ORIGINAL RESEARCH

Effectiveness of Patient-Held Paper Immunization Record and Immunization Express Lane at the Family and Community Medicine Outpatient Department in Increasing Utilization of Recommended Adult Vaccination*

Amalia E. Bernales, MD and Marishiel Mejia-Samonte, MD, DFM

Background: Significant efforts are being done to lessen the burden of vaccine-preventable diseases. However, missed opportunities for vaccination due to unfavorable clinic hours and the long waits at the clinic deter adults from obtaining vaccinations. Likewise, adult patients are rarely provided with their own vaccination record, which could heighten their awareness and remind them of the recommended vaccines they need to obtain, leading to being not vaccinated. At the outpatient clinic, promoting high-impact and cost-effective preventive services such as vaccination will not only save monetary expenses but more importantly, will lead to incidence reduction of vaccine –preventable diseases.

Objective: The objective of the study was to determine effectiveness of Patient-Held Paper Immunization Record and Immunization Express Lane in increasing the vaccination rate among adult patients at FMC OPD.

Subjectives and Setting: Study population consisted of adult patients at the Family Medicine Clinic (FMC)-OPD, with the following criteria: ages 19 years old and above regardless of co-morbidities and vaccination status; those who are consulting as new or follow-up patient at FMC-OPD from March- May 2016.

Design: The study utilized a before-and-after study design on the effectiveness of Patient-Held Immunization Record and Immunization Express Lane in increasing vaccination utilization among adult patients at FMC-OPD.

Data Collection: To determine baseline vaccination rate, chart reviews were done after each consult day. The sociodemographic data and vaccination data were gathered using the data obtained from the vaccination logbook.

Results: 66 adult patients who were vaccinated during the implementation of vaccination strategies were mostly elderly, married, with no work, college graduate, Manila resident, known hypertensive, informed by physician regarding vaccination, and obtained vaccination during clinic consults. Pneumococcal vaccine had the highest proportion (84%) of administered vaccine. Prior to the intervention, baseline vaccination rate yielded 0.04%. After implementation of the combined vaccination strategies, the generated vaccination was 1.17%. There was a 28.25% increase in vaccination rate.

Conclusion: The use of combined vaccination strategies, consisting of Patient-Held Immunization Record and Immunization Express Lane was effective in increasing the vaccination rate among adult patients at the FMC-OPD.

Key words: immunization, adult vaccination

* From the Department of Family and Community Medicine, Philippine General Hospital, University of the Philippines Manila

Introduction

Influenza, pneumococcal, Human Papilloma virus, and Hepatitis B infections are some of the vaccine-preventable diseases which could lead to substantial chronic illnesses, hospitalizations, and even premature death. Wong et al. reported that an estimate of 7.3 million Filipinos suffers from chronic HBV infection.[1] In addition, Hepatitis B infection accounts for 60% of hepatocellular carcinoma patients which affect more than 7000 people annually.[2] The World Health Organization documented that in 2011, deaths due to influenza and pneumonia reached 46,900 or 11.3% of total deaths in the Philippines. Moreover, the Philippine Cancer Society and Cancer Registry in 2005 revealed that 7,277 new cases of cervical cancer were known with 3,807 associated deaths from the disease. The economic impact of vaccine preventable diseases cannot be disregarded as well. Infectious Diseases Society of America estimated 10 billion dollars per annum is being utilized to address all these health concern.[3] All of these diseases are highly preventable; however, they remain a health and economic burden to the country.

Significant efforts are being done to lessen the burden of these vaccine-preventable diseases. Immunization has not only been a valuable public health intervention but it has also greatly decreased mortality and morbidity related to vaccine-preventable diseases.[4] The most effective means in incidence reduction of vaccine –preventable diseases is through vaccine delivery.[5]

Vaccine delivery in the Philippines is predominantly directed to cover childhood immunizations, for which vaccination implementation is routine and mandatory. Extended Program Immunization (EPI) is the known immunization program to ensure pediatric population is vaccinated. Conversely, vaccine delivery in adults is largely voluntary. It can be noted that local data on adult vaccination rates were limited. Despite the recognized cost-effectiveness and efficacy of adult vaccinations, it remains to be underutilized and falls way behind from the target vaccination coverage. Johnson, et al. (2008) concluded in a study that in order to improve adult vaccination coverage there is a need to better understand the reasons why adults do not get vaccinated. CDC emphasized missed opportunities for vaccination due to unfavorable clinic hour for parents as well as working adults and the long waits at the clinic. Also, Sanford, et al. highlighted that due to fragmented care of adults there is lack of immunization record of the patient that is accessible to the provider.[6] Likewise, adult patients are rarely provided with their own vaccination record, which could heighten their awareness and remind them of the recommended vaccines they need to obtain, leading to being not vaccinated.

Physicians are likely to utilize evidence-based strategies in increasing adult vaccination rates.[7] Vaccination interventions that improve the demands of patient and vaccine accessibility and surmount practical issues of vaccination delivery may improve vaccination rates among adult population. One of these interventions is the vaccination-only clinics which could reduce missed opportunity of vaccine delivery. Improving accessibility heightens vaccine availability in the medical setting as well as public clinic settings by offering increased hours of vaccination delivery and reduction of administrative barriers in acquiring vaccination services in the clinic setting (e.g. "drop-in" clinic or an "express lane" vaccination service).[8]

Due to the missed opportunities of the vaccination for adult population, one proven strategy that may improve vaccination coverage is the patient-held immunization record. Patient-held paper immunization records provide patients and families the vaccination history of the patient. It raises the awareness of patients on which vaccines are due. Equally, it provides physicians the vaccination status of the patient.[9] According to Guide for Community Preventive Services, the retention and. update of the client-held immunization card can be an essential means to the reduction of missed opportunities of vaccination. In a study done by Turner et al, patient-carried reminder card was effective in improving influenza vaccinations (47% vs 29%).[10] In the pediatric population, caregiver-held immunization card acts on both the physician and the caregiver of the pediatric patient. For physicians, the immunization record provides the current vaccination status of the patient. Likewise, for

the caregiver of the patient there is a sense of ownership over the patient's health maintenance and prompts the caregiver the due vaccines of the patient.

Two studies discussed that immunization strategies should be combined rather than used alone to heighten its impact in increasing vaccination rates.[11-12] In a study done by Szilagyi, et al. combined vaccination strategies utilized at inner-city primary care offices significantly increased vaccination coverage among elderly, compared to the vaccination rate of control group which utilized standard of care.[13]

Family and Community Medicine is in the forefront of preventive care. Immunization of patients is a primary component of this anticipatory measure. However, immunization of adults has been overlooked since more attention is being given to the medical concerns and issues of the patients. The focus of care is on disease treatment than mitigation of its onset. At the outpatient clinic, promoting high-impact and cost-effective preventive services such as vaccination will not only save monetary expenses but more importantly, will improve the health status of the adult population. This healthcare gap can be addressed at FMC since the greatest number of adult patients is being triaged daily to the FMC and with the constant growth of patients; the clinic is an avenue to close the gap. In addition, adult vaccination is an essential means to lessen vaccine-preventable diseases. However, there has not been an organized structure nor vaccination strategies implemented to accomplish such preventive goals for the patients. Hence, there is a need to develop and implement vaccination strategies to address this healthcare need. Considering such need, the implementation of combined vaccination strategies consisting of patient-held immunization record and Immunization Express Lane to increase vaccination rate was conducted at the FMC OPD.

Among adult patients at Family and Community Medicine - Outpatient Department, will a combined vaccination strategy of Patient-Held Paper Immunization Record and Immunization Express Lane be effective in increasing utilization of recommended adult vaccination?

The general objective was to determine the effectiveness of Patient-Held Paper Immunization Record and Immunization Express Lane in increasing the vaccination rate among adult patients at FMC OPD

Specific objectives were:

1. To determine the vaccination utilization among adult patients at FMC OPD before and after implementation of the combined vaccination strategies
2. To compare the vaccination rates between adult patients who utilized the Immunization Express Lane even without FMC consult versus patients who get vaccinated during medical consults
3. To determine the different vaccines utilized during the combined vaccination intervention
4. To describe the demographics of patients (age, gender, civil status, educational attainment, residence, occupation, co-morbidities) who opted to be vaccinated during the implementation of the combined vaccination strategies

Materials and Methods

Study Design

The study utilized a before-and-after study design on the effectiveness of Patient-Held Immunization Record and Immunization Express Lane in increasing vaccination utilization among adult patients at FMC-OPD.

Study Population

Study population consisted of adult patients consulting at FMC-OPD, guided with the following criteria: ages 19 years old and above regardless of co-morbidities and vaccination status; those who are consulting as new or follow-up patient at FMC-OPD from January- May 2016.

In contrast, the exclusion criteria were as follows: history of allergic reactions to vaccines, moderate to severe

illness on vaccination day, immune-compromised state, and patients from other specialty clinics but non FMC patients, PGH employees, and students requesting for vaccinations.

Study Setting

This study was conducted at the FMC-OPD, UP-PGH. The clinic offers free healthcare consults. The doctors who attend to the patients are Family and Community Medicine residents, UPCM and post-graduate medical interns.

Study Intervention

Combined vaccination strategies were used and the two components were Patient-held immunization record and Immunization Express Lane.

Patient-held Immunization Record

Patient-held immunization record included the recommended adult vaccines and vaccination history of the patient. On the other hand, the outside cover of the record offered patients a summary table of vaccines with its corresponding vaccine-preventable diseases and the target population.

Immunization Express Lane

The immunization express lane was a service offered for those FMC patients who are walk-in patients. Clinic appointments or consults on the day itself were not necessary to be vaccinated in this lane. This service was also offered to those who wanted to be vaccinated during their medical consult at FMC.

Study Procedures

Obtaining Baseline Vaccination Rate at FMC-OPD

Baseline vaccination rate was obtained by a research assistant who was provided with a monthly tally sheet wherein he reviewed charts and recorded the number of adult vaccinated at FMC-OPD for 2 consecutive months (January to February 2016).

Baseline vaccination rate was computed using the proportion of the total number of adult patients vaccinated over the total number of adult patients who consulted at FMC OPD for two consecutive months prior to implementation of the combined vaccination strategies.

Handing of Patient-Held Immunization Record

A research assistant was positioned at the nurse's discharge area to fill up and hand the patient-held immunization record to the patient after each consult for new and follow-up patients. In addition, the research assistant emphasized the importance of vaccinations and recommended vaccines according to the patient's needs as guided by the target population for each recommended vaccines for adults seen at the back cover of the immunization record. Patients were also instructed to bring the record if they wanted to avail of the vaccination at Immunization Express Lane. Qualifications of the research assistant included: age of 20 years and above, college graduate of any healthcare-related course, preferably with knowledge and experience on vaccines and vaccination. Prior to handing of immunization record and vaccine recommendation, a return demonstration to the primary investigator was done by the research assistant regarding vaccine recommendation based on the guide found on the outside cover of the immunization record.

The record included the name, sex, birthdate, co-morbidities, adverse vaccine reactions, current vaccination status of the patient, list of recommended vaccines with vaccination date, vaccinator, and vaccination remarks. The back cover of the record included a summary table of recommended vaccines and its target population, and vaccination schedule. Likewise, the importance of vaccinations and how vaccine works was also seen at the back cover. Specifically if hepatitis B and HPV vaccine were recommended to the patient, Pap smear and HBsAg screening results were required prior to vaccination.

Promotion of Immunization Express Lane

Promotion of Immunization Express Lane consisted of poster display and invitation to be vaccinated.

1. Poster Display

A 4 x 2 poster was placed beside the door of Rm 118 and Rm 119 and the walls of Rm 118 and Rm 119. It was displayed for the two-month implementation of the combined vaccination strategies.

The poster contained the title of the vaccination strategy (Immunization Express Lane), the schedule of vaccination and where the vaccination can be availed.

Invitation to be Vaccinated

After handing the patient-held immunization record, the patient was actively informed and encouraged by the research assistant to be vaccinated through the Immunization Express Lane. It was emphasized that patients need not wait in line to be vaccinated and may be vaccinated even without appointment (or as walk-in patient for vaccination only).

Conduct of Immunization Express Lane

Location, Personnel

A vaccination area at the FMC-OPD was designated to be the Immunization Express Lane. The area was a cubicle behind the nurse's discharge area at Rm 118. The primary investigator was the one to administer the vaccines and was available during clinic hours from 8 am to 4 pm, Mondays to Fridays.

Vaccines, Vaccine Storage, Vaccine Payment

During clinic hours, a small number (2-3 units per vaccine) of the recommended vaccines such as pneumococcal, influenza, tetanus, diphtheria, acellular pertussis (Tdap), Hepatitis B, Human Papilloma Virus (HPV), Measles, Mumps, Rubella (MMR), and Varicella were properly stored at a biologic-grade, full-sized refrigerator positioned at the vaccination area. For the purpose of the study, vaccine availability at the clinic was maintained. Patients were given the option to purchase the vaccine at the clinic or outside but the administration was still at the Immunization Express Lane. If patient opted to procure the vaccine at the Immunization Express Lane, the receipt from the source of vaccine was given to the patient. The list of vaccine cost was placed on the nurse's discharge area and the vaccination area of the Immunization Express Lane.

Vaccination Prerequisites

Adult FMC patients requesting to be vaccinated during consults or walk-in patients was seen and vaccinated at the Immunization Express Lane. Patients were required to bring immunization record. Without the record, patients were not able to avail of the vaccination service.

For HPV vaccine, a negative Pap smear results was needed prior to the vaccination. For Hepatitis B vaccine, HbsAg and antiHbs results were required prior to vaccination. The prerequisites for these vaccines were mentioned during the handing of patient held immunization record.

Informed Consent and Vaccine Administration

During vaccination, the patient presented the patient-held immunization record at the vaccination area of the Immunization Express Lane. The primary investigator screened the patient for presence of any contraindications to vaccination. A checklist of vaccine contraindications was provided.

If patient will be screened to have any contraindications to vaccination, patient was advised accordingly to the contraindication presented. Once cleared from any contraindications, patient was then be asked by the primary investigator to voluntarily sign the informed consent.

Vaccine procurement may come from Immunization express Lane or from outside the clinic. Once with vaccine, the primary investigator prepared the vaccine (and diluent) and loaded to its appropriate syringe. The patient's injection site (IM/SC) was prepared with application of an antiseptic (alcohol). The vaccine was then delivered to its injection

site by the vaccinator. The needle and syringe were safely disposed.

After vaccination, patient was asked to remain at the clinic for 10-15 minutes to observe any adverse vaccine reaction. If none, patient was discharged with an updated and signed immunization record.

Vaccine Adverse Event

In case of adverse event, patient was managed by the primary investigator. For mild to moderate reaction, patient was given an oral or intramuscular antihistamine (diphenhydramine). Once patient's symptoms resolved or patient's condition was assessed to be stable, the patient was sent home.

For severe cases of vaccine reaction, primary investigator initially managed the patient and assessed the need for further care. Additional management was coordinated with Ambulatory Care Unit or Acute Care Unit of the emergency room according to the severity of the adverse reaction.

All adverse events during the implementation of the intervention were documented in the immunization record and were reported accordingly.

Documentation of Vaccination

Vaccination logbook was accomplished by the primary investigator. The logbook recorded the vaccinated patients each day. It included the name, age, gender, civil status, educational attainment, residence, occupation, type of vaccine administered to the patient, if patient came from FMC consult or walk-in patient for vaccination, and adverse vaccine reaction if present.

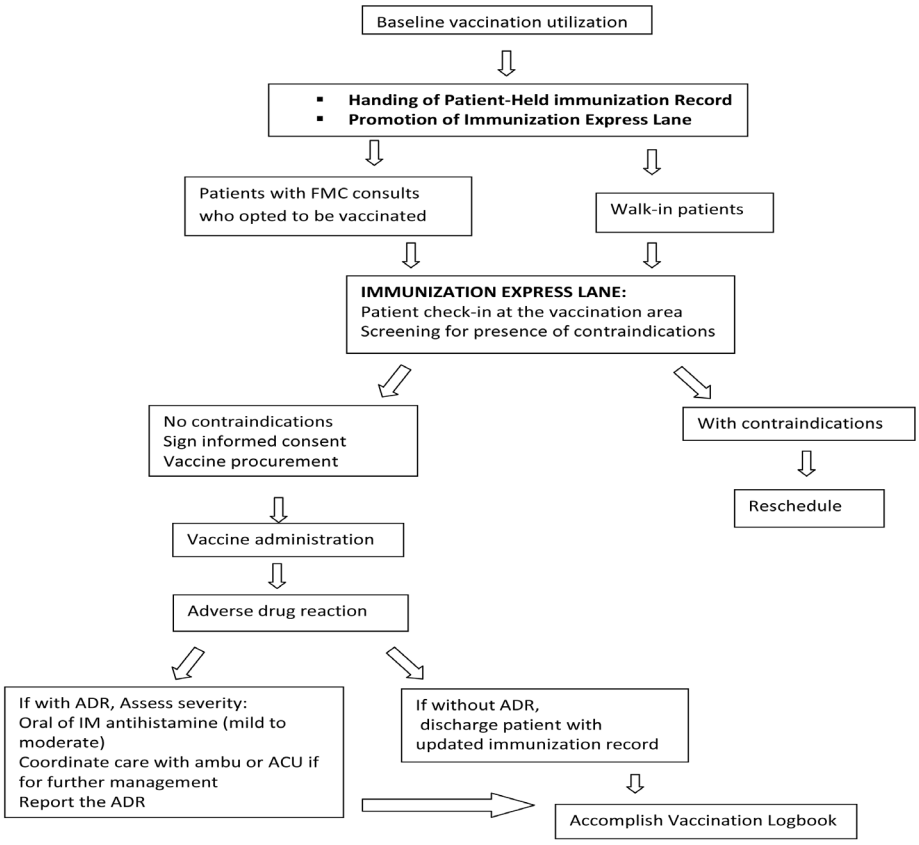

Figure 1. Flow chart of the implementation of combined vaccination strategies (Patient-Held Immunization Record and Immunization Express Lane)

Data Collection

Data collection started after informed consent has been given and voluntarily signed. The sociodemographic data and clinical data were gathered using the data obtained from the vaccination logbook. All outcomes were recorded in the data collection forms.

Data Encoding and Analysis

The data were encoded using Microsoft Excel. SPSS program was utilized to analyze frequencies and percentages.

Outcomes

Primary Outcomes:

1. Adult vaccination rate after implementation of the combined strategies:

$$\frac{\text{No. of adults vaccinated during 3-month implementation of vaccination strategies}}{\text{Total no. of adult patients who consulted and was given patient-held immunization card at FMC during 3-month implementation of vaccination strategies}} \times 100$$

2. Adult vaccination rate difference:

$$\frac{\text{No. of adults vaccinated during 3-month implementation of vaccination strategies}}{\text{Total no. of adult patients who consulted and was given patient-held immunization card at FMC during 3-month implementation of vaccination strategies}} - \frac{\text{No. of adults vaccinated 2 months before implementation of vaccination strategies}}{\text{Total no. of adult patients who consulted at FMC 2 months before implementation of vaccination strategies}}$$

Secondary Outcomes

1. The proportion of recommended vaccines administered at the Immunization Express Lane.
2. The total number of vaccinations given during the implementation of the combined vaccination strategies.
3. Sociodemographic characteristics of patients who opted to be vaccinated during the implementation of the combined vaccination strategies.

Ethical Considerations

The study protocol and informed consent forms were approved by the Extended Hospital Research Office (EHRO). All gathered data were kept confidential. All subjects signed the informed consent before any vaccination was provided. The vaccine costs and vaccination materials (syringe, cotton) were shouldered by the patients. The primary investigator was the one who administered the vaccine at the immunization express lane.

The primary investigator administered first aid measures in cases of adverse drug reactions with the vaccine. The investigator also coordinated care if further management was needed at the emergency room. There was no conflict of interest disclosed.

The completion of vaccine series of the study participants which was included in the study was scheduled and finished during the primary investigator's continuity clinic which was every Wednesday of the week.

Results

A total of 82 adult patients were vaccinated during the 3-month implementation of the combined vaccination strategies. Eight of which were non FMC patients (4 IM patients, 2 OB-Gynecology patients and 1 Urology patient). The remaining 74 patients were from FMC-OPD, only 66 patients were included in the study.

Eight FMC patients were excluded from the study for the following reasons: 1) patients were already scheduled for vaccination during the months of implementation of the combined immunization strategies; and, 2) Walk-in patient who were either or both not given the patient-held immunization card or informed of the Immunization Express lane.

Sociodemographics

Results showed that 45% ((30/66) of the vaccinated patients were elderly. The youngest vaccinated adult was 19

years old while the oldest was 81 years old. The mean age of vaccinated adults was 56 years old.

Forty four (67%) of 66 vaccinated adults were mostly females; 56% (37/66) were married; 71% (45/66) had neither work nor formal occupation which included the retired elderly and self-employed adults; 51% (34/66) were college graduates; 65% (43/66) reside within Manila area; and, physician was the most common source of vaccine and/ or vaccination knowledge/ information among 77% (51/66).

Most of the vaccinated patients had themselves vaccinated during their clinic consults which accounted for 58% (38/66). In contrast, walk-in patients who had themselves vaccinated comprised 42% (28/66) of the total vaccinated adults.

Medical Demographics

The most common co-morbidities of vaccinated adults was hypertension at 53% (35/66), followed by adults with no co-morbidities at 21% (14/66) and diabetics at 18% (12/66). Other co-morbidities (osteoarthritis, osteoporosis, fatty Liver, thyroid disorders, BPH, nephrolithiasis, and Alzheimer's disease) accounted for 17% of vaccinated adults.

Main Findings

The computed adult vaccination rate after implementation of the combined strategies was 1.17%.

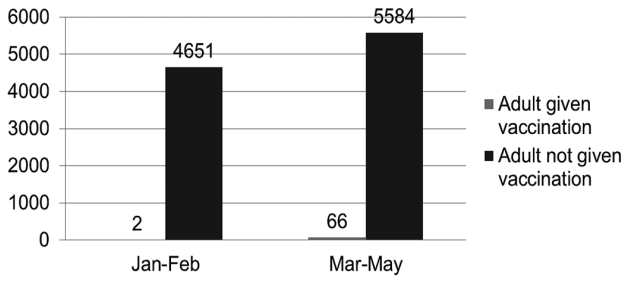

Figure 3. Adult vaccination rate before (Jan-Feb 2016) and after (Mar-May 2016) implementation of vaccination strategies

Prior to intervention, there were only two recorded vaccinations which yielded 0.04% (2/4651) baseline vaccination rate. In contrast, the generated vaccination rate after implementation of the combined vaccination strategies was 1.17% (66/5650).

Adult vaccination rate difference was at 1.13%. The adult vaccination rate increase was determined at 28.25%. Of the recommended vaccines administered at the immunization express lane, pneumococcal vaccine had the highest proportion at 84% (61/73), followed by flu at 10% (7/73), Hepatitis B at 4% (3/73), and HPV as well as MMR at 1% (1/73).

No vaccination-related adverse events were observed nor reported during the conduct of the study. No fatal adverse effects were attributable to the vaccines administered.

Discussion

According to studies by Shahbrani and Benzion older age and chronic health conditions were significant predictors to vaccination.[14] Likewise, socio-economic status and the level of education were essential in the decision-making process of vaccination.

Results showed that vaccinated adults were mostly informed by physician regarding vaccination. In addition, patient's relatives and media were also important source of vaccination information among adults who were vaccinated. Many studies found an important role of physicians for vaccine uptake. Vaccine-related media coverage, health behavior as social group norms, and peer group influences were essential factors for vaccination.

Vaccination strategies that render vaccine accessibility, which entails vaccine availability, can improve adult vaccination rate. One strategy is vaccination-only clinics which lessens missed opportunity for vaccinations. A "drop-in" clinic or an "express lane" vaccination service can reduce the administrative barriers to vaccine uptake at the clinics.[8] There was note of 28.25% vaccination rate increase from the baseline with the use of combined vaccination strategies.

The Advisory Committee on Immunization Practices (ACIP) recommends that the pneumococcal polysaccharide vaccine be administered to all persons aged greater than or equal to 65 years and immunocompetent persons aged greater than or equal to 2 years who has increased risk for pneumococcal disease and its complications because of chronic co-morbidities.

In conclusion, the decision to be vaccinated was due to different factors. These included physician factors, quality, availability and accessibility of resources as well as patient factors. One focus of the study was on determining the socio-demographic factors of adults who chose to be vaccinated.

Limitations

The study did not obtain the patient's knowledge and attitude towards vaccines and vaccination. Such may also be an avenue to explore for low vaccination rate at the FMC.

References

1. Wong SN OJ. Hepatitis B infection among adults in the Philippines: A national seroprevalence study. World J Hepato 2013; 27;5(4): 214-9.
2. Lucas ZDF. The clinical profile of hepatocellular carcinoma patients at the Philippine General Hospital. Phil J Int Med 2009; 47: 1-9.
3. (IDSA). Executive Summary—Actions to Strengthen Adult and Adolescent Immunization Coverage in the United States: Policy Principles of the Infectious Diseases Society of America 2007; 44.
4. Jee Y. WHO's Initiatives to Control Vaccine Preventable Diseases (VPD) and Labnet for Targeted VPDs in the Western Pacific Region. Osong Public Health Research Perspective 2011; 2(Suppl 1): S3.
5. Groom HE. Immunization Information Systems to Increase Vaccination Rates: A Community Guide Systematic Review. Lippincott.
6. Sanford RK. Addressing Immunization barriers, benefits, and risks. J Fam Pract 2007; 56(2): S61-S9.
7. Szilagyi SL. Physician practices and attitudes regarding adult immunizations. Prev Med 2005; 40(2): 152-61.
8. Zaza SR. Guide to Community Preventive Services.
9. Briss PA. Reviews of evidence regarding interventions to improve vaccination coverage in children, adolescents, and adults. Am J Prev Med 2000; 18(1S): 97-140.
10. Turner RW. The effect of patient-carried reminder cards on the performance of health maintenance measures. Arch Int Med 1990; 150(3): 645-7.
11. Stinchfield P. Practice-proven interventions to increase vaccination rates and broaden the immunization season. Am J Med 2008; 121(7): Suppl 2, S11–S21.
12. Estrella A. Use of adult vaccine screening form to increase physician's recommendation for influenza and pneumococcal vaccinations for patient's consulting at the UP-PGH Family Medicine Clinic. 2014
13. Szilagyi PG. Missed opportunities for immunizations: a review of the evidence. J Public Health Man Pract 1996; 2: 18-25.
14. Shahrabani, S and Benzion U. The effects of socioeconomic factors on the decision to be vaccinated: the case of flu shot vaccination. Israel Med Assoc J 2008; 8(9): 630-4.