPNE) has launched a comprehensive awareness campaign to promote influenza vaccination among senior members who are at high risk for complications of influenza. Approximately six percent of the Division's membership is aged 65 years or older (N = 32,875 as of November 1997). The campaign is targeted to members and practitioners, and includes a postcard reminder, informational articles in member, staff, and practitioner newsletters, promotional posters, educational brochures, and patient lists for practitioner follow-up to ensure vaccination. The production and postage costs for the postcard reminder represent 85% of the annual outreach campaign expenses.

The annual random telephone survey assesses the vaccination coverage level among KPNE members aged 65 years and older, and identifies barriers to and predictors of vaccination for this population. Bivariate and logistic regression analyses of the results have consistently confirmed that the single most important predictor of one's likelihood of receiving vaccination is a positive history of receiving vaccination the previous year (P<0.001).

This study examines the independent effectiveness of the postcard reminder intervention among KPNE members aged 65 years or older. The specific hypotheses investigated are the dominant role of habit in predicting vaccination, and the relative unimportance of the postcard reminder. Research of this nature allows us to identify programs with little or no impact and to reallocate resources from these programs to other programs which are beneficial.

### Methods

The study population consisted of 5,278 KPNE members aged 65 years or older who had been vaccinated against influenza the previous year (Fall 1996) according to administrative data (Table 1). The entire study population received the standard member education materials, and all practitioners received the same support information. Half of the study population (n = 2,631) were randomly selected to receive the postcard intervention in addition to the standard member education materials. The two study groups were followed for three months (October-December 1997), and vaccination coverage levels were assessed each month.

**Table 1.** Descriptive statistics of the two postcard study populations and the comparison group of members without evidence of vaccination in 1996.

Indicator	Vaccinated in 1996 (N=5,278)		Not vaccinated in 1996 (N=5,422)	
	Postcard (N=2,631)	No postcard (N=2,647)		
<b>Age (years)</b>				
Mean	73.37	73.49	72.63	
Range	65-97	65-96	65-98	
Std. Dev.	±6.163	±6.122	±6.467	
<b>Gender (% , n)</b>				
Male	43.7%    1,150	44.6%    1,180	42.2%	2,290
<b>Region (% , n)</b>				
Massachusetts	5.3%    139	5.4%    142	6.1%	329
New York	86.4%   2,274	86.7%   2,295	86.6%	4,697
Vermont	8.0%    211	7.7%    203	6.9%	376
Other	0.3%    7	0.3%    7	0.4%	20



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Any statistically significant difference in vaccination coverage rates was evaluated with the normal approximation to a binomial test for differences in two proportions at a conservative significance level ( $\alpha = 0.1$ ). The relative risk (RR) was estimated to measure the association between history of vaccination in 1996 and likelihood of receiving vaccination in 1997. The chi-square test for measuring association was calculated to evaluate the degree of association between history of vaccination and likelihood of vaccination. Confidence intervals were computed for all statistics at a significance level of  $\alpha = 0.05$ . An analysis of the financial implications of the proposed strategy was conducted for KPNE and was extrapolated to all Kaiser Permanente Divisions nationally.

## Results

The vaccination proportions among the intervention and control groups were statistically indistinguishable (78.6% and 77.2% respectively, Fig. 1,  $P > 0.1$ ). The large sample size allowed for greater than 99% power to detect a clinically meaningful 5% difference in vaccination coverage between the two study groups, were one to exist. In addition, all members were vaccinated at approximately the same pace in 1997 regardless of vaccination history and postcard intervention status, with more than 75% of all vaccinations administered by October 31, 1997 (Fig. 2). Finally, those with evidence of vaccination in 1996 were more than twice as likely to receive vaccination in 1997 than those without history of vaccination (77.9% and 32.0% respectively,  $RR = 2.43$ , Fig. 3,  $P < 0.001$ ).

## Conclusions

The postcard reminder intervention did not affect the likelihood of vaccination among those who had been immunized the previous year. This finding substantiates the hypothesis that habit is the defining predictor of the probability of vaccination. Emphasis should be placed on intensive outreach to individuals at highest risk for not receiving vaccination. Those at highest risk are those who did not receive vaccination the previous year and those who have not been vaccinated by the end of October. Strategically directing the postcards to those who were not vaccinated the previous year will reduce costs by 20% and will allow reallocation of resources to more intensive outreach among those not vaccinated by the end of October.

This study demonstrates the defining role of habit in predicting the likelihood of vaccination among seniors. Those who seek vaccination do so routinely, and those who do not are just as habitual in their abstention, with very little migration between these two behavior patterns. Recognizing the importance

of the first flu shot in establishing a habit of vaccination, further research will be conducted to identify predictors of first-time immunization as well as predictors of repeated abstention from immunization. These findings will catalyze a focused effort to recruit and retain those who have never been vaccinated. In addition, such a study will likely inform other preventive health programs such as mammography and colorectal cancer screening. ♦

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