Surveillance reports

STAGNATING INFLUENZA VACCINE COVERAGE RATES AMONG HIGH-RISK GROUPS IN POLAND AND SWEDEN IN 2003/4 AND 2004/5

MW Kroneman (m.kroneman@niveL.nl)¹, GA van Essen²

1. Nederlands instituut voor onderzoek van de gezondheidszorg (Netherlands Institute of Health Services Research), Utrecht, The Netherlands
2. European Scientific Working group on Influenza (ESWI), and Julius Centre for Health Sciences and Primary Care, University Medical Center Utrecht, The Netherlands

This paper examines influenza vaccine coverage rates (VCR) in Poland and Sweden during the 2003/4 and 2004/5 influenza seasons. An average sample of 2,500 persons was interviewed in each country and each season. Questions regarded age and possible chronic diseases, as well as information on whether they had had an influenza vaccination in the given season. Those who had not received the vaccine were also asked to give reasons for non-vaccination. About one in four (Sweden) to one in three (Poland) of the persons surveyed belonged to high-risk groups (≥ 65 years of age or suffering from chronic diseases). In the 2004/5 season, 17% (CI 12-19%) of the Polish elderly and 45% (CI 39-50%) of the Swedish elderly were vaccinated. In Poland, 9% (CI 7-12%) of respondents younger than 65 years of age with a chronic condition were vaccinated, whereas in Sweden the corresponding rate was 12% (CI 9-16%). In both countries, the VCR did not change significantly from the previous season. Personal invitations resulted in a higher VCR. In Sweden, the most frequently mentioned reasons for not being vaccinated were the assumption of not qualifying for a vaccination and perceived resistance. In Poland in both years, perceived resistance to flu and the cost of the vaccination were the most often mentioned reasons. The influenza vaccination rates in Poland and Sweden remain far below World Health Organization (WHO) recommendations for the high-risk population. No increase in VCR as demonstrated in this study may indicate that these two countries will not be able to meet the 2010 WHO target, if no further action is taken concerning vaccine uptake.

Introduction

Influenza continues to be a significant health risk for the elderly (≥ 65 years of age) and people with chronic conditions (e.g. cardiovascular or respiratory diseases, diabetes mellitus, renal failure, impaired immunity due to disease or treatment). All European countries have introduced recommendations for influenza vaccination of these high-risk groups [1]. Despite relatively uniform recommendation policies, influenza vaccination coverage rates (VCR) vary considerably between European countries [2,3]. The WHO recommended vaccinating 50% of the high-risk population in 2006, and increasing this rate to 75% in 2010. Studies carried out in eight European countries (Germany, France, Italy, the Netherlands, Poland, Sweden, Spain and the United Kingdom) revealed that Sweden and Poland had a VCR among the high-risk population below 50% in the 2003/4 influenza season [4-6]. In order to reach the WHO target for 2010, a significant increase in VCR would be needed in both countries. To determine whether there was a change in VCR, the study on vaccine uptake in Sweden and Poland was repeated in the 2004/5 season. The purpose was also to see what reasons the non-vaccinated high-risk persons in these countries have for not being vaccinated.

Methods

Data collection

For the purpose of this study, we used an existing short survey with questions about influenza vaccination uptake, personal invitation from general practitioners (GPs), chronic conditions and reasons for refraining from vaccination. The questions were defined and no open-ended questions were used. For the self-reported chronic conditions, we asked whether these were confirmed by a physician. The questionnaire was tested for validity in the Netherlands [6], and has been applied in several other European countries since then [4].

The survey was conducted in Poland and Sweden in April and May 2004 (2,000 and 2,500 respondents respectively) and in March and April 2005 (3,000 and 2,500 respondents respectively). It was carried out by TNS, an international market research agency that subscribes to the ICC/ESOMAR International Code of Marketing and Social Research Practice and has offices both in Sweden and Poland. Our questionnaires were included in Omnibus Public Opinion Polls – large surveys carried out on a regular basis and on different and changing subjects. Our survey made part of the omnibus only until a predefined number of respondents had answered the questions. In Sweden, the survey was carried out by means of a telephone interview, whereas in Poland the questions were asked face-to-face. In both countries, the respondents were aged 15 years and older. In Sweden, the upper age was 74 years, whereas in Poland no upper age limit was applied. Non-response rates were not available, but in order to establish whether the sample was representative, we compared the age and sex distribution of the sample with the relevant distribution in the actual population according to data from Eurostat. Similarly, the VCR of the sample was compared with the VCR of the total population estimated on the basis of vaccine sales data [3].

Terminology

In this paper we use the term 'diseased' for the group of people who suffered from a chronic condition, like cardiovascular diseases, respiratory diseases, diabetes mellitus, renal failure, impaired immunity due to disease or treatment and who are younger than 65 years of age. The 'elderly' are defined as those aged 65 years and older. The total high-risk group is both groups ('elderly' and 'diseased') combined. For the group of people younger than 65 years of age who did not suffer from a chronic condition (as mentioned above), we use the term 'healthy'.

The reasons for non-vaccination were divided into perceived misconceptions and perceived barriers. The perceived misconceptions were associated with knowledge about influenza

and influenza vaccination, whereas perceived barriers included practical problems preventing one from having a vaccination.

Statistical analyses

To calculate the confidence intervals we used Fleiss quadratic 95% confidence intervals in the statistical package EpiInfo 6. In order to make the study population comparable with the real population of each country, weight factors provided by the TNS offices were used. Since the omnibus polls differ per country, the variables used for the weight factor also differ. For Poland, community size, age, sex and household size were included, while for Sweden, region, age and sex. The data presented in this paper are the weighted data.

Results

Representativity of the samples

The sex distribution in our samples is comparable with the situation in the actual population (based on Eurostat data) (Table 1). The elderly in our samples are overrepresented compared to the actual population in both countries and both seasons. The Macroepidemiology of Influenza Vaccination (MIV) Study Group [3] estimated the vaccination coverage rates of the total population on the basis of vaccine sales data in 2003. The vaccine coverage in our 2003/4 Polish sample is slightly higher and in the Swedish one slightly lower compared to the MIV-group data. For the coverage rate of the elderly, no data were available on Poland. For Sweden, the coverage rate based on a national survey [7] was comparable to our results.

To establish the consistency between both seasons, we also calculated the rate of chronic diseases per person in the samples. In Sweden, 0.15 chronic conditions per person were reported in the total sample for both years. In Poland, 0.25 chronic conditions per person were reported in 2004 and 0.18 in 2005, which is significantly less ($t = 4.32$, $df = 5026$, $p = 0.00$). The decrease was mainly due to a 5% drop in reported heart diseases.

Vaccination rates

In the 2004/5 season, 17% (CI 12-19%) of the Polish elderly and 45% (CI 39-50%) of the Swedish elderly were vaccinated (Table 2). Among those younger than 65 years of age with a chronic condition, 9% (CI 7-12%) were vaccinated in Poland and 12% (CI 9-16%) in Sweden, in the same period. In both countries the VCR did not change significantly compared to the previous season.

In Sweden, in both seasons, the VCR of the elderly was much higher than that of the 'diseased' (over three times higher), and that of the 'healthy' (around 10 times higher). In Poland, the differences between the VCR of the three groups were much smaller (Table 2).

Personal invitations

Persons at high risk for influenza who had received a personal invitation from their GP were more likely to be vaccinated than those who had not received such an invitation (Table 3). This was the case in both countries and both seasons. Between 2003/4 and 2004/5 the number of people in the high-risk groups who received

TABLE 1

Age and sex distribution and vaccine coverage rates (VCR). Data obtained in the study compared with estimates for the actual population

	Season	Poland			Sweden		
		Study group	95% CI	Total population	Study group	95%CI	Total population
Females [%]	2003/4	52.2	50.0-54.4	51.6 ²	49	47.1-51.0	50.5 ²
	2004/5	52.3	50.5-54.0	51.6 ²	48.6	46.6-50.6	50.5 ²
Elderly (>=65 years of age ¹) [%]	2003/4	15.6	14.0-17.3	12.9 ²	12.6	11.3-14.0	8.3 ²
	2004/5	16.8	15.5-18.2	13.1 ²	11.9	10.7-13.3	8.4 ²
VCR (overall) [%]	2003/4	10.2	8.9-11.6	7.9 ³	11	9.8-12.3	12.7 ³
VCR (of elderly) [%]	2003/4	--		--	46	40-51	51 ⁴

1) For Sweden: 65-74 years of age

2) Eurostat data

3) Macroepidemiology of Influenza Vaccination (MIV) Study Group. The macro-epidemiology of influenza vaccination in 56 countries, 1997--2003. Vaccine 2005; 23(44):5133-5143.

4) Sten A. Gemensam start i år: Information och kampanjer ska öka vaccinationsstäckningen i riskgrupper [Collective start this year: Information and campaigns will increase influenza vaccination coverage among risk groups in Sweden]. Smittskydd 2004;(4):10-11.

TABLE 2

Distribution of risk groups in the study sample and vaccination coverage rates (VCR) per group in Poland and Sweden

Country	Season	Elderly					Diseased					Non-risk group				
		Total		Vaccinated			Total		Vaccinated			Total		Vaccinated		
		n	% ¹	n	% ²	95% CI	n	% ¹	n	% ²	95% CI	n	% ¹	n	% ²	95% CI
Poland	2003/4	307	16	55	18	14-23	405	21	40	10	7-13	1254	64	105	8	7-10
	2004/5	487	17	74	16	12-19	439	15	40	9	7-12	1972	68	158	8	7-9
Sweden	2003/4	316	13	144	46	40-51	332	13	43	13	10-17	1859	74	87	5	4-6
	2004/5	298	12	133	45	39-50	313	12	38	12	9-16	1890	76	82	4	3-5

1) Percentage in the total study sample

2) Percentage of vaccinated persons within the group

TABLE 3

Distribution of personal invitations among high-risk group (elderly and diseased combined) and vaccination coverage rate for those who have and have not received a personal invitation

Country	Season	Received a personal invitation?	Risk group (elderly and diseased combined)			Vaccinated risk group (elderly and diseased)		
			n	% ¹	95% CI	n	% ²	95% CI
Poland	2003/4	Yes	191	27	(24-30)	67	35	(28-42)
		No	521	73		24	5	(3-7)
	2004/5	Yes	192	21	(18-24)	84	44	(37-51)
		No	734	79		27	4	(3-7)
Sweden	2003/4	Yes	94	15	(12-18)	50	53	(43-63)
		No	554	85		134	25	(22-29)
	2004/5	Yes	95	16	(13-19)	56	59	(48-69)
		No	516	84		114	22	(19-26)

1) Percentage of persons who received/did not receive a personal invitation within the risk group

2) Percentage of vaccinated persons among those who received/did not receive a personal invitation?

a personal invitation to be vaccinated decreased significantly in Poland and stayed the same in Sweden.

Reasons for non-vaccination

Those non-vaccinated in the high-risk groups were asked to state why they had not had a vaccination. In Sweden, the reasons mainly had to do with misconceptions concerning influenza. The most frequently mentioned reasons were the assumption of not qualifying for a vaccination and perceived resistance to influenza. In the 2004/5 season, significantly more people mentioned not qualifying (2003/4: 15%, 95%CI: 12-18; 2004/5: 35%, 95% CI: 30-39) and significantly fewer persons cited having sufficient resistance than a year before (2003/4: 33%, 95%CI: 29-37; 2004/5: 20%, 95% CI: 16-24). In Poland, in both seasons misconceptions as well as barriers were mentioned: perceived resistance to flu and the cost of the vaccination being the most often cited reasons. There were no significant differences between reasons mentioned by the elderly and those given by the respondents with chronic diseases

in either of the countries. Table 4 displays the reasons in both seasons combined.

Discussion

Results

In 2004/5, the VCR of the Swedish elderly was just under the threshold of the WHO recommendations for 2006. For Poland, the VCR of the elderly was far below this figure. In both countries, no difference in VCR was found between the two seasons in the study. VCR of the diseased under the age of 65 in both Poland and Sweden remained well below the WHO recommendations, and no increase was noted between the two seasons. This is a cause for concern, since without an increase in VCR the recommendations for 2010 will certainly not be met. In Poland, no difference between the VCR of the diseased and the VCR of the healthy population was noted, which may imply that there is no (successful) strategy of vaccinating people with chronic diseases.

TABLE 4

Reasons for not having a vaccination. Combined results for 2003/4 and 2004/5 by risk group and country (in %)

	Poland		Sweden	
	Elderly (n=653)	Diseased (n=761)	Elderly (n=335)	Diseased (n=563)
Misconceptions				
I do not qualify for influenza vaccination	6	7	22	26
I have sufficient resistance to flu	34	36	29	25
Influenza is not a serious illness	4	4	7	13
Barriers				
The vaccination is too expensive	24	24	3	2
It slipped my mind	6	8	6	6
I was unable to attend at the given time	1	1	1	2
I have had bad experiences with flu in the past	2	4	9	5
On principle, I am against vaccination	12	9	6	5
The GP or public health worker was too far away for me	3	2	1	1
Miscellaneous				
My physician considered it unnecessary	3	4	2	3
Other	12	13	26	24
Don't know	4	2	3	4

Note: Percentages may add up to more than 100%, since it was possible to choose more than one answer.

When looking into the reasons why high-risk persons refrained from vaccination, in the case of Sweden, it was mainly misconceptions that seemed to matter. The number of people who thought they did not qualify for influenza vaccination increased significantly between the first and the second season – from 12.8% (95%CI: 8.4-19.0) in 2003/4 to 32.1% (95%CI: 25.4-40.1) in 2004/5 with the elderly, and from 15.7% (95%CI: 11.7-20.4) to 36.4% (95%CI: 30.8-42.5) with the diseased, respectively. The number of people who thought they had sufficient resistance to flu, however, decreased over time – in case of the elderly from 36.5% (95%CI: 28.6-43.4) to 21.3% (95%CI: 15.5-28.6), in case of the 'diseased' from 31.2% (95%CI: 25.9-36.9) to 18.9% (95%CI: 14.6-24.2). No significant differences between the seasons were noted for the other reasons.

In Poland, both misconceptions and perceived financial barriers played a role, with no differences between the seasons. Issues concerning perceived resistance and perceived non-qualification may be tackled by means of information campaigns. However, to solve the problem of the out-of-pocket payments, the authors think that the Polish government should consider changing its policy.

Receiving a personal invitation for a vaccination remains an effective way of increasing the VCR. It is therefore worrying that the number of people receiving personal invitations in Poland fell significantly between 2004 and 2005.

There was no difference in VCR within the different disease groups in either of the countries. The pattern found earlier in Germany [4] and the Netherlands [6] that persons with cardiovascular disease and diabetes were vaccinated more often than those with pulmonary disease was not valid for the two countries in this study. This may be related to the low VCR for the 'diseased' in Poland and Sweden compared to Germany and the Netherlands, which do not allow the detection of any significant differences.

Validity of data

In Sweden a telephone survey was used, whereas in Poland the respondents were contacted in their homes. It would have been preferable had the same interview method been used in both countries, but we had no choice of the method, as our surveys had to be included in existing omnibus polls due to financial constraints. However, since the number of households with telephones in Poland is about half that of Sweden, it is probable that the face-to-face interviews in Poland provided a better random sample. However, they may have also led to a higher proportion of elderly and chronically ill in the sample, because these persons can be expected to be at home more often than healthy people. It is not clear whether this method results in more socially desirable answers compared to the telephone interviews. However, even if there is a bias, it does not affect the comparison between the two seasons within the individual countries, since the same method was used in each country for both seasons. The interviews were held in March and April, although it would have been better to have a shorter period of time between the vaccination season and the survey. However, in both years, the data collection took place in the same period so there should be no systematic variation between the two seasons due to different timing of data collection.

The data concerning vaccine uptake and chronic conditions are based on self-reported information from the respondents. Although research into self-reported data compared with medical

records revealed a satisfactory reliability for self-reported medical conditions, there may still be over-reporting as well as under-reporting [8-10]. In our validation study in the Netherlands, we found a systematically lower VCR (approximately 10%) from the self-reported data for high-risk persons compared to registered influenza vaccinations at GP practices [6], although the results were comparable with a previous survey in the Netherlands [11]. However, a recent study on self-reported influenza vaccination uptake of the elderly in the past year in the UK showed a high level of concurrence with GP records [12]. We have no explanation for the decrease in reported heart diseases in Poland. There may have been a bias in the selection of respondents between the two years, although the system of data collection and the company that conducted the data collection remained the same.

The findings of this study are supported by the results of the research on the VCR in the total population carried out by the Macroepidemiology of Influenza Vaccination Study Group (MIVSG) in the 2003/4 season. This study group also found hardly any increase in VCR in either country for both seasons (personal communication by GA van Essen).

Conclusion

The most important finding of this study was the lack of increase in VCR of high risk groups in Sweden and Poland, which may indicate that these two countries will not be able to meet the 2010 WHO recommendations if no further action is undertaken concerning vaccine uptake. Personal invitations were found to increase the chance of being vaccinated significantly; therefore the decline of the number of personal invitations in Poland needs to be addressed in the future. The fact that out-of-pocket payments in Poland are mentioned as a barrier may be a result of the economic situation in this country, where the price of the vaccination appears to be a relatively large burden for the average household budget.

Competing interests

This study was financed by the European Scientific Working group on Influenza (ESWI) for the 2003/4 season and by the European Vaccine Manufacturers (EVM) for the 2004/5 season. EVM is a specialised group within the European Federation of Pharmaceutical Industries and Associations (EFPIA).

References

1. Van Essen GA, Palache AM, Forleo E, Fedson DS. Influenza vaccination in 2000: recommendations and vaccine use in 50 developed and rapidly developing countries. *Vaccine* 2003;21:1780-5.
2. Kroneman M, Paget WJ, Van Essen GA. Influenza vaccination in Europe: an inventory of strategies to reach target populations and optimise vaccination uptake. *Eurosurveillance* 2003;8(6):130-8. Available from: <http://www.eurosurveillance.org/em/v08n06/0806-225.asp>
3. Macroepidemiology of Influenza Vaccination (MIV) Study Group. The macroepidemiology of influenza vaccination in 56 countries, 1997-2003. *Vaccine* 2005;23(44):5133-43.
4. Kroneman M, Van Essen GA, Paget WJ. Influenza vaccination coverage and reasons to refrain among high-risk persons in four European countries. *Vaccine* 2006;24(5):622-8.
5. Szucs T, Müller D. Influenza vaccination coverage rates in five European countries - a population-based cross-sectional analysis of two consecutive influenza seasons. *Vaccine* 2005;23(43):5055-563.
6. Kroneman MW, Van Essen GA, Tacken MAJB, Paget WJ, Verheij R. Does a population survey provide reliable influenza vaccine uptake rates among high-risk groups? A case study of the Netherlands. *Vaccine* 2004;22(17-18):2163-70.

7. Sten A. Gemensam start i år: Information och kampanjer ska öka vaccinationsstäckningen i riskgrupper [Collective start this year: Information and campaigns will increase influenza vaccination coverage among risk groups in Sweden]. *Smittskydd* 2004;(4):10-1.
8. Martin LM, Leff M, Calonge N, Garrett C, Nelson DE. Validation of self-reported chronic conditions and health services in a managed care population. *Am.J.Prev.Med.* 2000;18(3):215-8.
9. Sheridan CL, Mulhern M, Martin D. Validation of a self-report measure of somatic health. *Psychol.Rep.* 1998;82(2):679-87. Lampe FC, Walker M, Lennon LT, Whincup PH, Ebrahim S. Validity of a self-reported history of doctor-diagnosed angina. *J.Clin.Epidemiol.* 1999;52(1):73-81.
10. Centraal Bureau voor de Statistiek (Statistics Netherlands, CBS). *Statistisch jaarboek 2003* (Statistical yearbook 2003). 96. Heerlen. Centraal Bureau voor de Statistiek. 2003.
11. Mangtani P, Shah A, Roberts JA. Validation of influenza and pneumococcal vaccine status in adults based on self-report. *Epidemiol.Infect.* 2007;135(1):139-43.

Citation style for this article: Kroneman M, van Essen G, . Stagnating influenza vaccine coverage rates among high-risk groups in Poland and Sweden in 2003/4 and 2004/5. *Euro Surveill* 2007;12(4)[Epub ahead of print]. Available online: <http://www.eurosurveillance.org/em/v12n04/1204-221.asp>