

Public Health in Managed Care: A Randomized Controlled Trial of the Effectiveness of Postcard Reminders

ABSTRACT

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Objectives. This study evaluated the effectiveness of an annual public health intervention in a managed care setting.

Methods. Managed care organization members 65 years and older who received influenza immunization in 1996 were randomized to an intervention group (mailed a postcard reminder to receive an influenza vaccination in 1997) or a control group (no postcard). Vaccination rates for both groups were assessed monthly.

Results. Members receiving the intervention were no more likely to be immunized (78.6%) than members of the control group (77.2%, $P = .222$). Members were vaccinated at the same pace regardless of vaccination history and postcard intervention status.

Conclusions. Postcard reminders were not an effective intervention among seniors who had been vaccinated the previous year. (*Am J Public Health*. 1999;89:1235-1237)

Each fall, public and private sector organizations collaborate to promote influenza vaccination among the elderly and others who are at increased risk of complications from influenza. As the proportion of Medicare beneficiaries enrolled in managed care increases, so do the opportunities for collaboration in this important initiative. In the past 5 years, the number of Medicare beneficiaries enrolled in managed care has more than doubled, to 6.1 million, or 16.2%.¹

The morbidity and mortality impact of influenza is striking, particularly among the elderly. In each US influenza epidemic during the 20-year period 1972 to 1992, an estimated 20 000 deaths were attributed to complications of influenza, and during each of 4 of these epidemics more than 40 000 influenza-associated deaths occurred.² The elderly are a large, high-risk population; more than 90% of the deaths attributed to pneumonia or influenza occur among persons 65 years and older.²

Influenza vaccination campaigns are targeted nationally at approximately 32 million persons 65 years and older, and at 27 million to 31 million persons younger than 65 years who are at elevated risk for influenza-associated complications.² National health objectives for the year 2000 include vaccination of at least 60% of people at risk for severe influenza-related illness.² Kaiser Permanente Northeast Division's ongoing efforts to reduce morbidity and mortality from all causes include a target influenza vaccination coverage level of 85%.

Each fall since 1993, Kaiser Permanente Northeast Division has launched a comprehensive awareness campaign to promote influenza vaccination. Approximately 6% of the division's membership is 65 years or older ($n = 32\,875$ as of November 1997). The campaign is targeted at both members and primary care 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 postcard reminder intervention represents 85% of the annual outreach campaign expenditures.

This study examined the independent effectiveness of the postcard reminder intervention among the division's members who were 65 years and older. The specific hypoth-

esis investigated is the dominant role of habit in vaccination adherence and the relative unimportance of the postcard reminder. Research of this nature allows us to identify programs with little or no impact and to re-allocate resources to other programs that may be more beneficial.

Methods

The study population consisted of 10 700 Kaiser Permanente Northeast Division members 65 years and older who were enrolled in the division's group model health centers. This population comprised 5278 members who, according to administrative data, had been vaccinated against influenza the previous year (fall 1996) and 5422 members with no record of vaccination in fall 1996 (Table 1).

The entire study population received the standard member educational materials, and all practitioners received the same support information. Those members with no record of vaccination were mailed the postcard reminder in addition to the standard educational materials. Of the members with a record of vaccination in fall 1996, half ($n = 2631$) were randomly selected to receive the postcard reminder in addition to the standard member educational materials (intervention group), and the other half did not receive a postcard (control group; $n = 2647$). The randomized postcard study was restricted to seniors at lowest risk of refusing vaccination—those who had been vaccinated the prior year—in case, contrary to the study hypothesis, the postcard intervention proved to be effective.

The randomization process was conducted by household. Only 1 study group was assigned to each household because members

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of the same household would share postcard information and dilute any difference between study groups. Members were followed for 3 months (October–December 1997), and vaccination coverage levels were assessed each month.

The presence of any statistically significant difference in the vaccination coverage rates was evaluated with the normal approximation to a binomial test for differences in 2 proportions at a conservative significance level ($\alpha = .1$). The relative risk was estimated to measure the association between history of vaccination in 1996 and vaccination status in 1997. The χ^2 test for measuring association was calculated to evaluate the degree of association between demographic variables and study group assignment, as well as history of vaccination and likelihood of vaccination. Variation in the age of study group members was evaluated by the Kruskal-Wallis method because the distribution of age was skewed. Ninety-five-percent confidence intervals were computed for all estimates.

The study was reviewed and approved by the institutional review boards of Kaiser Permanente Northeast Division and the State University of New York (SUNY).

Results

All 3 study groups had similar age, sex, and residence distributions (Table 1). The 1-year difference in age between those not vaccinated in 1996 and those randomized for the postcard study achieved statistical significance due to the large sample size (Kruskal-Wallis $P < .0001$). Among those in the randomized postcard study, the proportions

TABLE 1—Descriptive Statistics of 2 Randomized Postcard Study Populations and of Comparison Population: Kaiser Permanente Northeast Division

Indicator	Vaccinated in 1996		Not Vaccinated in 1996 ^a (n = 5422)
	Postcard (n = 2631)	No Postcard (n = 2647)	
Mean age, y (range)	73.4 (65–97) ^b	73.5 (65–96) ^c	72.6 (65–98) ^d
Male, % (n)	43.7 (1150)	44.6 (1180)	42.2 (2290)
Region, % (n)			
Massachusetts	5.3 (139)	5.4 (142)	6.1 (329)
New York	86.4 (2274)	86.7 (2295)	86.6 (4697)
Vermont	8.0 (211)	7.7 (203)	6.9 (376)
Other	0.3 (7)	0.3 (7)	0.4 (20)

^aAll members of the comparison group received postcards.

^bSD = 6.16.

^cSD = 6.12.

^dSD = 6.47; Kruskal-Wallis $P < .0001$.

vaccinated in 1997 among the intervention and control groups were statistically indistinguishable (78.6% and 77.2%, respectively; $P = .222$) (Figure 1). The large sample size allowed for greater than 99% power to detect a clinically meaningful 5% difference (i.e., the ability to detect a relative risk as small as 1.2) in vaccination coverage between the 2 study groups, were one to exist.

In addition, all members 65 years and older 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. Finally, those with evidence of vaccination in 1996 were more than twice as likely to receive vaccination in 1997 as those without a history of vaccination (77.9% and 32.0%, respectively; relative

risk = 2.43; 95% Taylor series confidence interval = 2.33, 2.54; $P < .001$). When vaccination rates were stratified by age group, no strong evidence was found to suggest a pattern of elevated risk among specific age subgroups.

Discussion

Although managed care organizations have undertaken influenza immunization initiatives since the mid-1980s, results of studies of the effectiveness of postcard reminders have been mixed.^{3–19} The evaluations conducted in managed care settings have generally concluded that postcard reminders contribute to increased vaccination compliance.^{15–19} The research presented here challenges these findings and suggests reallocation of

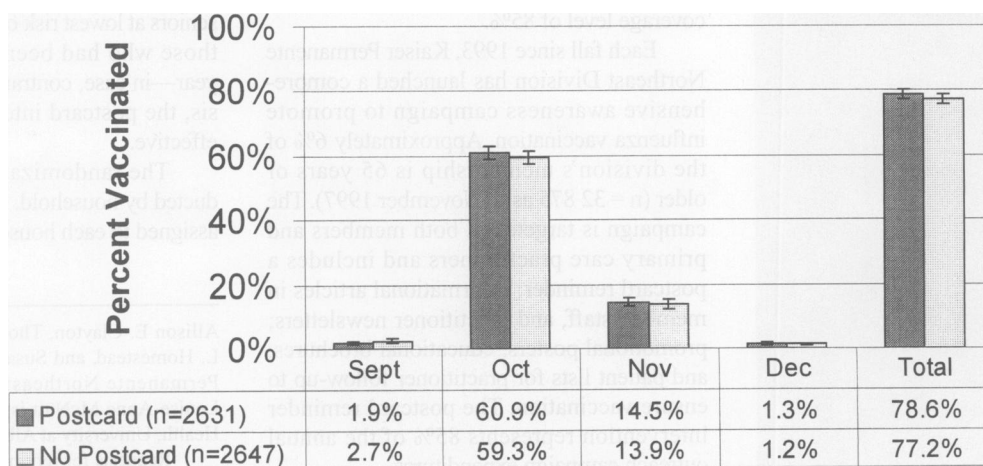


FIGURE 1—Proportion of managed care organization members 65 years and older vaccinated in 1997 by study group and month, with 95% confidence intervals.

resources to more targeted outreach. Without this evaluation, it is likely that the preponderance of expenditures to promote influenza vaccination among seniors would continue to be spent on postcard reminders. Instead, our recommendation is to discontinue the postcard intervention among seniors vaccinated the previous year and redirect funds for promoting immunization to more intensive outreach among those at highest risk of not accepting vaccination (seniors not vaccinated the previous year).

The randomized study was restricted to the lowest risk group of seniors, those who were vaccinated the previous year. The vaccination rates were estimated through administrative data, thus eliminating recall bias as a potential source of measurement error. Several factors may explain lack of evidence of vaccination in both groups (21.4% in the intervention group, 22.8% in the control group). Because the sensitivity of administrative data is somewhat limited (estimated to be 62.4%, according to Kaiser Permanente Northeast Division studies), the vaccination rates presented are underestimates of the true rates.

Although the sample sizes decreased significantly with age, no strong evidence of a relationship between age and likelihood of vaccination was found in this study. Potential bias related to loss to follow-up because of death or disenrollment was controlled by restricting the analysis to Kaiser Permanente Northeast Division members enrolled throughout the study period (September 1, 1997–December 31, 1997). Randomization of study participants was the best mechanism to control for variables that were not within the influence of the investigators. For example, although information on practitioner outreach to members is not available for all study participants (this data is only available via patient interview), the effect of practitioner outreach is likely minimal based on data collected from patients during an annual telephone survey. Only 8% of the 323 members interviewed during the 1998 telephone survey indicated they had received a phone call from their practitioner's office in the fall of 1997 reminding them to get their flu shot.

Conclusions

The results of this study suggest that postcard reminders may be an effective component of a multifaceted intervention strategy among members with no history of vaccination (32% of members without a history of vaccination in 1996 were vaccinated in 1997). This should be studied further.

As the proportion of seniors enrolled in managed care increases, it becomes increasingly important to evaluate the effectiveness of public health interventions among this large, high-risk population. In order for managed care organizations to continue demonstrating improvements in preventive health performance, it is essential to evaluate interventions and to concentrate resources on effective programs. Without such evaluation, programs that appear useful, yet lack impact, become institutionalized and members remain unnecessarily at risk for disease. □

Contributors

A. E. Clayton designed the study, conducted the analysis, and wrote the manuscript. L.-A. McNutt consulted on the study design and reviewed the manuscript. H. L. Homestead abstracted the enrollment and claims data. T. W. Hartman and S. Senecal approved the study design and reviewed the manuscript.

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