

# Can We Improve Influenza Vaccination Rates in Older People With Chronic Diseases?

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**Objective.** To determine the proportion of older patients ( $\geq 65$  years) with chronic diseases served by the health center studied here who were not vaccinated during the 2001-2002 influenza vaccination campaign, and to find out why they were not vaccinated.

**Design.** Observational, descriptive, retrospective study.

**Setting.** The urban health center serving Area 19 in the Community of Valencia (eastern Spain).

**Participants.** Of the 29 757 inhabitants served by this center (10.4%  $\geq 65$  years), we included 3868 patients registered in chronic disease care programs and 2980 registered in the influenza vaccination program. We found 853 older patients with chronic diseases who were not vaccinated.

**Main measures.** Vaccination rate for patients with chronic diseases, for older patients, and for older patients with chronic diseases. Audit of the medical records to identify the reasons why some patients in the latter group were not vaccinated.

**Results.** The vaccination rates were 52.12% (95% CI, 50.4-53.9) for older patients, 26.96% (95% CI, 25.6-28.4) for patients with chronic diseases, and 54.43% (95% CI, 51.4-57.5) for older patients with chronic diseases. Of the 853 older patients with chronic diseases who were not vaccinated, 48.17% came to the center at least once during the vaccination campaign, 27.34% had not come to the center since more than 1 year before the campaign, and the cause for nonvaccination was recorded for only 10.4%.

**Conclusions.** Coverage for influenza vaccination in older patients with chronic diseases was low. Intervention to increase vaccination rates is possible in groups of patients for whom accessibility is good.

**Key words:** Influenza. Vaccination. Older people. Chronic diseases.

¿PODEMOS MEJORAR LAS TASAS DE VACUNACIÓN ANTIGRIPIAL EN LOS ANCIANOS CON ENFERMEDADES CRÓNICAS?

**Objetivo.** Determinar la proporción de pacientes ancianos ( $\geq 65$  años) adscritos al centro de salud estudiado, con alguna enfermedad crónica y que no fueron vacunados en la campaña antigripal 2001-2002, y conocer el porqué.

**Diseño.** Observacional, descriptivo, retrospectivo.

**Emplazamiento.** Centro de salud urbano del Área 19 de la Comunidad Valenciana.

**Participantes.** De los 29.757 habitantes adscritos (10,4% ancianos), se incluyó a 3.868 pacientes registrados en los programas de crónicos y a 2.980 en el de vacunación antigripal (VAG), y se encontró a 853 pacientes crónicos ancianos no vacunados.

**Mediciones principales.** Tasa de VAG en crónicos, ancianos y crónicos ancianos. Auditoría de historias clínicas para conocer las causas de la falta de vacunación en estos últimos.

**Resultados.** La tasa de VAG en los pacientes ancianos fue del 52,12% (intervalo de confianza [IC] del 95%, 50,4-53,9), en los pacientes crónicos fue del 26,96% (IC del 95%, 25,6-28,4) y en los pacientes ancianos crónicos del 54,43% (IC del 95%, 51,4-57,5).

De los 853 ancianos crónicos no vacunados, el 48,17% acudió al menos una vez al centro de salud durante la campaña de vacunación. El 27,34% hacía más de 1 año que no acudía al centro de salud y sólo en el 10,4% se había documentado la causa de la falta de vacunación.

**Conclusiones.** La cobertura de VAG en ancianos y crónicos es baja. Es posible intervenir en grupos accesibles de pacientes para incrementar la tasa de vacunación.

**Palabras clave:** Gripe. Vacunación. Ancianos. Enfermedades crónicas.

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## Introduction

There is evidence that influenza vaccination in older people in developed countries prevents from 30% to 40% of all hospital admissions and deaths from diseases related with this viral infection.<sup>1,2</sup> In Spain, vaccination has been shown to prevent 37.4% of all such hospitalizations.<sup>2</sup>

Influenza vaccination in people older than 65 years is an effective and efficient strategy for primary prevention.<sup>3-5</sup> Nevertheless, a considerable proportion of these persons go unvaccinated each year, with figures of around 30% to 50% in different regions of Spain and in developed countries.<sup>6-9</sup> Our aims in this study were to determine the proportion of older patients ( $\geq 65$  years) with chronic diseases served by our health center who were not vaccinated during the 2001-2002 influenza vaccination campaign, and to find out why they were not vaccinated.

## Methods

Observational, descriptive, retrospective study in an urban health center serving Area 19 in the Community of Valencia (eastern Spain), chosen randomly from among similar centers. This health center serves a population of 29 757 users, which includes 3116 older persons (10.47%) according to figures obtained in February 2002 from the *Sistema de Información Poblacional* (Population Information System).

We included patients registered with chronic disease care programs and the influenza vaccination program at our center. The chronic care programs covered hypertension, diabetes mellitus, hyperlipidemia, obesity, chronic medication, and limited mobility. At the time of the study these programs served 3868 patients, 1872 (48.4%) of whom were older than 65 years in 2001. The influenza vaccination register comprised 2980 patients vaccinated during the 2001-2002 campaign, 1624 (54.5%) of whom were older than 65 years in 2001.

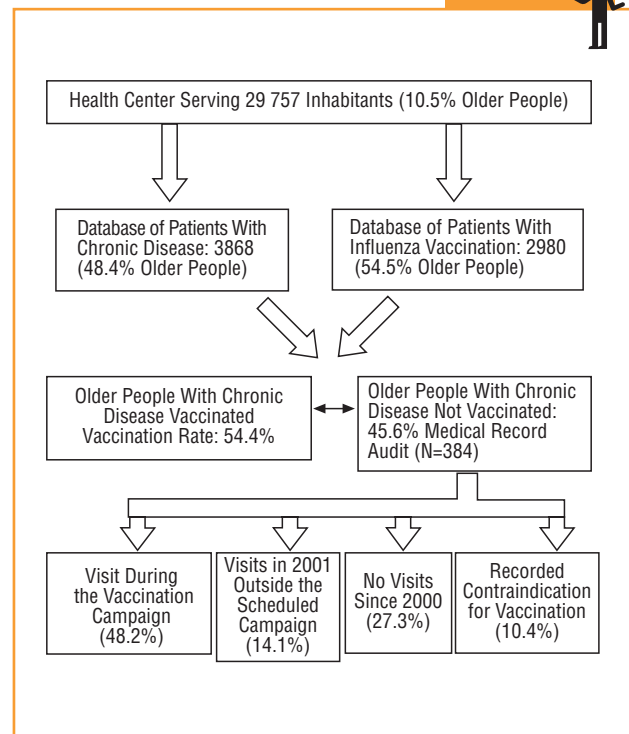
The 2 databases were merged and carefully purged of duplicate patients and other errors with the Windows® ACCESS program. This yielded a list of 1019 older patients with chronic diseases who had been vaccinated during the 2001-2002 influenza vaccination campaign.

The level of statistical significance was set at  $P < .05$ , and 95% confidence intervals (95% CI) were calculated.

The medical records of all older patients with chronic diseases who were not vaccinated were audited. A representative sample of 384 medical records (95% CI, 0.05 precision, 0.50 expected proportion), was studied to determine why these patients were not vaccinated, and to determine how many visits to the health center they made during 2001 and the months while the influenza vaccination campaign was in progress. The following hypotheses were used to investigate the causes of nonvaccination:

- Motive 1: the patient did not visit the health center during the vaccination campaign (October 2001-February 2002) but did come to the center during 2001 before October.
- Motive 2: the patient was seen at least once at the health center during the vaccination campaign, but for reasons other than vaccination.

## Material and methods



## General Scheme of the Study

Descriptive and retrospective observational study to determine the number of chronic patients <65 years old not vaccinated for flu in the 2001-2002 campaign and to find the reasons for this.

- Motive 3: the patient had not visited the center since the year 2000.
- Motive 4: the patient declined to be vaccinated, according to information entered in the medical record.
- Motive 5: physician's express contraindication because of allergy or other motive.
- Motive 6: any other cause that resulted in nonvaccination.

## Results

Table 1 shows data for the population studied, patients with chronic diseases and patients who were vaccinated at the health center. The rate of influenza vaccination at the center was 52.12% (95% CI, 50.4-53.9) for all older patients and 54.43% (95% CI, 51.4-57.5) for older patients with chronic diseases.

The findings from our audit of the medical records are shown in Table 2. Among the patients who were not vaccinated, 48.2% visited the health center during the vaccination campaign. The reason for nonvaccination was given in only 10.4% of the medical records we audited.

The chronic care program with the highest proportion of patients who were not vaccinated was the program for pa-

**TABLE 1** Data for the Population Served by the Health Center\*

Year 2001	Total	Older People
Population	29 757	3116 (10.47%) 95% CI, 10.1-10.8
Patients vaccinated	2980	1624 (52.12%) 95% CI, 50.4-53.9
Patients with chronic disease	3868	1872 (48.4%) 95% CI, 46.8-50.0
Vaccinated patients with chronic disease	104†	1019 (97.7%)‡ 95% CI, 96.8-98.6

\*CI indicates confidence interval.

†Vaccination rate for people with chronic disease: 26.96%.

‡Vaccination rate for older people with chronic disease: 43%.

**TABLE 2** Classification of Older Patients With Chronic Diseases Who Were Not Vaccinated, per Cause of Nonvaccination\*

Motive	N (total=384)	Percentage	95% CI
1	54	14.06	10.6-17.5
2	185	48.17	43.2-53.2
3	105	27.24	22.9-31.8
4	14	3.6	1.7-5.5
5	2	0.5	0.0-1.2
6	24	6.25	3.83-8.67

\*CI indicates confidence interval.

†Motive 1: no visits to the doctor during the campaign, but other visits during 2001. Motive 2: visits during the campaign. Motive 3: no visits since 2000.

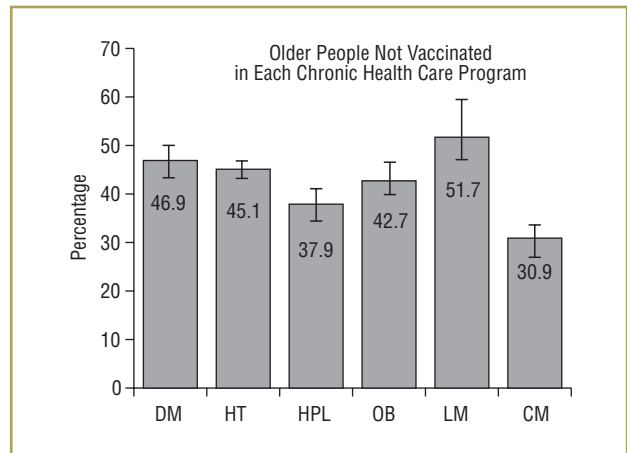
Motive 4: record of refusal to be vaccinated. Motive 5: record of contraindication for vaccination. Motive 6: other causes.

tients with limited mobility (51.7%), followed by the program for diabetes (46.9%). The highest proportion of patients who were vaccinated was found for the chronic medication program (30.9% not vaccinated) (Figure 1).

## Discussion

In our health area, influenza vaccination coverage in older people for the 2001-2002 campaign was 61.3% according to official figures (Source: Dirección General de Salud Pública, data from the Statement of Doses Used, checked against the municipal census). The goal set by the contract for services for the year 2001 was to vaccinate more than 60% of all older people.

At the health center studied here, the influenza vaccination rate was 52.12% (95% CI, 50.4-53.9) for all older people, and 54.43% (95% CI, 51.4-57.5) for older people with chronic diseases. It is nevertheless surprising that coverage was similar in these 2 groups since it might be expected to be significantly higher in patients with chronic



**FIGURE 1**

Classification of older patients who were not vaccinated, by health program. DM indicates diabetes, HT, hypertension; HPL, hyperlipidemia; OB, obesity; LM, limited mobility; CM: chronic medication.

diseases, who attend a number of scheduled check-up visits.

It was notable that only 26.9% of all patients with a chronic disease (regardless of age) were vaccinated (95% CI, 25.6-28.4). Some chronic care programs such as chronic medication or obesity might be considered not to be directly related with risk groups for vaccination, but this would hardly account for the low figures we found.

Nearly half (45.6%) of the older patients with chronic diseases were not vaccinated. When we investigated the causes by auditing the medical records (taking into account the biases from underreporting) we found the following:

- Among older people who were not vaccinated, 14.06% did not visit the center during the vaccination campaign, although they did come to the center for check-ups as part of their health program in other months during 2001 outside the campaign. There was no record that they had been advised during these visits to come in for vaccination.
- Of greater concern was the fact that almost half of the older people with chronic diseases who were not vaccinated did come to the center during the campaign (for an appointment with the physician or a nursing appointment as part of their chronic care program), but were not advised to get vaccinated. This means that once we rule out refusal to be vaccinated, oversight or physician's contraindication, the apparent reason for nonvaccination is that these patients were not advised to be vaccinated. We feel this is a clear opportunity to improve coverage for influenza vaccination, as it would be easy to ensure that these patients are vaccinated once they come to the center for any other reason.

Discussion  
Key points

### What Is Known About the Subject

- Influenza is an important public health problem, and yearly vaccination is recommended for specific risk groups.
- Influenza vaccination for older people in developed countries prevents from 30% to 40% of all hospital admissions and deaths caused by diseases related with this viral infection.
- Nevertheless, a considerable proportion of persons older than 65 years go unvaccinated each year.

### What This Study Contributes

- Coverage of influenza vaccination in older people is low (52.1%). Older people in chronic care programs are not vaccinated on schedule despite the fact that they often belong to more than one risk group, and despite the accessibility of this health service.
- Nearly half of all older patients with chronic diseases (45.6%) were not vaccinated even though they visited the health center during the campaign.
- Of all groups of patients with chronic disease, patients with limited mobility were vaccinated the least frequently, suggesting that accessibility problems influence vaccination.
- The results of the vaccination campaign could be analyzed thanks to the existence of a computerized register of vaccinated patients.

– Approximately one out of every 4 older persons with chronic diseases who was not vaccinated (27.34%) had not come to the health center for more than 1 year, for reasons that have not been determined. Further studies are needed to determine whether these patients are noncompliers or whether the database was not entirely up to date regarding diagnoses or patient-related information.

– Only 3.6% of the patients refused vaccination, according to the medical records. Only 2 patients (0.5%) were not vaccinated because of medical contraindications. A small percentage of patients (6.25%) were not vaccinated for a number of other reasons. Thus the clinical motives for nonvaccination were recorded for only 10.35% of the patients. Vaccination is thus a potential goal for all remaining nonvaccinated patients.

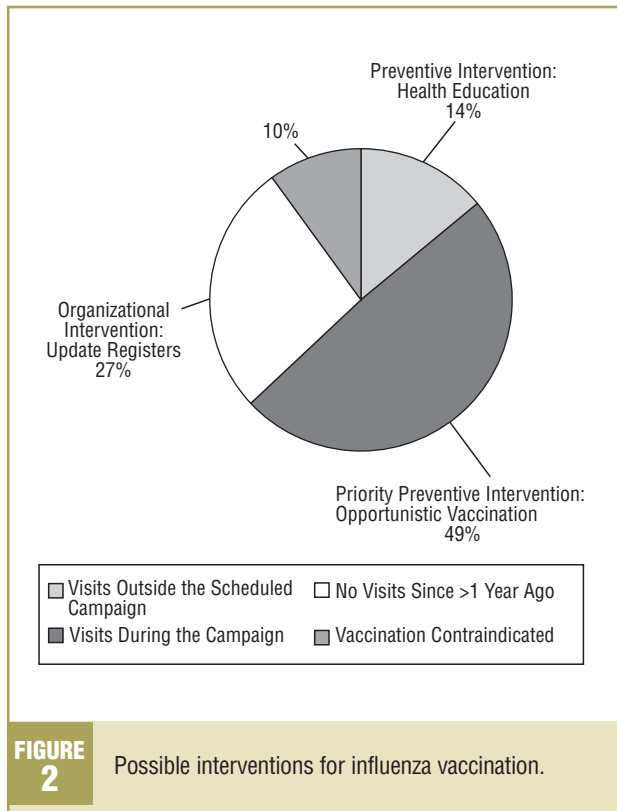
The causes of noncompliance with influenza vaccination are multiple and often complex. Mulet et al<sup>10</sup> reported, in their evaluation of compliance with influenza vaccination, that the main causes of nonvaccination were the belief that it was unnecessary (63.5%), unawareness of the influenza vaccination campaign (35.7%), fear of reactions to the vaccine (24.3%), and oversight (10.4%). In the present study, two motives stood out:

- The patient had not come to the center during at least 1 year (motive 3) even though he or she was registered in a continuing care program.
- The patient came to the center at least once during the campaign, but we missed the opportunity to offer vaccination (“We let this one get away.”)

One way to analyze nonvaccination is to ask patients why they did not get vaccinated. In this study we analyzed why the health center staff did not try to vaccinate the patient. If the patient did not visit the center for more than 1 year despite being enrolled in a chronic care program, we clearly could not offer him or her vaccination opportunistically. If the patient was allergic to the vaccine or declined to be vaccinated, this justifies nonvaccination. But the remaining causes are amenable to intervention by providing information or simply by prescribing vaccination.

Different authors have tried a number of strategies to increase influenza vaccine coverage in older people, including telephone or personalized letter reminders, more extensive information campaigns, and a more active role of nursing staff.<sup>12-16</sup> Costa et al<sup>17</sup> concluded from their study that nursing staff have a positive influence on compliance with influenza vaccination, and are also a useful element in strategies intended to persuade patients with negative attitudes toward vaccination. Puig Barberá et al<sup>14</sup> showed that coverage in the preceding year, human resources, written, or telephoned invitations, the nursing staff being ordered to provide vaccination, and discussion of the findings of external evaluations were independently associated with higher vaccination rates. A study from Switzerland reported that systematic intervention with health professionals before they saw the patient led to coverage rates of up to 85% for vaccination in older people.<sup>18</sup> This study gives us an idea of what might be accomplished for the group of patients we studied.

We believe that interventions to implement vaccination should be aimed initially at the groups at greatest risk and who are most accessible, as this would result in an efficient intervention in terms of the effort required in time and human and material resources. Common sense dictates that the most easily identifiable risk group is older patients, since patients with chronic diseases must first be diagnosed. However, if a register of chronic disease patients is available at the health center, this identifies another accessible target group for vaccination with the advantage,



**FIGURE 2** Possible interventions for influenza vaccination.

in comparison to older patients, that visits to the center are scheduled regularly. These visits offer inestimable opportunities for intervention, which we unfortunately are failing to take advantage of.

When we analyzed the results for our older patients who participated in different chronic disease programs (Figure 1) we found that nearly half of the patients with hypertension or diabetes had not been vaccinated.

We were surprised to discover that somewhat more than half of the patients with limited mobility were not vaccinated; in contrast, the program with the largest percentage of vaccinated patients was the program for chronic medication, and the difference between these 2 programs was statistically significant. This indicated a problem with accessibility of vaccination that was not remedied by a programmed care intervention such as home vaccination. In other words, the vaccination process was not integrated into any specific program, and all indications pointed toward on-demand vaccination. As a result, the patients with the best access (who are usually the healthiest patients) were the ones vaccinated most often.

Obviously, additional measures to implement influenza vaccination are needed. The optimum approach would be to use automated registers of influenza vaccination, but the present analysis suggests several proposals that are applicable at any health center regardless of whether computerized registers are available (Figure 2):

- Organizational intervention: updating registers of patients with chronic diseases who have not visited the center in more than 1 year.
- Priority preventive intervention: systematic opportunistic vaccination for patients who come to the center for a chronic disease program appointment during the campaign, and who made up nearly half of the patients who were not vaccinated.
- Preventive intervention in health education: recommending vaccination systematically to all patients with chronic diseases who come to the center for a scheduled appointment even if the appointment falls outside the dates of the campaign.

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## COMMENTARY

## Preventive and Care Activities for Chronic Patients: a Challenge for Health Services in the 21st Century

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Aging and increasing life expectancies in the population have led to a steady rise in the importance of preventive, follow-up and treatment measures for persons with a chronic disease or disorder. Moreover, diseases that were formerly fatal within a short period can now be considered chronic. Health planning is fundamental in the face of limited economic resources and growing health care needs. Because preventive methods of proven efficacy and effectiveness are now available, different health care systems share the view that priority should be given to interventions that reduce high-incidence chronic diseases, accidents, and infectious diseases such as AIDS and all diseases potentially preventable by vaccination.<sup>1,2</sup> In persons 65 years of age or more, who may be at risk for more than one problem simultaneously, preventive measures constitute a fundamental activity in any health system, and in this connection primary care clearly has a leading role to play. According to data from the Spanish National Institute of Statistics,<sup>3</sup> persons older than 65 years now make up almost 20% of the population—a fact with health care implications worthy of consideration.

Among the various preventive activities that can be implemented in primary care, vaccination has one of the most clearly favorable cost-benefit ratios. As shown in the study by Schwarz et al,<sup>4</sup> among others, influenza vaccination should be considered a fundamental preventive activity. Although this conclusion is beyond question, additional

### Key Points

- Health planning is fundamental in the face of limited economic resources and growing health care needs.
- The importance of the appropriate use of measures for prevention, follow-up, and treatment in persons with a chronic disease or disorder has increased steadily.
- Further research and studies are needed on the application of strategies to increase vaccination coverage in the general population.

research and work are needed on the application of different strategies to increase vaccination coverage in persons 65 years of age or more, for whom this measure is especially indicated.<sup>5</sup> A more active approach is needed in primary care centers toward vaccinating this population and reaching patients with chronic diseases, as these are often the persons who have the most problems obtaining access to preventive programs. It is noteworthy that more than 30% of the population aged 65 years or more had one or more disabilities (involving sight, hearing, communication, mobility, self-care, learning and applying knowledge,

or performing household chores), the most frequent being limited mobility (65% of the participants).<sup>3</sup>

A number of strategies can be considered to provide enhanced service to patients with chronic diseases and disabilities. These strategies should be considered part of preventive and follow-up programs; in addition, measures such as home visits and telephone contacts should be implemented to actively seek out patients. However, these measures are not always easy to implement because of the resources they require in our already overburdened centers; as a result we must resort increasingly to telemedicine and to what can generally be termed the new information and communication technologies. A number of studies have examined ways to manage these situations, and the topic has received much attention from the European Union and World Health Organization.<sup>6</sup>

Of note are the findings of a recent study<sup>7</sup> that evaluated influenza vaccination coverage in Spain from 1993 to 2001. Despite the efforts of many, only a slight improvement was achieved in vaccination coverage among persons aged 65 years or more. In persons less than 65 years old who had a chronic disease—an indication for vaccination—there was no increase in coverage. Accordingly, we should take note of the findings in Catalonia and in European countries where the age when influenza vaccination is indicated has

been lowered to 60 years. This, in theory, may constitute an additional means of increasing coverage among older persons who have other associated risk factors.

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