



## Trends in influenza vaccine coverage among primary healthcare workers in Spain, 2008–2011

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### ARTICLE INFO

Available online 1 June 2013

#### Keywords:

Influenza vaccination  
Primary health care  
Healthcare workers  
Vaccine coverage  
Pandemic influenza

### ABSTRACT

**Objective.** To evaluate trends in seasonal influenza vaccination coverage in primary healthcare workers (PHCWs) in Spain between 2008 and 2011.

**Methods.** We made an anonymous web survey of PHCWs in 2012. Information on attitudes towards and knowledge of influenza vaccine, and immunization in previous seasons was collected. Self-reported vaccination coverage and factors related to vaccination continuity were analysed.

**Results.** Of 5433 workers contacted, 2625 (48.3%) responded to the survey: 47.0% were general practitioners, 10.3% paediatricians and 42.7% nurses. Their reported vaccination rates from seasons 2008–2009 to 2011–2012 decreased over time: 58.4%, 57.4%, 53.2% and 49.3% (linear trend,  $p < 0.001$ ). Among workers vaccinated in any previous season, 70.2% were vaccinated again in 2011–2012, compared with 5.2% among those not previously vaccinated ( $p < 0.001$ ). Continuity of vaccination increased with age and with the worker or cohabitant having a major chronic condition. Vaccination was higher in workers who recognized vaccination as effective and those worried about being infected or infecting patients.

**Conclusion.** Influenza vaccination coverage in PHCWs has declined, especially after the pandemic. Intensive interventions are needed to change this trend. Knowledge of vaccination should be reinforced by stressing the effectiveness of the vaccine and the risks of influenza for workers and patients.

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### Introduction

Influenza affects a significant percentage of the population annually and is associated with excess hospitalization and mortality (Glezen, 1982). The main preventive measure is annual vaccination (Fifty-sixth World Health Assembly, 2003).

Various reasons justify influenza vaccination in healthcare workers: firstly, to protect their health, as healthcare workers have a greater

probability of infection; secondly, to avoid sick leave during periods of increased demand for health services; and thirdly, to avoid disease transmission and thereby reduce morbidity and mortality in patients (Carman et al., 2000; Castilla et al., 2013; Jordan and Hayward, 2009; Potter et al., 1997; Vanhems et al., 2011).

Annual influenza vaccination is recommended for all healthcare workers who have no contraindications (Centers for Disease Control and Prevention, 2011; European Union, 2009). In Spain, influenza vaccination is recommended and offered voluntarily free-of-charge to all healthcare workers (Ministerio de Sanidad Servicios Sociales e Igualdad, 2012a). Every year a campaign publicizes vaccination sites and encourages workers to be vaccinated; despite it, coverage rarely

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reaches 50% (De Juanes et al., 2007; Jiménez-García et al., 2008; Virseda et al., 2010).

Several authors have reported vaccination coverage and the attitudes, knowledge and practices of healthcare workers in hospitals in relation to seasonal influenza vaccination (Brandt et al., 2011; Maltezou et al., 2008; Sánchez-Payá et al., 2012). However, there are few studies on seasonal influenza vaccination in primary healthcare workers (PHCWs) (Ward et al., 2011), although they are the gateway to the health system, serving the vast majority of patients with influenza and playing an important role in vaccinating patients (Tuells et al., 2012). The factors influencing influenza vaccination coverage in healthcare workers have been analysed in other studies (Brandt et al., 2011; Hothersall et al., 2012; Maltezou et al., 2008; Sánchez-Payá et al., 2012), but the factors that mark the advances and setbacks in coverage during successive vaccination campaigns have hardly been evaluated.

A decreased uptake of seasonal influenza vaccines has been recently reported in Spain in the first post-pandemic season (Sánchez-Payá et al., 2012). The objective of this study was to describe the trends in seasonal influenza vaccination coverage in PHCWs in the 2008–2009 to 2011–2012 seasons, which included the pre-pandemic, pandemic and two post-pandemic seasons. We also analysed the factors contributing to the continuity of vaccination in PHCWs who had been vaccinated in previous seasons and the first vaccination of PHCWs who had not been vaccinated previously.

## Methods

### Study design and population

A survey was conducted in PHCWs of seven regions that account for 70% of the population of Spain (Andalusia, the Basque Country, Castile and Leon, Catalonia, Madrid, Navarre and Valencia Community). A random sample of primary care centres was selected in order to reach approximately 600 PHCWs in each region. All general practitioners, paediatricians and nurses from each selected centre were included in the study. A first message was sent to the personal email address of 5433 candidates containing the study presentation and objectives. Between March 1 and April 9, 2012, depending on the region, a message was sent to all candidates with a link that enabled them to complete a web-based, anonymous and self-administered survey. During the following month three automatic reminder messages were sent every 10 days to candidates who had not completed the survey (Baricot et al., 2013).

The questionnaire was adapted from that developed by Kraut et al., and was improved after a pilot study in a sample of PHCWs. The survey consisted of three sets of questions: the first about the influenza vaccination status, the second on attitudes and perceptions about influenza vaccination, and the third on sociodemographic and professional information.

Sociodemographic variables included sex, age group (25–34, 35–44, 45–54 and  $\geq 55$  years), whether they had children aged  $< 2$  years or 2–15 years, and cohabitants with an indication for vaccination (age  $> 65$  years or major chronic conditions). Professional variables included professional category (general practitioner, paediatrician or nurse), participation in the influenza surveillance sentinel network, and the region. The variables related to vaccination included whether the PHCW had any major chronic condition that was an indication for influenza vaccination, whether they had been vaccinated in the 2011–2012 season, and whether they had been vaccinated in each of the vaccination campaigns from 2008–2009. Variables related to attitudes and perceptions of PHCWs about influenza vaccination were covered by a set of close-ended questions evaluated with Likert-type response options, which included aspects such as the motivation for vaccination, concerns about being infected by influenza in the workplace, spreading it to the family or patients, the perception of influenza as a potentially serious illness, and the effectiveness of vaccination against influenza. The answers to these questions were dichotomized in two categories: positive (totally agree, agree quite a lot) and negative (neither agree or disagree, disagree quite a lot, and totally disagree).

### Statistical analysis

Self-reported vaccination coverage for the four seasons from 2008–2009 to 2011–2012 was calculated in accordance with the characteristics of PHCWs. To

evaluate the influence of pandemic vaccination on seasonal subsequent influenza vaccination coverage we analysed changes in coverage in PHCWs who received the pandemic vaccine and those who did not separately.

In PHCWs who had been vaccinated in at least one of the previous three seasons (2008–2009 to 2010–2011) we evaluated vaccination continuity in the 2011–2012 season and analysed the factors associated with vaccination continuity.

In PHCWs who had not been vaccinated previously we analysed the factors associated with vaccination for the first time in 2011–2012.

The  $\chi^2$  test was used to compare proportions. Annual changes in vaccination coverage were assessed using the  $\chi^2$  test for linear trends. Bivariate analyses and multivariate logistic regression were performed, calculating the adjusted odds ratios (aORs) with 95% confidence intervals (CIs).

## Results

### Influenza vaccination coverage between seasons 2008–2009 and 2011–2012

Of the 5433 candidate PHCWs, 3239 (59.6%) opened the message, 2625 (48.3%) answered the first part of the survey on influenza vaccination in previous seasons and 1965 (36.2%) responded to the complete survey. Of these, 67.9% were aged  $\geq 45$  years, 74.4% were female, 47.0% were general practitioners, 10.3% paediatricians and 42.7% nurses. Some participants also met the criteria for influenza vaccination due to health problems (9.8%) or living with someone at high risk for influenza (21.1%).

Of the 2625 PHCWs who responded to questions about influenza vaccination, 58.4% reported having been vaccinated in the 2008–2009 season, 57.4% in 2009–2010, 53.2% in 2010–2011 and 49.3% in 2011–2012 ( $p_{\text{linear trend}} < 0.001$ ). Among PHCWs who did not receive the pandemic vaccine, the reduction in coverage was observed from the 2008–2009 season onwards ( $p_{\text{linear trend}} < 0.001$ ), while in PHCWs who did receive the pandemic vaccine, seasonal vaccination coverage reached a peak in the 2009–2010 season (88.7%) and fell in the next two seasons to 85.9% and 78.4%, respectively ( $p_{\text{linear trend}} < 0.001$ ) (Fig. 1).

Among the 1965 PHCWs who completed the survey, there was a reduction in the proportion of vaccinated subjects in successive seasons, regardless of the characteristics of the workers. Nevertheless, this reduction was smaller and not statistically significant in paediatricians, in workers with major chronic conditions and in those with a high-risk person in the household (Table 1).

Of the PHCWs who had been vaccinated in any of the previous three seasons (2008–2009 to 2010–2011), 70.2% were also vaccinated in the

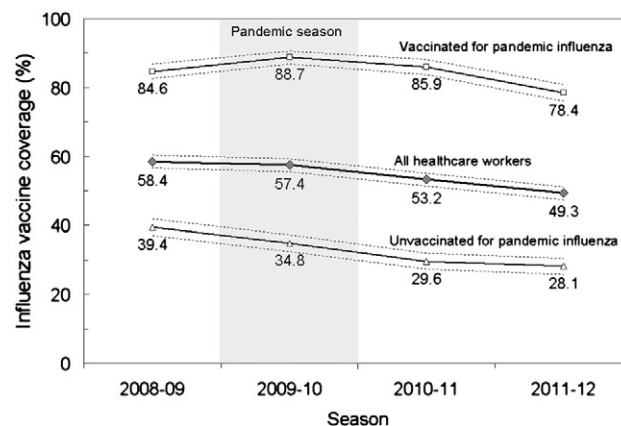


Fig. 1. Seasonal influenza vaccination coverage reported by Spanish primary healthcare workers during the seasons 2008–2009 to 2011–2012. Line trends correspond to all primary healthcare workers [middle] and separately for workers who had received the pandemic vaccine [upper] and those who did not [lower]. Discontinuous lines show the corresponding 95% confidence intervals.

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