

# **Influenza pandemic preparedness: Reaching WHO vaccination coverage objectives in Europe**

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## **Conflict of interest**

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## **Summary**

The European Scientific Working Group on Influenza (ESWI) recently set an objective of vaccinating one third of the European population annually by 2010. This is an obvious route to secure pandemic vaccine supply. This article highlights ways to reach this objective, identified as the result of a symposium organized by the European Vaccine Manufacturers (EVM). Success depends on a strong political will to adapt “universal” drivers of implementation to national specificities. This must be sustained by a substantial funding. Country by country analysis allowed working out solutions to increase national vaccine coverage, based on national specificities such as health care system organization, cultural factors or administrative or economical barriers.

## **Keywords**

Influenza vaccination, implementation, vaccination campaigns, drivers, pandemic vaccine, supply, policy, European Union, pandemic preparedness, health care system.

## Introduction

There is an emerging global consensus that the supply of influenza vaccines must be increased in order to cope with the needs of a pandemic. One obvious route to secure pandemic vaccine supply is to increase the annual uptake of seasonal vaccine [1-3].

With this aim in mind, the European Union has endorsed the WHO's objectives of increasing vaccine coverage in high-risk groups (the elderly and those with chronic conditions e.g. cardiovascular disease, lung disease, diabetes mellitus, renal failure and weakened immunity due to illness or treatment) to 50% by 2006 and to 75% by 2010 [3, 4]. A position paper recently issued by the European Scientific Working Group on Influenza (ESWI) set an objective of vaccinating one third of the European population annually by 2010 [5].

On the occasion of the Second Influenza Conference organized by ESWI in Malta (September 11-14 2005), the European Vaccine Manufacturers (EVM) gathered experts and national health authority representatives to elaborate on the implementation of their national annual influenza vaccination campaigns. The objective was to identify ways to enhance the effectiveness of future vaccination campaigns, based on the experiences to date in eight European countries (France, Germany, the UK, Poland, the Netherlands, Spain, Italy, and Sweden).

## An overview of the European situation: “universal” factors of implementation

Following presentations by Klaus Stöhr (Global influenza programme, WHO, Geneva) and Franz Karcher (DG Sanco, Luxembourg), providing the rationale for seasonal influenza vaccine recommendations and their link with pandemic preparedness [1, 4], Madelon Kroneman (NIVEL, The Netherlands) and Koos van der Velden (European Influenza Surveillance Scheme [EISS]) presented a comparative analysis of the vaccination campaigns in Italy, the Netherlands, Spain and Sweden, France, Germany, Poland and the UK with the aim of identifying “universal” factors necessary for successful implementation [6]. Vaccine coverage rates in the elderly (those aged  $\geq 65$  years) vary from 74% in the Netherlands to 55% in Germany and 18% in Poland (Figure 1). Data available for those with high-risk conditions and persons younger than 65 years of age show that vaccine coverage rates in these groups lag significantly behind those for the elderly, ranging from 54% in the Netherlands to 9% in Poland (Figure 2).

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<b>Public</b>		<b>Private</b>	
Italy*)	62	France*)	67
Netherlands**)	74	Germany	55
Spain	69	Poland	18
Sweden	46	UK*)	73

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\*) Source: Szucs e.a, 2004, 2005 [7]

\*\*\*) 2001-2002 season

**Figure 1. Influenza vaccine coverage rates for the elderly in 8 European countries for the influenza season 2003-2004 [6]. (Reproduced with the permission of Madelon Kroneman).**

Public		Private	
Italy	—	France	—
Netherlands**)	54	Germany	26
Spain	31	Poland	9
Sweden	15	UK*)	—

\*) under 65 years of age

\*\*\*) 2001-2002 season

**Figure 2. Influenza vaccine coverage rates for the high-risk group <65 years in 8 European countries for the influenza season 2003-2004 [6] (Reproduced with the permission of Madelon Kroneman).**

In these eight countries, the vaccine market is organized either as “public” sector-based or “private” sector-based programs. In public sector-based vaccination programs (Italy, Netherlands, Spain and Sweden), vaccines are ordered in advance for the upcoming influenza season by national or regional public health authorities (tender purchase) on the basis of the estimated number of doses that will be required. This means that vaccine coverage objectives are assessed in advance.

In private sector-based programmes (France, Germany, Poland and the UK), the vaccine is directly purchased by the end-user. Purchases are made either by vaccinees, General Practitioners (GPs) or healthcare workers (according to the arrangements in place in each health system). As a result, vaccine coverage rates are always estimated *a posteriori*. However, according to an overview of the European situation, the two systems can perform equally well: the highest vaccine uptakes were reported in the UK where the market is private (GPs purchase vaccine), and in the Netherlands, where the market is public.

Differences between countries were also noted at the level of implementation of vaccination policies: channels of distribution, organization of vaccination, payment for the vaccine by the vaccinees, financial incentives for the vaccinator, advice on facts and misconceptions by the target populations, and access to vaccine. The comparative analysis between countries shows that differences of vaccine coverage rates cannot be explained by a single factor [6]. However, some factors are associated with increased vaccine uptake whereas others were found to hinder usage.

**The person who vaccinates** is a key element of the vaccination campaign [8]. In a European study it was found that the GP was responsible for vaccination of the elderly in 22 out of a total of 26 countries [9]. Factors that increase GP motivation are important. In particular, financial incentives have contributed significantly towards successful programme outcomes in the UK and the Netherlands (where for each vaccination the GP receives €9). The role of incentives must, however, be carefully addressed in each situation. In Sweden, the introduction of an additional payment for the vaccinator resulted in a 1.5 fold increase of vaccine uptake in the elderly. In the at-risk group aged <65 years, however, the extra remuneration did not influence vaccine uptake. In addition to the GP, other health professionals, such as paediatricians, school physicians and nurses, are also involved in influenza vaccination campaigns in Italy, Poland, Spain and Sweden. In Sweden, the number of different professional groups involved had an adverse impact on vaccine uptake in the elderly: the higher their number, the lower the vaccine uptake. In the at-risk group <65 years, there was no such effect.

**Information and education** are also key drivers. In particular, personal invitations were clearly identified as a successful method in a population-based study conducted in Germany, Spain, Poland and Sweden (with on average 2,300 persons) [10]. These results were summarized by Madelon Kroneman and Koos van de Velden [6], and show that sending personal invitations greatly increases vaccine uptake. Vaccine uptake in high-risk persons (due both to age and to chronic conditions) receiving an invitation in Germany was 63%, in Poland 39%, in Spain 72% and in Sweden 59%, compared to only 13%, 4%, 40% and 29% respectively, in high risk persons not receiving an invitation [10]. In both the UK and the Netherlands, personal vaccination invitations are an important component of their successful programmes [11, 12].

**Facilitated access to vaccination** also encourages vaccination. In the UK and the Netherlands, vaccinations can be obtained on demand at specially convened clinics, with no absolute need to make an individual appointment. This has contributed to the successful implementation of vaccination campaigns [11, 12]. Although common sense dictates that easy access to vaccines is more beneficial than difficult access, practical factors alone are not sufficient for vaccine uptake. In France, the procedure for vaccination is complex. First, the patient receives an invitation from his health insurance. They must then go to the GP for a prescription, next to the pharmacist to obtain the vaccine and then return to a GP or an appointed nurse to have the vaccine administered. Despite this, the vaccination rate is higher in France than in Germany (67% versus 55%) where the process is more straightforward as many GPs hold vaccine stocks. Likewise, payment for the vaccine by the vaccinee may hamper vaccine uptake, particularly in low income countries. In Poland, 24% of non-vaccinated persons mentioned co-payment as a barrier. In Sweden, which is a high income country, payment for the vaccine in some regions does not influence the chance of being vaccinated. The impact of patients' characteristics (socio-economic position, social environment, high risk condition, personal motivations) was also assessed in 5,023 persons in Poland and in 5037 persons in Sweden [6]. The results show that these factors may influence uptake but are not "universal". In Sweden, coverage rates were twice as high in middle income persons <65 years with underlying diseases than in those on low incomes. However, such a difference was not reported for the high income group, nor for the different income groups of the elderly population. In Poland, vaccine uptake did not vary with regard to the income of the vaccinated population. Patient environment also influences the opportunity of being vaccinated. In the study, persons with high risk conditions (<65 years) living in large households were less likely to receive vaccination than others. In Poland, being in contact with other persons at work or at school facilitates vaccine uptake in this target group, as well as living in an urban environment.

The study also explored common misconceptions about influenza vaccines and vaccination. A person's belief that they had "*sufficient resistance and were thus not likely to catch flu*" was reported as a reason to refrain from vaccination in all the countries [6], varying from 21% of the answers received in Italy to 42% of those received in Germany. In Germany, beliefs contributing to low vaccine uptake among high risk persons included "*I do not qualify for influenza vaccination*" (28% of answers) and "*It slipped my mind*" (23%).

## **Political will as a key factor to reach WHO objectives in The Netherlands and in UK**

Two countries in Europe, the UK and the Netherlands, are close to reaching the WHO objectives in the elderly. In the UK, the vaccine coverage rate for the elderly increased from about 50% in 1999/2000 to 73% in 2003/4 [11, 12]. In the Netherlands in 2003/04, vaccine coverage rates reached 74% for the elderly and 54% for those with underlying conditions [6].

In both countries, success resulted from a strong political will to set up a programme for the implementation of influenza vaccination sustained by substantial funding. The key components and results of the vaccination programme in the UK were presented by Jane Leese (Department of Health, UK) [11], and those of the programme in the Netherlands were presented by Marja Esveld (Ministry of Health, Welfare and Sports, The Netherlands) [12].

Both programmes integrated “universal” drivers at all levels of implementation of the vaccination policy: communication campaigns, financial incentives for the vaccinator, sending of invitations, easy access to the vaccine, and monitoring of vaccine uptake. In the Netherlands, the cost of the program is M€ 38 a year, which represents 20% of the cost of all national prevention programmes (including children’s immunisation programmes, screening of breast cancer and cervical cancer) [12].

In both cases, the “universal” drivers were adapted to the specific national situation. In the UK, the vaccination campaign had a strong national profile: It was promoted by well-known celebrities that the age group identified with, used punchy language and local providers were given artwork materials to keep local advertising consistent with the national campaign [11]. Also, the organization of the vaccination campaign was adapted to the organization of the health care system. It involved a central implementation team that worked in close liaison with local influenza co-ordinators. GPs and nurses were involved in developing implementation plans. GPs were in charge of sending individual letters to the patients and following-up non-attenders. Vaccine uptake was monitored monthly and at the end of the campaign. An ongoing public relations programme offered help to those appearing to have difficulties. A league table issued at the conclusion of the campaign acted as an incentive to improve performances in the future. Meetings were also held to exchange best practice experience. A central contingency stock of vaccine was available to help overcome temporary supply problems.

In the Netherlands, the program was carried out by GPs who organized the selection and invitation of patients [12]. Data were registered through a sentinel system that enrolled 1.5% of all GP practices and that allowed the follow-up of the vaccination campaign. The communication campaign was performed through mass media.

During the influenza season, the vaccination programme in the Netherlands was shown to reduce mortality due to influenza, pneumonia, acute lung and heart disease and strokes by 53%, hospital admissions by 48% and respiratory infections by 41%. The cost per life-year saved was estimated at €592-1427 [12]. In order to further decrease the burden of influenza, a request to modify influenza vaccine recommendations has been made to the Dutch Health Council. This includes the assessment of costs and benefits of the new recommendations to those aged  $\geq 50$  years, to health care workers, to pregnant women and to young children. New recommendations may lead to some revision of practices, as some risk groups could be selected or immunised in a more cost effective way [12].

## **Fitting universal drivers to specific national situations**

Facing the growing pressure on pandemic vaccine supply, European countries must increase their individual and collective political will to implement their seasonal influenza vaccination policies. Studies should be pursued at national levels in order to address the ways “universal” drivers can be used optimally.

### ***Putting the GP at the centre of the system in France***

François Bricaire (Head of Infectious Diseases Service, Hôpital Piété-Salpetrière, France) [13] presented the main components of the new organization of influenza vaccination in France, the aim of which is to reach the WHO’s objectives. In France, increasing influenza vaccine coverage is one of the 100 components of a 5-year public health law issued in August

2004. In the current situation, the initiative to be vaccinated is taken by the patient. Each year, patients identified as high risk by the National Health Insurance receive a voucher that permits them to get influenza vaccine free in a pharmacy. This includes persons  $\geq 65$  years and those with chronic conditions (e.g. cardiovascular disease, lung disease, diabetes mellitus, renal failure and weakened immunity due to illness or treatment). However, several conditions such as asthma are not included in this system. The new organization of influenza vaccination campaigns is the result of the consultation of two working groups, one of which is an independent working group and the other, a committee representing the French pharmaceutical industry. It places the GP at the centre of the system. The physician's role will be paramount. He/she will coordinate influenza vaccination campaigns, by following up recommended patients and identifying those who are eligible but who have not received the vaccine voucher. Telephone reminders will be sent to those who have not been vaccinated and more advice will be given to patients. The new proposal also includes simplified access to the vaccine, by allowing the distribution of flu vaccine samples by industry representatives to health care professionals and encouraging companies to organise *in situ* vaccination programmes. Pharmacists and GPs will also be encouraged to co-operate in order to allow some vaccine stockpiling by GPs. In addition, the validity of the vaccine voucher will be extended. The revision of influenza vaccine recommendations is also an important component of the new proposal. This will include the reinforcement of vaccination for health care professionals in close contact with at-risk groups as well as institutional groups: firemen, police, the armed services. The list of long-term chronic diseases recommended for flu vaccination will be also reviewed by an *ad hoc* expert committee. Enlargement of the age-based recommendations to those aged over 60 years will be considered.

#### ***Increasing influenza vaccine coverage: funding for regional authorities in Italy***

Data for Italy were presented by Donato Greco (Director General of Health Prevention Ministry, Ministry of health, Italy).

In Italy, the Public Health Authorities have set an objective for influenza vaccine coverage of 50% by 2006 and 75% by 2010 for the recommended groups (subjects aged  $\geq 75$  years, children and adults affected by chronic diseases), in line with WHO targets. Together, these groups represent 40% of the Italian population [14]. In Italy influenza vaccination is organized at the level of each of the 21 regions, permitting each region to implement its own vaccine campaign. The average reported rate of influenza vaccination during the 2003-2004 season in 8 European countries was 58% for those aged  $\geq 65$  years [6]. To help local health authorities to sustain the objectives of the National Health Authorities, substantial funding will be delivered at regional levels. In addition, the awareness of influenza and influenza vaccination will be increased through communication campaigns using different channels. This will include national TV campaigns targeted at the general public, as well as letters to GPs. An inter-ministerial working group gathering education, health, transport, and foreign affairs specialists has also been set up in order to address issues related to the implementation of influenza vaccination, both from a seasonal and a pandemic perspective.

#### ***Identifying effective national approaches: harmonised approaches and public information campaigns recommend by the Spanish influenza working group***

In several European member states, more attention is given to specific barriers to the implementation of national influenza vaccination policies, and to ways to improve matters.

In Spain, huge differences in implementation are observed between the various autonomous regions, as highlighted by Raul Ortiz de Lejarazu (Head of Virology Service, Influenza Centre of Valladolid) [15]. A national vaccine coverage of 69% for those aged 65 years and over, and 31% for the high-risk group aged  $< 65$  years was reported for the year 2003-2004 [6].

However, the results of a survey conducted during 3 successive influenza seasons by Spanish health authorities from 1995 through 1998, reported uptakes of less than 10% in Castilla Mancha to more than 75% in the region of Cantabria [15]. Vaccine coverage also varies according to the size of the cities. For the year 2000, the highest rates were reported in cities of more than 200,000 inhabitants. Spain is divided into 17 autonomous regions, which are responsible for the implementation of their own vaccination policies. Each region is also free to order the vaccine from various manufacturers. As a result, means and infrastructures allocated to influenza vaccination vary in Spain, as well as the types of vaccines used. Harmonization of vaccination campaigns between the different regions is thus needed in order to increase vaccine uptake. One option would be the application of methods that have proved to be successful in one area to other regions. This has been the case for the successful synergy of strategies for influenza and pneumococcal vaccination. In Castilla and Leon, campaigns to promote pneumococcal vaccination have resulted in an increase of influenza vaccine uptake from 74.3% to 90.28% between influenza seasons 2001-2002 and 2002-2003 for those aged 65 years and over. The Spanish influenza working group also recommends enhancing communication. Advice from health care workers is paramount in Spain, as in most European countries [16]. In a telephone survey of 400 persons aged 15 to 65 years conducted in 2000, 48% were vaccinated because of the advice of a health care worker [15]. Communication campaigns should also be developed in order to change risk perception about influenza, as well as to increase the motivation to be vaccinated. According to the results of a telephone survey, most vaccinees have a good perception of vaccination, 65% considering that vaccination protects them. However, the perception of the risk of catching influenza in those not receiving the vaccine was low: 83% stated that they did not get vaccinated because they thought it was unnecessary. In contrast, in the study performed by Szucs et al of 20,118 persons aged over 14 years in five European countries, the typical answer (40.4%) was “*I don't think I am very likely to catch influenza*” to explain the reason for not getting vaccinated [8]. To tackle this misconception, the Spanish influenza working group recommends using messages of responsibility and solidarity such as “*by protecting yourself, you protect others*” [15]. Such an approach has been successful for other health issues such as organ transplantation. This should help to increase awareness about influenza, particularly in the recommended subgroups where the perception of risk is lowest, e.g. potential influenza transmitters (health care workers, general carers, and institutionalized persons, siblings and relatives living with those at high-risk) and employees of the community services (public transport, fire service, police, media etc). These information campaigns could be implemented as part of the “plan pandemico”. Increasing accessibility to the vaccine, through measures like making it free of charge, and widening the offer to subgroups of the population whose vaccination would be a priority in the case of a pandemic (essential community public services, enterprises and factories, universities, schools) should also help to increase uptake.

### **Overcoming administrative barriers in Sweden**

Anders Tegnell (Head of the Division of Communicable Disease Prevention and Control, National Board of Health and Welfare) presented the Swedish government's strategy to increasing influenza vaccine uptake in Sweden [17].

Sweden is one of the countries in the world where infant mortality is among the lowest and where childhood vaccination has been successfully implemented. However, influenza vaccination is poorly implemented in this country. According to a telephone survey of 2,508 persons, for those aged 65 years and over, the national vaccine uptake is 46% and only 15% for those <65 years with chronic diseases [10]. As in Spain, there are important variations between the autonomous Swedish counties in the degree to which the national influenza vaccination policy is implemented. Influenza vaccines are purchased at the lowest price by

each county. Although this may result in cost savings there is no delivery guarantee and shortages may occur in some counties [17]. In order to address this issue, the government intends to increase the funding for implementation of influenza vaccination, in particular by encouraging counties to buy influenza vaccines at a price that guarantees delivery on time. Another shortcoming is the lack of national coordination and variations in intensity of campaigns (funding, integration into the health care system). Using existing contacts between GPs and parents has brought about successful implementation of childhood vaccination. The Swedish health authorities will use this strategy to improve vaccine uptake in the recommended groups in Sweden through the existing contact between GPs and target patients. This may be more efficient than the current vaccination campaigns. Communication will also be enhanced in order to tackle some misconceptions about influenza vaccination. In Sweden, influenza is confused with the common cold by most of the population, which results in the misconception that the vaccine does not prevent influenza. Thus, in this country, information campaigns should emphasize information on the efficacy of the vaccine.

### ***Enhancing awareness in Germany***

Klaus Wahle (University of Münster, Germany) presented an overview of the implementation of influenza vaccination in Germany [18].

In Germany, the current situation falls far short of achieving the WHO's objectives for the elderly population. For those aged  $\geq 60$  years, the major group recommended for vaccination, the vaccine uptake is only 52%, among the lowest in Europe [19]. Paradoxically, the vaccine coverage of the population aged  $>14$  years is one of the highest in Europe (26.4%), due to a higher than average uptake in the working population [18, 19].

In Germany, vaccination is performed by GPs who play a key role in vaccine uptake. A recent telephone survey in Germany has shown that patients would like more information on influenza as a disease and on influenza vaccination [19]. Thus, enhanced training of GPs and the public through information campaigns is likely to raise demand for vaccination among target groups [18]. If GPs were better informed about influenza vaccine and the disease itself, they would be in a better position to proactively inform their patients and recommend vaccination [19]. Another approach that will be used by the German health authorities is the vaccination of well known public figures, creating publicity that will help improve the perception of vaccination. New recommendations will also be introduced for persons aged  $\geq 50$  years in order to increase vaccine supply.

### ***Using the positive image of vaccines in Poland***

In Poland, the average vaccine coverage is 8.1% of the overall population [6]. It was 18% for those aged  $\geq 65$  years in 2003-04 and 9% for those with high-risk conditions  $<65$  years [8]. An overview of the situation was provided by Jacek Wysocki (President of the Polish Vaccinology Society) [20].

Influenza vaccine is recommended in Poland, but in contrast to the vaccinations that are mandatory, it is not reimbursed because the health care system is not able to cover the cost.

In this situation, the final decision to get vaccinated depends on the patient. He/she must first buy the vaccine, and then present to his GP or to a private clinic to be vaccinated. Alternatively, he can take advantage of campaigns organized by an employer or city council. In contrast to other European countries, the role of the GP is limited, although to some extent he/she can influence the decision by informing the patient. The lack of reimbursement is thought to be the main barrier to influenza vaccine uptake in Poland [6]. There is, however, little chance that this will be resolved in the short term. An effective approach would take advantage of the good image that vaccines have in Polish society and the beneficial partnership between the public health authorities and the media. In his presentation, Jacek

Wysocki emphasized the misconceptions that could be removed by communication campaigns [20]. Factors influencing the low use of influenza vaccines in Poland include anxiety about adverse reactions, lack of knowledge about influenza vaccines and influenza complications, the idea that influenza vaccines do not protect against all respiratory tract infections, and the necessity of vaccination each winter [20].

Collaborations between public health authorities and the media in the past have proved to increase vaccination coverage. Promotion of influenza vaccine has increased the consumption of the vaccine from 0.5 doses per 1000 inhabitants in 1989 to 87 doses in 2004. This included education, media campaigns and sponsoring by employers, city councils and local governments. In order to increase public knowledge about influenza vaccination, the Polish Vaccinology Society intend to sponsor partnerships between health institutions (national influenza centres, universities, medical societies) and several professional bodies including those in medicine, journalism, and education. Letters and brochures will be sent to GPs and leaflets for the general public will be distributed all over the country during the season 2005/2006. Increased information on pandemics via the media will also probably help to increase awareness about vaccination.

## Conclusions

There was a wide consensus about the need to increase annual influenza vaccine uptake in those categories of patients who are at increased risk of complications following influenza infections. The use of available safe and effective vaccines would help to reduce the annual burden of influenza disease. An additional benefit would also be an improvement in the level of pandemic preparedness on a global scale.

This consensus forces us to consider ways to improve routine immunisation practices against influenza.

At the EVM symposium the effective “universal drivers” for the successful implementation of influenza vaccination practices were identified as; a financial incentive for the person who vaccinates, information and education, and a facilitated access to vaccination. The need to adapt these “universal” drivers to individual national circumstances was highlighted, and it will be necessary for each country to increase its knowledge of the factors specific for their own vaccination campaign in order to identify the level at which drivers may be effective.

A strong political will is paramount for successful implementation. As the threat of a pandemic increases, European countries appear to be responding to the challenge. It is hoped that these efforts will be sufficient to reach the WHO’s objectives of influenza vaccine coverage.

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