

# Beliefs, knowledge and attitudes of community-dwelling Greek elders towards influenza and pneumococcal vaccination

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## Abstract

**Background:** Influenza is a major cause of mortality and morbidity in the elderly.

**Objective:** To explore the knowledge, attitudes, and beliefs of community-dwelling Greek elders towards influenza and pneumococcal vaccination.

**Method:** Content analysis methodology was used to analyse three focus group interviews (n=22). The theoretical framework of the Health Belief Model was used.

**Results:** Two-thirds of the elderly participants have received flu vaccine last year. The main motives and barriers that explain elders' behaviour were: having routine access to medical care; the recommendation of health care professionals; beliefs about the benefits of influenza vaccination; having a relative who delivered the vaccine; being less than 75 years old; having unpleasant reactions in the past; lack of adequate information about the side effects of influenza vaccine; and vaccine shortages.

**Conclusions:** Availability of sufficient vaccines and health education programs are needed to increase the uptake of influenza and pneumococcal vaccination.

## Introduction

Immunization coverage estimates are useful tools for a variety of purposes such as to monitoring the performance of immunization services in order to identify areas for improvement, as to planning strategies to eradicate certain communicable diseases and to designing an evidence-based health policy.<sup>1</sup> Vaccine-preventable diseases are still major causes of mortality and morbidity for people of all ages. Early vaccination against influenza viruses is the cornerstone in preventing influenza, a disease that can reach epidemic levels in any time. Influenza and pneumococcal disease are two important causes of mortality and morbidity in vulnerable population groups such as the elderly, especially in countries with temperate climates.<sup>2, 3, 4</sup> Simultaneous distribution of influenza and pneumococcal vaccine to the elderly is highly recommended as it is a safe and effective procedure.<sup>5, 6</sup> In Greece influenza and pneumococcal vaccination are recommended for people aged >65 years old and for high risk groups.

During the 2005-2006 the risk for an avian influenza outbreak received substantial global media attention, including reports of vaccine shortages leading to an excessive vaccine demand. In order to respond to these, a number of various influenza surveillance systems has been developed in Greece aiming at: (1) the monitoring of influenza activity trends in the entire country, as well as in each geographical district, (2) the detection of seasonal influenza outbreaks, (3) the identification of prevalent serotypes in order to produce vaccines, and (4) the timely identification of a possible new subtype with pandemic potential, as well as the distribution of new influenza strains ([www.keel.org.gr](http://www.keel.org.gr)). In Greece, influenza is a disease subject to mandatory report only when recording a laboratory confirmed case or reporting a connection to a laboratory-confirmed case.

In Greece there are no formal data about the vaccine coverage of elderly against influenza and pneumococcal disease. According to the Macroepidemiology of Influenza Vaccination Study Group<sup>7</sup> on the distribution of influenza vaccine (expressed as the number of doses distributed/1000 total population each year), in Greece there was an increase in the distribution of vaccine from 62/1000 total population in 1997 to 165/1000 total population in 2003. Fedson stressed that pneumococcal vaccine coverage among elderly is relatively low in the developed countries with the exception of the United States where vaccination is widespread.<sup>8</sup> According to the relevant literature the estimate of influenza vaccine uptake rates for the elderly in Europe<sup>9</sup> range from 25% to 81% as opposed to America<sup>10, 11</sup> ranging from 34.9% to 80.3% for the elderly who suffer from diabetes or asthma and 71.5% for the HMO members, to Canada<sup>12, 13</sup> ranging from 55.6% to 44.8% and to Iran<sup>14</sup> that was 68.1%. Among the twenty countries of OECD<sup>15</sup> that provided data, the annual percentage of immunized elderly people ranged from 16.5% (Czech Republic) to 79% (Netherlands). In general, many countries exceeded 60%. The rate of influenza vaccination also stood at over 60% in most G7 countries, with the exception of Germany and Japan where less than 50% of the elderly population reported having been vaccinated against influenza in 2003.<sup>15</sup>

Several researchers suggested a number of reasons for low immunization rates or for refusal of influenza vaccination in the elderly population.<sup>16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27</sup> Some other researchers have used theoretical models such as the Health Belief Model and the Multidimensional Locus of Control Theory to explain the low proportion of elderly vaccination.<sup>14, 28, 29</sup> The Health Belief Model was originally developed as a systematic method to explain and predict preventive health behaviour.<sup>30</sup> A person's motivation to undertake certain health behaviour relates to individual perceptions, modifying behaviours and likelihood of action. Individual perceptions include factors that affect the perception of illness or disease; they deal with the importance of health to the individual, perceived susceptibility and perceived severity. Modifying factors include demographic variables, perceived threat and cues to action. The combination of these factors often manifests into action. The result of this action can be interpreted as certain behaviour. According to the evidence, three of the Health Belief Model dimensions (perceived barriers, perceived benefits and perceived severity) were found to be significant predictors of the acceptance of influenza vaccination among the elderly.<sup>29</sup>

The aim of the study was to explore the knowledge, the attitudes, and the beliefs of community-dwelling Greek elders towards influenza and pneumococcal vaccination in order to elicit those factors that contribute to the acceptance or to the refusal of vaccination.

## Sample and method

Potential subjects who met the following inclusion criteria were selected to participate to the study: (1) willingness to participate, (2) ability to speak and read Greek (3) age 65 or above (4) no apparent cognitive impairment that was assessed from the researcher. Participants were either age-appropriate or had clinical indications to receive a strong recommendation for influenza and pneumococcal immunizations. Participants received a brief explanation of the purpose and the aim of the study and from those who agreed to participate was asked to give an informed consent. The sample of participants was randomized in time and region. Finally 22 elderly individuals were approached. In qualitative research, sample sizes are not determined by hard and fast rules but by other factors, such as the depth and duration required for each interview and how much it is feasible for the interviewer to undertake.<sup>31</sup> The mean age of the elderly participants was 70.5±5.22 years old ranging from 65 to 82 years old. Baseline characteristics of the respondents are shown in Table 1.

**Table 1: Demographic characteristics of the sample**

| Variable              | N  | %    |
|-----------------------|----|------|
| <b>Gender</b>         |    |      |
| Male                  | 8  | 36.4 |
| Female                | 14 | 63.6 |
| <b>Education</b>      |    |      |
| Elementary            | 11 | 50   |
| Secondary             | 5  | 22.7 |
| Higher                | 5  | 22.7 |
| High                  | 1  | 4.6  |
| <b>Live</b>           |    |      |
| Alone                 | 3  | 13.6 |
| With my family        | 19 | 86.4 |
| <b>Marital status</b> |    |      |
| Single                | 1  | 4.6  |
| Married               | 18 | 81.8 |
| Widow/er              | 3  | 13.6 |

In order to explore Greek elderly knowledge on influenza and pneumococcal vaccination we conducted three focus groups (8+7+7=22). Qualitative research is designed to obtain in-depth responses about what people really know, think, and feel for a certain issue. Its value relates to its ability to collect and match unfiltered comments from the representatives of a target population. We recruited our convenience sample from the community and from a senior centre. To assure geographic representiveness of the sample two focus groups were performed in two rural regions of Central (n=7) and West Greece (n=8) and the third in Athens (n=7) the capital of Greece. The focus group interviews were completed between July and September 2006.

Before starting the focus group elderly participants were kindly asked to fill out a short self-completion questionnaire that contained questions about demographic data, health history data and details about vaccination history. We asked from the participants to rate their self reported health status from 0 (very bad) to 10 (excellent). In addition, to assess disease burden and comorbidities elderly participants were asked a number of dichotomous questions on the presence of a variety of chronic diseases. Furthermore they indicated whether or not this disease caused impairment.

Focus groups questions were divided in four major categories: (1) those related to flu experience, (2) those related to flu prevention (3) those related to flu vaccination and (4) those related to flu vaccination prevention. The theoretical framework of the Health Belief Model was used to guide the comparison of differences between elderly who were immunized and those not immunized against influenza and pneumococcal disease. We tried to identify perceived barriers and facilitators related to influenza and pneumococcal immunization as determinants of a certain health-seeking behaviour. We included items that explained: (1) perceived susceptibility (e.x. how susceptible are you to flu? Why do you think some people are more susceptible to flu than others? What kind of people is more susceptible to flu? Among them, who are the most susceptible? Would you consider the impact of flu on them to be more serious?) (2) perceived seriousness (e.x. how serious do you consider influenza and/or pneumonia? What are the difficulties that would create to you?), (3) perceived benefits of Taking Action (e.x. why and who do you think would benefit from flu vaccination and hence should be highly recommended to have the flu shot?), (4) perceived barriers to taking action (e.x. why did you refuse to get a flu shot?), (5) cues to action (e.x. by whom or by what source of information were you prompted to get a flu shot? Describe how the information appealed to you) and (6) cultural practice and ethnic beliefs (e.x. describe what does flu vaccination mean to you).

To explore the *"lived experiences"* of elderly participants, they were asked to describe their vaccination behaviour as fully and deeply as possible until they had nothing more to say. The audiotapes were transcribed verbatim to best represent the dynamic nature of the living conversation. Each transcript was analyzed independently by two readers by the examination of key phrases and concepts about vaccination.

# Data analysis

Overall, the majority of the participants were females (n=15, 68.2%), living with their family (n=19, 86.4%) and being married (n=18, 81.8%) as seen in Table 1. The mean score of self reported health status was  $8.14 \pm 2.18$  and the median was 9.

Seven (31.8%) participants reported a heart disease (mainly hypertension), while 5 (22.7%) reported psychological problems such as depression and anxiety, 2 (9.1%) a chronic respiratory disease, 5 (22.7%) a vascular disease, 6 (27.3%) musculoskeletal disease (mainly arthritis and osteoporosis), 5 (22.7%) a gastrointestinal disease (mainly constipation and gastric ulcer) and 1 (4.5%) a renal disease.

Participants were asked to rate their overall current health status by using a three point Likert scale ranging from not well, moderate to good. The majority of the elderly rated their current health as good (n=13, 59.1%) while the rest 40.9% (n=9) rated it as moderate. 9 (40.9%) participants thought that their health was better or similar to that of other people in the same age group whereas 4 (18.2%) found it worse. Seventeen participants declared that their current health status was similar to that of last year, while 4 (18.2%) replied it was worse and only one (4.5%) answered that it was better. The vast majority of the elderly takes medicines in a daily basis because of a chronic disease. Half of the respondents reported visiting their physician more than four times a year, while 36.4% is seeing them for two or three times a year.

All the participants were knowledgeable about flu and the flu shot and its necessity to the elderly people. On the contrary, only 6 (27.3%) have heard about the pneumococcal vaccine at least once in their life. Fourteen (63.6%) have received influenza vaccination the last year during the autumn. No one has received pneumococcal vaccine during his life. Five (22.7%) persons refused to be vaccinated against influenza. The main places that participants reported to have received the vaccine at least once in their lifetime were the physician's office, local health centres, pharmacy and in their home. Of the vaccinated respondents some were vaccinated from the nurse/health visitor in a health centre, or at a pharmacy or at home from their relative (mainly their daughter). The vaccinated elderly people reported that the flu shot is not painful as opposed to the unvaccinated who reported that they dislike shots or they are afraid of needles. Four (18%) participants reported difficulties getting the vaccine due to vaccine shortage.

Two-thirds of the elderly reported that they have experience influenza like syndrome at least once in their life. Five of them have been infected from influenza this year while 7 reported an infection during the previous year. Four (25%) persons answered that they have never been infected in their life. The infected participants reported medium severity symptoms. Most of them recovered fully within a week. The reported symptoms were high fever, cough and loss of appetite, sore throat, runny nose, headache, myalgia and general fatigue. The main symptom was body ache. Half of them did not get drug therapy while the other half used antipyretics and bronchodilators. Only two persons reported more than two episodes of influenza yearly.

To explore how elderly people differentiate influenza from respiratory track infections we asked them directly what is the difference between these two health conditions. Table 2 shows some of their answers. Additionally we forwarded the following question: "can you tell us the difference between pandemic influenza and avian flu?" Table 2 shows also some of their answers.

Eight respondents who had never gotten the flu vaccine in their lifetime were encouraged to give a free response reason. The most common reason for not ever receiving a flu shot was the belief that the person is currently healthy or does not belong to a high risk group for getting the flu. Furthermore they harboured doubts about the vaccine safety: *"...I am afraid about the side effects of vaccination. A week after the vaccination I suffer from influenza like symptoms and mainly sneeze..."* This was a common comment that was associated with an unpleasant previous experience.

Some respondents found it difficult to explain why they have never got the flu vaccine. Their answers were: *"... I don't know. I have never thought why..."* or *"...simply I don't want the flu shot..."* In Table 3 are summarized some of the answers and are grouped according to the Health Belief Model. Five very old participants mentioned that a relative (mainly their daughter) brought them the flu vaccine.

**Table 2:** Perceived differences between influenza/respiratory infections and pandemic influenza/avian flu

| Main differences between influenza and respiratory track infections  | Main differences between pandemic influenza and avian flu   |
|--|---|
| "...respiratory infection gives symptoms from the respiratory system whereas influenza is a systematic disease..." | "...avian influenza is not transmitted to human unless he has a direct contact with infected poultry and emigrating birds..." |
| "...respiratory infection is a serious condition..."   | "...both of them are caused by different types of viruses..."   |
| "...respiratory infection shortens your breath..."   | "...avian influenza kills you. Influenza does not kill you..."  |
| "...influenza is caused by a virus. Respiratory infection is caused by bacteria..."                                |   |
| "...influenza has a short duration. A respiratory infection needs hospital care..."                                |   |

Two thirds of the vaccinated elderly participants declared that although not susceptible to influenza they got the flu as a preventive measure. They believed that they are able to reduce or even eliminate the likelihood of getting the flu by avoiding the direct contact with infected persons, by eating well and by keeping a stable temperature in the environment they live. Those non-vaccinated promoted the fact that flu shots are for the "very old people" or for people who are sick or weak.

Half of the participants replied that people living in their community are quite vulnerable to influenza virus infection as they are not well informed. When we asked them why they think some people are more susceptible to flu than others, the majority replied: "due to bad immune system", "due to poor health" and "because they do not take preventive measures". In addition elderly participants argued that the most susceptible to flu are the very old people, those who suffer from chronic cardiovascular diseases, children and newborns. They all believed that these people belong to a high risk population and considered the impact of flu on them to be more serious. All indicated flu vaccine as the most effective preventive measure for flu in combination with nutritious food, avoiding the society of other infected individuals, sanitation, avoiding visiting indoors places, personal hygiene and cleanliness. When we asked from the participants to rank these preventive measures according to their perceived importance, all recommended that the vaccine is the first choice for those who want to be protected against influenza.

Table 3: Health Belief Model items index

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*Perceived susceptibility*

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1. Most of the time I live in the village where the air is clean and foods are fresh. As a result I have a decreased likelihood to get ill
  2. I live with my grandchildren who usually get sick in the school. I was vaccinated to protect myself from getting ill
  3. I have a good fitness. I can cope influenza
  4. I live alone. I am not susceptible to influenza
  5. I suffer from a chronic respiratory disease so I am susceptible to influenza
  6. I take off my clothes when I come from outside for avoiding the transfer of germs in the house
  7. I open the windows every day to refresh the air
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*Perceived benefits*

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1. Influenza vaccination keeps the people from getting influenza
  2. I was vaccinated to protect my family
- 

*Perceived barriers*

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1. If you get the flu shot, you get the flu with minor symptoms
  2. If you get the flu shot, you sneeze for a long period
  3. Believed themselves to be healthy
  4. Did not receive the flu vaccine this year because of vaccine shortage
  5. Believed that influenza immunization is necessary for the old olds and for those who suffer from a serious chronic disease
  6. Live alone and have few visits
  7. Their doctor did not ever mentioned pneumococcal vaccine
  8. Did not ever heard about pneumococcal vaccine in the media or in the newspapers
  9. Have been immunized in the past and had a bad experience from the side effects
  10. Believed that there was a groundless anxiety about influenza caused by the pharmaceutical industry to promote the vaccines
  11. Have never gotten the flu vaccine in the past and so they are afraid to do it now
  12. Barriers related to the access to the doctor, the nurse or the health visitor
  13. The flu vaccine is ineffective as it does not protect you against flu symptoms
  14. The physician did not convinced me about the effectiveness of the flu vaccine
  15. The physician did not encourage immunization. I did not have a clear answer
  16. My child or my neighbor advised me not to be vaccinated
  17. I forgot to ask my physician
  18. I forgot to get the flu
- 

*Cues to action*

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1. My physician advised me to get the flu
  2. My daughter brought me the flu vaccine. She visited my physician for my drugs prescription and he advised her to get me the flu shot as I do every year. We live together. She has two lovely children who attend the kindergarten and they usually get sick during the winter
  3. My health insurance covers the cost of the vaccine
  4. I got the flu as a screen test. To test whether it is effective or not
  8. My daughter gave me no choice. I had to be vaccinated because I suffer from asthma
  5. I decided to get the flu because of the increased media attention due to the avian influenza risk
  6. I decided to be vaccinated because flu vaccine was offered free of charge at the KAPI
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*Cultural practice and ethnic beliefs concerning the choice of the certain health-seeking behaviour*

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1. My friends in the coffee house reminded me to get the flu
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## Knowledge and beliefs about flu, pneumonia and related vaccines

The vast majority of the elderly recognized that flu is caused by a virus that is spread through direct or indirect contact with other humans such as inhaling germs transmitted by sneezing or coughing and having close physical contact. They usually use the term "cold" to describe influenza symptoms. They relate the cold/flu with cold weather during the winter.

When they were asked how they protect themselves, many of the participants answered: "I wear enough clothes when I am exposed to lower temperatures", "I wash my hands with soap or I use an alcohol based solution when I get in direct contact with persons who have flu symptoms", "I eat enough", "I eat honey and I drink lemon juice", "I take a siesta", "I take vitamins", "I eat cheese, milk and yogurt".

Those who live in the village associate the clean air of the village with a decreased possibility of getting infected from influenza. Furthermore, for this people the most consistent predictor of not being vaccinated was difficulties in accessing health care facilities. They had to travel a lot to see a doctor so they did not get vaccinated.

The majority of the elderly are aware about pneumonia as a major complication of influenza. They usually mention that flu could turn into pneumonia if certain preventive measures are not followed such as stay at home, avoid getting wet or chilled and eat enough.

The fourth category of questions included items that related to flu prevention by vaccination. Respondents were directly asked whether they think that flu is preventable or not. All vaccinated and not-vaccinated were convinced that influenza is a preventable disease if people take the adequate preventive measures as previously reported. The vast majority of the elderly of the sample were convinced that vaccination only protects the individuals from getting influenza. They ignored that it can also limit the spread of influenza in the general population.

## Source of information

During the '80s various municipalities initiated a pilot program to provide social services on neighbourhood basis to senior citizens by creating centres that are called KAPIs. KAPI is an acronym standing for Centres Open for the Protection of the Elderly. There, they can drink their coffee, talk with other elderly and have access to basic medical and nursing services such as drug prescription, vaccination and health promotion. Five participants attended a KAPI and therefore they were more likely to be immunized by a community nurse, due to their participation to the health promotion program.

In the province -mainly- Greek men visit daily the coffee houses "kaffenias". These "kaffenias" are usually small places with a few tables and chairs and a coffee bar. Men gather here to drink black coffee, talk politics, and share their health problems. Greek women, traditionally, stay home, cook, do housework and take care of the grandchildren. Ventures outside the home are usually for shopping and for attending the church. The vast majority of the participants from the rural regions has heard and has been reminded about the flu vaccine in the "kaffenio".

Some of the elderly have been informed from their physician during a formal visit for drug prescription. Other sources of information gathering were the television, the radio, the newspapers and the magazines. No one has ever received a personal invitation from their insurance, or from their GP. They commented it as a "science fiction" scenario.

All the participants supported the free provision of flu vaccination to the elderly who need it.

## Discussion

Influenza and pneumococcal infections are two serious public health problems that cause significant mortality and morbidity particularly in the elderly and other high-risk groups. This study demonstrates the main motives and barriers that explain why elderly people chose or avoid respectively to get vaccinated against influenza and pneumococcal disease. Almost two-thirds of the elderly participants have received flu vaccine last year. Some researchers report low vaccination rates and others report satisfactory proportions. [9](#), [10](#), [11](#), [12](#), [13](#), [14](#), [15](#), [19](#), [20](#), [21](#), [22](#), [23](#) In fact monitoring of

influenza vaccination uptake in Greece as well as in Europe is underdeveloped.<sup>9</sup> Only half of the European countries monitor and document the proportion of elderly vaccinated people. In Greece no official data are available.<sup>15</sup>

Many factors have a synergic relationship with the final behaviour of elderly participants. A key influence on specific elderly behaviour is physicians' recommendations, as some elderly mentioned that they did not get the flu because of a lack of a clear position on vaccination by their physician. Our findings are congruent with other studies.<sup>14, 18, 19, 20, 21, 23, 32</sup> This was also supported by other researchers regarding pneumococcal vaccination.<sup>17, 22</sup> Greek physicians and especially internal medical doctors play a central role in motivating elderly people to get a flu shot. An in depth investigation of this finding showed that elderly either forget to ask directly their physician, or have a negative attitude towards immunization and are negatively predisposed, or they do not recall what their physician advised them, or their physician really lack updated knowledge on the benefits of vaccination. In some cases physicians really fail to persuade their patients to get the flu shot, or even to provide adequate information and advice about the effectiveness and the side effects of influenza vaccine.<sup>14, 24, 26, 33</sup> On the other hand those elderly who visit their physician very often for screening purposes or for drug prescription were more likely to ask for an advice regarding flu shot and to get the flu vaccine. It has to be mentioned that in 85% of the European countries the GP is the main distribution channel for vaccine provision to the population at risk.<sup>9</sup> In some other countries public health Organizations and institutional physicians administer the vaccine. In Greece the system of vaccine provision is mixed as healthy elderly people can either buy the vaccine by themselves own without drug prescription from the physician, or they take it after a prescription from an internist, or a GP, in the hospital, in the health centre or in the KAPI. The persons who carry out flu shot is in most of the cases the nurse, the health visitor, the pharmacist, the unlicensed nurse or even a relative.

For many other researchers the strongest predictive factor of future flu shots is whether they received a flu shot this year or in the past.<sup>21, 28</sup> In our analysis this was also a main factor that contributed to the refusal of the vaccine this year or in the future as persons who experienced side effects or unpleasant reactions were also more likely to avoid future flu shots. This attitude combined with misperceptions and misunderstandings of the elderly about how the vaccine "works" explained why some elderly participants do not continue getting the vaccine. It is remarkable that the overwhelming majority of our participants think that flu vaccine causes influenza with minor symptoms.<sup>14</sup> The comments of the individuals in Table 2 reflect their beliefs regarding the mechanism of the flu shot.

Judging from the results obtained for the very old participants who live with their children or their partner, the most important factor for being vaccinated is "having a relative who delivered the vaccine at the beginning of autumn". The catalytic role of the family in the acceptance of influenza vaccine among the elderly people was previously supported<sup>14, 32</sup> and in case of Japan was attributed to cultural differences. The role of family was previously documented in Greek.<sup>34</sup> In fact the Greek elderly people adapt their behaviour according to the "values" of their family.<sup>35, 36</sup> Values are clear statements about what is right, wrong, good, bad; thus, they are within the realm of moral claims. Human values are often referred to as relatively stable beliefs about the personal or social desirability of certain behaviours and modes of existence known as "subjective norms" that depend on values for their ultimate support.<sup>36</sup> In fact elderly persons feel social and moral pressure to get the flu shot. This explains why elderly individuals justify either following or not following a norm that in our case is the acceptance of a flu vaccine. A usual comment of the participants was "I was vaccinated to protect my family from getting the flu" and shows that decision making is an interpersonal process between family members. The paternalist model of informal care provided from the daughters to their elderly parents determines their health behaviour. Greek elderly follow a tacit rule that could be articulated as something like: *"don't try to change your World; just receive whatever is provided to you"*. Elderly people grasp most rule of social behaviour in the same way that they grasp "rules" of grammar.<sup>36</sup>

All the participants counted a number of possible alternative ways that could prevent influenza, such as to stay at home, to avoid getting wet or chilled and to eat enough.<sup>27, 29</sup> In our study all the individuals assumed that flu vaccine is the most effective preventive measure. In another research<sup>27</sup> the percentage was 65%.

Overall, about one third of the participants have received influenza vaccination. Although they were in a risk group, as they suffered from chronic pulmonary or heart disease and diabetes, and so were eligible for pneumococcal vaccination no one has ever received a pneumococcal shot. Only 27.3% of the participants have heard about the pneumococcal vaccine at least once in their life but no one has received pneumococcal vaccine during his life. Not many of the individuals knew enough about the pneumococcal vaccine, a finding that is in accordance with the research of Santibanez.<sup>27</sup>

A leading reason for non vaccination reported from the elderly participants was vaccine unavailability.<sup>17, 25, 27, 37</sup> Recent problems with vaccine shortages have delayed or even limited the access to vaccination. In Greece during 2005-2006 influenza season the global media attention to the risk of an avian influenza pandemic has emerged the need of elderly and other high risk groups to get vaccinated. As a result there was an increased demand for vaccines. Some elderly participants commented their difficulties in finding the flu vaccine.

Prevalence rate for the refusal of influenza vaccination was relatively low (22.7%) in comparison with other studies<sup>16, 38, 39</sup> that mentioned a prevalence ranging from 12% to 16%. Non-immunized individuals perceived more barriers to getting vaccinated. Some elderly participants criticized the whole process of prescribing and getting the flu vaccine as they had to make an appointment with their physician, to prescribe the vaccine and then to buy it from the pharmacy and revisit the health centre or the physician to carry out the flu shot, a rather time consuming procedure. They found it very complicated and they perceived it as a barrier for vaccination. In Greece influenza vaccination is covered from the Health Insurance. We note that the cost per vaccine is about 5 €. Elderly participants aged less than 75 years old disliked the previous mentioned bureaucratic process and finally bought the vaccine themselves as they believed that the cost was too low. This finding suggests that a more client friendly procedure would be appreciated from this category of elderly people and would encourage them to receive the vaccine.

Some non vaccinated elderly participants from rural regions reported difficulty in reaching the medical centre or the physician as the main cause of their vaccination behaviour.<sup>40</sup> The geographic disparities faced by the elderly who live in the rural regions represent a major barrier to the appropriate delivery of the vaccine. The expanding use of home care visits in these regions would contribute to the increase in influenza and pneumococcal vaccination uptake.

Common reasons unvaccinated respondents cited for not receiving vaccination included the belief that it was unnecessary, the belief that vaccination would cause illness, and failure to think about it.<sup>25, 32</sup> The majority of older people do not consider themselves eligible for vaccine uptake as they do not perceive themselves to be at risk of serious consequences of influenza.<sup>39</sup> In the United States approximately 40% of Medicare beneficiaries who reported not receiving recent influenza and pneumococcal vaccinations cited concerns about the vaccine, including thinking it could cause influenza, could have side effects, or would not prevent influenza.<sup>17, 23</sup>

Many researchers have used several methods to improve the uptake of influenza vaccination among the elderly people. These methods varied from personal mailed letters,<sup>41, 42, 43, 44</sup> postcard influenza vaccine reminders (Armstrong, 1999) through mailed educational brochures,<sup>45</sup> to computerized reminders<sup>46</sup> and nurse-initiated protocols.<sup>47</sup> In Greece no automated or even a manual system for reminding eligibly elderly people to get the influenza or pneumococcal vaccine is available. Public health care makers should evaluate the potential of a reminder system as it is an effective measure to improve the vaccination uptake and to monitor the progress of the system. It is a measure that adds "value" to the consumer of health care services and assures his active participation to his health promotion.

There are limits to the study to be discussed here. We did not select a random sample. However, we decided to proceed with a convenient sample. A further concern was that due to language barriers, our sample consisted chiefly of persons fluent in spoken and written Greek. Despite these restrictions, we decided to proceed, as we believed that this study could serve as a precursor for future research.

## Conclusions

The study provides an insight and in-depth understanding of the factors that contribute to the elderly immunization decision making and demonstrates the appropriateness of the Health Belief Model as a theoretical framework that delimits all the prerequisites of a certain health seeking behaviour, which is influenza vaccine uptake. The results of the study provide implications for further research. Availability of sufficient vaccines to meet the needs of elderly is crucial in the beginning of autumn. Previous experience affords the opportunity to examine alternatives for future evidence based interventions. Focused health education programs incorporated in a national campaign to sensitize and educate seniors and their health care providers towards influenza and pneumonia are needed to increase the uptake of influenza and pneumococcal vaccination. The program should clarify the absence of systemic side-effects, the efficacy of the vaccine and the danger of the complications associated with influenza.

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