Rapid communications

PUBLIC PERCEPTIONS IN RELATION TO INTENTION TO RECEIVE PANDEMIC INFLUENZA VACCINATION IN A RANDOM POPULATION SAMPLE: EVIDENCE FROM A CROSS-SECTIONAL TELEPHONE SURVEY

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A cross-sectional telephone survey on a nationally representative sample of 1,000 Greek households was performed to assess the acceptability of the pandemic influenza A(H1N1)v vaccine, factors associated with intention to decline and stated reasons for declining vaccination. The survey was initiated the last week of August 2009 (week 35) and is still ongoing (analysis up to week 44). The percentage of participants answering they would “probably not/definitely not” accept the vaccine increased from 47.1% in week 35 to 63.1% in week 44 (test for trend: $p < 0.001$). More than half of the people with chronic illnesses (53.3%) indicated “probably not/definitely not”. Factors associated with intention to decline vaccination were female sex, age between 30–64 years, perception of low likelihood of getting infected or of low risk associated with influenza, and absence of household members suffering from chronic illnesses. For the majority of the respondents (59.8%), the main reason for intending to decline vaccination was the belief that the vaccine might not be safe. Promotion of vaccination programmes should be designed taking into account the attitudinal barriers to the pandemic vaccine.

Introduction

One of the first priority actions following the declaration of influenza A(H1N1)v as the first pandemic of the 21st century was the timely development of a safe and effective vaccine. Although vaccination is an effective measure to reduce the number of infections, hospitalisations and deaths, modelling studies have shown that the impact of vaccination depends strongly on the time when it is initiated as well as on the coverage of the target populations [1–3]. Until the beginning of November 2009, the European Commission had granted authorisation for three specific influenza A(H1N1)v vaccines and vaccination has already started in several European countries. However, there is a major concern about the acceptability of the pandemic vaccine among target populations in several European countries. In the present study, we analysed the data from a weekly telephone survey carried out in the Greek population in order to assess the levels of acceptance of the vaccine and the related attitudinal barriers.

Methods

Telephone survey

A telephone survey on 1,000 households has been carried out in Greece on a weekly basis starting from the last week of August 2009 (week 35) and was still ongoing until the time of this analysis (week 44). One of the aims of the study was to assess perceptions in relation to risks of pandemic influenza A(H1N1) and the attitude towards immunisation. Proportional quota sampling was used to ensure that selected households were representative of the total of Greek households, with quotas based on household size and urban/rural location. The average household size in the selected households was 2.9 persons. The mean age of the respondents was 51.9 (standard deviation ± 17.0) years and 65.8% of them were female.

One participant per household was asked to provide answers to questions about the age and sex of the household members, knowledge and perceptions about influenza A(H1N1)v, the presence of members with chronic illnesses etc. Chronic illnesses included chronic respiratory diseases (including asthma), chronic cardiovascular diseases (except hypertension), chronic metabolic disorders (including diabetes mellitus), chronic renal and hepatic diseases, haematological disorders (including sickle cell disease), immunosuppression and chronic neurological/neuromuscular diseases. A specific question was asked concerning the willingness of the participants to accept vaccination once the pandemic vaccine becomes available: “Do you consider getting vaccinated against the novel influenza (you or the other members of your household) once the vaccine becomes available?” with five possible answers (“definitely yes”, “probably yes”, “probably not”, “definitely not”, “don’t know”).

Statistical methods

The presence of trend in the intentions of the population sampled every week was evaluated using the chi-squared test for trend. The data from week 44 were further used to identify associations between questionnaire-related variables and the

reported vaccination intentions using one-way analysis of variance and the chi-squared test. A multiple logistic regression model was used to evaluate independent predictors of intention to decline the vaccine (where the answers were grouped as “definitely not/probably not” versus “definitely yes/probably yes”). A similar model was used to identify the profile of a non-negligible proportion of the sample answering “don’t know” (versus “definitely yes/probably yes”).

Results

Overall, according to the most recent data of week 44, 63.1% of the sample indicated “probably not/definitely not” as their intention to get vaccinated. The trends from week 35 through week 44 in the willingness of the respondents to get the pandemic vaccine are depicted in Figure 1 (1,000 persons per week). The percentage of participants answering “definitely not” increased from 32.3%

on week 35 to 45.8% in week 44 (test for trend: $p<0.001$). The proportion of individuals responding “definitely yes” decreased from 22.9% in week 35 to 9.1% in week 44 (test for trend: $p<0.001$).

Respondents’ age, sex and educational attainment, the presence of chronic illness and history of seasonal influenza vaccination in the past year (of the respondents and of members of their household), presence in the household of children aged 0-12 years or of individuals aged 65 or older, and respondents’ perceptions concerning the risk related to infection were associated with the reported intention towards getting vaccinated (Table 1). Women intended to decline vaccination at higher rates (67.6%) compared with men (54.4%) and were more determined in their answer (51.8% answered “definitely not”). Persons with a history of previous seasonal influenza vaccine reported intention to decline vaccination at lower rates compared with those who have not

FIGURE 1

Trends in respondents’ intention to receive pandemic vaccine, Greece, 2009 (1,000 respondents per week)

TABLE 1

Univariate association of variables potentially affecting respondents’ intentions concerning vaccination, Greece, 2009

	Intention to accept vaccination					P value
	Definitely yes	Probably yes	Probably not	Definitely not	Don't know	
Age, mean	56.7 (17.0)	49.3 (19.3)	52.4 (16.9)	49.8 (15.8)	56.8 (17.3)	<0.001
Sex						
Male	50 (14.6)	62 (18.1)	60 (20.2)	117 (34.2)	44 (12.9)	<0.001
Female	41 (6.2)	69 (10.5)	104 (15.8)	341 (51.8)	103 (15.7)	
Urban/rural location						
Athens/Thessaloniki	41 (8.2)	61 (12.2)	84 (16.8)	250 (50.0)	64 (12.8)	0.196
Other urban	21 (8.4)	36 (14.4)	49 (19.6)	106 (42.4)	38 (15.2)	
Semi-rural/rural	29 (11.6)	34 (13.6)	40 (16.0)	102 (40.8)	45 (18.0)	

Educational attainment						
Primary school	20 (7.4)	34 (12.6)	53 (19.6)	101 (37.4)	62 (23.0)	<0.001
High school (3 years)	11 (10.8)	16 (15.7)	16 (15.7)	36 (35.3)	23 (22.6)	
High school (6 years)	32 (10.2)	39 (12.4)	47 (14.9)	162 (51.4)	35 (11.1)	
University/postgraduate studies	28 (9.0)	42 (13.4)	57 (18.2)	159 (50.8)	27 (8.6)	
Presence of chronic illness (respondent)						
No	65 (8.3)	97 (12.3)	138 (17.6)	379 (48.2)	107 (13.6)	0.016
Yes	26 (12.2)	34 (15.9)	35 (16.4)	79 (36.9)	40 (18.7)	
Presence of chronic illness (household)						
No	54 (8.2)	75 (11.4)	116 (17.7)	325 (49.5)	87 (13.2)	0.005
Yes	37 (10.4)	56 (16.4)	56 (16.4)	132 (38.7)	60 (17.6)	
Children aged 0-12 years in the household						
No	77 (9.9)	110 (14.1)	139 (17.9)	332 (42.7)	120 (15.4)	0.005
Yes	14 (6.3)	21 (9.5)	34 (15.3)	126 (56.8)	27 (12.2)	
Persons ≥65 years in the household						
No	45 (7.2)	81 (13.0)	113 (18.1)	306 (49.1)	78 (12.5)	0.003
Yes	46 (12.2)	50 (13.3)	60 (15.9)	152 (40.3)	69 (18.3)	
Pregnant women (respondent)						
No	90 (9.1)	130 (13.1)	173 (17.5)	451 (45.6)	146 (14.8)	0.513
Yes	1 (10.0)	1 (10.0)	0 (0.0)	7 (70.0)	1 (10.0)	
Pregnant women (household)						
No	90 (9.2)	129 (13.2)	171 (17.4)	445 (45.4)	146 (14.9)	0.372
Yes	1 (5.3)	2 (10.5)	2 (10.5)	13 (68.4)	10 (5.3)	
Seasonal vaccination (respondent)						
No	61 (7.5)	102 (12.6)	146 (18.0)	399 (49.2)	103 (12.7)	<0.001
Yes	30 (15.9)	29 (15.3)	27 (14.3)	59 (31.2)	44 (23.3)	
Seasonal vaccination (household)						
No	56 (7.6)	97 (13.1)	138 (18.6)	359 (48.5)	91 (12.3)	<0.001
Yes	35 (13.5)	34 (13.1)	35 (13.5)	99 (38.2)	56 (21.6)	
Self-reported level of knowledge about pandemic influenza						
Very much	16 (10.1)	18 (11.3)	26 (16.4)	78 (49.1)	21 (13.2)	0.705
Quite enough	46 (7.7)	76 (12.8)	103 (17.3)	284 (47.8)	85 (14.3)	
Little	24 (12.2)	29 (14.7)	35 (17.8)	76 (38.9)	33 (16.8)	
Not at all	5 (12.2)	6 (14.6)	7 (17.1)	17 (41.5)	6 (14.6)	
Likelihood of getting infected						
Very likely	9 (10.0)	10 (11.1)	16 (17.8)	44 (48.9)	11 (12.2)	0.472
Quite likely	16 (9.1)	26 (14.8)	32 (18.2)	83 (47.2)	19 (10.8)	
Not very likely	26 (8.3)	47 (14.9)	59 (18.7)	145 (46.0)	38 (12.1)	
Not likely at all	13 (7.0)	17 (9.1)	24 (12.8)	110 (58.8)	23 (12.3)	
If likely to become infected, perceptions related to severity						
High risk	15 (19.2)	9 (11.5)	9 (11.5)	30 (38.5)	15 (19.2)	<0.001
Moderate risk	19 (11.2)	31 (18.3)	35 (20.7)	58 (34.3)	25 (15.4)	
Little risk	10 (4.3)	30 (12.8)	43 (18.4)	131 (56.0)	20 (8.6)	
No risk	2 (3.6)	3 (5.4)	12 (21.4)	37 (66.1)	2 (3.6)	

Values express number of respondents and brackets indicate the corresponding percentage with the exception of age where mean (standard deviation) are provided.

TABLE 2

Multiple logistic regression models for intention to decline pandemic vaccination (versus those intending to accept), Greece, 2009

Variable	odds ratio	95% confidence interval	P value
Sex			
Male	1		
Female	2.75	(1.94 to 3.90)	<0.001
Age (years)			
15-29	1		
30-64	1.85	(1.07 to 3.22)	0.029
65+	1.24	(0.54 to 2.81)	0.612
Educational attainment			
Nine-year high school/university	1		
Primary/three-year high school	1.07	(0.71 to 1.60)	0.751
Urban/rural location			
Semi-rural/rural	1		
Athens/Thessaloniki	1.56	(1.02 to 2.38)	0.040
Other urban	1.22	(0.75 to 1.96)	0.424
Presence of chronic illness (household)			
Yes	1		
No	1.60	(1.10 to 2.33)	0.013
Presence of child aged 0-12 years in household			
Yes	1		
No	1.47	(0.91 to 2.38)	0.118
Vaccination for seasonal influenza in the household			
Yes	1		
No	1.46	(0.96 to 2.23)	0.077
Person ≥65 years in the household			
Yes	1		
No	1.17	(0.65 to 2.09)	0.600
Self-reported level of knowledge about pandemic influenza			
Not at all/little	1		
Quite enough/very much	1.30	(0.87 to 1.93)	0.196
Likely to get infected and perceived severity			
Likely and dangerous	1		
Likely but not dangerous	2.72	(1.73 to 4.27)	<0.001
Not likely at all	3.26	(1.92 to 5.53)	<0.001
Don't know if likely	1.36	(0.84 to 2.18)	0.210

FIGURE 2

Reasons for intention to decline pandemic vaccination as reported by 631 participants in week 44/2009 (multiple answers were allowed), Greece

received that vaccine before (45.5% versus 67.2%). It is of note that more than half of the respondents with chronic conditions (53.3%) did not intend to accept pandemic vaccination ("probably not/definitely not") and seven of the 10 pregnant women in the sample provided "definitely not" as an answer.

According to multiple logistic regression analysis, respondents who did not intend to get vaccinated were more often found among females (odds ratio (OR) versus males: 2.75, 95% confidence interval (CI): 1.94 to 3.90, $p < 0.001$), among individuals aged 30-64 years (OR versus 15-29 year-olds: 1.85, 95% CI: 1.07 to 3.22, $p = 0.029$), among those with a perception of low likelihood of getting infected or low risk associated with it (OR (95% CI) compared to those reporting "likely of getting infected and dangerous": 2.72 (1.73 to 4.27) for those answering "likely but not dangerous" and 3.26 (1.92 to 5.53) for those reporting "not likely at all", $p < 0.001$) (Table 2). Additionally, participants from households where no member suffered from chronic illnesses were more likely to provide negative answers concerning vaccination (OR 1.60 versus households with members suffering from chronic illness, 95% CI: 1.10 to 2.13, $p = 0.013$). A multiple logistic regression model was used to identify factors associated with higher probability of answering "I don't know" compared to "probably yes/definitely yes". Females and individuals reporting a low educational status of the head of their household were more likely to be undecided whether to get vaccinated or not (females versus males: OR=2.42, 95% CI: 1.50 to 3.93, $p < 0.001$ and primary/three-year high school versus nine-year high school/university: OR=2.24, 95% CI: 1.35 to 3.73, $p = 0.002$).

In week 44, 631 participants who indicated "probably not" or "definitely not" as their intention to get vaccinated were further asked to indicate their reasons among a pre-defined set of possible answers (multiple answers were allowed) (Figure 2). For the vast majority of the respondents (59.8%), the main reason was their belief that the vaccine might not be safe.

Discussion

According to our findings, the intention to decline vaccination against pandemic influenza A(H1N1) showed increasing trends since the end of August 2009 and reached 63% in week 44 (26 October-1 November 2009). The corresponding rate of likely acceptance in week 44 was 22.2%, whereas a considerable proportion of the population (15%) had not decided yet. Vaccination had not started in Greece at that time. The most frequently reported barrier against the uptake of vaccination was the fear that the vaccine might not be safe. It is noteworthy that the rates of intention to decline among individuals belonging to vaccination target groups were high: 53.3% among people with chronic conditions and 70.0% in a small sample of pregnant women. Factors independently associated with intention to decline vaccination were female sex, age between 30 and 64 years, perception of low likelihood of getting infected or of low risk associated with it, and absence of household members suffering from chronic illnesses.

To our knowledge, this is the only study conducted so far in a European population during the ongoing influenza A(H1N1) pandemic that assesses perceptions towards influenza, willingness to accept vaccination and related barriers in vaccine uptake. The sample was large (1,000 households per week) and representative of Greek households with quotas based on household size and urban/rural location. Data was collected on numerous items that allowed identifying the profile of the population that will be less likely to accept vaccination. It should be taken into account that as

an epidemic unfolds in a population, intentions may change. Other factors, such as media attention or vaccine promotion programmes, may also play a role in shaping perceptions and attitudes. These may differ from country to country and as a result, our estimates concerning willingness to accept vaccination might not strictly apply in the case of other populations. However, as those who do not wish to get vaccinated may have similar characteristics in all countries, qualitative results concerning attitudinal barriers could be used to explain negative intentions towards vaccine uptake in other countries too.

Low rates of intention to accept vaccination have also been reported by other studies on the current pandemic or pre-pandemic vaccines [4-7]. As in our study, perceptions concerning the risk associated with infection were consistently found to affect the intention to accept or decline vaccination and the fear of side-effects was the most frequently reported barrier [6,7]. Even in the case of seasonal influenza, concerns about side effects were reported at high rates (43%) as a reason for avoiding immunization [8].

Overall, this study has identified high rates of intention to decline pandemic vaccination in the Greek population, even among vaccination target groups, mainly due to the perception that the vaccine might not be safe. Vaccination promotion programmes should be carefully designed in order to achieve timely vaccination of the target populations at satisfactory levels of coverage.

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