

# Improving influenza vaccination rates in the elderly

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- **BACKGROUND:** Vaccination coverage for influenza in the elderly remains low when the physician is the only person responsible for immunization. Integration of other health care workers may improve the coverage rate of at-risk groups.
- **OBJECTIVES:** To estimate vaccination coverage rate by using a strategy based on the systematic intervention of a health care professional proposing vaccination before the doctor's consultation, to evaluate the changes in coverage rates before and after introduction of this strategy, and to assess the feasibility of this intervention and the achieved coverage rate in family physician offices.
- **STUDY DESIGN:** Prospective study in a medical outpatient clinic and 5 family physician practices in Switzerland.
- **POPULATION:** Participants consisted of all patients 65 years or older attending a medical outpatient clinic during the vaccination period in 1999 (n = 401), patients 65 years or older regularly followed at a medical outpatient clinic in 1998 and 1999 (n = 195), and patients 65 years or older presenting to 5 family physician offices in 1999 (n = 598).
- **OUTCOME MEASURED:** Rates of vaccination coverage.
- **RESULTS:** Among all participants, vaccination coverage rates in 1999 were 85% at the medical outpatient clinic and 83% in family physician offices. Among participants regularly followed at the medical outpatient clinic, vaccination coverage increased from 48% in 1998 to 76% in 1999. Rates of refusal were 9% at the medical outpatient clinic and 14% in the family physician offices.
- **CONCLUSIONS:** The systematic intervention of a health care professional to suggest vaccination before the doctor's visit is an effective measure to achieve high coverage rate. Such a strategy also improves outpatient clinic or private practice efficiency by reducing pressures on physicians.

**key words** Influenza; vaccine; coverage; strategy; intervention (J Fam Pract 2002; 51:856)

Annual influenza vaccination is recommended for all persons 65 years and older.<sup>1-3</sup> Unfortunately, coverage rate remains low. In Switzerland during the winter season of 1998-1999, estimated vaccination coverage was only 8% in the general population.<sup>4</sup> In institutionalized elderly patients, coverage was 37% in the same study. In 1994, the rate estimated from a telephonic survey was only 36% in elderly patients in Geneva.<sup>5</sup> Since then, an active promotional

campaign among the public led to a coverage rate among persons older than 65 years of about 60% (L. Toscani, personal communication 2000), a rate that approaches that in the United States (67%).<sup>6</sup>

Apart from making the general population or the target groups aware of the importance of the vaccination to prevent influenza complications, a strategy commonly used to improve coverage consists of training the physicians. However, their knowledge about vaccination does not always explain their behavior; although doctors know that vaccines are efficacious and are convinced that they should offer vaccination to all at-risk patients, they do not propose it to all eligible patients.<sup>7</sup> Reimbursement of vaccines, as done since 1996 in Switzerland, does not seem to increase vaccination rates.<sup>8</sup>

At the Medical Outpatient Clinic, University of Lausanne, we recorded the influenza vaccination coverage rate of patients 65 years and older who were followed regularly in 1997, after an intensive education of physicians including a state-of-the-art lecture and interactive seminars; the same was done in 1998, but letters also were sent to all patients who did not have an appointment during the vaccination period. The vaccination coverage increased from 39% in 1997 to 47% in 1998, presumably because of the reminder letter.<sup>9</sup> This rate was still unsatisfactory. We postulated that the main reason for low rate of influenza vaccination coverage of elderly patients was the physicians' omission to propose the vaccination rather than the patients' refusal. To test this hypothesis and to improve the coverage at the same time, we introduced at the medical outpatient clinic a strategy coupling a systematic intervention of a medical person allowed to do injections (medical student) with the existing educational program and reminder letters. A similar method (except for the reminder letters) was applied in 5 general practices, with the receptionists providing the information and the paramedical staff performing the vaccination.

The specific objectives were (1) to estimate vaccination coverage rate by using a strategy based on the systematic intervention of a health care professional proposing vaccination before the doctor's consultation, (2) to evaluate the changes in coverage rates before and after introduction of the strategy, and (3) to assess the feasibility of this intervention and the achieved coverage rate in family physicians' offices.

## ■ METHODS

The protocol was approved by the ethical committee of the Department of Internal Medicine, University Hospital, Lausanne. **Table 1** summarizes the study profile, populations, strategy applied, and outcome measures that are described below. The study took place in the Medical Outpatient Clinic, University of Lausanne, which provides medical care to the general population (attendees are biased toward young people, refugees, foreigners, and elderly individuals with low incomes); and in 1 rural general practice office (Orbe) and 2 urban general practice offices (Neuchâtel), with 5 physicians.

### Study populations

To estimate vaccination coverage rate after implementing the new strategy in the medical outpatient clinic (objective 1), we included all patients 65 years and older attending the 1999 vaccination period (401 patients). To evaluate the changes in coverage rates before and after the introduction of the strategy (objective 2), we included patients 65 years and older who were followed regularly at medical outpatient clinic in 1998 and 1999 (195 patients). To assess the feasibility of this intervention and the achieved coverage rate in family physicians' offices, we included all patients 65 years and older attending family physicians' offices in 1999 (598 patients).

### Medical outpatient clinic procedures

Pre-intervention season (1998). During the vaccination period (mid-October to mid-December), all patients 65 years and older presented to the receptionist and then waited until they were seen by a first to fifth-year resident physician who proposed the vaccination during the consultation. The injection was then done by a nurse. Alternatively, anyone could go straight to the nurse (walk-in clinic) and ask for an influenza shot, which was done after checking that there was no contraindication (egg allergy, fever during the past 2 days, or use of anticoagulants, in which case subcutaneous injection was performed). To check that all patients regularly followed at the medical outpatient clinic had made contact

during the vaccination period, an independent registrar in mid-November reviewed all files of patients 65 years and older. For those regularly followed, he checked whether an appointment had been made; if not, a reminder letter was sent to the patient.

Intervention season (1999). During the vaccination period, all patients 65 years and older were told by the receptionist that a medical student would propose an influenza vaccination before seeing the doctor. The medical student informed the patients about influenza complications and prevention by vaccination, and asked them whether they had been vaccinated in the previous year. The patient then had to decide whether to be vaccinated immediately, discuss the vaccination with the doctor first, or refuse the vaccination. In case of refusal, the reason was investigated. The patient who agreed to the vaccination received the injection from the medical student and a label was attached to the patient's file to inform the doctor about the vaccination status. The same procedure performed in 1998 was applied for the reminder letter

## General practice procedures

During the intervention season only (1999), the receptionist at the admission desk proposed influenza vaccination to all patients 65 years and older and the paramedical staff promptly performed the injection, if the patient agreed. The same information and questionnaires were applied in the family physician's offices and the medical outpatient clinic.

## Outcomes

Several outcomes were predefined: (1) vaccination coverage rate of all patients 65 years and older who attended the medical outpatient clinic spontaneously or on appointment during the 1999 vaccination period; (2) vaccination coverage rate of patients 65 years and older regularly followed (excluding those coming only once without a follow-up) at the medical outpatient clinic in 1998 and 1999 (all were contacted by a reminder letter, if not seen during vaccination period); (3) vaccination coverage rate of all patients 65 years and older who attended the family physicians' offices during the 1999 vaccination period; and (4) reasons for nonvaccination among those interviewed.

## Data management and analysis

The data were entered immediately into Epi Info 6.0 and analyzed with SPSS 7.5. Testing for differences between the 1998 and 1999 rates in the medical outpatient clinic was done with chi-square tests.

## ■ RESULTS

Rate of vaccination coverage at the medical outpatient clinic during the intervention period

A total of 401 patients 65 years and older came to the outpatient clinic during the vaccination period in 1999. The median age was 74 years (range, 65-97 years) and most patients were male (56%). **Table 2** shows that 85% (341/401) accepted the vaccination at the medical outpatient clinic. Of those, 52% were advised by the medical student before consultation, 26% came spontaneously to the nurse for influenza vaccination, and 19% came with advice from their physicians. The rate of refusal was 9% (see **Table 2** for details).

Changes in rates of vaccination coverage of patients regularly followed at the medical outpatient clinic in 1998 and 1999

In 1998, 195 patients 65 years and older regularly followed at the medical outpatient clinic were monitored.<sup>9</sup> A reminder letter was sent to patients who did not have an appointment during the vaccination period (73/195 patients). About one fifth (15/73) came for vaccination after the reminder letter. Overall, 48% (93/195) were vaccinated in 1998.

In 1999, 325 of 401 patients 65 years and older were regularly followed by a resident-physician. The larger number in 1999 (when compared 195 patients in 1998) was due to the fact that, in 1998, only those who followed in 1997 were monitored. Among the 325 patients, 268 came to the office during the vaccination period; 57 persons regularly followed

did not have an appointment during the vaccination period and were sent a reminder letter. Overall, 76% of patients regularly followed (246/325) were vaccinated in 1999. Of those, 65% were advised by the medical student. The rate of refusal was 11%. Only 2 patients in the targeted population were missed during the target period, and 2 patients had medical contraindications for vaccination. Thus, the new strategy led to a relative increase of 58% for vaccination coverage (from 48% to 76%;  $P < .0001$ , Yates correction).

### **Rate of vaccination coverage in family physicians' offices in 1999**

A total of 598 patients 65 years and older attended their family physicians' offices during the vaccination period. The median age was 74 years (range, 65-99 years) and most were female (62%). Eighty-three percent accepted the vaccination at the family physicians' offices, 3% wished to be vaccinated somewhere else, and 14% refused.

### **Reasons for nonvaccination**

The rates of refusal were 14% in the family physician's offices and 9% in the medical outpatient clinic. Reasons for nonvaccination in the medical outpatient clinic were obtaining the influenza vaccination elsewhere (5%) and medical contraindications (1%; **Table 2**).

## **■ DISCUSSION**

Our study demonstrated that the systematic intervention of a paramedical person before the doctor's consultation can lead to a considerable improvement in vaccination coverage in an ambulatory setting. A 58% relative increase (from 48% to 76%) over 1 year in the same institution has never been achieved. This suggested that failure of the physician to propose vaccination is an important reason for low vaccination coverage of high-risk patients in teaching institutions, where physician turnover is high. Thanks to our organizational strategy, we reached an 85% vaccination coverage among all outpatient attendees, which far surpassed that achieved by an ongoing educational program or alternative strategies such as reminder letters.

Until now, the highest coverage ever reported in Europe in persons 65 years and older was 82% in a study in Finland, where the investigators used an age-based strategy, with free vaccines and personnel-mailed reminders.<sup>10</sup> Even when efficacious<sup>11</sup> and cost effective,<sup>12</sup> these strategies are insufficiently used.<sup>4</sup> Other means to improve vaccination coverage such as centralized planning identification through computerized enrollment files at central registry and immunization clinics have improved vaccination coverage rates to almost 80% among chronically ill seniors in the United States.<sup>13</sup>

Two American studies showed that approaches incorporating administrative and organizational measures were more successful in improving vaccination rates than the education of providers. A pilot study<sup>14</sup> and a 10-year follow-up<sup>15</sup> done in the Minneapolis Department of Veterans Affairs Medical Center used a strategy including annual educational and publicity mailing to patients, walk-in clinics for vaccine administration, standing orders for nurses, and use of standardized patient information and medical record documentation forms. The follow-up study showed a remarkable improvement in the coverage rate, which reached 92% in 1996-1997 in specific groups. Another study done in the University Department of Emergency Medicine of Chicago that used standing orders for nurses at triage was only partly successful, with 47% coverage.<sup>16</sup>

Our study adds to the knowledge gathered in the United States, where administrative and organizational strategies (standing orders for nurses) improved vaccination coverage significantly.<sup>14-16</sup> These studies were conducted in a different population sample, including hospitalized patients and other high-risk groups, which is quite different from the situation in general practice. Comparing vaccination coverage rates between different studies is always hazardous because of differences in inclusion criteria and reporting biases. The highest vaccination coverage ever achieved was 92%, but the method used for the rate estimation was a mailed survey where vaccinated persons may have been more likely to respond than nonvaccinated ones.<sup>15</sup> The investigators exported their program from a teaching hospital to a community outpatient setting, with an increase in coverage from 56% to 72% in 1 clinic and no significant increase in the

other clinic, which shows that several factors should be considered when a new strategy is implemented (staff, motivation, etc).<sup>17</sup> The relatively low coverage (47%) reached in another study conducted in an emergency department was due in part to the fact that the nurse dedicated to providing vaccination was diverted from the preventive task of caring for patients when the workload increased. In addition, only one fourth of the emergency attendees was screened.<sup>16</sup>

To our knowledge, this is the first time that such an active strategy has been reported and applied in family physicians' offices. The implementation in private practices documents its feasibility and effectiveness in those settings. The consistent coverage rates obtained in the medical outpatient clinic and the general practices (85% and 83%, respectively) confirmed the usefulness of the strategy, whatever the patient population and the medical staff involved. One may argue that patients had little choice between accepting or actively refusing the vaccination. We hope that the quality of information provided to the elderly, the possibility for them to ask specific questions that come to mind, and even to delay the decision until they can discuss the decision further with the doctor balances the potential enforcement.

The main disadvantage of our strategy is the need for an additional person in the outpatient clinic. The direct cost of an extra person in public service can be justified if it decreases the indirect costs for society, which is the case for influenza vaccination.<sup>12</sup> More pragmatically, at the institutional level, the additional income generated by the increase of vaccine sales outweighed the salary of the medical student (about US\$100/day for a total of 40 days, ie, 20 working days for 2 months). The implementation in the family physicians' offices showed that such a procedure can work in a small setting without additional staff. Counseling about vaccination represents an additional task for the paramedical personnel, but it certainly provides more credit to the overall work and improves the therapeutic network. Also, because the vaccination has to be proposed, the time for discussion has to be taken by whoever is the most willing to do the job.

Some doctors may feel that this strategy excludes them from important duties. We must face the reality that physicians often do not accomplish their tasks properly. With our procedure, they remain informed about the vaccination status of their patients and maintain their important role in counseling patients who cannot decide about the vaccination or when problems arise.

One can argue that the increase in vaccination coverage rate was due, at least in part, to external factors such as media propaganda, and that the new strategy played only a marginal role. Of course, we cannot exclude such an influence, but it certainly unlikely was to be the cause of a 58% increase in coverage rate; indeed, no particular campaign was launched in 1999 and no change in coverage rate between 1998 and 1999 was observed in a similar institution in the same area. We chose to use historical controls because we were convinced that the new strategy would dramatically improve vaccination in the elderly and felt therefore that it was unethical not to offer this procedure to all our patients. Moreover, the main interest of the study was to investigate the maximum coverage rate that could be expected with a very active intervention and to estimate precisely the rate of true refusals, so that defined objectives in terms of coverage rates can be set in similar institutions.

The new strategy assessed in this study is in line with the recommendations of the Advisory Committee on Immunization Practices, published in March 2000, that promoted the use of standing orders to improve adult vaccination delivery.<sup>18</sup> Evidence of effectiveness of such programs is increasing. They could be adapted to other preventive measures to improve delivery of those services, and they could be used to improve outpatient clinic efficiency by reducing pressures on physicians.

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#### REFERENCES

1. WHO Influenza vaccination recommendations. *Wkly Epidemiol Rec* 1999;74:57-64.
2. Working Group Influenza. Recommendations for influenza vaccination during the 1999/2000

- season. Bull OFSP 1999;39:737–9.
3. CDC Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep 1998;47:1–26.
  4. Ammon CE. Vaccination against influenza in Switzerland. A survey in health facilities. Bull OFSP 1999;4:62–4.
  5. Gauthey L, Toscani L, Chamot E, Larequi T, Robert CF. Influenza vaccination coverage in the geriatric population of the State of Geneva, Switzerland. Eur J Pharmacol 1999;9:36–40.
  6. Centers for Disease Control and Prevention. Influenza and pneumococcal vaccination levels among persons aged 65 years-United States, 1999. MMWR Morb Mortal Wkly Rep 2001;50:532–7.
  7. McKinney WP, Barnas GP. Influenza immunization in the elderly: knowledge and attitudes do not explain physician behavior. Am J Pharmacol 1989;79:1422–4.
  8. Etkind P, Simon M, Shannon S, et al. Impact of the Medicare Influenza Demonstration Project on influenza vaccination in a county in Massachusetts, 1988-1992. Community Health 1996;21:199–209.
  9. Zorzoli M, Favrat B, D'Acremont V, Pécoud A, Genton B. Strategies to improve vaccination coverage among elderly patients. J Gen Intern Med 1999;14:83.
  10. Honkanen PO, Keistinen T, Kivela SL. The impact of vaccination strategy and methods of information on influenza and pneumococcal vaccination coverage in the elderly population. Vaccine 1997;15:317–20.
  11. Armstrong K, Berlin M, Schwartz S, Propert K, Ubel P. Educational content and the effectiveness of influenza vaccination reminders. J Gen Intern Med 1999;14:695–7.
  12. Baker AM, McCarthy B, Gurley VF, Yood MU. Influenza immunization in a managed care organization. J Gen Intern Med 1998;13:469–75.
  13. Pearson DC, Jackson LA, Wagener B, Sarver L. A comprehensive influenza campaign in a managed care setting. Vaccine 1998;16:1718–21.
  14. Margolis KL, Lofgren RP, Korn JE. Organizational strategies to improve influenza vaccine delivery. A standing order in a general medicine clinic. Arch Intern Med 1988;148:2205–7.
  15. Nichol KL. Ten-year durability and success of an organized program to increase influenza and pneumococcal vaccination rates among high-risk adults. Am J Med 1998;105:385–92.
  16. Slobodkin D, Kitlas J, Zielske P. Opportunities not missed systematic influenza and pneumococcal immunization in a public inner-city emergency department. Vaccine 1998;16:1795–802.
  17. Margolis KL, Nichol KL, Wuorenma J. Exporting a successful influenza vaccination program from a teaching hospital to a community outpatient setting. J Am Geriatr Soc 1992;40:1021–3.
  18. CDC Adult immunization programs in nontraditional settings: quality standard and guidance for program evaluation. A report of the national Vaccine Advisory Committee and Use of standing orders programs to increase adult vaccination rates. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep 2000;49:18–27.

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