

# Improving uptake of influenza vaccination among older people: a randomised controlled trial

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## SUMMARY

**Background:** The uptake of influenza vaccination among older people is suboptimal. Contact with a doctor or nurse is associated with older people deciding to accept influenza vaccination.

**Aim:** To compare different forms of approach in improving uptake of influenza vaccination among patients aged 75 years and over in primary care.

**Design of study:** Randomised controlled trial.

**Setting:** One large rural general practice serving the town and surrounding area of Melton Mowbray, Leicestershire.

**Method:** All 2052 patients aged 75 years and over, registered with the practice and not living in nursing/residential homes or sheltered accommodation, were included in the study. One-third of patients were randomised to receive an offer of influenza vaccination as part of an over-75 health check administered by a practice nurse in the patient's home, and two-thirds of patients were randomised to receive a personal letter of invitation to attend an influenza vaccination clinic held at the surgery. The main outcome measure was uptake of influenza vaccination.

**Results:** Six hundred and eighty patients were randomised to the health check arm of the trial and 1372 were randomised to receive a personal letter. Of those randomised to the health check arm, 468 received the health check from the nurse. Overall, the difference in influenza vaccination uptake was 6.4% (95% confidence interval [CI] = 2.2% to 10.4%) with 67.9% (n = 932) of those who were sent a personal letter actually receiving the vaccine, compared with 74.3% (n = 505) of those offered a combined health check and influenza vaccination (P = 0.003).

**Conclusion:** Combining home-based over-75 health checks with influenza vaccination can improve uptake among older patients. However, this intervention is likely to be costly and its effect on influenza vaccination rates is modest. The difference in uptake is greater among those who do not routinely come forward for vaccination and a more viable option may be to target these patients.

**Keywords:** aged; influenza vaccine; geriatric assessment; randomised controlled trial.

## Introduction

Vaccination may halve the incidence of influenza among older people.<sup>1</sup> Where there is a good match between the vaccine strain and the epidemic strain, longer-term outcomes of influenza vaccination include reduction in the risk of hospitalisation and death.<sup>2</sup> Although hospitalisation may only be necessary for the minority of cases, there is still likely to be a reduction in physical functioning for older people in the aftermath of influenza.<sup>3</sup>

Prior to the winter of 2000/2001 and in response to two consecutive winters of high levels of influenza activity,<sup>4</sup> the Department of Health lowered the age limit of those recommended to receive influenza vaccine from 75 to 65 years.<sup>5</sup> In the past, influenza vaccination rates in the United Kingdom among those aged 75 years and over has been around 50%,<sup>5</sup> and general practices have relied on older people coming forward to receive the influenza vaccine.<sup>6</sup> However, with the setting of a minimum target of 60% uptake among the over-65s for winter 2000/2001, practices are now being encouraged to be more proactive in their influenza immunisation programmes.

The majority of older people do not consider themselves ill and therefore do not perceive themselves to be at risk of serious consequences of influenza.<sup>7</sup> Not coming forward for influenza vaccination is associated with fear of adverse side effects<sup>8</sup> and the perception of not being susceptible to influenza.<sup>9</sup> However, among those who hold negative beliefs about the effectiveness and adverse consequences of the vaccine, information from a health visitor may encourage older people to receive the influenza vaccine.<sup>8</sup>

Effective interventions designed to improve the uptake of influenza vaccination among older people have ranged from simple personal invitation<sup>10</sup> and postcard reminders,<sup>11</sup> through mailed educational brochures,<sup>12</sup> to telephone reminders by practice nurses.<sup>13</sup> More intensive methods of approach appear to have a greater impact on uptake rates. The biggest predictor of accepting influenza vaccination is contact with a doctor or nurse.<sup>14</sup>

In the UK, the over-75 health checks represent the most structured method of preventive health care for older people. However, there is little evidence to support the routine use of preventive home visits to older people<sup>15</sup> and the introduction of over-75 health checks has been met with scepticism by general practitioners (GPs), although it remains popular among older people themselves.<sup>16</sup> The aim of the present study was to examine the impact on influenza vaccination uptake of combining two services for older people in primary care: the over-75 health check and the influenza immunisation programme.

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Submitted: 20 April 2001; Editor's response: 12 June 2001; final acceptance: 21 September 2001.

©British Journal of General Practice, 2002, 52, 717-721.

**HOW THIS FITS IN**

*What do we know?*

Although immunisation against influenza can lower the risk of hospitalisation and death among older people, the uptake of influenza vaccination is suboptimal. Observational and qualitative studies suggest that contact with a doctor or nurse is the most likely predictor for receiving the vaccine.

*What does this paper add?*

Offering influenza vaccination as part of an over-75 health check carried out by a practice nurse in the older person's home has a moderate effect on increasing uptake of the vaccine. The improvement in uptake is more marked for those who do not routinely come forward for vaccination.



**Method**

*Setting and selection criteria*

The study took place in Melton Mowbray, Leicestershire where one large general practice (list size 34 000) is the sole provider of primary care services. Patients were eligible for the trial if they were aged 75 years and over on 22 September 2000 and registered with the practice. Those who were living in residential care, nursing homes, or sheltered accommodation were excluded from the study, as influenza vaccines are provided annually by a visiting practice nurse for older people in these settings. The study was approved by Leicestershire Health Authority Research Ethics Committee.

*Interventions*

This study compared two forms of approach to maximise uptake of influenza vaccination among older people. The first approach was a personal letter of invitation to attend any of the influenza vaccination clinics held at the surgery. The letter stressed the importance of preventing influenza and attempted to reassure patients that the vaccine was associated with few side effects. All letters were mailed at the beginning of October 2000.

The second approach was to combine an over-75 health check carried out by a practice nurse in the patient's home, with an offer of influenza vaccination. Patients were contacted by letter offering a health check that could also include an influenza vaccination if the patient wished. The letter made clear that by agreeing to the health check, the patient was under no obligation to receive the vaccination. For those wishing to decline the offer of a health check, a tear-off slip and pre-paid envelope were provided. Patients were also advised that they could still be vaccinated against influenza at the surgery if they preferred.

The health check itself involved an assessment of physical and mental health and took the same format that has been used locally since the introduction of over-75 health checks in 1990.<sup>17</sup> After the initial assessment, patients were offered the influenza vaccine and the nurse dealt with any concerns that the patient had regarding the vaccination. If the patient

agreed to be vaccinated and there were no contraindications, the nurse administered the vaccine. Health checks were carried out between 2 October 2000 and 4 December 2000, each one taking around 30 minutes to complete.

*Randomisation and consent*

All eligible patients were randomised to receive either a personal letter or a health check combined with the offer of a vaccination. Resources were available to provide one-third of the eligible population with the health check. Therefore, one-third of patients were randomised to receive the health check and two-thirds were randomised to receive the personal letter. For practical reasons, as well as to limit contamination between trial arms, randomisation occurred at household level. To assign households to trial arms, each household was given a unique identifier. The SAS data analysis program was then used to randomly assign the codes to each identifier, with the personal letter code being generated twice as often as the health check code.

Approaching patients for informed consent prior to randomisation was not feasible owing to the nature of the interventions themselves. Written consent was obtained for all patients prior to the administration of the vaccine regardless of where the patient was vaccinated.

*Sample size*

Based on the previous year we expected an uptake of 50% among the personal letter group, and from a non-randomised pilot study in a neighbouring practice in the previous year we expected an uptake of 64% in the health check group. If all 2000 potentially eligible patients were randomised, then we calculated that we would have 99% power at the 5% significance level to detect the above difference.

*Primary outcome measure*

The primary outcome measure was the proportion of patients receiving the influenza vaccine by 31 December 2000.

*Statistical analysis*

The data was analysed using an intention-to-treat approach. The  $\chi^2$ -test was used to analyse the difference in uptake between trial arms among all eligible patients as well as among those who did not receive an influenza vaccine in the previous year. All analyses were carried out using the software SAS version 8.

**Results**

Of the 2408 patients aged 75 years and over and registered with the general practice, 356 were ineligible to take part in the trial because they were living in residential care, nursing homes or sheltered accommodation (Figure 1). A total of 1372 patients were randomised to receive the personal letter and 680 were offered a combined health check and influenza vaccination. Following randomisation, 66 patients in the personal letter arm received the influenza vaccine at home when the GP was aware of medical reasons that prevented the patient from attending the surgery. In the health check arm 468 (68.8%) actually received the nurse health

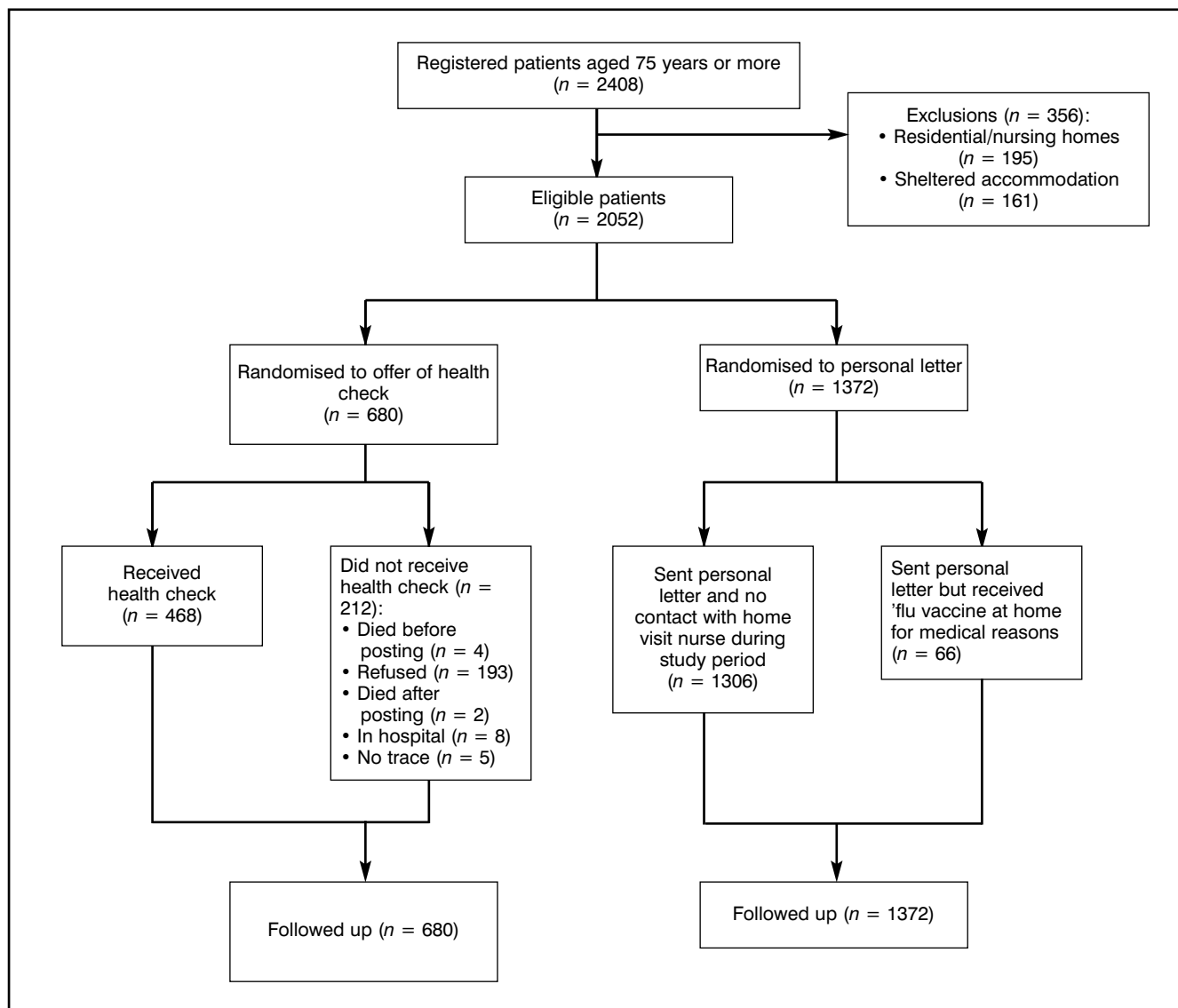


Figure 1. Progress through the trial.

check.

Table 1 shows the baseline characteristics of the 2052 patients randomised to the two groups. A total of 972 (47.4%) patients received the influenza vaccine in the previous year. There appeared to be no difference in age, sex and vaccination status for the previous year between the two groups.

Of the 212 patients randomised to, but not receiving the nurse health check, 193 actively declined the offer with the remainder having died, been admitted to hospital, or not been traceable. These patients were less likely to have received the influenza vaccine in the previous year than those who received the nurse health check (38.7% versus 53.2%) although they were similar in age and sex.

Both interventions succeeded in improving uptake from the previous year. The difference in uptake of influenza vaccination between the two study groups was 6.4% (95% CI = 2.2% to 10.4%) with 67.9% (932/1372) of those who were sent a personal letter actually receiving the vaccine com-

pared with 74.3% (505/680) of those offered a combined health check and influenza vaccination (Table 2). When the analysis was restricted to those who had not been vaccinated in the previous year, rates of influenza vaccination uptake were lower in both the nurse health check group (56.2% [196/349]) and the personal letter group (44.0% [322/731]), but the difference between the groups was greater (12.1%, 95% CI = 5.8% to 18.4%).

## Discussion

Our intervention of combined health check and offer of influenza vaccine produced a higher uptake than personal invitation letter. The effect of the health check on vaccination uptake was particularly marked for those who were eligible for, but did not receive, a vaccine in the previous year. The increase in vaccination uptake among those offered health checks could be attributed to the greater opportunity for patients who have misgivings about the vaccine to discuss their concerns with the nurse. On a more cautious note, it

Table 1: Baseline characteristics of patients according to trial arm.

	Health check arm (n = 680)	Personal letter arm (n = 1372)
Median (interquartile range) age (years)	79 (77 to 83)	79 (77–83)
Females, n (%)	401 (59.0)	847 (61.7)
Had 'flu vaccine in previous year, n (%)	331 (48.7)	641 (46.7)

Table 2. Number of patients receiving flu vaccination according to trial arm.

	Health check arm	Personal letter arm	Percentage of difference (95% CI)	P-value <sup>a</sup>
All eligible patients who received 'flu vaccination (%)	505 (74.3)	932 (67.9)	6.4 (2.2 – 10.4)	0.003
All eligible patients who received 'flu vaccination but did not receive an influenza vaccine in the previous year (%)	196 (56.2)	322 (44.0)	12.1 (5.8 – 18.4)	<0.001

<sup>a</sup> $\chi^2$  test.

may be owing to the fact that this group did not have to travel to the surgery. It also remains to be seen whether in future years, older people are more likely to present themselves to an influenza vaccination clinic as a result of a positive experience of receiving the vaccine, or less likely to do so owing to increased complacency.

Originally the trial was designed to include a third group who were to receive no direct information about the influenza vaccination programme other than through the national and local advertising campaigns. However, it soon became apparent that the national drive to increase influenza vaccination rates was making practices increase their efforts in encouraging older people to receive the influenza vaccine. Therefore, it was decided that all patients aged 75 years and over should at least receive a personal letter. Carrying out the study in its revised two-arm form, where two-thirds of eligible patients received a personal letter and one-third were offered influenza vaccination as part of a health check has meant that we are unable to assess the impact of the personal letter on vaccination uptake. However, there is evidence from other studies to suggest that personal letters are more effective than more general forms of publicity.<sup>10,12,18</sup>

The overall vaccination uptake was higher in 2000 than in the previous year. This is probably owing to the combination of using a personal letter for the first time, and the national campaign to publicise the importance of getting immunised against influenza for older people. Another reason for the increase could be that, for the first time, the method of reimbursement for GPs to provide influenza immunisation for those aged 65 years and over gave a financial incentive for practices to maximise their vaccination rates in this age group.

To our knowledge, this is the first randomised controlled trial to be carried out in the UK to evaluate the effect of different approaches on influenza vaccination uptake among older people. Combining the over-75 health checks with the influenza immunisation programme may be a more efficient use of practice nurse time. The results of this trial provide those in primary care with some evidence of the relative merits of different strategies to meet government targets for influenza vaccination rates.

The restriction of this study to one large general practice

limits the generalisability of the results. There is wide variation in the way general practices carry out their over-75 health checks.<sup>19</sup> The effect of combining influenza vaccination with the over-75 health check may be weaker where health checks are carried out opportunistically and not in the older person's home. Another limitation is that we cannot say how uptake rates among those aged 65 to 74 years may be maximised as there is no equivalent to the over-75 health checks for this age group.

Health checks carried out by a nurse in the older person's home can be an effective way of increasing vaccination uptake among older people. However, in the absence of cost effectiveness data, it must be assumed that this is an expensive intervention that achieves a relatively modest increase in influenza vaccination uptake. It may also be unrealistic to expect practices to carry out all their over-75 health checks in a three-month period to coincide with the influenza vaccination season when workload is high. A more viable option may be to use this approach for the minority of older patients who have not routinely taken up influenza vaccination in the past. For others, personal letters to encourage older people to come forward to receive the influenza vaccine is a relatively cheap alternative that, unlike posters and surgery leaflets, does not favour those already in regular contact with their GP.

## Acknowledgements

We would like to thank the patients, staff and partners of Latham House Medical Practice, the nurses who carried out the health checks, Joy Slater for data entry and clerical support, and Danny Kirby for computing management. We are grateful to the Melton, Rutland and Harborough Primary Care Group and Leicestershire Health for funding the project.

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