

Title: Increasing Healthcare Workers' (HCW) uptake of seasonal influenza vaccination (SIV) in a tertiary pediatric hospital in Greece with a 3-step, tailor-made multifaceted strategy

1. Background

Relevance: Outbreaks of vaccine preventable diseases among patients have serious and costly consequences among patients. Seasonal Influenza Vaccination (SIV) of healthcare workers (HCW) is of great importance and any action taken to promote vaccination and counter growing vaccine hesitancy can lead to better outcomes for hospitalized patients and prevent influenza outbreaks in the community.

Every influenza season, hundreds of Greek people die from complications caused by influenza¹, especially the very young, very old, and people with chronic medical conditions who are at increased risk of severe disease and influenza-related complications. Hospitalized immune-suppressed children are also at high risk for severe influenza infection.

The 2009 Council of the European Union's Recommendation on Seasonal Influenza Vaccination (2009/1019/EU) encouraged countries to implement measures that would increase seasonal influenza vaccination uptake to at least 75% for defined older age groups and other high-risk groups by the 2014-2015 winter season. Health care workers (HCW) were one of the identified high-risk groups because staff immunization against transmissible infections is considered an important part of maintaining a safe patient care environment.

Specifically, vaccination of HCWs with the seasonal flu vaccine every year constitutes a significant infection prevention measure, which ensures their own safety but also promotes the safety of their patients who many times are either unable to develop protective immunity after vaccination or are simply not eligible to be vaccinated.

Many studies have described the serious and costly consequences of outbreaks of vaccine preventable disease among patients, including influenza. Despite the evidence, recent data from Greece indicate that only an average of 10.93% of Greek HCWs in hospitals receive annual influenza vaccination², although many hospitals offer the vaccine to their employees free-of-charge. In a recent ECDC report³ Influenza vaccination rates among healthcare workers for the 2013–14 and/or 2014–

¹ Hellenic Centre for Disease Control and Prevention (KEELPNO) yearly reports

² Hellenic Centre for Disease Control and Prevention (KEELPNO) October 2016 report on HCW's SIV

³ European Centre for Disease Prevention and Control. Seasonal influenza vaccination and antiviral use in Europe – Overview of vaccination recommendations and coverage rates in the EU Member States for the 2013–14 and 2014–15 influenza seasons. Stockholm: ECDC; 2016.

2015 seasons were provided by 13 Member States and were ranging from 5% to 54.9%, with the median in 2014–15 at 24% and Greece reporting a 10.72%.

Studies in the U.S. suggest that both logistical factors and personal beliefs contribute to HCWs' decisions not to receive the annual influenza vaccine. Examples of frequently reported barriers among HCWs include concerns about adverse reactions, low perceived vaccine efficacy, low perceived susceptibility to influenza infection and inconvenience.

In Greece, little is known about the factors that contribute to the very low rate of HCW influenza vaccination locally and even less is known about the specific determinants of these factors in pediatric hospitals.

2. Case study

In Greece seasonal influenza vaccination is recommended but voluntary for healthcare workers, it is at their individual free will to decide on being vaccinated and there is no penalty for not getting the vaccine. Each year, seasonal influenza vaccines are provided free at the hospital.

As the SIV rates of HCW in Greece are in such low levels, we decided to develop a tailor-made approach to tackling this in the setting of a children's hospital. In the process we would achieve to develop a multifaceted strategy that can be applied to each hospital separately at an institutional level or used as a model for a national program.

More importantly, we wanted to use the experience gained from this project to promote similar programs in other hospitals in Greece as well as serve as a base for further improvement of other vaccination rates in healthcare settings.

3. Action proposed

In the fall of 2015, we contacted the infection control committee of "Agia Sophia Children's Hospital" in Athens (the director and the Infection control nurses) and suggested to collaborate on an initiative that would address the problem of low SIV rates among HCWs at this particular hospital.

Our plan had a three-step approach: Identify the factors associated with HCW non-vaccination; design a multifaceted intervention to increase HCW influenza vaccination implement and evaluation of the intervention

Step 1: Identify the factors associated with HCW non-vaccination

Duration: Influenza Vaccination Period 2015 – 2016 [October 2015 – April 2016]

Firstly, we evaluated attitudes, knowledge as well as specific barriers and facilitators for seasonal flu vaccination among HCWs to inform the development of localized interventions to increase seasonal flu vaccination among HCWs who practice in pediatric settings. Our main 4 objectives for this step were to:

- a. assess the knowledge and perceptions of pediatric HCWs on seasonal flu vaccination;
- b. identify specific barriers and facilitators to seasonal flu vaccination among pediatric HCWs;
- c. identify and prioritize HCW target groups for SIV
- d. identify potential interventions to increase the rate of HCW vaccination against seasonal flu and explore their acceptability and feasibility.

Step 2: Designing a multi-faceted strategy

Duration: May 2016 – September 2016

Use the knowledge acquired from the previous step to design a tailor-made multifaceted strategy to promote vaccination.

Step 3: Implementation and evaluation of the intervention

Duration: Influenza Vaccination Period 2016-2017 [October 2016 – April 2017]

Implement the designed strategy during the SIV period of 2016-2017 and monitor rates of HCW vaccination with seasonal flu vaccine through IC records.

4. Methodology

For the purpose of this study HCW were defined as all persons employed in a health care facility with or without involvement in direct patient care and regardless of employment status (i.e. permanent, temporary or contract staff). In this group were included clinical HCWs (doctors, nurses, physiotherapists) and non-clinical staff (e.g cleaning staff, kitchen personnel). KEELPNO defines the seasonal flu period to be between the months of October and April with high activity between the months of December and February.

A cross-sectional anonymous survey of HCWs was conducted during the 2015-2016 influenza season. The survey instrument consisted of 16 multiple choice questions and included vignettes with the presentation of real-life scenarios. It had the following 5 sections (number of questions per section in parenthesis)

1. Demographic questions (4)
2. Attitudes and perceptions towards influenza vaccination, facilitators and barriers for vaccination at the hospital setting (5)

3. Self-reported intention to vaccinate in 2015, reason for intention, and trusted communication media (3)
4. Vignettes to assess knowledge on seasonal influenza vaccination. (3)
5. Views on mandatory vaccination (1)

It was offered in person to HCWs (doctors, nurses, cleaning and food services, administrative personnel) at their workplaces who could freely decide to take part. The team involved in the project carried out visits to all units and departments at the hospital offering the questionnaire to the workers. Refusals were noted to allow for response rate calculation. The survey was offered in the same workplace in more than one occasion to address rotating shifts and increase diffusion.

A multifaceted intervention was designed based on the findings, to improve HCW SIV uptake.

In the fall of 2016 we implemented the intervention that included:

- a. 2-page Q-and-A leaflet, distributed throughout the hospital, addressing the most common myths about seasonal influenza vaccine's safety and effectiveness;
- b. Four visits by the Infection Control (IC) director and nurses to each unit to discuss the importance of SIV and vaccinate on-site;
- c. Regular SIV clinic hours at the hospital's IC office were established and advertised; and
- d. A sticker indicating they had been vaccinated was handed out to all HCWs after SIV.

Rates of HCW SIV were tracked through IC records.

The intervention material is presented in the Appendix.

5. Results

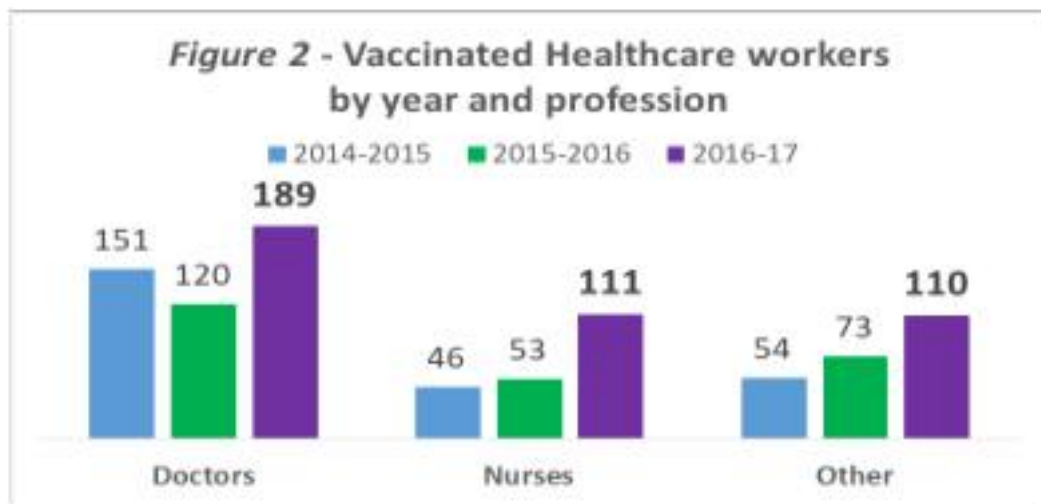
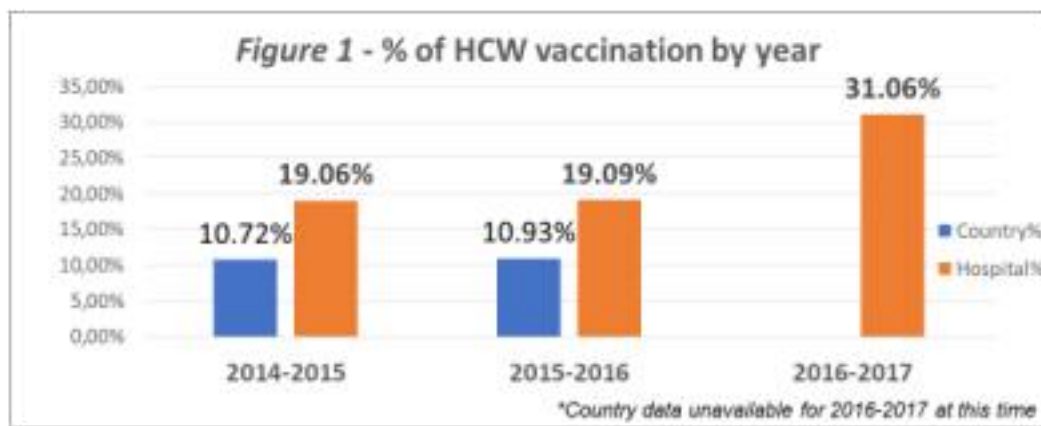
Our survey was responded by 352 participants (response rate ~65%): 106 doctors, 145 nurses, and 101 other hospital staff. Overall, 64% of participants had not been vaccinated in the previous 3 years and only 14.2% of the respondents received influenza vaccine annually. The 3 main findings of our survey were:

- a. Non-vaccination rates were significantly higher among nurses (75.7%) and cleaning/food service workers (72.7%), compared to doctors (40%) ($P < 0.001$).

- b. The most commonly cited reasons for non-vaccination were misconceptions and concerns regarding vaccine side-effects (40.1%) and ineffectiveness (26.6%); and
- c. Less than half of HCW (48.7%) stated that they had enough information about where and when they could get vaccinated at the hospital.

Surprisingly only 26.6% strongly disagreed with a mandatory administrative directive for vaccination.

In January 2017, the hospital's vaccination rate was at 31.06% - much higher than previous years of around 19% (Figure 1). The vaccination rate increased in all types of HCW with the greatest increase in nurses (2-fold increase) (Figure 2).



6. Conclusions

A simple, low cost tailor-made vaccination strategy can lead to an increase of SIV uptake.

Intersectoral collaboration

CLEO (Center for Clinical Epidemiology and Outcomes Research) established a working group which included the infection control nurses and the Head of the infection control at Agia Sophia Children's Hospital, a tertiary children's hospital in Athens, Greece. The working group collaborated on the design, execution and implementation of a seasonal influenza vaccination strategy.

Innovation and creativity

The working group analyzed the results of the survey and created three communication tools/instruments. Our 2-paged Q&A explained in simple language the importance of SIV among healthcare workers and at the same time addressed the misconceptions identified regarding the vaccine. The sticker that indicated that someone had been vaccinated for the 2016-17 season (see appendix), even though it was a simple, low-cost 'reward' for the ones that were vaccinated, was received with enthusiasm from the hospital staff. It also worked as a promotion tool for the vaccination campaign as they were worn by the workers with pride. Finally, the poster for the SIV hours at the office promoted at the vaccination with messages on personal safety and the safety of the others and subtly communicated the need to vaccinate each year (addressing another misconception that was identified with the survey of the previous year).

Most importantly, the pro-active approach with a mobile unit to vaccinate on-site and at the same time hand out the Q&A, discuss with the HCWs and address any concerns right away proved effective in promoting the vaccination and in vaccinating.

Sustainability

Throughout the whole process of this initiative, the infection control nurses and the head of the infection control committee at Agia Sophia Children's Hospital were involved. In this manner they now possess the know-how on how assess barriers and facilitators on SIV in their setting, how to design an intervention based on information acquired and how to implement and adapt a multifaceted strategy. The tools developed and used during the SIV campaign can be used each year. Additionally some could be easily adapted to facilitate future campaigns on health issues.

During the campaign of the fall of 2016 we raised awareness on the significance of SIV among healthcare workers, but most importantly among key stakeholders in the hospital. The hospital CEO, the head of the medical office, the head of the pharmacy and other significant members of the administration supported the effort and were happy to take pictures with the SIV staff to be used in social media and on the hospital's website. These alliances will be sure to help future efforts and campaigns.

Already the IC nurses and the head of the committee are making plans for next season's (2017-2018) campaign that will include the use of social media and internet and are designing a way to track vaccination side effects which will be used to tackle vaccine hesitancy due to side effects.

Transferability

The experience gained from this project can be used to promote similar programs in adult and children's hospitals in Greece as well as serve as a base for further improvement of other vaccination rates in healthcare settings or the community. Tools developed can be used in a hospital setting but also in the community.

Our results were presented at the European Society for Pediatric Infectious Diseases both in 2016 (Brighton, UK) and 2017 (Madrid, Spain) and generated some talk among peers.

I. 2-page Q-and-A leaflet

ΓΡΙΠΗ ΚΑΙ ΑΝΤΙΓΡΙΠΙΚΟ ΕΜΒΟΛΙΟ ΕΡΩΤΗΣΕΙΣ & ΑΠΑΝΤΗΣΕΙΣ

ΕΠΙΧΗΜΑΤΟΓΕΝΗ ΔΙΑΚΟΜΗ (2015-2016):

433 αθλητές προσέλασαν στην αποστολή εθνικού ομίλου γυναικών. Τα 408 νοσηλεύθηκαν σε ΜΚΟ. 25 νοσηλεύθηκαν στο σπίτι. 187 (43%) από τις 408 νοσηλεύθηκαν σε ΜΚΟ. Τα 408 νοσηλεύθηκαν στο σπίτι. 187 (43%) από τις 408 νοσηλεύθηκαν σε ΜΚΟ. Τα 408 νοσηλεύθηκαν στο σπίτι. 187 (43%) από τις 408 νοσηλεύθηκαν σε ΜΚΟ.

Ε. Είναι το αντιγριπικό εμβόλιο αποτελεσματικό;

Α. Προλαμβάνει την ανάπτυξη μέρων ως σοβαρών ασθενειών από τον ιό της γρίπης σε περίπου 70 στα 100 άτομα που τα λαμβάνουν. Παράδειγμα που μπορεί να μην παρέρει πλήρη προστασία από τη γρίπη, με όσους οι διαταραχές και τη σοβαρότητα της λαμβάνει.

Ε. Μπορώ να πάρω γρίπη από εμβόλιο;

Α. Όχι, το εμβόλιο δεν μπορεί να προκαλέσει γρίπη. Το εμβόλιο της γρίπης παραμένει αδρανειακή μορφή και ως εκ τούτου δεν προκαλεί νόσηση.

Ε. Έχω γιατί μπορεί δεν ασθματικός κατά μέτρο το εμβόλιο;

Α. Ναι. Το αντιγριπικό εμβόλιο μπορεί να προκαλέσει πόνο, ερυθρότητα, εμβόσπυρα στα σημεία της ένεσης. Τα συμπτώματα αυτά είναι το πιο συνηθισμένο και εξαφανίζονται σε δύο μέρες. Μερικοί άνθρωποι μπορεί να παρουσιάσουν αλλεργική αντίδραση στην αλάτι που περιέχει το εμβόλιο. Αν κάποιος έχει αλλεργία σε οποιοδήποτε από τα συστατικά του εμβολίου, πρέπει να μιλήσει με τον γιατρό πριν το λάβει.

Ε. Υπάρχουν άνθρωποι που σέβονται το ανοσογενικό εμβόλιο, γιατί;

Α. Υπάρχουν άνθρωποι που σέβονται το ανοσογενικό εμβόλιο, γιατί;

Α. 1. Όλοι ανεξαιρέτως είμαστε ευάλωτοι στην ασθένεια της γρίπης. 2. Η γρίπη μπορεί να προκαλέσει σοβαρά προβλήματα υγείας, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο. 3. Η γρίπη μπορεί να προκαλέσει επιπλοκές, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο. 4. Η γρίπη μπορεί να προκαλέσει επιπλοκές, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο.

Ε. Είναι το αντιγριπικό εμβόλιο αποτελεσματικό;

Α. Προλαμβάνει την ανάπτυξη μέρων ως σοβαρών ασθενειών από τον ιό της γρίπης σε περίπου 70 στα 100 άτομα που τα λαμβάνουν. Παράδειγμα που μπορεί να μην παρέρει πλήρη προστασία από τη γρίπη, με όσους οι διαταραχές και τη σοβαρότητα της λαμβάνει.

Ε. Μπορώ να πάρω γρίπη από εμβόλιο;

Α. Όχι, το εμβόλιο δεν μπορεί να προκαλέσει γρίπη. Το εμβόλιο της γρίπης παραμένει αδρανειακή μορφή και ως εκ τούτου δεν προκαλεί νόσηση.

Ε. Έχω γιατί μπορεί δεν ασθματικός κατά μέτρο το εμβόλιο;

Α. Ναι. Το αντιγριπικό εμβόλιο μπορεί να προκαλέσει πόνο, ερυθρότητα, εμβόσπυρα στα σημεία της ένεσης. Τα συμπτώματα αυτά είναι το πιο συνηθισμένο και εξαφανίζονται σε δύο μέρες. Μερικοί άνθρωποι μπορεί να παρουσιάσουν αλλεργική αντίδραση στην αλάτι που περιέχει το εμβόλιο. Αν κάποιος έχει αλλεργία σε οποιοδήποτε από τα συστατικά του εμβολίου, πρέπει να μιλήσει με τον γιατρό πριν το λάβει.

Ε. Υπάρχουν άνθρωποι που σέβονται το ανοσογενικό εμβόλιο, γιατί;

Α. Υπάρχουν άνθρωποι που σέβονται το ανοσογενικό εμβόλιο, γιατί;

Α. 1. Όλοι ανεξαιρέτως είμαστε ευάλωτοι στην ασθένεια της γρίπης. 2. Η γρίπη μπορεί να προκαλέσει σοβαρά προβλήματα υγείας, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο. 3. Η γρίπη μπορεί να προκαλέσει επιπλοκές, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο. 4. Η γρίπη μπορεί να προκαλέσει επιπλοκές, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο.

Ε. Είναι το αντιγριπικό εμβόλιο αποτελεσματικό;

Α. Προλαμβάνει την ανάπτυξη μέρων ως σοβαρών ασθενειών από τον ιό της γρίπης σε περίπου 70 στα 100 άτομα που τα λαμβάνουν. Παράδειγμα που μπορεί να μην παρέρει πλήρη προστασία από τη γρίπη, με όσους οι διαταραχές και τη σοβαρότητα της λαμβάνει.

Ε. Μπορώ να πάρω γρίπη από εμβόλιο;

Α. Όχι, το εμβόλιο δεν μπορεί να προκαλέσει γρίπη. Το εμβόλιο της γρίπης παραμένει αδρανειακή μορφή και ως εκ τούτου δεν προκαλεί νόσηση.

Ε. Έχω γιατί μπορεί δεν ασθματικός κατά μέτρο το εμβόλιο;

Α. Ναι. Το αντιγριπικό εμβόλιο μπορεί να προκαλέσει πόνο, ερυθρότητα, εμβόσπυρα στα σημεία της ένεσης. Τα συμπτώματα αυτά είναι το πιο συνηθισμένο και εξαφανίζονται σε δύο μέρες. Μερικοί άνθρωποι μπορεί να παρουσιάσουν αλλεργική αντίδραση στην αλάτι που περιέχει το εμβόλιο. Αν κάποιος έχει αλλεργία σε οποιοδήποτε από τα συστατικά του εμβολίου, πρέπει να μιλήσει με τον γιατρό πριν το λάβει.

Ε. Υπάρχουν άνθρωποι που σέβονται το ανοσογενικό εμβόλιο, γιατί;

Α. Υπάρχουν άνθρωποι που σέβονται το ανοσογενικό εμβόλιο, γιατί;

Α. 1. Όλοι ανεξαιρέτως είμαστε ευάλωτοι στην ασθένεια της γρίπης. 2. Η γρίπη μπορεί να προκαλέσει σοβαρά προβλήματα υγείας, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο. 3. Η γρίπη μπορεί να προκαλέσει επιπλοκές, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο. 4. Η γρίπη μπορεί να προκαλέσει επιπλοκές, όπως πνευμονία, καρδιακή προσβολή, νεφρική ανεπάρκεια και θάνατο.

- II. Regular SIV clinic hours at the hospital's IC office were established and advertised

**ΚΑΜΠΑΝΙΑ ΑΝΤΙΓΡΙΠΙΚΟΥ ΕΜΒΟΛΙΑΣΜΟΥ
2016-2017**

**Προστάτεψε τον εαυτό σου
Προστάτεψε τους γύρω σου**

Δ	Τ	Τ	Π	Π
7	8	9	10	11
14	15	16	17	18
21	22	23	24	25
28	29	30		

Διάλεξε μια μέρα για να
κάνεις το εμβόλιο

**Καθημερινά
08:00 – 10:00 πμ**

Στο Γραφείο Νοσοκομειακών
Λοιμώξεων

1^{ος} όροφος – Γραφείο 4

**Φρόντισε για τον αντιγριπικό εμβολιασμό σου
κάθε χρόνο**

Messages:

- “Protect yourself, Protect the ones around you”
“Pick a day for your vaccine”
“Take care of your influenza vaccination each year”

- III. A sticker indicating they had been vaccinated was handed out to all HCWs after SIV



(Reads: Influenza Vaccine 2016-2017)

