ORIGINAL RESEARCH

Knowledge, Attitude and Compliance of Employees in a Tertiary Hospital in Iloilo City with the 2012 Recommended Immunization for Filipino Healthcare Workers*

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Background: To determine the level of knowledge, attitude and compliance of employees in St. Paul's Hospital in Iloilo City to the 2012 Recommended Immunization for Filipino Healthcare Workers

Methodology: This was a cross-sectional study participated in by 261 employees. An expert-validated research instrument was used during the survey with simple random sampling as a method in selecting study participants. Socio-demographic profile, health status, awareness of the 2012 Recommended Immunization for Healthcare Workers, their knowledge, attitude, and compliance to it, and the reasons why they received or refused vaccination were described. Descriptive statistics were utilized for data analysis.

Results: Nine out of ten study participants were either moderately knowledgeable (51.3%) or highly knowledgeable (35.2%) on the said immunization schedule. As to attitude, seven out of ten study participants (74.7%) have favorable attitude while the remaining 25% have either ambivalent (24.1%) or unfavorable (1.2%) attitude. With regard to compliance, nine out of ten study participants either have better (85.82%) or excellent (10.48%) level of compliance and about 4% (3.7%) have poor level of compliance. The top three reasons for having vaccination are: "It protects my health" (85.4%), "It is safe" (81.6%), and "It is effective" (76.5%). The study participants' top three reasons for not receiving vaccination are: "It is expensive" (78%), "I'm busy" (41.9%), and "I forgot" (32.3%).

Conclusion: Study participants' level of awareness, knowledge, attitude, and compliance to 2012 Recommended Immunization for Healthcare Workers were far from the optimum level. Most were aware of the guidelines, moderately knowledgeable and complied to it in general. Why they either complied or refused to follow the guidelines appeared to be personal in nature.

Key words: 2012 Recommended Immunization for Filipino Healthcare Workers, vaccination, reasons for and against immunization

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Introduction

In 2012, the Philippine Society for Microbiology and Infectious Diseases, the Philippine Hospital Infection Control Society and the Philippine Foundation for Vaccination came up with a set of national immunization guidelines for all healthcare workers (HCWs). Popularly known as the 2012 Recommended Immunization for Filipino Healthcare Workers, it aims to protect HCWs from vulnerable preventable diseases through vaccination that gears towards immunity or resistance to a disease.

In particular, it identifies the strongly recommended immunization to all HCWs, the correct number of doses one should have, and the corresponding schedule when to receive the vaccine. It likewise provides information on the type of vaccine needed by specific groups such as the first-line and support staff. Hence, it is hoped that concerns on risk as well as well-being of HCWs would be addressed through this national immunization guideline.

The vulnerability of HCWs to vulnerable preventable diseases has been well-documented. Not only they have substantially high risk of being exposed to diseases, it also implies infecting their patients.[1] It has been observed that they have an increased risk for acquiring measles and influenza compared to adults working in non-healthcare settings.[2]

A number of literature have claimed that HCWs susceptibility rates range from 4.6% to 17% for measles, 15.7% to 25% for mumps, 4.5% to 18.6% for rubella, 4.1% t0 16.7% for varicella, 48.3% to 68.8% for pertussis, 22.6% to 35% for hepatitis B, 21.2% to 64.3% for tetanus and diphtheria.[2-3]

However, most literature review has shown a relatively low level of awareness, knowledge, attitude and compliance to national immunization programs or standards among HCWs.[4-6] In fact, a study contends that the rates are far below the level needed to achieve herd immunity.[7-8]

Furthermore, it has been documented that complete immunization is still in its sub-optimal level globally, ranging from 18.8% to 70.5% against measles and mumps, 22.2% to 70.5% against rubella, 1.9% to 3% against varicella, 0% to 49% against pertussis, 3.6% to 5.8% against hepatitis A, 40% to 95% against hepatitis B, and 35.7% to 47.3% against tetanus-diphtheria.[9]

Why HCWs received or refused vaccination is also interesting to deal with. A study contends that the most commonly cited reasons underlying healthcare professionals' self-vaccination were to protect patients, themselves and non-patients.[10] However, Alshammari and his colleagues found out that respondents did not have vaccination because they believe that they are young and healthy. Many also highlighted factors like non-availability of vaccine, being unaware of vaccine availability,[4,11] safety concerns for patients,[12] lack of knowledge, misperceptions and distrust in vaccines.[13-14]

With these in mind, the present study aimed to determine the knowledge, attitude, and compliance to the 2012 Recommended Immunization for Filipino Healthcare Workers of employees of St. Paul's Hospital in Iloilo City, Philippines. Results would provide baseline data on vaccination rates locally as well as reasons why HCWs receive or refuse vaccination, which are very important in identifying appropriate institutional interventions.

Objectives

This study aimed to:

1. Determine the level of knowledge, attitude, and compliance to the 2012 Recommended Immunization for Filipino Healthcare Workers of employees of St. Paul's Hospital in Iloilo City, Philippines; and
2. Identify the reasons why these employees received or refused vaccination stated in the 2012 Recommended Immunization for Filipino Healthcare Workers

Methodology

Research Design

This study used the cross-sectional research design. Research participants were employees from various

departments of St. Paul's Hospital in Iloilo City. They were selected using a set of exclusion and inclusion criteria.

Research Participants

As of December 2016, the total number of hospital employees in the chosen site was 803. Forty (40) of whom participated in the pretest, reducing the population to 763. Using the Slovin formula, the ideal sampling size was then determined, which was 261.

Data collection was carried out from December 19-24, 2016 at the site. Thus, those who were on leave on those dates were excluded as research participants. Employees who had been with the institution for six (6) months only at the time of data gathering were likewise not considered.

In selecting the 261 participants, the simple random sampling with proportional allocation was utilized. This method provided an opportunity to ensure that the sampling size and the chosen participants truly represent the study population. Hence, this study included more nurses than anyone else since they comprised the bulk of the population, which was about 40%.

During the conduct of the study, there were 13 participants who did not fully complete the research instrument. Replacements were then taken to satisfy sampling size requirements and preserve data integrity.

Research Instrument

In formulating the research instrument, a wide array of sources, particularly articles in medical journals, were consulted. The research-made questionnaire had five parts: personal data, knowledge on 2012 Recommended Immunization for Filipino Healthcare Workers (HCWs), attitude towards and compliance with the same, and reasons for/against having vaccination.

Participants' personal data consisted of socio-demographic variables such as sex, age, educational attainment, and civil status. The number of years of working as HCW, history of illness for the past six months and its cause, awareness of the 2012 Recommended Immunization for Filipino HCWs, and the sources of information on it were likewise accounted for.

The second part of the instrument measured the participants' knowledge on the 2012 Recommended Immunization for Filipino HCWs. The website phil.vaccine.org was very useful in providing the immunization schedule, which guided in framing the 10-item multiple choice questions that focused on the type of vaccines required depending on the risk and the corresponding doses.

On the other hand, the studies of Alshammari, et al. (2014), Rehmani and Memon (2010), and Aluko, et al. (2016) were handy in constructing the 10-item attitude scale towards the 2012 Recommended Immunization for Filipino HCWs. The scale consisted of five positive and five negative statements about one's feelings, values, opinions and beliefs on vaccination, which were arranged alternatively to minimize participants' internal bias.

The next part of the instrument was on participants' compliance with the said schedule of immunization. It asked them if they received or not vaccinations such as Tdap, Hepatitis B, influenza, varicella, measles, mumps and rubella, pneumococcal polysaccharide, rabies, and meningococcal.

Finally, the instrument also looked into the participants' reason(s) for or against in having vaccination. Possible answers have been culled out from journal articles and rephrased for brevity. To elicit more responses from participants, the option for other answers was provided for. In summary, Table 1-3 deal with the domains of participants' knowledge, attitudes, compliance, and reasons for/against having vaccination, the numerical values assigned for each response, and the quantitative interpretation of scores.

After formulating the research instrument, it was subjected to face and content validation. Three medical consultants from one tertiary health facility reviewed the research constructs as well as the instrument's physical appearance. Their suggestions and comments were then incorporated in the revised questionnaire.

To test the reliability of the revised questionnaire, a pretest was done among 40 healthcare workers from the same health facility. Cronbach's alpha results revealed 0.76,

Table 1. Domains of knowledge, attitudes, and compliance with 2012 Recommended Immunization of Filipino Healthcare Workers

Variable	Domains	No. of Items
Knowledge	Type of vaccines, number of required doses, types of healthcare workers	10
Attitudes	Values, feelings, thoughts about vaccination	10
Compliance	Type of vaccines, compliance to the schedule of vaccination	8

Table 2. Numerical values for responses

Variable	Numerical values	No. of Items
Knowledge	Incorrect answer = 0; Correct answer = 1	10
Attitudes	For positive statements: Strongly agree = 5; agree = 4; uncertain = 3; disagree = 2; strongly disagree = 1 For negative statements: Strongly agree = 1; agree = 2; uncertain = 3; disagree = 4; strongly disagree = 5	10
Practices	Yes = 1; No = 0	8

Table 3. Interpretation of scores

Variable	Average Score	Description	Interpretation
Knowledge	0-3	Poor	Respondent have ≤ 40%knowledge
	4-6	Moderate	Respondents have > 40% but ≤70% knowledge
	7-10	High	Respondents have > 70% but ≤ 100% knowledge
Attitudes	1.0 - 3.5	Unfavorable	Respondents have unfavorable attitude towards vaccination
	3.6-7.0	Neutral	Respondents are yet to decide whether or not to have vaccination
	7.1-10.0	Favorable	Respondents have favorable attitude towards vaccination
Practices	0- 3	Poor	Respondents have difficulty to comply with the vaccination schedule
	4- 6	Better	Respondents have less difficulty to comply with the vaccination schedule
	7-8	Excellent	Respondents fully comply with the vaccination schedule

indicating an acceptable level of internal reliability. This means that it is relatively safe to assume that items in the questionnaire were consistent with each other.

Data Gathering Procedures

Once the research instrument was ready, the approval of the Medical Ethics Committee was sought. Communications about the purpose, permission to study, sample research instrument, and consent forms were then sent to the health care facility where the study was conducted.

To properly distribute the questionnaires, a list of healthcare workers was secured from the Human Resource Department of the said health facility, identifying its various departments and the corresponding number of HCWs assigned. The list served as a guide in determining the sample size, the number of heathcare workers from each department in the sampled population.

Data retrieval took place a day after the questionnaire was distributed. It might also happen if participants asked the researcher to wait for the newly-filled up questionnaire. This likewise provided a time to check the data and, in any event, looked for possible replacements for participants who did not fully answer the questionnaire.

Data Treatment and Analysis

Data were processed using SPSS version 17. Descriptive statistics like frequency counts and percentage distributions were employed in describing the participants' knowledge, attitude and compliance with the 2012 Recommended Immunization for Filipino Healthcare Workers, and their reasons for and not receiving it.

Results and Discussion

Profile of Study Participants

Table 4 presents the demographic profile of the study participants. It shows that at least six out of ten participants are females (67.8%), single (64.4%), and belong to 20-30 year old group (66.3%). Most also hold bachelor's degree (57.9%), are nurses (40.2%), and have been HCWs for at least 6 months up to three years (49.8%).

Table 4. Demographic profile of study participants

Characteristics	n = 261	%
Sex		
Male	84	32.20
Female	177	67.80
Civil Status		
Single	168	64.40
Married	93	35.60
Age (in years)		
20-30	173	66.30
31-40	60	23.00
41-50	25	9.60
51 and above	3	1.20
Educational Attainment		
High School	28	10.70
College Level/Vocational	40	19.20
Bachelor's Degree	151	57.90
Master's	2	0.80
Post-Graduate	30	11.50
Type of Healthcare Worker		
Nurses	105	40.20
Medical Technologists	34	13.00
Nursing Aides	22	8.40
Doctors	21	8.00
Physical Therapists	12	4.60
Radio-technologists	12	4.60
Students on rotation	11	4.20
Engineering	10	3.80
Janitor	10	3.80
Nutritionists	9	3.40
Linen/Laundry	6	2.30
Clinical Pharmacists	4	1.50
Admitting	4	1.50
Ambulance Driver	1	0.40
Years of Working Experience as HCW		
> 6 mos - 3 years	130	49.80
> 3 years - 5 years	33	12.60
> 5 years	98	37.60

Table 5 deals with the health status of study participants. It reveals that a little over 50% (51%) of them have been sick in the past six months. Among those who got sick, the top five causes of illness were influenza (12.80%), fever (6.9%), cough (6.6%), upper respiratory tract infection (4.6%), and fatigue (3.1%).

Table 5. Health status of study participants

Characteristics	n = 261	%
Have you been sick for the past 6 months?		
Yes	128	49.00
No	133	51.00
What caused your sickness?		
Influenza	33	12.80
Fever	18	6.90
Cough	17	6.60
Upper Respiratory Tract Infection	12	4.60
Fatigue	8	3.10
Asthma	7	2.70
Pneumonia	7	2.70
Allergic rhinitis	5	1.90
Acute thrombocytopenic purpura	5	1.90
Sore throat	5	1.90
Allergy	5	1.90
Dengue	4	1.60
Diarrhea	4	1.60
Lymphadenitis	1	0.40
Dehydration	1	0.40

Table 6, provides data on participants' awareness of 2012 Recommended Immunization for Filipino HCWs and their sources of information on it. It shows that a little over 60% (62.9%) were aware of the said immunization schedule. Of whom, their top five sources of information were co-workers (30.7%), hospital administrators (17.9%), internet (16.2%), television (15.9%), and school (6.9%). Radio and newspapers as sources of information on the same only accounted for 4.1% and 3.7%, respectively.

Table 6. Awareness of 2012 Recommended Immunization for Filipino HCWs and Sources of Information

Characteristics	n = 261	%
Are you aware of the 2012 Recommended Immunization for Filipino HCWs?		
Yes	164	62.90
No	97	37.10
Where did you learn about the 2012 Recommended Immunization for Filipino HCWs? (multiple response)		
Co-workers	91	30.70
Hospital administrators	53	17.90
Internet	48	16.20
TV	47	15.90
School	19	6.40
Family members	15	5.10
Radio	12	4.10
Newspaper	11	3.70

Study Participants' Level of Knowledge, Attitude and Compliance with 2012 Recommended Immunization for Filipino Healthcare Workers

Table 7 presents the study participants' level of knowledge, attitude and compliance with the 2012 Recommended Immunization for Filipino Healthcare Workers. It shows that nine out of ten study participants are either moderately knowledgeable (51.3%) or highly knowledgeable (35.2%) on the said immunization schedule. However, it should be noted at a little over 10% (13.5%) have low level of knowledge.

As to the level of attitude, Table 7 reveals that seven out of ten study participants (74.7%) have favorable attitude towards the 2012 Recommended Immunization for Filipino Healthcare Workers. Interestingly, the remaining three study participants either have ambivalent (24.1%) or unfavorable (1.2%) attitude towards the same.

Table 7 likewise shows that nine out of ten study participants either have better (85.82%) or excellent (10.48%) level of compliance to the 2012 Recommended

Immunization for Filipino Healthcare Workers. Yet, about 4% (3.7%) have poor level of compliance with the same.

Table 7. Study participants' level of knowledge, attitude and compliance with 2012 recommended immunization for Filipino healthcare workers

Variables	n = 261	%
Level of Knowledge		
Low	35	13.50
Moderate	134	51.30
High	92	35.20
Level of Attitude		
Unfavorable	3	1.20
Neutral	63	24.10
Favorable	195	74.70
Level of Compliance		
Poor	11	3.70
Better	224	85.82
Excellent	26	10.48

Furthermore, Table 8 details the type of vaccination received by the study participants. It reveals that at least six out of ten study participants received Tdap (78.16%), hepatitis B (85.82%), influenza (61.3%), and measles, mumps and rubella (77.78%) vaccination. On the other hand, at least 70% of them had not been vaccinated with varicella (69.35%), pneumococcal polysaccharide (78.54%), rabies (85.82%), and meningococcal (91.57%).

Table 8. Vaccination received by study participants

Vaccination Received	n=261			
	Yes		No	
	n	%	n	%
Tdap	204	78.16	57	21.84
Hepatitis B	224	85.82	37	14.18
Influenza	160	61.30	101	38.70
Varicella	80	30.65	181	69.35
Measles, Mumps, Rubella	203	77.78	58	22.22
Pneumococcal Polysaccharide	56	21.46	205	78.54
Rabies	37	14.18	224	85.82
Meningococcal	22	8.43	239	91.57

Reasons for and against receiving vaccination

Table 9 summarizes the study participants' reasons for and against receiving vaccination. The top three reasons for having vaccination are: "It protects my health" (85.4%), "It is safe" (81.6%), and "It is effective" (76.5%). On the other hand, at most 40% had vaccination because their "co-workers had it" (37.3%) and "it is accessible and free" (35.8%). However, only a little over three percent (3.1%) received vaccination because "it is required".

Study participants' top three reasons for not receiving vaccination are: "It is expensive" (78%), "I'm busy" (41.9%), and "I forgot" (32.3%). It is worthy to take note that a few did not have vaccination because "it is not effective" (6.5%), "their colleagues told them not to" (3.8%), and "they just feel not to" (1.1%).

Table 9. Study participants' reasons for and against receiving vaccination

Reasons (multiple response)	n=261	%
Reasons for vaccination		
It protects my health	222	85.40
It is safe.	213	81.60
It is effective.	199	76.50
It is a way to protect my patients.	140	53.80
DOH recommends it.	115	44.20
My co-workers have had it.	97	37.30
It is accessible and free.	93	35.80
It is required.	8	3.10
Reasons against vaccination		
It is expensive.	145	78.00
I'm busy.	78	41.90
I forgot.	60	32.30
I fear about its side effects.	37	19.90
I'm afraid.	13	7.00
It is not effective.	12	6.50
My colleagues told me not to.	7	3.80
I just feel not to.	2	1.10

Discussion

This study determined the level of knowledge, attitude and compliance to the 2012 Recommended Immunization for Healthcare Workers of employees in one tertiary hospital in Iloilo City, Philippines. Along with this investigation, the participants' awareness of the said set of vaccination, their data sources, and reasons for and against receiving vaccination were likewise elicited.

Four major research findings highlighted the literature review on vaccination. First, this study noted that 40% of study participants were not aware of the aforementioned guidelines considering it was set almost five years ago and that they are healthcare workers. Nevertheless, the same situation has been documented in other settings.

Looking into their data sources, it can be said that workplace environment which includes co-workers, hospital administrators and school play a significant role in their awareness. In fact, co-workers (30.7%), hospital administrators (17.9%), and school (6.9%) figured in the top five data sources. The influence of internet and television has been relatively less prevalent as they only accounted for 16.2% and 15.9%, respectively.

In a report about data sources, Yaqub and his colleagues argued that scientific journals, vaccination experts, and government have the strongest influence on more general public. They also pointed out that a few relied on media, internet and their colleagues, which is contrary to the present finding.

As to participants' knowledge, it can be observed that, while almost 90% had either moderate or high level of knowledge, 10% scored very low in the scale. Theoretically, it is assumed that, as healthcare workers, they must be knowledgeable and updated on vaccination. The 10% is relatively insignificant when one deals with the total population but it is a different story when applied to the population of healthcare workers.

Two researchers strengthened this claim. A study in Saudi Arabia revealed that health care practitioners (HCPs) have poor knowledge towards influenza disease and its prevention aside from having misconception on its vaccine.12 Ghomraoui and his team further observed that 53.5% of their study participants have medium to low knowledge levels on the same.[15]

With regards to attitude, three-fourths of study participants have favorable thoughts, feelings, and values towards the recommended set of immunization while the rest reacted ambivalently or unfavorably. Perhaps, this might be attributed to their low level of awareness and knowledge on the same, though more conclusive findings are still needed.

Literature review has likewise shown favorable attitude towards the same. In fact, a research indicates majority of the HCPs believed that vaccination is effective in preventing diseases, hence, should be administered annually.[4]

Another equally significant finding is on study participants' compliance to the recommended immunization for Filipino healthcare workers. While almost all have excellent or better compliance, about 4% poorly complied with the standards, a situation which should not be ignored.

Aside from determining the level of compliance, it is also relevant to find out the type of vaccine the study participants had received. The 2012 Recommended Immunization for Healthcare Workers strongly encourages Tdap, Hepatitis B, and influenza vaccination to all HWCs, regardless the nature and extent of work.

In the present study, between 14% and 39% of study participants had not been vaccinated against Tdap (21.84%), Hepatitis (14.18%) and influenza (38.70%). Although there are strongly recommended vaccines for specific occupation, the fact remains that at least 78% of study participants are yet to receive pneumococcal polysaccharide (78.54%), rabies (85.82%), and meningococcal (91.57%) vaccination.

Worldwide statistics provide that compliance to vaccination programs varies across countries but has remained relatively low. In two researches about influenza vaccination programs, compliance rates are described as far below the level needed to achieve herd immunity.[7-8]

It has been documented that complete immunization is still in its sub-optimal level globally, ranging from 18.8% to 70.5% against measles and mumps, 22.2% to 70.5% against rubella, 1.9% to 3% against varicella, 0% to 49%

against pertussis, 3.6% to 5.8% against hepatitis A, 40% to 95% against hepatitis B, and 35.7% to 47.3% against tetanus-diphtheria.[9]

On the other hand, three researches revealed high vaccination rates in Kuwait (67.2%), among university hospital residents in Saudi Arabia (88.7%), U.S.A, and France.[16-18]

The list of reasons why study participants received vaccination also requires scrutiny. The top three reasons for having vaccination are: it protects my health, it is safe, and it is effective. These reasons are very personal in nature, though have been heavily influenced by the nature of their work.

It is very interesting to note, however, that protecting their patients through vaccination, heeding to DOH recommendation, following their co-workers, having access to free vaccination and vaccination being a requirement did not figure prominently as reasons for receiving vaccination.

These observations have to be integrated in literature review. For instance, a study contends that the most commonly cited reasons underlying healthcare professionals' self-vaccination were to protect patients, themselves and non-patients.[10] On the contrary, some studies argue that these reasons only reflect life practicalities (workplace vaccination, free vaccination, and vaccination to avoid absenteeism) which, may not be completely true in other research settings, especially in developing countries.[4,10]

Those who refused vaccination pointed out price, time, and lack of focus, which may be facilitated in healthcare facilities. The same can be done to clarify concerns on adverse effects, self-motivation, and peer influence. These reasons are seemingly different from the ones reflected in literature review.

In a research by Alshammari and his colleagues, it was found out that respondents did not vaccination because they believe that they are young and healthy. Many also highlighted factors like non-availability of vaccine, being unaware of vaccine availability, safety concerns for patients, lack of knowledge, misperceptions and distrust in vaccines. Hence, some authors believe that studying variables that either facilitate or hinder vaccine hesitancy is more important than explaining the practical barriers to vaccination such as lack of time, forgetting to vaccinate, and missing the vaccination day at the hospital. Despite differences in findings, the fact remains that healthcare workers are vulnerable to hazards detrimental to their health and well-being. In a study of Aluko and his colleagues, an estimated 100,000 people die from occupational illnesses while about 400,000 new cases of occupational diseases are diagnosed every year.

Health personnel, in particular, have substantially high risk of being exposed to diseases and of infecting their patients. In other words, there is a need to protect HCWs at all means. Of which, immunization guidelines have been set to address such concern like the 2012 Recommended Immunization for Filipino Healthcare Workers in the Philippines. The many issues that confront vaccination, however, appear to be multifaceted which call for interdisciplinary research approaches.

Conclusion

The 2012 Recommended Immunization for Filipino Healthcare Workers provides the national immunization guideline, which gears towards protection against diseases and promotion of well-being.

Study participants' level of awareness, knowledge, attitude, and compliance to the said guideline was far from the optimum level. Most were aware of the guidelines, moderately knowledgeable and complied to it in general. Why they either complied or refused to follow the guidelines appear to be personal in nature.

Recommendations

This study only provided a local database on vaccination rates among employees of St. Paul's Hospital in Iloilo City. As such, there is a need to generate similar, if not the same data, from other hospitals so that data banking would be improved.

While it is valuable to establish the vaccination rates, it is equally meaningful to look into the association between

and among the variables used in the present study. Not only they offer more specific observations but also contribute to the growing body of literature on vaccination.

For instance, one may analyze the effect of sources of information on vaccination rate, its influence to the extent of compliance, and how these information were processed by the receiver, which directly affects their attitude towards vaccination. It is likewise valuable to determine the particular reasons why study participants did not receive a specific vaccine. In the present study, these have not been accounted for.

On the other hand, it is very interesting to deal with ways, programs, policies relative to vaccination that healthcare and government institutions implement. Insights on planning, implementation, and evaluation are helpful in improving these programs and policies. Strategies have been identified already by a number of researches. It is hoped, therefore, that appropriate strategies and efficient feedback system be employed in implementing any vaccination program in the local setting.

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