Abstract of dissertation entitled

“Increasing uptake of influenza vaccine among community-dwelling elderly in Hong Kong”

Submitted by

Chu Yin Ling

for the degree of Master of Nursing
at The University of Hong Kong
in August 2013

Influenza is a serious public health problem that circulates worldwide affecting every age group and spreads easily from person to person. It can cause severe illnesses and deaths especially in high risk groups including the aged 65 or above. Influenza vaccination programme is an important issue in Hong Kong health care system. More preventive measures should be targeted on the elderly in practice. Mailing invitation, phone invitation, training-the-trainer program and home visit by nurse in primary care settings are found to be effective in increasing the influenza vaccination rate as evidenced by 10 systematic reviews.

Several approaches of recommendations for increasing the utilization of influenza
vaccination among elders in community have been proposed in this paper.

Communication plan, pilot testing and evaluation plan have been discussed to implement and improve the proposed guidelines.
Increasing uptake of influenza vaccine among community-dwelling elderly in Hong Kong

by

Chu Yin Ling

A dissertation submitted in partial fulfillment of the requirements for the Degree of Master of Nursing at The University of Hong Kong August 2013
Declaration

I declare that the dissertation and the research work thereof represent my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualifications.

Signed……………………………………………………

Chu Yin Ling
Acknowledgements

The author is greatly indebted to her supervisor, Dr. Marie Tarrant, in the School of Nursing, The University of Hong Kong, for her guidance, advice, encouragement and sharing with me her experience generously throughout the candidature.

The author also wishes to thanks to her family and friends for the support and encouragement which motivate the author during her candidature to complete this paper.
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Chapter 1: Statement of the Problem

Introduction

Influenza is a serious public health problem that circulates worldwide affecting every age group and spreads easily from person to person (WHO, 2005). Hong Kong is a city with high density of population and small landmass that influenza can spread more easily and rapidly among people. Under an epidemic season, high absenteeism from work resulting in the loss of productivity happens. The health system can be overwhelmed due to a rapid increase in demand of population seeking medical treatment during peak seasons (WHO 2005). Influenza can cause severe illnesses and deaths especially in high risk groups including adults aged 65 or above (WHO 2005). According to the Census and Statistics Department, the number of the population aged 65 or above is projected to increase markedly from 13% in 2011 to 30% in 2041. Hence more preventive measures should be targeted on the elderly in practice.

Vaccination is one of the most effective strategies for prevention of influenza (WHO, 2005). Under immunization program, the hospitalization number can be decreased by 25-39% in elders while the mortality rate can be decreased by 39-75% during influenza seasons (CHP, 2008). According to CDC in 2007, annual seasonal vaccination is the most effective method to reduce the morbidity from influenza. Immunization can also decrease expenditure related to influenza illness related health
care as well as loss of productivity (WHO, 2009). Hence, authentic hospitalization system, death rate reduction and the overall health care expenditure saving can be accomplished if the coverage rate of influenza vaccination program in elders aged 65 or above could be increased (CDC, 2012). Some studies out in Hong Kong concluded that elder influenza immunization is cost-effective and the expenditure of health care provider can be reduced (Cram, 2001). Immunization can effectively reduce elderly influenza-related complications like hospitalization and even death (James, 2000). It is also effective in reducing morbidity and mortality among the community dwelling elders (Danielle, 2006).

The vaccination rate recommended by the WHO was 75% (WHO, 2012) and by the Healthy People 2010 was 90% of target group (US Department of Health and Human Services, 2000). In Hong Kong, many societal resources have been placed in the promotion of influenza vaccination under the Hong Kong Government vaccination programme. However, the coverage rate of seasonal influenza immunization in elderly aged 65 or above in the year 2011/12 was about 30%, which is not a satisfactory data (CHP, 2012, Census, 2012). Based on the best evidence based studies, this paper is to review the different effective promotion methods to increase the utilization of influenza vaccination among elders in community.
Background

Influenza is an acute viral infection causing human illness. In Hong Kong, it is common to have influenza cases all around the year. Usually there are two peaks. The winter peak is in February and March, while the summer peak is in July and August (CHP, 2011). Influenza can be classified according to three types of viruses involved: Type A, Type B and Type C. Type A and Type B would constantly evolve and would generate new viral strains which are associated with widespread outbreaks. The efficacy of immunization is about 70-90% in protecting healthy adults from influenza illness if the strain of vaccine and circulating influenza viruses are well-matched. Annual immunization is recommended as the efficacy of immunity will decrease after one year and also the circulating strain may have changed. There are two types of influenza vaccines, including the inactivated trivalent influenza vaccine (TIV) and the live attenuated influenza vaccine (LAIV). TIV has been used for over 60 years. As the LAIV can only be used on aged-2-to-49 healthy non-pregnant woman, so the elderly can only use the TIV.

Official immunization target group among different countries may vary, but the aged are always included. Almost all aged people are defined as aged 65 or above. In Hong Kong, the Scientific Committee on Vaccine Preventable Diseases has given recommendation on the target groups to receive seasonal influenza vaccination, which
is based on all angles of considerations including scientific evidence, societal disease burden and global experience (CHP, 2012). And elderly people aged 65 or above are one of the high risk target groups included under this consideration.

Influenza is presented with common signs and symptoms like sore throat and malaise. It is well known that most adults getting influenza will recover within 2-7 days with symptomatic treated medication. It would present more serious complications in the high risk group like the elders, including pneumonia or even death (CHP, 2012).

**Affirming the Need**

The Hong Kong Government had started to provide free influenza immunization to the elders living in residential and disabled care homes since 1998 and 2003 (Daily Information Bulletin 1998). After the SARS outbreak in 2003, this target groups were further extended to community dwelling elderly who are aged 65 or above with chronic illnesses or receiving the Comprehensive Social Security Allowance during winter peak season. In 2009, in order to further encourage uptake of influenza vaccination by elderly, the Elderly Vaccination Subsidy Scheme was introduced to reduce influenza-related hospital admissions and the risk of complications. Those elders aged 65 or above who were not eligible for free seasonal influenza vaccination in the public clinics, they could receive subsidized influenza vaccination from
enrolled clinics. The subsidy included both vaccine and injection costs which would be reimbursed back to the enrolled doctors. The subsidy for each dose of seasonal influenza vaccine was HK$130 ($80 vaccine cost + $50 injection cost). Approximately 30% of the enrolled clinics provide free-of-charge seasonal influenza vaccination service after deducting Government subsidy. Besides, most of the enrolled private clinics charge the elders $50 or below.

For publicity side, famous TV artist was invited to participate in TV advertisement to arouse the public’s acknowledgement. Measures including printed health education materials, hotline service, CHP website information and online e-Health system demonstration were adopted to assist the general public and private sectors to get familiar with the new arrangement and functions of the online system. Related messages were delivered in mass media such as newspaper and TV/radio programmes via press briefings and media interviews.

Although the publicity measures mentioned above have been carried out, the alarming decrease in the influenza vaccination in elderly recently may be due to the widely publicized adverse events following the H1N1 pandemic vaccine. In December 2009, when the Government started to carry out the human swine influenza vaccination programme, there were extended reports of suspected cases of adverse cases of Guillain-Barré Syndrome and intrauterine death after receiving the new
influenza vaccination. The sharp drop of new influenza vaccination rate was due to the fear of adverse side effects of public. Actually, there are no serious adverse events reported for vaccine recipients under vaccination subsidy scheme. Review of the surveillance data so far continues to support the safety of seasonal influenza vaccines.

The CHP website continues to update the adverse event reported, however, the public seems fail to receive the vaccination safety message. According to a study on the Government Vaccination Programme for seasonal influenza 2010/11, only half of the elderly perceived that the influenza vaccine was safe. Most of the respondents who did not take the vaccination considered the vaccination unnecessary while 70% of them worried about the side effects of vaccine on health. Nevertheless, most elderly indicated that they would follow their doctor’s advice on vaccination. However, they seldom get information about the programme from the health care personnel.

Although influenza vaccination is strongly recommended by WHO and many countries, the immunization rates are still suboptimal. In 2010, one of the health targets in United States was to meet 90% influenza immunization coverage rate for elderly 65 or above. Italian National Vaccine plan is to vaccinate 75% of the elderly population every year. The vaccination target rate of other countries, like Japan, United Kingdom and German, range from 60 to 80%. In Hong Kong, three is no studies found stating the concrete target coverage rate of influenza vaccination.
According to WHO, the target of vaccination coverage of risk groups is 75% by the 2014-2015 winter season. In Hong Kong, there was an about 20% fall in the number of doses of influenza vaccination in 2010/11 compared with 2009/10. The coverage rate of seasonal influenza vaccine in 2010/11 for elders in the Hong Kong Government vaccination programme was only 30%, which is far below the target rate of WHO or the countries mentioned. Obviously, there is still room to introduce evidence based strategic interventions to increase the seasonal influenza vaccination rate.

The current promotion measures are not enough to meet the coverage rate compared with the international standard. In order to improve the immunization coverage rate among elderly, there is a need to find new evidence based interventions focusing on the knowledge and encouragement to health care workers in promoting seasonal influenza vaccination for the elderly.

Significance

In the year 2011/12, the influenza season of Hong Kong has been extended longer than previous peak seasons. The activity of local influenza kept high from mid-January to early June (CHI, 2012). By the end of 2012 May, the hospitalization rates with principal diagnosis as influenza for elders 65 years or above were more than double of previous two years, making 40% more influenza- associated deaths. It
results in a significant burden in Hong Kong public health system (CHP, 2012).

Influenza is associated with 36,000 deaths and 226,000 hospitalizations per year in the United States. The elderly account for 90% of these deaths and 63 percent of these hospitalizations (Thomson, 2003). Elder persons account for over 90% deaths rate which is due to pneumonia and influenza. Also, pneumonia is the top 10 leading causes of death. In view of the impact on the health system in influenza season, vaccination is on of the best way to reduces elder’s severe influenza infection and complications by a percentage of 60%, and deaths by a percentage of 80% (WHO, 2009). Preventive measures to boost up influenza immunization coverage rate can release the financial and health burden.

Although the WHO has stated that vaccination is safe and has been used for 60 years, the vaccination rate among elderly keeps low in Hong Kong. With practical experience in the community and clinics, there is not only misunderstanding of the benefits and possible side effects of getting vaccination among the elder people, but also it is common for health care workers to refuse being vaccinated. Health care workers has always stayed close contact with the public, there should be a guideline with more evidence grounded to facilitate them to tackle more promptly on this issue.

**Objectives**

The objective of this paper is:
1. To perform an international literature search on strategies for increasing influenza vaccination utilization rate among elders in the community

2. To extract data from the sampled studies and generate a series of table evidence

3. To conduct a quality assessment of the selected sampled studies

4. To synthesize data extracted from the selected sampled studies

5. To use the synthesized data to propose clinical guideline practice

**Research Question**

Based on the four elements of PICO format: Patient population, comparison intervention, intervention of interest, and the outcome, a research question is developed as below:

"Is a multi-discipline programme (intervention of interest) more effective when compared to the previous promoting strategies (comparison), to increase influenza vaccination utilization (outcome) in Hong Kong elders aged 65 and above (patient population) in the community?"
Chapter 2: Critical Appraisal

Selecting Studies for Review

**Inclusion criteria.** Firstly, the literature has to be primary study and in English language. As there have been many researches done on this issue, only studies of randomized controlled trails are selected. Secondly, participant population is defined as elders 65 years old or above living in the community. Thirdly, the type of intervention can be any interventions aiming to increase utilization of influenza vaccination in elder people consisting of strategies focusing on participants or service providers. Lastly, the outcome should be measures of seasonal influenza vaccination coverage rate.

**Exclusion criteria.** Firstly, non-RCT studies were excluded. Secondly, hospitalized or residential elders were also excluded. Lastly, studies which were published before 2000 were not included.

Search Strategies

The literature study search was started in July and ended in August 2012 using the electronic access of the University of Hong Kong. By the advice from lecture tutor, four electronic databases were selected: Medline (Ovid SP) (2000 to August 2012), CINAHL (2000 to August 2012), Pub Med (2000 to August 2012), Cochrane Library (2000 to August 2012). The keywords used in the database search were as follows:
1. Influenza

2. Vaccination, vaccine, vaccines, immunization

3. Aged, elder, elderly,

4. Community, community-dwelling,

5. Randomized controlled trial

Advanced search tools of the above electronic database were used. The above keywords were searched in different combinations. The studies were limited to the published years 2000 - August 2012. The search results are listed in figure 1 and appendix 1.
Methods of the Review

Data extraction. After screening of titles and abstracts, full text of the sample studies were printed out and scanned. Studies were further selected out after applying the inclusion and exclusion criteria. Studies other than randomized controlled trials
like experimental studies or cross sectional studies were excluded. Some studies were overlapped between several electronic databases. 10 papers were yielded.

**Quality assessment.** Two assessment tools: Public Health Resources Unit’s Critical Appraisal Skills Programme (CASP, 2006) and the Scottish Intercollegiate Guidelines Network (SIGN) were used to assess the quality of the 10 selected randomized controlled trial studies.

**Description of the Studies**

**Table of evidence.** All the studies are reviewed and the data extracted were presented in the form of quality assessment tables (Table 1 & 2).
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Ev lev</th>
<th>Number of patients</th>
<th>Patient characteristics</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Antony J Arthur, Ruth J Matthews, Carol Jagger, Michael Clarke, Alison Hipkin, and Dean P Bennison. Improving uptake of influenza vaccination among older people: a randomised controlled trial. <em>Br J Gen Pract.</em> 2002 September; 52(482): 717-8, 720-2</td>
<td>RCT</td>
<td>1-2</td>
<td>2052 patients</td>
<td>Aged 75 years and over, registered with the practice and not living in nursing/residential homes or sheltered accommodation.</td>
<td>An offer of influenza vaccination as part of an over-75 health check administered by a practice nurse in the patient’s home, or personal letter of invitation to attend an influenza vaccination clinic held at the surgery. (n=2052)</td>
<td>Uptake influenza vaccination or not.</td>
<td>3 months</td>
<td>Uptake of influenza vaccination of: (1) Eligible patients received flu vaccination (2) Eligible patients received flu vaccination but did not receive an influenza vaccine in previous year</td>
<td>(1) Health check arm (74.3%) Personal letter arm (67.9%) Percentage of difference 6.4 (p=0.003) (95%CI: 2.2% - 10.4%) (2) Health check arm (56.2%) Personal letter arm (44.0%) Percentage of difference 12.1 (p&lt;0.001) (95%CI: 5.8% to 18.4%)</td>
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</table>

*General comments: Unable to include elderly aged 65 to 74 years and unrealistic to carry out all over-75 health checks in a 3 month period*
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Evlev</th>
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<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Leighton Chan, Richard F. MacLehose, Peter M. Houck. Impact of physician reminders on the use of influenza vaccinations: a randomized trial. Archives of Physical Medicine and Rehabilitation 2002;83(3):371-5.</td>
<td>RCT</td>
<td>1-</td>
<td>4300 patients 1997 and 4025 in 1998</td>
<td>Patients’ physiatrists participated in the USA Medicare program (patients can be eligible when age 65 and older or younger people with disabilities); Any patient who was seen by more than 1 physiatrist was excluded. Mean age: 70.2(1997); 69.5(1998)</td>
<td>In 1997, the solo practitioners and practitioner group were separately randomized to receive either 4 separate monthly mailing reminders during the influenza season or nothing, the mailing findings of previous study and reminded them to have their patients immunized against influenza; in 1998, the intervention and control groups were switched. Control: no reminders in alternate years</td>
<td>Influenza vaccination rate of intervention group and control group</td>
<td>2 years</td>
<td>Medicare claims for influenza vaccination</td>
<td>For group practitioners in 1997 (42.5% vs 30.1%, P=.07)</td>
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<td></td>
<td>For solo practitioners in 1998 (40.6% vs 31.6%, P=.12)</td>
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<td></td>
<td>The solo practitioners in 1997 and group practitioners in 1998 revealed no increase in vaccination rate for patients seen by physicians receiving the intervention</td>
</tr>
</tbody>
</table>

General comments: 2 of 4 intervention groups had some improvement in immunization but not statistically significant. Underestimated vaccination rates because some patients were immunized in other providers.
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
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<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Dawn M. Dalby, John W. Sellors, Fred D Fraser, Catherine Fraser, Cornelia van Ineveld, Michelle Howard. Effect of preventive home visits by a nurse on the outcomes of frail elderly people in the community: a randomized controlled trial. Canadian Medical Association Journal 2000;162(4):497-500.</td>
<td>RCT</td>
<td>1+</td>
<td>142 participants</td>
<td>Patients aged 70 years of age or more were eligible if they reported functional impairment, or admission to hospital or bereavement in the previous 6 months. Those who were living in a nursing home, were involved in another research study, had previously been visited by the nurse in their home or had participated in the pretest of the survey were excluded.</td>
<td>Participants were assessed and followed up in their homes by visiting nurse (VN) group to provide influenza vaccinations, monitor, promote health and provide psychosocial support with care plan developed together with physicians and related parties.</td>
<td>To compare VN group and UC group: The combined rate of deaths and admissions. The rate of health services utilization.</td>
<td>14 months</td>
<td>Health services utilization during study period including influenza and pneumonia vaccination rates.</td>
<td>Influenza and pneumonia vaccination rates were significantly higher in the VN group (90.1% and 81.9%) than in the UN group (53.0% and 0%) (p&lt;0.001)</td>
</tr>
</tbody>
</table>

**General comments:** There is no mention on the number of vaccination clients in the journal. Small sample size which lack the statistical power.
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
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<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Oliver Frank, John Litt, Justin Beilby. Opportunistic electronic reminders. Improving performance of preventive care in general practice. Australian Family Physician 2004;33(1-2):87-90.</td>
<td>RCT</td>
<td>1-1-10507 patients, 1847 of whom were eligible</td>
<td>Patients attended an outer urban general practice of 10 fully qualified experienced GPs who have used computer medical records for 8 years who were 65 or above and eligible for the influenza vaccination</td>
<td>Automatic electronic record preventive care reminder</td>
<td>Proportion of preventive care opportunities taken for patients in the intervention and control groups for each preventive activity including influenza vaccination rate</td>
<td>1 year</td>
<td>Influenza vaccination rate</td>
<td>GPs took 26% of opportunities to administer influenza vaccine to intervention patients and 27% for control patients which was a significant decrease.</td>
<td></td>
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</tbody>
</table>

**General comments:** There is no blinded to the allocation of patients to the intervention or control groups.
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Ev lev</th>
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<th>Comparison</th>
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<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. W Hogg, J Lemelin, ID Graham, J Grimshaw, C Martin, L Moore, et al. Improving prevention in primary care: evaluating the effectiveness of outreach facilitation. Family Practice 2008;25(1):40-8.</td>
<td>RCT</td>
<td>1+</td>
<td>54 primary care practices</td>
<td>Aged 65 or above</td>
<td>Prevention facilitators who were nurses were assigned 13 to 14 practices and visited each practice once a month with each visit lasting an average 46 minutes. Facilitators would encourage 26 counted maneuvers with baseline audit, feedback and consensus building, and periodic follow up and consensus building.</td>
<td>Preventive maneuver performance between intervention and control practices</td>
<td>Ranges between 3 and 21 months</td>
<td>Influenza vaccination rate</td>
<td>Eligible patients of Intervention practices and control practices having influenza vaccination were 78.2% and 69.2% (p=0.04 95% CI: 0.4-17.6))</td>
</tr>
</tbody>
</table>

General comment: There is no mention of eligible patients involved in the study.
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
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<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Sally Hull, Nicola Hagdrup, Ben Hart, Chris Griffiths &amp; Enid Hennessy. Boosting uptake of influenza immunisation: a randomised controlled trial of telephone appointing in general practice. British Journal of General Practice 2002;52(482):712-6.</td>
<td>RCT</td>
<td>1-</td>
<td>1261 participants</td>
<td>Patients of 3 general practices aged between 65 and 74 years who have not been in a recall system for influenza immunization at their general practice.</td>
<td>A telephone call from the practice receptionist to intervention group households, offering an appointment for influenza immunization at a nurse-run clinic.</td>
<td>Rate of immunization among in intervention and control groups</td>
<td>3 months</td>
<td>Number of individuals in each group receiving immunization. Practice costs of a telephone-appointing program</td>
<td>Vaccination rate of Intervention and Control are 50% and 44%. Adjusted OR: 1.29 (95%CI: 1.03- 1.63) (p=0.026) Practice costs in terms of income generated (per vaccination) With item-of-service payment: Control: £11.35 Intervention: £5.20 Without item-of-service payment: Control: £4.9 Intervention: -£1.24</td>
</tr>
</tbody>
</table>

General comment: Method of concealment was not mentioned.
<table>
<thead>
<tr>
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<th>Ev level</th>
<th>Number of patients</th>
<th>Patient characteristics</th>
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<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Rick D.Kellerman, CharleT Allred, Larry E Frisch. Enhancing influenza immunization. Postcard and telephone reminders and the challenge of immunization site shift. Archives of Family Medicine 2000;9(4):368-72.</td>
<td>RCT</td>
<td>1-</td>
<td>475 participants</td>
<td>65 years above and have received at least 1 office service in the previous 2 years, living in the community, noninstitutionalized, excluded those living in nursing home</td>
<td>Postcards were sent to urge prompt influenza immunization. Those not responding within 1 month were contacted by telephone or none as control</td>
<td>Difference in immunization rate between telephone intervention group and controls.</td>
<td>1 month</td>
<td>Change in practice-administered influenza immunizations compared with baseline rate of preceding 2 years</td>
<td>Immunization rate 28% which shows 57% increase over the 18% practice rate each of previous 2 years (p&lt;0.001)</td>
</tr>
</tbody>
</table>

General comment: Vaccination rates for the practice within 2 preceding years are mentioned, but no mention in the intervention and control groups of previous year.
| 8. Krieger JW, Castorina JS, Walls ML, Weaver MR, Ciske S. Increasing influenza and pneumococcal immunization rates: a randomized controlled study of a senior center-based intervention. American Journal of Preventive Medicine 2000;18(2):123-31. | **RCT** | 1- | 5512 | Recruited from senior centre membership and a marketing database | N=622 | Mailed educational brochure, senior volunteers called 25 participants using script, follow-up phone call, same interventions as control | N=624 | Control: usual senior centre and community immunization newspaper articles, health fair, pamphlets, posters, media announcements, mailed letter from regional Medicare office to 10% of seniors, vaccine available at senior center | 6 week | Proportion of individuals reporting receipt of immunization during the study period by self-report | TG VS CG | Increased from 78.3% to 88.2% after intervention VS 83% decreased to 81.7% |

Among those without influenza immunization in the prior year, significantly more (50.0%; 95% CI 5 40.0%–60.0%) were immunized against influenza in the intervention group than in the control group (23.0%; 95% CI 5 15.2%–33.3%) (rate ratio 5 2.17; 95% CI 5 1.42–3.31). Among those with influenza immunization in the prior year, the rate ratio was 1.04 (95% CI 5 1.01–1.07).
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>9. McCaul KD, Johnson RJ, Rothman AJ. The effects of framing and action instructions on whether older adults obtain flu shots. Health Psychology 2002;21(6):624-8.</td>
<td>RCT, clustered by countries</td>
<td>1-6</td>
<td>6730 male and 9107 female elders 65 years or above</td>
<td>Rural residents in North Dakota Medicare recipients who had not submitted Medicare reimbursement requests for flu shots the previous year</td>
<td>1. Card reminding recipients of advantages of flu shots 2. Letter reminding recipients of advantages of flu shots and stating time, date and place of flu shot clinics</td>
<td>Letter informing participants of importance of flu shot to reminder letter stating date and time of clinic</td>
<td>6 months</td>
<td>1) % vaccinated</td>
<td>TG VS CG: 1)28.2% VS 19.6%</td>
</tr>
</tbody>
</table>

**General comments:** (1) Differential framing(23.5-24.5%) was no more effective than providing a simple reminder(28.2%). (2) Providing action instruction had a powerful incremental effect on vaccination rates(Increased 44%)
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Ev level</th>
<th>Number of patients</th>
<th>Patient characteristics</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
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<tbody>
<tr>
<td>10. Siriwardena AN, Rashid A, Johnson MR, Dewey ME. Cluster randomised controlled trial of an educational outreach visit to improve influenza and pneumococcal immunisation rates in primary care. British Journal of General Practice. 52(482):735-40, 2002 Sep.</td>
<td>Cluster RCT</td>
<td>++</td>
<td>92 practices</td>
<td>Volunteer practices from West Lincolnshire Primary Care Trust and Trent Focus Collaborative Research Network. Patients aged 65 years and over, and patients with CHD, diabetes, and splenectomy</td>
<td>An educational outreach visit to 30 practice team</td>
<td>Vaccination rates of intervention and control practices at baseline and six months after the educational intervention.</td>
<td>8 months</td>
<td>Improvement in influenza vaccination rates of intervention(I) and control(C) practices in</td>
<td>(1) I:18.1%, C:13.1%(p=0.09) (2) I: 15.5%, C:12.0%(p=0.08) (3) 16.1%, 2.9%(p=0.38) (4) I:20.7%, 25.4%(p=0.42) (5) I:14.8%, C:6.5%(p&lt;0.001) (6) I: 15.5%, C: 6.8%(p&lt;0.001) (7) I: 6.5%, C: 4.7%(p=0.83)</td>
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</table>

**General comments:** Study shows values in improving vaccination rates by educational outreach visits. It may be taken into practice if more evaluation of cost is taken into account.
<table>
<thead>
<tr>
<th>Study</th>
<th>Clearly focused Question</th>
<th>Random Allocation</th>
<th>Adequate Concealment</th>
<th>Double Blind Treatment Allocation</th>
<th>Groups Comparable</th>
<th>Only Difference is Treatment</th>
<th>Valid Measurement of Outcome</th>
<th>Drop out Rate</th>
<th>Intention to Treat Analysis</th>
<th>Comparable Results from all Sites</th>
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<td>+++</td>
<td>29</td>
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<td>Frank, et al. (2004)</td>
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<td>(2002).</td>
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<td>+++</td>
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Well covered(+++), Adequately covered(++) , Poorly Covered(+), Not Covered(-), Not Reported (NR), Not Applicable(NA)
<table>
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<tr>
<th>Study</th>
<th>Bias Minimized</th>
<th>Direction of Bias</th>
<th>Effect due to Intervention</th>
<th>Results Applicable to Target Group</th>
<th>Overall Quality Rating</th>
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<tr>
<td>Arthur, et al. (2002)</td>
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<td>Approaching patients for informed consent prior randomization was not feasible</td>
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<td>Chan, et al. (2002)</td>
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<td>++</td>
<td>-</td>
<td>Yes</td>
<td>Yes</td>
<td>Fair good(++)</td>
</tr>
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Results of Review

The selected ten studies were all randomized controlled trials which were carried out in several countries. Four of the studies were in United States (Chan, et al., 2002; Kellerman et al., 2000; Krieger, et al., 2000; McCaul, et al., 2002) and England (Arthur, et al., 2002; Hogg, et al., 2008; Hull, et al., 2002; Siriwardena, et al., 2002) respectively. The remaining studies were carried out in Canada (Dalby, et al., 2000) and Australia (Frank, et al., 2004). The sample size of eight studies ranged from 475 to 15,837 while one study only recruited 142 participants which lack the statistical power (Dalby, et al., 2000). Two other studies’ were on practice number based (Hogg, et al., 2008; Siriwardena, et al., 2002) ranging from 54 to 92 practices. All the studies were done in primary care settings or home settings. The length of follow-up period was ranged from 6 weeks to 2 years. The publication year of the literatures selected were from the years 2000 to 2008.

Quality Assessment

Overview of methodological quality. All the studies had clear questions focused and description of random allocation. Five studies had adequate concealment done (Arthur, et al., 2002; Dalby, et al., 2000; Hogg, et al., 2008; Krieger, et al., 2000; Siriwardena, et al., 2002) while two studies (Hull, et al., 2002; McCaul, et al., 2002) did not reported the concealment, which may induce bias of the outcomes. Blinding is
essential in minimizing the risk of bias, though it is difficult to make the private doctors’ individual computer system blind while the content of sending information sheets can be blinded.

Considering the “group comparable” and “only different treatment”, all the researches were well covered and clearly stated. All the studies stated valid measurement of the outcomes which was the influenza vaccination uptake rate. One study (Dalby, et al., 2000) reported the drop out was 29 participants while two studies (Arthur, et al. 2002; Siriwardena, et al. 2002) reported that there were no reports of drop out rate. The remaining studies did not report the drop out rate.

Four studies have their bias well-controlled. One study McCaul, et al. 2002 reported much more female elders were recruited than male elders. Another study Hull, et al. 2002 reported the small effect size may bias the result.

With reference to the evidence level (SIGN) and also considering the overall quality, the studies of the topics were ranked as “fair” or “fair good” (Appendix 4). The result of the outcomes can be applied to the target groups as these studies’ quality were acceptable in many aspects

**Summary and Synthesis**

**Analysis of the characteristics of interventions reviewed.**

**Sample characteristics.** The sample was elderly 65 years or above living in the
community. Among the studies, the samples were lived in United States, United Kingdom or Canada. All of them were excluded from those in institutions or hospital.

In study by Siriwardena, et al. 2002, the sample was noted to have CHD diabetes and splenectomy. In study by McCaul, et al. 2002, sample was the medicare recipients that did not receive flu shots in the previous year.

**Intervention—Increase elders’ knowledge of seasonal influenza vaccination.**

Studies of Arthur, et al. (2002); McCaul, et al. (2002); Krieger, et al. (2000) had adopted preventive measures of mailing materials like postcards, letter and brochures to enhance the demand of the elderly towards seasonal influenza vaccination, which showed significant increase in the vaccination rate compared with the control group.

**Enhance encouragement by the health care providers.** Authors in studies of Siriwardena et al. (2002) introducing the home visit by practice nurses to offer vaccination at home found to be more effective than only mailing materials offering vaccination at practice. Hull (2002) used the method of the phone call from the practice receptionist to elderly offering them an appointment for influenza immunization at a nurse-run clinic. This also raises the target group’s vaccination coverage rate. Hogg (2008) proposed to use comprehensive preventive intervention program for health care providers at practice. Though not all the medical utilization increased, there was a significant increase in the percentage of influenza vaccination.

**Programme implementation.** Programme was done by different types of people in each study. In Arthur, et al. (2002) study, patient home visit and vaccine administration at patient’s home were done by practice nurse. The educational outreach visit of Siriwardena, et al. 2002’s study was run by volunteers from Primary Care Trust & Trent Focus Collaborative Research Network. Study of Krieger, et al. (2000) also adopted senior volunteers to make follow-up phone call. Telephone call from study of Hull, et al. (2002) was done by the practice receptionist to intervention group offering an appointment (at a nurse-run clinic) for influenza immunization. As the interventions were only mailing materials in study of McCaul, et al. (2002), no supporting people were mentioned. Hogg, et al. (2008) mentioned that facilitators were assigned to certain amount of practices to encourage maneuvers with periodic follow up, baseline audit, feedback and consensus building.

**Study settings.** Four studies were done in different settings in general practices of primary care settings i) Arthur, et al. 2002; ii) Siriwardena, et al. 2002; iii) Hull, et al. 2002; iv) Hogg; et al. 2008). One study was carried among 29 countries in US
(McCaul, et al. 2002). The study of Krieger, et al. (2000) was carried out by Telephone outreach in Seattle Partners.

**Analysis of intervention effectiveness.**

**General outcomes.** All studies showed successful in improving seasonal influenza vaccination uptake among elderly. One study showed that comprehensive educational package was not so effective than so call a mailing reminder.

**Data synthesis.** Criteria for effective preventive measures to increase the vaccination coverage rate after summarizing the data from the selected studies are shown as follows:

**Target group.** Target population is considered as the elderly 65 years or above living in the community. No matter the elders having received influenza vaccination in previous years or not could be included in the study.

**Programme implementation.** As telephone call for education and offering appointment are found to be effective, it can be carried out by receptionist and this did not pose extra burden on the workload of health care workers.

**Study settings.** Though all studies found to be effective in increasing immunization coverage rate, invitation card with information and reminder letter for offering appointment to vaccination seem to be more cost effective in increasing influenza vaccination. Also, telephone call for offering appointment to immunization
is also recommended for the same reason.

**Implications.** To conclude, Influenza vaccination rate among elderly 65 years or above in Hong Kong is relatively low compared with WHO’s objective and many countries like United States and United Kingdom. New preventive strategies adopted in foreign countries finding to be effective should be considered. Strategies can be included non-HCWs like receptionists or volunteers. Also, new measures like mailing materials, which are found to be effective in increased vaccination demand, is more proactive. It should be considered in the strategic plan in Hong Kong. Similar measures like SMS or email could also be considered.

By beginning with considering authentic hospitalization, deaths rate reduction and the overall health care expenditure saving can be accomplished if the influenza vaccination coverage rate of the aged 65 or above was increased. Some countries’ studies prove that elder influenza immunization is cost-effective and is able to reduce the expenditure of health care provider. Immunization can effectively reduce elderly influenza-related complications like hospitalization or even death. It is also effective in reducing morbidity and mortality among the community dwelling elders.

In reviewing the available effective promotion methods to increase the utilization of influenza vaccination among elders in community, the following conclusion is drawn:

Influenza vaccination rate among elderly 65 years or above in Hong Kong is
considered relatively low as comparing with the objective of World Health Organization, as well as other developed countries like the United States of America and United Kingdom. Latest preventive strategies from many foreign countries shall be taken into considerations and strategies shall be incorporated with non-HCWs like receptionist or volunteer. New suggestive measures such as mailing to provide updated knowledge on influenza vaccination is considered to be more proactive preventive approach and should be included in the strategic plan utilized in Hong Kong. Another method such as using SMS or email for sending relevant messages should also be taken into consideration.
Chapter 3: Implementation Potential of the Evidence-based Innovation

Several approaches of recommendations for increasing the utilization of influenza vaccination among elders in community can be proposed by using the summarized evidences in Chapter 2. These include letter invitation, telephone appointment offer, mailing reminder with brochures, health check intervention, home visit by nurse and computerized vaccination history screening. Before that, the implementation potential of the innovation, including the transferability of evidenced based findings, the feasibility and cost-benefit ratio of the innovation, has to be taken into consideration.

Target Audience & Settings

The writer is working the Department of Health (DH) which is responsible for collaborating with different public and private sectors to carry out the Government Vaccination Programmes. Elderly Health Centre (EHC) is one of the public sectors which provide free influenza vaccination for their members. There are 18 elderly health centres established in Hong Kong. They provide clinic service of health assessment, physical checkup, counseling, curative treatment and health education to elderly. Elderly aged 65 or above can be enrolled as members of elderly health centres. One of the ECHs situated in Kowloon region will be proposed as the setting, to carry out the innovation. The centre is run by a medical officer, three nurses and other
health professional including dietian, clinical psychologist, physiotherapist and occupational therapist. Nursing staff is mainly responsible for the body-checkup interview, health talk and clinic operation. The clinic consists of around 5000 elder members. There are 15-20 client visits every working day.

If the proposed recommendation is proven to be effective, the remaining 17 EHCs can implement the protocol into their practice to increase the utilization of vaccination under Government Vaccination Programme.

Transferability of the Findings

The innovation fits the proposed setting in following ways:

**Target population and settings.** Among the 10 selected studies, the target population of 7 studies is 65 years or above (Chan, et al., 2002; Frank et al., 2004; Hogg, et al., 2008; Kellerman et al., 2000; Krieger et al., 2000; McCaul et al., 2002; Siriwardena et al., 2002) while the other 3 studies are 65-74 years (Hull et al., 2002), 70 year or above (Dalby et al., 2000) and 75 years or above (Arthur et al., 2002). Also, the elders of these studies come from the community excluding those living in residential homes. These are similar to the innovation that the target group is elder 65 or above in the community. Also, all the selected studies are carried out in the primary care setting in the community which indicate that there is a good transferability in setting (Arthur et al., 2002; Chan, et al., 2002; Dalby et al., 2000; Frank et al., 2004;
Hogg, et al., 2008; Hull et al., 2002; Kellerman et al., 2000; Krieger et al., 2000; McCaul et al., 2002; Siriwardena et al., 2002)

**Philosophy of care.** The philosophy of care among the setting and the innovation are similar which all aim to increase the influenza vaccination rates among the elders. In Hong Kong, influenza has caused a serious burden to the health care system (CHP, 1a 2012). The Scientific Committee on Vaccine Preventable Diseases has made a recommendation to the Hong Kong Government that elders aging 65 years or above should receive seasonal influenza vaccination annually. (CHP, 1a 2012) Those aging 65 or above having chronic diseases or receiving comprehensive social security allowance can receive free influenza vaccination at the public clinics. . In 2009, in order to further increase the influenza vaccination rate among elders aging 65 or above, the Government co-operated with the private doctors to provide subsidized vaccination to the elders. Numerous promotions like television broadcast, website and new paper promotion had been used since 2009. The influenza vaccination rate among elders aged 65 or above has been raised to 30% of the target population (CHP, 1b 2012). For Western Countries like USA, the coverage rate in elders is up to 70% (CDC, 2012). Also, most of the selected 10 studies show a positive result in increasing the vaccination uptake rates. Therefore, the elder vaccination rate in Hong Kong still has room to improve.
**Time span.** The innovation will take 3 months to implement including 1 month of planning and preparation with another 2 months of implementation. It will start in October and will be implemented from November to December which is the period in parallel with the Government free vaccination Programme starting in November. This period is selected because the influenza vaccination is recommended to be received before the end of December in Hong Kong to prevent the winter influenza season. As the record and report of vaccination rate in elderly center is a current practice, this data can conveniently be used to monitor the progress to help adjustment of the innovation in the middle of implementation.

**Feasibility**

The innovation is feasible to carry out if there is an approval from head of Vaccination Office and elderly health service. Vaccination Programme is an outstanding issue in Department of Health. In recent years, a series of vaccination promotion including influenza vaccination is planned before it starts every year. The elderly centres co-ordinate with Vaccination Office to implement the Government Vaccination Programme. Both of them share the same objective on increasing the coverage rate. It is possible for the innovation to carry out if it is proven to be effective.
Innovations carry out freedom. There is regular meeting in Vaccination Office for all health care professional including recruitment of nurses to plan for the preceding year’s promotion. Effective innovation is welcome and relatively flexible to be adopted aiming to increase the coverage rate. There will then be further meetings with other departments including the elderly health service to discuss about the updated details in implementing the Government vaccination programme.

Implementation interfere current staff or not. As a department to promote the outstanding Government Vaccination Programme, the programme details still being reviewed and adjusted, the staff in the department is ready to change from time to time. Funding and manpower are available in Vaccination Office to support the administrative work of new innovative programme. It can minimize the extra burden on the staff in elderly health centre.

Organizational climate. Organizational climate in the Department of Health is conductive to research utilization. Medical library and certain amount of power journals are free to access online in office. Monthly journals are circulated to all medical staff to update their own medical knowledge. Colleagues get used in using the evidence based studies and experience to plan for the new programme and educational promotion.
Consensus among staff. The aim of the vaccination programme carried out by the Department of Heath is to maximize the influenza vaccination coverage rate. There is no doubt that the staff and the administrators have consensus that the innovation could be beneficial. However, there might be restraint from elderly center frontline staff to co-operate with the vaccination office and hence careful planning should be implemented to minimize their disturbance.

Friction within organization. As there had been vaccination program held from elderly health centres for several years, staff is familiar with the current vaccination programme and should support the innovation in a certain extent. To minimize the friction, continual communication within elderly centre is essential to explain clearly how the innovation works so that the implementation of protocol could be facilitated well.

Skills to carry out the innovation program. Information of influenza vaccination including the benefits and safety message would be included in the training session. Demonstration of phone call reminding skills could be provided.

Equipment and facilities. There is vaccination enquiry hotline in vaccination office to support any enquires. Computers are also available there for accessing to the online system about the clients’ vaccination status.
Release of staff for training. The number of training session and training location should be flexible for the staff to join as to minimize the workload barriers by only one staff from each clinic released for training. If possible, the training can be held in the centre for the staff’s convenience during office hour.

Measuring tools. The number of influenza vaccination rate assessed by the e-health system in each clinic would be the measuring tool. Statistics from the centers could be collected in vaccination center weekly for evaluation.

Cost – Benefit Ratio of the Innovation

Innovation risk to clients. Vaccination has a good profile of safety. 15-20% administration of influenza vaccination may follow by local reactions like pain and swelling. Less than 10% may develop systemic side effects like fever and malaise. These will subside in 2-3 days without treatment. (CHP 1c, 2012) Some may be afraid of the severe side effect like Guillain-Barré syndrome (GBS). There is no association between GBS and receiving influenza vaccination till now. There is no GBS reported case following influenza vaccination reported in the 2011-12 seasons. And the baseline 40-60 GBS reported case does not increase after the implementation of vaccination programme in Hong Kong in recent years. (CHP 1c, 2012)

Innovation potential benefits. Innovation can directly decrease the complications of those elders received vaccination after getting influenza. The
hospitalization rate and death can be largely decreased which would lessen the medical system burden especially the influenza peak season during winter in Hong Kong (CHP, 2009).

**Risks of not trying the innovation.** Elderly is one of the vulnerable groups suffering during peak season if not receiving influenza vaccination. In 2012, the hospitalization number of elders diagnosed as influenza doubled when compared with previous year. It led to 40% more influenza-associated deaths and a heavy burden on the health care system in Hong Kong. (CHP, 2012) Vaccination is one of the most effective preventive measures.

**Material cost.** The material cost include a room for training staff, computers for accessing the patients vaccination date, printed materials for mailing, telephones for calling the clients. Of all the materials mentioned above are already present in setting who has been prepared for use to promote the Government Vaccination Programme.

**Non-material cost.** Non-material cost mainly consists of the manpower including the vaccination office staff (RN) for training the staff, the clerk for making reminder calls to the clients and the staff responsible for preparing the mailing pack for the clients. Some staff is responsible for accessing data from the e-health system.
Chapter 4: Evidence-based Guideline

We would develop an evidenced-base guideline of recommendations for the health care professionals when carrying out vaccination programme to increase the elderly influenza vaccination utilization in the community.

Title

Increase utilization of influenza vaccination among Hong Kong elders in the community.

Aim

This guideline aims to assist the health care professional in primary care setting to increase the vaccination coverage rate among the elderly aged 65 or above in the community.

Objectives

1) To increase the influenza vaccination rate in the public clinic such as elderly health care centres.

2) To increase the target group’s knowledge on influenza

3) To facilitate target group to receive influenza vaccination

4) To facilitate the health care professional to encourage vaccination by updating their knowledge on influenza vaccination and promotion skill.
Target Population

The target population is the members of the elderly health centre, either new or existing members who are 65 years old or above.

Recommendations

Recommendation 1.0

Mail the education brochures and reminder to all the elders aged 65 or above

Grade A (recommendation)

Mailing reminder with education brochures to the elders in the community can increase the influenza vaccination rates. (Arthur et al., 2002) (1-); (Dalby et al., 2000) (1+); (Hull et al., 2002) (1-); (Kellerman et al., 2000) (2-); (Krieger et al., 2000) (1-); (McCaul et al., 2002) (1-). The reminder letter should be in one page inviting the target population to receive influenza vaccination before seasonal influenza season. (McCaul et al., 2002)(1-). In order to increase the awareness of the target group, the programme information like the recommended injection period, available access location and vaccine information are included in the reminder. (Armstrong et al., 1999)(1-); (McCaul et al., 2002) (1-) ; (Kellerman et al., 2000) (2-). Both the Vaccination Office hotline and selected elderly service centre contacts are included in the letter for the elders’ further enquiry.

The mailing letter draft will be prepared by Vaccination Office and then approved by
both the heads of Vaccination Office and elderly health service. The selected elderly health centre will provide the mailing list of their elder members for the Vaccination Office to prepare for sending the letter out.

**Recommendation 2.0**

**Phone invitation to elders who have no influenza vaccination history to encourage them to receive vaccination at clinics**

**Grade A (recommendation)**

Phone invitation can reinforce the importance of vaccination and solve the worries of side-effects in recipients in order to boost the influenza vaccination rates (Arthur et al., 2002) (1-); (Dalby et al., 2000) (1+); (Hull et al., 2002) (1-); (Kellerman et al., 2000) (2-); (Krieger et al., 2000) (1-).

E-health system is an online database for clients’ medical record including the vaccination status which can be used to screen the non-vaccinated clients. (Hull et al., 2002) (1+); (Humair et al., 2002) (2+); (Igoe et al., 1999) (2-) The elderly health centre can trace the influenza vaccination status of theirs clients from the e-health system to see whether their members have gotten vaccinated in private or public sectors.

After one month the vaccination programme had started, the selected elderly centre can prepare a list of non-vaccinated members for the clinic administrative staff
(Hull et al., 2002) (1+) or the Vaccination Office hotline nursing staff to invite them for vaccination. Vaccination Office can provide trainings to the staff whom are responsible to make the reminder calls and arrange an appointment with their clients. The training content includes the influenza, vaccination information, techniques of communication and recording the call history.

**Recommendation 3.0**

**Provide training and briefing sessions for health care providers**

**Grade A (recommendation)**

Facilitating training courses increase the vaccination rate (Hogg et al., 2008) (1+); (Siriwardena et al., 2002) (1+). Briefing sessions on influenza vaccination to the Department of Health’s health care workers has been carrying out for several times every year in recent years. The content was already focusing on the safety profile and updates of the influenza vaccination. Promotions including mailing education brochures, telephone appointment, promoting skills supported with evidence based research findings could be included in these briefing sessions to facilitate them to promote the vaccination and support Government Vaccination Programme.
Recommendation 4.0

Home visit for elders who are followed up by elder health centre

Grade A (recommendation)

Home visit by nurse to elders are found to be effective in promoting the vaccination rate in those elders who fail to attend the clinic (Arthur et al., 2002) (1-); (Dalby et al., 2000) (1+) although it is relatively costly (Arthur et al., 2002) (1-). As those clients have difficulties to attend clinics for follow-up, this would be the barriers for them to utilize the influenza vaccination services. In elderly health centres’ routine practice, only occupational therapists provide home visit to those who are in needed. The home visits by elderly health centre nurses are considered to be the trial scheme to offer those who are not able to attend the centre in the vaccination period.

To conclude, mailing invitation, phone invitation, training-the-trainer program and home visit by nurse are found to be effective with evidenced based in boosting vaccination rate and are recommended to be adopted for use when carrying community elder vaccination programme in Hong Kong.
Chapter 5: Implementation Plan

The guideline of evidenced-based recommendation proposed in chapter 4, including mailing reminder, phone invitation, train the service provider and home visit can be adopted by the health care professionals for promoting elder influenza vaccination programme in the community. Besides, the communication and evaluation plan are also important for guidelines to be successfully carried out.

Communication Plan with Potential Users

Communication is important to the success of organizational change (Melnyk & Fineout-Overholt, 2011). Before the communication plan implemented, the stakeholders has to be identified. Stakeholders include the administrative team, frontline staff and the clients. The administrative team includes the Vaccination Office head, senior medical officers, nursing officers, chief executive officer and Chief Elderly Health Officer who play a role to make important decisions in any new programme. They set up new working protocol and make ongoing amendments, as well as monitor the progress through regular internal meetings which can keep a good communication (Gallagher-Ford et al., 2011). The frontline staff includes the clinic and hotline staff which consist of nursing officer, registered nurses and clerks who carry out the guidelines. They are important in providing feedbacks and comments on the new guidelines. The elder members in elderly health centre are also one of the
stakeholders to give comments and suggestions for the effectiveness to make improvement of the programme. Listening to these stakeholders in a respective and accepting way can also reduce their resistance to change (Corey & Corey, 2002).

At the beginning, a small working group including a registered nurse, a nursing officer and senior medical officer could draft a proposal in early June. The aim is to seek the approval from the head of Vaccination Office before the end of June. As vaccination programme is one of the important issues in the Department of Health, new promotion method is welcome to be adopted annually in recent years. The proposal should focus on showing the benefits of the new evidenced-based guidelines on influenza vaccination uptake, feasibility of guidelines in clinic setting and how to prevent the implementation plan from adding an extra heavy workload in the elderly centre routine practice.

After the approval, more administrative members including the medical officer, the Chief executive officer, senior executive officer could be invited to join the working group to revise the guideline from their different points of view such as the manpower and guideline presentation. An inter-departmental meeting with the Chief Elderly Health Officer and the elderly health centre’s senior medical and nursing officers could be held in the end of July. A presentation of the proposed guidelines will be given in 20 minutes by the senior medical officer of Vaccination Office.
People may resist changing when they do not understand the benefits of new change and would be in anxiety of their role in the change process (Melnyk & Fineout-Overholt, 2005). Open discussion is welcomed to settle any worries and amendments required. An action plan would then be worked out together to set out the timeline and assign each task with subject officer. For example, i) for mailing the education brochures and reminder to the clients, nurses and medical officers of Vaccination Office would be responsible to prepare an education brochure by revising the content of the information sheet in the present influenza vaccination programme to suit the target group need, with a covering letter prepared as well. The senior medical officer in elder center will be responsible to prepare a mailing list. The senior executive officer will need to assign clerical staff in Vaccination Office for packing and sending out the mailing letters. Registered nurse will brief the Vaccination Office hotline staff to answer any clients’ call for any queries raised out when receiving the reminder. For ii) phone invitation to clients who have no influenza vaccination history to receive vaccination at clinics, registered nurse will prepare and provide script for the hotline staff to make phone calls to invite them to receive vaccination. The reply list including consent to get vaccination at clinic or in home will be sent to the elder centre for further action. iii) For training the health care provider in elder centre, briefing about the new guidelines will be provided to the frontline staff in the daily
regular meeting at the end of September before the pilot test. iv) Educational materials on influenza vaccination, which is prepared in Vaccination Office, will be provided to the home visit nurse.

An intra-departmental meeting will be held at the end of September to revise the programme after the pilot test. Before that, emails and direct phone calls in-between frontline and vaccination office nursing officers will be the communication methods especially when there are questions which need to clarify. Emails will also be the communication network when there is update of the action plan, mailing list or other special issues. The administrative nursing and medical staff will go for site visits during the preparation and intermittent stage of programme to receive feedbacks from frontline staff and give guidance when necessary. For example, if there are difficulties within frontline staff to carry out the programme, instant advice can be provided. If the decision making needs a higher management level for further advice, the problem will be reflected to the higher management grade like the senior medical officer or head to seek advice or approval for an important issue.

To sustain the change process is the key to the success of a new programme. Staff may show reluctant and anxious to change when they are not familiar with the change benefits and their roles in the change process (Melnyk & Fineout-Overholt, 2011). The hotline contact number will be provided to them in case of any comments
or questions raised out. An instant follow-up action is needed to discuss within the administrative staff, solution and advice would be provided to reduce the worries within the frontline staff and to ensure the smooth running of the new plan.

**Pilot Testing**

Before a new plan is implemented, pilot test can be used to test for the feasibility and the barriers in running of new plan could be found out. Revision of the programme can be made before the actual implementation of the plan.

The pilot test will be held in the same elder centre from late August to mid September. A clerk from elder centre, a registered nurse from vaccination hotline and an administrative assistant in vaccination office will be involved in the pilot test. A nursing officer will over look the test. For mailing education brochures and reminder, the contents will be packed in envelopes by an office assistant after the approval of both heads of two departments. The frontline clerk will be asked to prepare a mailing list of thirty clients for back up office assistant to send out the invitation letter.

For phone invitation aspect, the frontline clerk will need to use the e-health system to screen and prepare a list of 30 elder members who have no influenza vaccination history. The list will be sent to the hotline nurse to make phone invitation to the listed clients. The call results will be recorded as either refusal or agreement to get vaccination in clinic or in home, and the result would be sent back to elder centre for further action.
After the phone invitation, the frontline clerk will refer those elders who chose home visit vaccination to clinic nurse for making further appointment. A 20 minutes briefing session will be provided for involved staff before the pilot test, whose content would include innovations and influenza vaccine information. Another 10 minutes will be Q & A session for clarification. The hotline nurse will gather the vaccination rate among the pilot test group and seek feedbacks from involved staff and clients. The result will be presented and discussed in the latter joint meeting for revision of the guidelines.
Chapter 6: Evaluation Plan

Last but not the least, an evaluation plan should be included in an innovation proposal to assess the effectiveness (Fitzner, 2001) and recommendation would be made in future direction on entire programme. Goals would be set and being evaluated in which the result would be a key evidence for the policy maker to consider whether preceding proposal should be implemented in normal practice or not.

Intervention Outcomes

The influenza vaccination rate among elders 65 or above was 36% in previous year. The primary outcome is to increase the coverage rate to 10% more in relevant to the selected studies so that the overall vaccination rate can meet 40% (Arthur, et al., 2002; Chan, et al., 2002; Hogg, et al., 2008; Krieger, et al., 2000; McCaul, et al., 2002; Siriwardena, et al., 2002). The statistics of vaccination in chosen elder centre would be reported weekly to monitor the progress. To avoid under-estimating the vaccination rate among the target group, the vaccination record within e-health system will also be counter-checked to see if the target group receive influenza vaccination in other public sector like general outpatient clinic or private sector like the general practitioners.

The secondary outcome is the willingness of the target population to receive
vaccination in future and their comments on the programme. Questionnaire will be sent to target group and selected phone interviews will be made to seek comments at the end of programme.

**Nature and Number of Clients Involved**

**Eligibility criteria.** The target group of this programme are elders 65 or above who are Hong Kong resident and holding a valid Hong Kong identification card. These elders need to be the members of the chosen elderly health centre. All of the enrolled members in the chosen centre will receive mailing letter invitation with reminder to get vaccination at this centre. Those members who had not received influenza vaccination before after checking with the e-health record will receive phone call invitation to choose if they get vaccination at centre or their own home. The cut off date would be the day of mailing letter to target group. Newly joined members after the cut-off date will not be included in the new programme.

**Sample size calculation.** The effect size is set to 0.1, significance level at 0.05 and power at 0.8. By using the SAS Power & Sample size v.3.1 to calculate the sample size (Castelloe,. 2000), the significantly estimated sample size is at least 256 participants. Assuming the drop-out rate is about 20%, 320 participants are to be recruited. This sample size can be recruited in the chosen elderly health centre, which includes about 2500 enrolled doctors.
Data Analysis

Data collection. The influenza vaccination rate of elderly health centre will be recorded weekly until the end of programme and the data would be compared with the previous year of the same week. Questionnaire will be posted to all target group at the end of the programme (Appendix A).

The questionnaire content includes:

1) Personal particulars: age, gender

2) Choice on receiving vaccination or not in preceding season

3) Place of receiving vaccination

4) Reason for receiving/ not receiving vaccination

5) Rating of several methods on facilitating or encouraging vaccination
   - Mailing education brochures and reminders
   - Phone invitation
   - Providing option of home visit vaccination
   - Training programme on health care workers

6) Overall comments of government vaccination programme at elder centers

7) Willingness of receiving influenza vaccination in coming season.

8) Other comments

Person-to person interviews will be held to seek the feedbacks of involved staff
on the new programme (Appendix B). The content includes:

1) Satisfaction on the new guidelines

2) Satisfaction on increased workload if any

3) Effectiveness of several methods on facilitating or encouraging vaccination
   - Mailing education brochures and reminders
   - Phone invitation
   - Providing option of home visit vaccination
   - Training programme on health care workers

4) Satisfaction on the support from hotline or vaccination office

5) Satisfaction on the overall running of new guidelines

6) Other comments

A final report will be sent to the department heads and subject officer in May for comments and then to the Department of Health for information.

**Data evaluation.** The data will be statically analyzed by using the Statistical Package for the Social Sciences (SPSS) software (Marija, 2012) to see whether there is a significantly difference between the vaccination rate of last year and this year after the programme implemented. Chi-square test will be used to see if the demographic variables like the age or gender associated with the vaccination determinations. The use of 95% confidence interval and two-tailed z-test will be
applied on reported vaccination rate and see whether it is significantly increased after implementation of programme. Two-tailed paired t-test will be employed on the staff satisfaction feedbacks. P-value=0.05 will be set as significantly different of the programme.

Criteria for Effectiveness

Client outcomes. The vaccination rate will be analyzed by using the two-tailed z test and 95% confidence interval (Polit & Beck, 2004). To see whether there is a significantly increase in the chosen elderly centre after the programme implemented, 10% increase in vaccination rate would be set as short-term primary outcome. In long term, the vaccination rate will be set at 60%.
Conclusion

Influenza vaccination programme is an important issue in Hong Kong health care system. Compared with other developed countries, Hong Kong vaccination rate is sup-optimal and still have rooms for improvements. By using evidenced-based studies from these countries, four aspects of innovations are proposed in primary care setting in order to increase the utilization of influenza vaccination among elders 65 or above in the community. An elderly health centre was chosen in this proposal as a sample aiming to increase 10% vaccination rate of target population in first step and the evaluation plan results in proposing improvement of future further implementation so that the vaccination rate can reach at least 60% in future. Hence the Hong Kong health care system can benefit from reducing the burdens especially during seasonal period or pandemics.
Reference


residents of age 65 or above. *Vaccine, 24*(26), 5526-5534.


controlled trial. *Journal of the American Geriatrics Society, 47*(1), 1-5.


## Appendix 1: Literature Study Search History

<table>
<thead>
<tr>
<th>Keyword</th>
<th>British nursing index</th>
<th>CINAHL</th>
<th>MEDLINE</th>
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<td>3161</td>
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Appendix 2: Critical Appraisal Skills Programme (CASP)

1. Did the study ask a clearly-focused question?

2. Was this a randomized controlled trial (RCT) and was it appropriately so?

3. Were participants appropriately allocated to intervention and control groups?

4. Were participants, staff and study personnel ‘blind’ to participants’ study group?

5. Were all of the participants who entered the trial accounted for at its conclusion?

6. Were the participants in all groups followed up and data collected in the same way?

7. Did the study have enough participants to minimize the play of chance?

8. How are the results presented and what is the main result?

9. How precise are these results?

10. Were all important outcomes considered so the results can be applied?
Appendix 3: Sign Grading System

Levels of Evidence and Grades of Recommendation

Levels of evidence

1++ High quality meta analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias

1+ Well conducted meta analyses, systematic reviews of RCTs, or RCTs with a low risk of bias

1 - Meta analyses, systematic reviews of RCTs, or RCTs with a high risk of bias

2++ High quality systematic reviews of case-control or cohort studies, High quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal

2+ Well conducted case control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal

2 - Case control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 Non-analytic studies, e.g. case reports, case series

4 Expert opinion
## Appendix 4: Intervention Content

<table>
<thead>
<tr>
<th>Journal</th>
<th>Study</th>
<th>Setting</th>
<th>Implementation Time</th>
<th>Whole Period including follow-up</th>
<th>Outcome Measure</th>
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<td>(2002).</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Chan, et al.</td>
<td>RCT</td>
<td>solo or group physiatrist practice</td>
<td>1997-1998</td>
<td>2 years</td>
<td>Analyzed the Medicare billing date to determine impact of doctor reminders on influenza vaccination rates</td>
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<tr>
<td>(2002).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dalby, et al.</td>
<td>RCT</td>
<td>Primary care setting</td>
<td>Not addressed, the program was implemented over 14 months</td>
<td>14 mths</td>
<td>Nurse audit the records by using Meducak Chart</td>
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<tr>
<td>(2000).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frank, et al.</td>
<td>RCT</td>
<td>GP</td>
<td>Not addressed</td>
<td>1 year</td>
<td>To measure the taken of preventive care for patients in the preventive activities</td>
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<tr>
<td>(2004).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hogg, et al.</td>
<td>RCT</td>
<td>Primary care setting</td>
<td>11.5 mths</td>
<td>3-21 mths</td>
<td>Use the client survey database and chart review to estimate the preventive performance</td>
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<tr>
<td>(2008).</td>
<td></td>
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<td></td>
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<tr>
<td>Study</td>
<td>Design</td>
<td>Setting</td>
<td>Intervention Duration</td>
<td>Follow-up Duration</td>
<td>Methodology</td>
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<td>----------------------------------------------------------------------------</td>
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<tr>
<td>Kellerman et al. (2000)</td>
<td>Quasi-experimental study</td>
<td>GP</td>
<td>In Sep 1996</td>
<td>3 mths</td>
<td>Vaccination rate by medical record reviewed</td>
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<tr>
<td>McCaul, et al. (2002)</td>
<td>RCT</td>
<td>Public Clinic</td>
<td>Not addressed, FU for 6 mths after intervention</td>
<td>6 mths</td>
<td>Use the Medicare reimbursement claim to calculate the Vaccination rate</td>
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GP: General Practice  
mth: month
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<tr>
<th>Journal</th>
<th>Study</th>
<th>Intervention by Mail</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chan, et al. (2002).</td>
<td>RCT</td>
<td>Mailing reminder for physician to have their patients get vaccinated against influenza</td>
<td></td>
</tr>
<tr>
<td>Dalby, et al. (2000).</td>
<td>RCT</td>
<td>Mailed survey for invitation and screening purpose</td>
<td></td>
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<tr>
<td>Frank, et al. (2004).</td>
<td>RCT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hull, et al. (2002).</td>
<td>RCT</td>
<td>Mailed reminder letter and leaflet from health authority</td>
<td>Reminders to get vaccinated</td>
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<tr>
<td>---------------------</td>
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<td>-------------------------------------------------------</td>
<td>-----------------------------</td>
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<tr>
<td>Kellerman et al. (2000).</td>
<td>Quasi-experimental study</td>
<td>Mailed invitation postcard</td>
<td>Describing the availability of vaccination. Encouraging patients receive vaccination and to contact practice if there is further need</td>
</tr>
<tr>
<td>Krieger, et al. (2000).</td>
<td>RCT</td>
<td>Mailed invitation and reminder, education brochure, post-paid reply card for vaccination tracking</td>
<td>Health behaviors model was considered when designing the educational brochure; post-paid reply card for vaccination tracking</td>
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<tr>
<td>McCaul, et al. (2002).</td>
<td>RCT</td>
<td>Mailed reminder letter, 1 page only</td>
<td>Address the risk/benefits of vaccination; costs, and lists the time and places for the vaccination; signed by director of nursing</td>
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<td>Siriwardena, et al. (2002).</td>
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<td></td>
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<tr>
<td>Journal</td>
<td>Study</td>
<td>Phone Intervention</td>
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<tr>
<td>Arthur, et al.</td>
<td>RCT</td>
<td>Phone follow-up questionnaires</td>
<td>Home visit (30 mins) by nurse, offered vaccine as part of the health check, allows discuss concerns</td>
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<td>(2002)</td>
<td></td>
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<tr>
<td>Chan, et al.</td>
<td>RCT</td>
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<td>(2002)</td>
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<tr>
<td>Dalby, et al.</td>
<td>RCT</td>
<td>Phone follow-up conducted if needed during the program</td>
<td>Home visit by nurse, offered as part of the health assessment program</td>
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<tr>
<td>Frank, et al.</td>
<td>RCT</td>
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<td>(2004)</td>
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<tr>
<td>Hull, et al. (2002)</td>
<td>RCT</td>
<td>Phone invitation to attend vaccination clinic, by receptionists</td>
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<tr>
<td>Kellerman et al. (2000)</td>
<td>Quasi-experimental study</td>
<td>Phone reminders to those not responding within 1 month (Reinforcing the need and availability of influenza vaccination)</td>
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<td>Krieger, et al. (2000)</td>
<td>RCT</td>
<td>Phone follow-up by senior volunteers</td>
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<tr>
<td>McCaul, et al. (2002)</td>
<td>RCT</td>
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<td></td>
</tr>
<tr>
<td>Siriwardena, et al. (2002)</td>
<td>RCT</td>
<td>Educational outreach visit (1hr) with evidence-based info, using audit, feedback, discussion of barriers</td>
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</table>
Appendix 5: Questionnaire for the target group after the end of the programme

Age:

Gender: M/F

1) Did you receive seasonal influenza vaccine during September 2013 – June 2014?

2) Where did you receive influenza vaccination during September 2012 – April 2013?

3) What are your reasons for receiving/not receiving influenza vaccination?

4) Are the following promotion strategies effective? Please rank them for the effectiveness. “1” for the most effective…… “4” for the least effective.

   a) Mailing education brochures and reminders

   b) Phone invitation

   c) Providing option of home visit vaccination

   d) Health advice from the health care workers

5) Do you satisfied on the overall running of government vaccination programme at elder centers?

6) Will you receive influenza vaccination in coming season.

7) Specific comments and suggestions
Appendix 6: Person-to person interviews for involved staff on the new programme

1) Is the increased workload acceptable?

2) Are the following promotion strategies effective? Please rank them for the effectiveness. “1” for the most effective…… “4” for the least effective.
   
   a) Mailing education brochures and reminders
   
   b) Phone invitation
   
   c) Providing option of home visit vaccination
   
   d) Training programme on health care workers

3) Do you satisfied with the support from hotline or vaccination office

4) Do you satisfied with the overall running of new guidelines?

5) Specific comments and suggestions