

Coverage Target for Influenza Immunization

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Key Take Home Messages

1. There is no evidence in the synthesized literature to support a specific influenza immunization target coverage rate for the general population against which Public Health influenza programs can be evaluated
2. There is insufficient evidence to identify a herd immunity threshold for influenza, i.e. the coverage required to achieve indirect protection for the proportion of the population that is not immunized against the influenza virus
3. The evidence recommends that as many people as possible be immunized. The guidelines place emphasis on reaching people at high risk for serious influenza related complications
4. Prior to implementing any changes to Peel Public Health (PPH) influenza program, further evaluation is needed, including collection of demographic, health insurance and risk factor information about Peel residents who attend PPH community influenza clinics

Executive Summary

Peel Public Health (PPH) influenza immunization coverage has been consistently below the coverage targets of 60% and 90% for the general population and high priority populations respectively. These targets were set by the Ministry of Health and Long Term Care (MOHLTC) in 2000 when they launched the Universal Influenza Immunization Program (UIIP). The reason for this rapid review is to identify the influenza immunization coverage required to achieve the health outcomes identified by the MOHLTC. It is important to know this information prior to making a program decision about whether to attempt to improve coverage.

In Peel, the range of laboratory confirmed cases of influenza per year from 2006 to 2010, excluding H1N1 was 226 to 466 and the range of reported deaths per year was from 1 to 12. In 2010, 263,324 doses of influenza vaccine were administered in Peel, achieving 22% coverage of Peel's population of 1.2 million. Of these, 8,505 doses were administered at PPH community influenza clinics, contributing 3% to the total influenza vaccine coverage in Peel. The cost to PPH is \$21.00 per dose administered and a total cost of \$178,000.00 cost shared between the Region of Peel and the MOHLTC. The cost to the MOHLTC for physician administered influenza vaccine is \$9.60 per dose if this is the only purpose for physician visit and \$4.50 if influenza vaccination is an additional reason for physician visit. Approximately 75% of vaccine was administered by physicians and the remaining 22% by workplaces and other health care providers.

This rapid review was conducted to answer the question: What is the influenza immunization coverage rate for the general population required to achieve the health outcomes identified by the MOHLTC?

Two guidelines were identified and reviewed, the first from the Centers for Disease Control-*Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP)* and the second from Public Health Agency of Canada (PHAC)- *An Advisory Committee Statement, National Advisory Committee on Immunization (NACI): Statement on Seasonal Influenza Vaccine for 2011-2012*. The CDC guideline was quality assessed as strong and the NACI guideline as moderate. Both guidelines were included in this rapid review.

There is no evidence in the synthesized literature to support the identification of a specific influenza immunization coverage target for the general population against which the PPH influenza immunization program can be evaluated. The guidelines recommend that influenza immunization programs aim to immunize as many people as possible, with an emphasis on immunizing those people at high risk for serious influenza related health outcomes.

At the applicability and transferability meeting, the group agreed that changes to the influenza program would be accepted by Peel Regional Council if the changes are based on evidence. A decision to eliminate PPH community influenza clinics would be more difficult as it provides a service for the residents of Peel. Individuals, who rely on PPH community influenza clinics,

including those without OHIP or a family physician, must be considered if the influenza clinic services are changed. The possibility of redirecting resources to other providers that have greater capacity to reach Peel residents, e.g. physicians or community provider, was discussed.

However, it is not known if there is capacity among these groups. The guidelines recommend immunizing those at high risk for serious influenza related health outcomes. A recommendation that an evaluation be conducted to determine the demographics, health insurance and risk factors of Peel residents who currently attend PPH community influenza clinics was agreed on.

Final recommendations of this review are that PPH Vaccine Preventable Disease (VPD) does the following:

- 1.** Gather additional data on demographic, health insurance and risk factor information associated with Peel residents who attend PPH community influenza clinics prior to implementing any changes to PPH influenza program.
- 2.** Ask Public Health Ontario to conduct a synthesis of single studies on the indirect benefits of influenza immunization.
- 3.** Inquire about the possibility of the Manitoba Centre for Health Policy using their administrative data base to link physician visits, hospitalization, and death with influenza immunization for the purpose of identifying if influenza immunization is decreasing rates of morbidity, hospitalization and mortality.

1 Issue

The Universal Influenza Immunization Program (UIIP) is mandated by the Ministry of Health and Long Term Care (MOHLTC). Twenty-two percent of the Peel population received the influenza vaccine in 2010. Peel Public Health administered 8,505 doses to residents in Peel at community influenza clinics, contributing 3% to the total influenza vaccine coverage in Peel (See appendix G for vaccine coverage calculations). The cost of this program was \$178,000 or \$21.00/dose. This cost is shared between the Region of Peel and MOHLTC (MOHLTC 75% and Region of Peel 25%). The Region of Peel receives a rebate of \$5.00/dose from the MOHLTC which brings the cost of the program down to \$136,000 or \$16.00/dose. The cost for physician administered influenza vaccine is \$9.60 per dose if this is the only reason for physician visit and \$4.50 if influenza vaccination is with an additional reason for physician visit¹.

The MOHLTC set coverage targets of 60% for the general population and 90% for high priority populations in 2000 when they launched the UIIP. There is a gap between the MOHLTC influenza coverage targets and Peel's actual coverage (See Appendix G for coverage definition).

The evidence that the MOHLTC based the original target coverage rates on is unclear. Therefore, prior to making a program decision about whether to improve coverage, it is beneficial to confirm the influenza immunization coverage required in the general population to achieve the health outcomes identified by the MOHLTC, which are:

- To protect individuals by reducing the number and severity of influenza cases,

- To reduce the impact on the health care system during the influenza season, and
- To decrease the economic impact of influenza during the influenza season².

This Rapid Review addresses the question: What is the influenza immunization coverage rate for the general population required to achieve the health outcomes identified by the MOHLTC?

The scope of this review does not include influenza vaccine efficacy, effectiveness or safety (See Appendix G for definitions on vaccine efficacy and effectiveness).

1.1 *An Anecdote:*

Peel Public Health has a 10 year strategic plan that includes, among other things, a commitment to performance measurement, evidence-informed decision making and ensuring that resources are used to maximum effect. Given this and our commitment to effective public health interventions, those of us in the Vaccine Preventable Diseases Section (VPD) have been proudly confident that we indeed are practicing a proven public health intervention. Who could argue against influenza immunization as a core public health strategy? The numbers are impressive; thousands are immunized every year at Peel Public Health community influenza clinics, some years, tens of thousands. Not only are we delivering a recognized and respected public health intervention, the public is being served and they love us; we have the customer satisfaction surveys to prove it. As we work toward meeting our commitment to use our scarce public health resources wisely, the words ‘population level impact’ keeps coming up. This has caused a bit of worry and confidence has started to wane, just a little. There are annual reports on influenza immunization clinics achievements, but not one of them identifies the impact at the population level. What if we really don’t have the impact that we have been feeling so confident about?

How could immunizing thousands of people not have an impact? But then again, how much is enough?

2 Context

2.1 Influenza Cases and Mortality in Peel:

In Peel, the range of laboratory confirmed cases of influenza per year from 2006 to 2010, excluding 2009 in which H1N1 was the predominate strain, was 226 to 466. The range of reported deaths per year from influenza was from 1 to 12³. Table 1 illustrates the numbers of influenza deaths and confirmed cases by year.

Table 1: Number of influenza Cases and deaths in Peel (2006-2010)

Episode Year	# Deaths	# Confirmed Flu Cases
2006	1	249
2007	4	265
2008	12	466
2009	16	1830*
2010	7	226

Source: iPHIS, Region of Peel, March 16, 2012.

* Pandemic H1N1 2009

Confirmed flu cases and mortality rates are low in Peel, however; limited laboratory case confirmation and the difficulty in distinguishing influenza cases from other influenza-like illnesses may cause under reporting and an incomplete picture of the health impacts of influenza.

2.2 Universal Influenza Immunization Program (UIIP):

In 2010, Peel Public Health distributed 312,184 doses of influenza vaccine to providers that administer the influenza vaccine in Peel; of these 48,860 (16%) were returned, resulting in vaccine coverage of 22% (263,324 doses). Peel Public Health (PPH) distributes approximately 75% of the annual influenza vaccine to physicians' offices, 22% to other health care providers and 3% to PPH community influenza clinics.

Under the UIIP, four provider groups administered the influenza vaccine. These include physicians, health care organizations, workplaces and public health units that offer influenza vaccines to the general public in community-based clinics. Peel Public Health:

- Distributes influenza vaccine to all providers,
- Provides information on influenza to providers,
- Facilitates the administration of the UIIP program in Peel for the MOHLTC,
- Promotes the UIIP program,
- Provides influenza health information to the general public,
- And administers vaccinations in its community clinics.

2.3 Peel Public Health Influenza Program and Influenza Coverage Gap Conceptual Framework

The conceptual model in Appendix A illustrates the movement of influenza information and vaccine from the MOHLTC to the population of Peel. The model also illustrates the coverage gap and the uncertainty about the coverage target.

3 Literature Review

3.1 Question:

This rapid review addresses the question:

What is the influenza immunization coverage rate for the general population required to achieve the health outcomes identified by the Ministry of Health and Long Term Care?

3.2 PICO

P= General population

I= Influenza immunization coverage rate

C= Unimmunized population

O= Influenza related health outcomes (e.g. mortality, morbidity and hospitalization)

3.3 Search Strategy:

MEDLINE, MEDLINE In-Process and other Non-indexed Citations, Cochrane Library, Global Health, and EMBASE were searched with no date limit to June 2012. The main search concepts include immunization, vaccination, herd immunity or protection, influenza, coverage or uptake. Methodological filters were applied to limit retrieval to systematic reviews and/or meta-analyses and guidelines (See Appendices B for a detailed search strategy and See Appendix G for a definition of herd immunity).

Websites of guidelines and summaries were searched, as well as other topic specific sites including CMA InfoBase, National Guideline Clearing House, National Institute for Health and Clinical Excellence (NICE), Center for Diseases Control and Prevention (CDC), WHO Health

Organization (WHO), Trip database, and National Collaborating Centre for Infectious Diseases (NCCID), National Collaborating Centre for Methods and Tools (NCCMT), Health Evidence, Registered Nurses Association of Ontario Guidelines Advisory Committee and Database for Promoting Health Effectiveness Reviews (DoPHER).

Reference lists of identified papers were reviewed. In addition, two experts in the field were contacted to inquire if they were aware of any relevant emerging evidence. The experts were Dr. Jeff Kwong and Dr. Allison McGeer⁴.

3.4 Relevance Assessment:

The following criteria were used to assess search results:

Inclusion Criteria	Exclusion Criteria
Meta analyses	Studies that only address influenza target in high-risk groups, pregnant women, health care workers, H1N1, SARS, Avian Flu, and other pandemic influenza
Systematic Reviews	Studies published in languages other than English
Evidence based clinical guidelines	Studies that address influenza vaccine effectiveness, efficacy and safety with no information on influenza immunization target coverage
Evidence based technical or position papers	
Studies that include influenza immunization target coverage	
General Population	

3.5 Results of Search

Database and websites of guidelines and summaries searches yielded 97 articles. Twenty six of these articles were duplicates and were eliminated. The remaining 71 articles were assessed for relevance. Sixty five were not relevant based on the title and abstract screening. Six were

deemed potentially relevant and the full text documents were retrieved and reference lists of these were reviewed. Four of the six were not relevant as they did not provide information on a target coverage rate for the general population (See Appendix C).

Two single studies, which did not meet the inclusion criteria, provided information on coverage rates and health outcomes. These single studies may be relevant for future work. A 2005 presentation by Longini, I.M. et al used probabilistic modeling to forecast potential indirect benefits of vaccinating children for the protection of the broader community⁵ (See appendix G for information on probabilistic modeling). Longini I. M. et al (2005) was included in a paper by Schwartz et al (2006) titled *Universal Influenza Vaccination in the United States: Are We Ready? Report of Meeting*⁶. A 2008 study by Kwong, J.C. et al, demonstrates a decrease in the burden of influenza in Ontario in all age groups compared to other provinces as a result of an increase in influenza vaccination rates⁷. This paper by Kwong, J. C. et al (2008) was included in a paper by Monto A. S. titled *Seasonal Influenza and Vaccination Coverage*⁸.

The following two guidelines met the relevance criteria and were retrieved for critical appraisal (see Appendix C for Search Results):

1. The Centers for Disease Control- *Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP)*⁹.
2. Public Health Agency of Canada (PHAC). An Advisory Committee Statement, *National Advisory Committee on Immunization (NACI): Statement on Seasonal Influenza Vaccine for 2011-2012*¹⁰.

4 Critical Appraisal

The two guidelines that were identified were critically appraised by three independent reviewers, using the Appraisal of Guidelines for Research and Evaluation II (AGREE II)¹¹. Disagreements among the reviewers were resolved through discussion, until the reviewers reached consensus (see Appendix E).

Agree II Domains	CDC	NACI
Scope and Purpose	87%	91%
Stakeholder Involvement	80%	50%
Rigour and Development	81%	51%
Clarity and Presentation	98%	89%
Applicability	72%	19%
Editorial Independence	100%	50%
Overall Rating	86%, Strong	44%, Moderate
Recommended for Use	Yes	Yes, with modifications

4.1 CDC Guideline Appraisal Score:

The Centers for Disease Control- *Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices* guideline was rated as strong, received an overall rating of 86% and all three reviewers recommended it for use¹².

4.2 NACI Guideline Appraisal Score:

Public Health Agency of Canada (PHAC)-An Advisory Committee Statement, *National Advisory Committee on Immunization (NACI): Statement on Seasonal Influenza Vaccine for 2011-2012* statement was rated as moderate, received an overall rating of 44% and the reviewers recommended it for use with modification¹³. We sought additional information on the rigour of development of this guideline. NACI published a supplementary document outlining the process used for developing all of its statements¹⁴. While the information provided in the supplement

suggests a high degree of rigour, the lack of specific information on the methods for searching and selecting the evidence for this guideline was unavailable to the reviewers. NACI was contacted for additional information, and at the time of writing a response had not yet been received. Should it become available this guideline will possibly rate higher. Given that the NACI guideline is Canadian and provides the basis for PPH immunization program, this guideline was included.

4.3 Description of included Studies:

4.3.1 CDC Guideline (see Appendix D for detailed data extraction tables)

The aim of the CDC guideline was to provide practice guidance to prevent and control influenza. The CDC guideline includes a recommendation for all persons over the ages of 6 months to be immunized annually and emphasis is placed on protecting persons at a higher risk of influenza related complications¹⁵. The CDC guideline referred to the *Healthy People 2010* objective of a coverage target of 90% for persons aged 65 years and above and for nursing home residents. However the guideline does not present evidence related to this target and does not incorporate the target in their recommendations¹⁶. The guideline acknowledges that research is lacking about the health effects of immunization coverage rates; that “additional data on indirect effects of vaccination also are needed to quantify the benefits of influenza vaccination of health care providers in protecting their patients and the impact of a universal immunization recommendation on influenza epidemiology, particularly the impact on persons at higher risk for influenza complications”¹⁷ (See Appendix for a definition for indirect protection).

4.3.2 NACI Statement: (see Appendix D for detailed data extraction tables)

The aim of the NACI guideline was to provide practice guidance to prevent serious illnesses including death caused by influenza and its complications¹⁸. Similar to the CDC guideline, the NACI Statement encourages everyone who has no contraindication to the influenza vaccine to receive the vaccine. It recommends priority for the influenza vaccine is given to persons at high risk of influenza related complications, capable of transmitting influenza to individuals at high risk of complications and who provide essential community services. Based on national goals and objectives established through a consensus process, the NACI statement made reference to a national target of 80% for influenza vaccine coverage for seniors and adults less than 65 years of age with chronic conditions. However evidence related to this target is not included in the guideline and the coverage target is not included in their recommendations¹⁹. The guideline suggests that evidence to support community immunization is emerging; “in addition to the direct protection of vaccine recipients, there is emerging evidence that vaccination may provide indirect protection to others in the household or in the community”²⁰. Research studies on Hutterite communities in Canada, school-based trials and health care worker trials are cited as indicating indirect protection but no specific target coverage recommendation is made in the guideline.

5 Synthesis of Findings

In summary, there is no evidence in the synthesized research literature to support the identification of a specific influenza immunization coverage rate target for the general public against which public health influenza programs can be evaluated. There is evidence that

influenza immunization provides direct benefit to those immunized by preventing disease and reducing morbidity and mortality. The guidelines identify emerging evidence on the indirect benefits however, more data is needed. Overall, the included guidelines recommend that influenza program objectives aim to immunize as many people as possible, with an emphasis on reaching those at high risk for serious health outcomes.

6 Applicability and Transferability

6.1 Political Acceptability

Changes to PPH influenza program and services that are based on careful consideration of evidence would be politically acceptable. A decision to eliminate PPH community influenza clinics would be more difficult as it provides a convenient service for the residents of Peel. PPH influenza clinic survey results indicate that 88% of clients who attended PPH influenza clinic attended a clinic in the same city/town where they live²¹. Ninety-two percent found PPH influenza clinics to be convenient for their schedules²².

In 2009, 17.2% of those immunized at PPH influenza clinics were 65 years and older²³. The group recommended an evaluation of the demographics, health insurance and risks of the Peel residents who attend PPH influenza clinics to determine who is currently being immunized through PPH community influenza clinics.

6.2 Social Acceptability

Should future PPH community influenza clinics become focused on high risk clients, access to clinic services for the general population needs to be considered. Consideration needs to be given to those individuals who do not have OHIP and therefore cannot get the vaccine at a

family physician or walk-in clinic. High risk Peel residents may not identify themselves as such and therefore not attend clinics targeted at high risk clients. A change in emphasis to immunizing only high risk individuals would require a promotional strategy targeted at these individuals. Given that there are a variety of factors that identify individuals as high risk the communication may be complex.

6.3 Resources

Any future changes to the influenza program would need to be cost neutral. The group discussed the cost of PPH administering community influenza clinics and the acceptability of redirecting resources to other providers that are more cost effective and may have greater capacity to reach Peel residents, e.g. physicians or community providers. However, the capacity among these groups to handle an increase in the numbers of patients is unknown.

6.4 Magnitude of the health issue

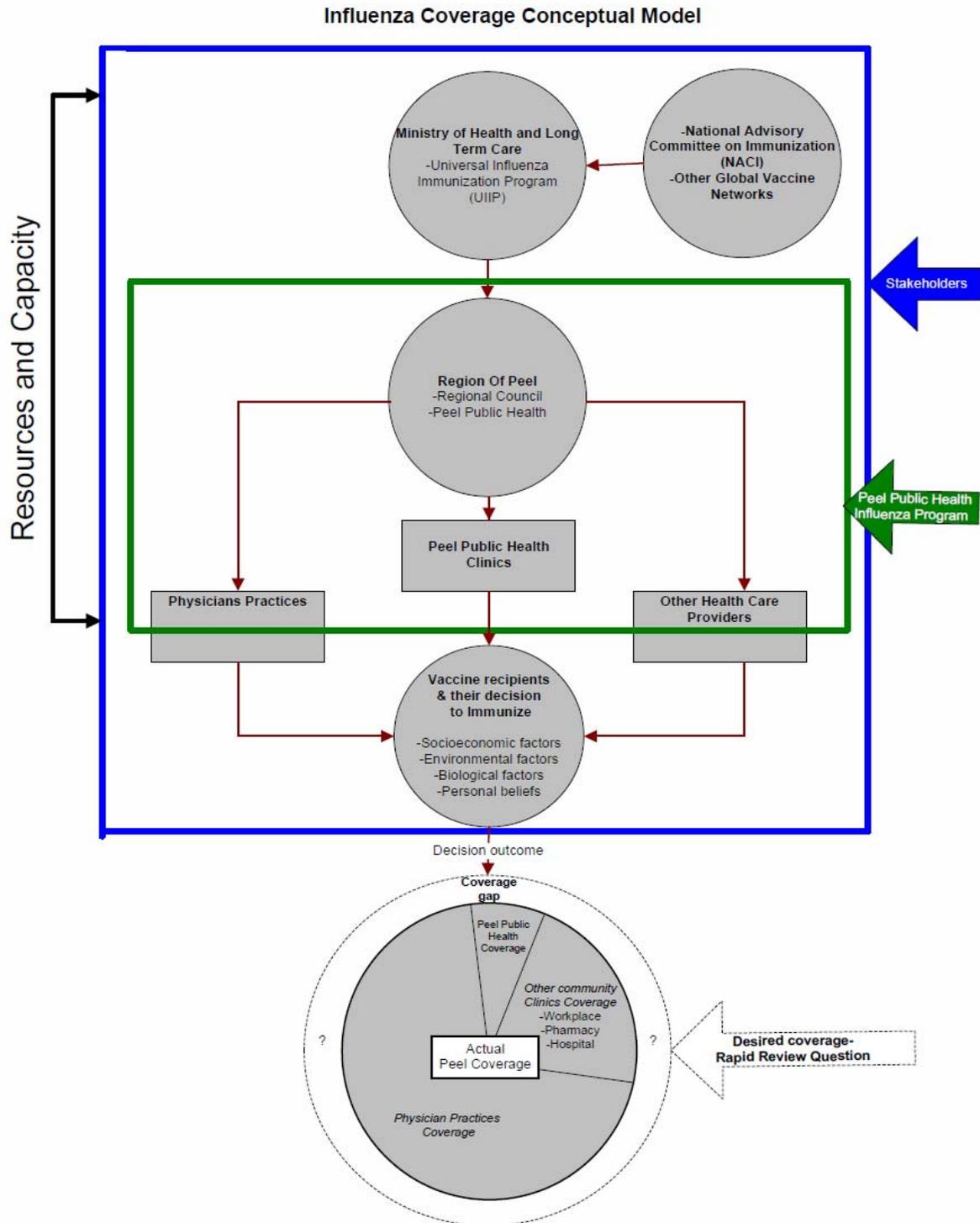
Given the limited research evidence on influenza vaccine coverage targets, the group agreed that a better understanding of the health impact of influenza in Peel would be helpful in determining the program direction in the future.

7 Recommendations

Final recommendations of this review are that PPH Vaccine Preventable Disease (VPD) does the following:

1. Gather additional data on demographic, health insurance and risk factor information associated with Peel residents who attend PPH community influenza clinics prior to implementing any changes to PPH influenza program.
2. Ask Public Health Ontario to conduct a synthesis of single studies on the indirect benefits of influenza immunization.
3. Inquire about the possibility of the Manitoba Centre for Health Policy using their administrative data base to link physician visits, hospitalization, and death with influenza immunization for the purpose of identifying if influenza immunization is decreasing rates of morbidity, hospitalization and mortality.

Appendix A: Concept Model



Appendix B: Search Strategy

Database: EBM Reviews - ACP Journal Club <1991 to November 2011>, EBM Reviews - Cochrane Database of Systematic Reviews <2005 to November 2011>, EBM Reviews - Database of Abstracts of Reviews of Effects <4th Quarter 2011>, EBM Reviews - Health Technology Assessment <4th Quarter 2011>, EBM Reviews - NHS Economic Evaluation Database <4th Quarter 2011>, Global Health <1973 to October 2011>, Ovid MEDLINE(R) <1948 to November Week 2 2011>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <November 16, 2011>

Search Strategy:

-
- 1 (immuniz\$ or immunis\$).ti,ab. (133017)
 - 2 exp Immunization/ (167176)
 - 3 "immunization programmes".sh. (2293)
 - 4 exp Immunity, Herd/ (254)
 - 5 ("herd protection" or "herd immunity").tw. (1484)
 - 6 exp Vaccination/ (81422)
 - 7 exp Vaccines/ (188163)
 - 8 (vaccine\$ or vaccinat\$).ti,ab. (240771)
 - 9 (influenza or flu).ti,ab. (78284)
 - 10 exp Influenza, Human/ (29392)
 - 11 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 (398136)
 - 12 9 or 10 (82996)
 - 13 11 and 12 (27323)
 - 14 (coverage\$ or uptake).ti,ab. (311540)
 - 15 13 and 14 (2042)
 - 16 meta-analysis.mp,pt. (73811)
 - 17 (search or systematic review or medline).tw. (213477)
 - 18 cochrane database of systematic reviews.jn. (15354)
 - 19 16 or 17 or 18 (250626)
 - 20 exp guideline/ (34566)
 - 21 (practice guideline or guideline).pt. (21927)
 - 22 20 or 21 (34566)
 - 23 19 or 22 (283679)
 - 24 (comment or letter or editorial or note or erratum or short survey or news or newspaper article or patient education handout or case report or historical article).pt. (1568831)
-

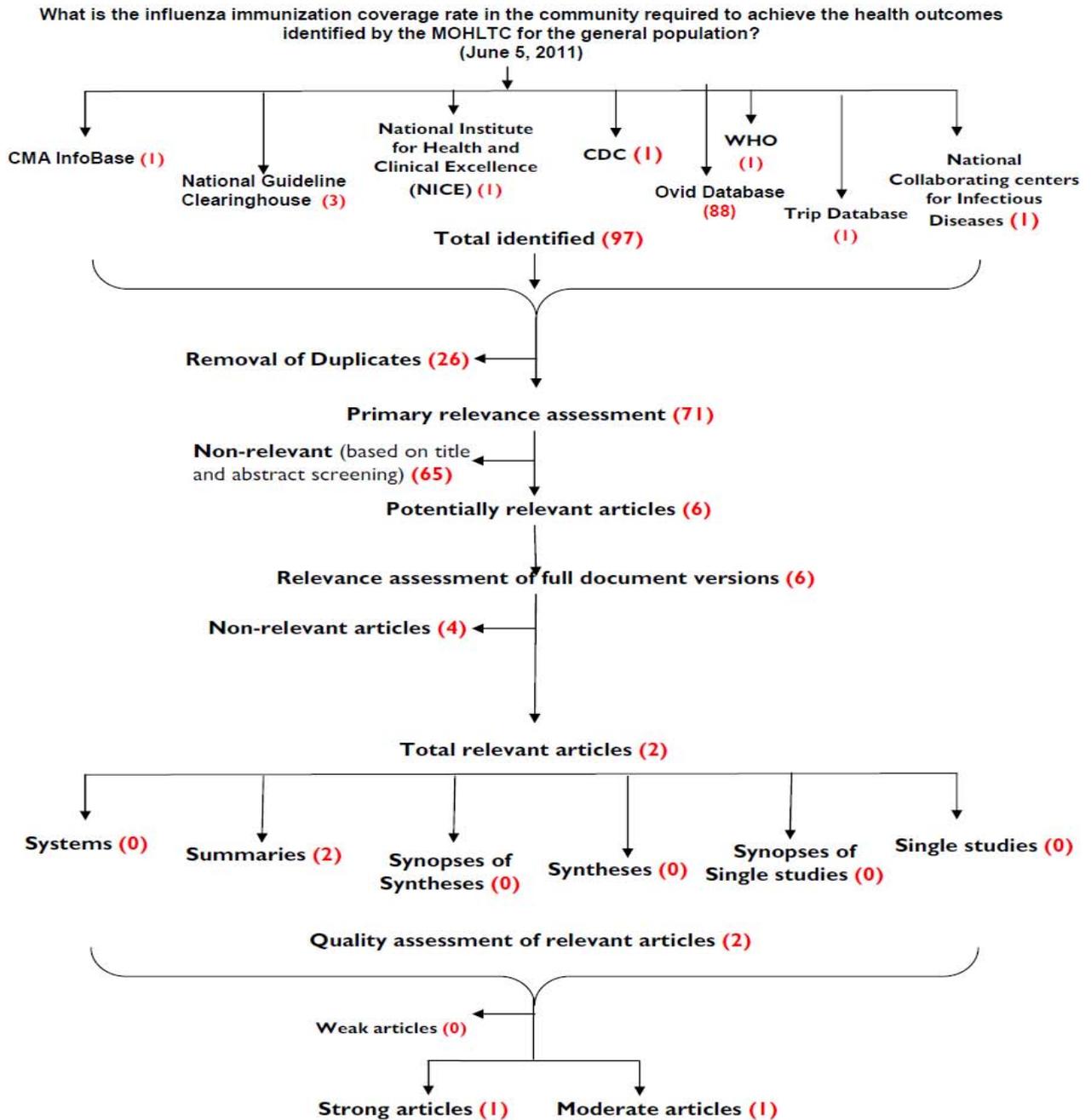
- 25 23 not 24 (274453)
- 26 15 and 25 (66)
- 27 remove duplicates from 26 (53)

Database: Embase <1996 to 2012 Week 22>

Search Strategy:

-
- 1 (immuniz\$ or immunis\$).ti,ab. (66768)
 - 2 exp Immunization/ (116065)
 - 3 "immunization programmes".sh. (0)
 - 4 exp Immunity, Herd/ (701)
 - 5 ("herd protection" or "herd immunity").tw. (896)
 - 6 exp vaccination/ (66651)
 - 7 exp vaccines/ (144235)
 - 8 (vaccine\$ or vaccinat\$).ti,ab. (148754)
 - 9 (influenza or flu).ti,ab. (49065)
 - 10 exp Influenza, Human/ (39124)
 - 11 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 (235697)
 - 12 9 or 10 (58821)
 - 13 11 and 12 (23263)
 - 14 (coverage\$ or uptake).ti,ab. (210915)
 - 15 13 and 14 (1701)
 - 16 MEDLINE.tw. (52339)
 - 17 exp systematic review/ (49971)
 - 18 systematic review.tw. (37260)
 - 19 meta-analysis/ (59022)
 - 20 16 or 17 or 18 or 19 (129922)
 - 21 15 and 20 (35)

Appendix C: Literature Search Flowchart



Source: Health-evidence.ca. *Keeping Track of Search Results: A Flowchart*. [Retrieved January 13, 2010]

Appendix D: Data Extraction Tables

Items Reviewed	Guideline # 1: Centre for Disease Control and Prevention (CDC)
General Information & Quality Rating for Review	
1. Author(s) and Date	<p><i>Centres for Disease Control- Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP).</i> <i>Fiore, A. E et al.</i></p> <p>This Statement is produced by ACIP, published in the United States, in the Morbidity and Mortality Weekly Report. August 6, 2010 Vol. 59 No. RR-8.</p>
2. Country	USA
3. Quality Rating Using AGREE TOOL	<p>Assessed by 3 Peel Public Health Reviewers, using the Agree II instrument:</p> <p>Scope and Purpose = 87% Stakeholder Involvement=80% Rigour of Development=81% Clarity and Presentation = 98% Applicability=72% Editorial Independence =100% Overall Guideline Assessment =83% Recommended for Use: Yes</p>
4. Objectives of Review (of interest)	<ul style="list-style-type: none"> To provide recommendations on the use of influenza vaccine for the prevention and control of influenza
Details of Review	
5. Number of studies Included	552 articles were referenced
6. Types of Studies	<p>Types of studies included: Randomized Controlled Trials (RCTs) and observational studies.</p> <p>Note: Studies that assessed vaccination program practices that improve vaccination coverage were influential in formulating recommendation.</p>
7. Search Period	Data presented in the guideline was current as of June 2010

8. Number of databases searched	The ACIP guideline is produced based on the US Preventative Task Force recommended methods. The US Preventative Task Force searches at least the MEDLINE English-language database and the Cochrane Collaboration Library
9. Inclusion and Exclusion Criteria	Inclusion/exclusion criteria and search criteria for evidence presented in the guideline not specified.
Details of Interventions	
10. Description of interventions	The intervention of interest for this guideline is influenza vaccination for the control and prevention of influenza, addresses the use and administration of vaccine and strategies for increasing vaccine coverage.
11. Target groups	Persons aged 6 months and over, who have no contraindications to vaccination Intended users of guideline include Health Care Providers
12. Primary Outcomes	The guideline provides updates on recommendations provided by ACIP in 2009, for the use of influenza vaccine for the prevention and control of influenza
Results of Review	
13. Main Results of Review	<p>The evidence does not provide a target coverage rate required to achieve specific outcomes in the general population</p> <p><u>Guideline Recommendations regarding coverage</u></p> <ul style="list-style-type: none"> • All persons over the age of 6 months be vaccinated annually • Influenza vaccination focus should be placed on protecting persons at higher risk of influenza related complication • Strategies for vaccination programs to improve uptake/coverage • Recommendations for research related to indirect benefits (p.43) <p><u>Comments</u></p> <p>The guideline made reference to the Healthy People 2010 objectives (objective no.14-29a), which includes achieving an influenza vaccination coverage level of 90% for persons aged 65 years or older and for nursing home residents. ACIP did not go on to make this a recommendation in the guideline.</p> <p>In addition, the guideline states that, “additional data on indirect effects of vaccination also are needed to quantify the benefits of influenza vaccination of health care workers in protecting their patients and the impact of a universal immunization recommendation on influenza epidemiology, particularly the impact on persons at higher risk for influenza complications.” (p.43)</p>

Items Reviewed	Guideline #2: National Advisory Committee on Immunization (NACI)
General Information & Quality Rating for Review	
1. Author(s) and Date	<p>Public Health Agency of Canada (PHAC). An Advisory Committee Statement, National Advisory Committee on Immunization (NACI): Statement on Seasonal Influenza Vaccine for 2011-2012.</p> <p>This Statement is produced by NACI, published in Canada, in the Canada Communicable Disease Report Vol.37, October 2011.</p>
2. Country	Canada
3. Quality Rating Using AGREE TOOL	<p>Assessed by 3 Peel Public Health Reviewers, using the Agree II instrument:</p> <p>Scope and Purpose = 91% Stakeholder Involvement=50% Rigour of Development=51% Clarity and Presentation = 89% Applicability=19% Editorial Independence =50% Overall Guideline Assessment =44% Recommended for Use: Yes, with modification</p>
4. Objectives of Review (of interest)	The guideline provides recommendation for immunization with the seasonal influenza vaccine based on current evidence
Details of Review	
5. Number of primary studies Included	198 articles were referenced Evidence was appraised based on NACI's evidence based process methods document published January 2009 for developing the annual influenza statement.
6. Types of Studies	Systematic Reviews, cohort studies, RCTs. All studies were all appraised using GRADE system
7. Search Period	The document does not outline search period
8. Number of databases searched	The document does not outline databases searched

9. Inclusion and Exclusion Criteria	Inclusion/exclusion criteria for selected evidence provided not specified. Search criteria not specified
Details of Interventions	
10. Description of interventions of included studies	This document provides NACI recommendations for immunizing the general public with the seasonal influenza vaccine for the 2011-2012 season Intended users: Persons administering influenza vaccine
11. Target groups	All Canadians with no contraindication to the influenza vaccine
12. Primary Outcomes	To prevent serious illness caused by influenza and its complication, including deaths
Results of Review	
13. Main Results of Review	<p>The evidence does not provide a coverage rate required to achieve health outcomes in the general population</p> <p><u>Guideline Recommendations regarding coverage</u> Priority for the influenza vaccination is given to those persons at high risk of influenza- related complications, those capable of transmitting influenza to individuals at high risk of complication and those who provide essential community services.</p> <p>Everyone who has no contraindication to the vaccine is encouraged to receive the vaccine</p> <p><u>Comments:</u></p> <p>In section VI the guideline states “In addition to the direct protection of vaccine recipients there is emerging evidence that that vaccination may provide indirect protection to others in the household or in the community” (p. 30). Research studies on Hutterite communities in Canada, school-based trials and health care workers indicate indirect protection but no specific target coverage recommendation is made in the guideline.</p>

Appendix E: Appraisal Scores

CDC Domain Name	Min	Max	Rater 1	Rater 2	Rater 3	Overall Score	Scaled Domain Score
			Score	Score	Score		
Scope and Purpose							
Item 1			7	6	7	20	
Item 2			6	6	6	18	
Item 3			6	6	6	18	
Total	9	63	19	18	19	56	87%
Stakeholder Involvement							
Item 4			7	7	7	21	
Item 5			6	6	6	18	
Item 6			5	4	4	13	
Total	9	63	18	17	17	52	80%
Rigour of Development							
Item 7			6	5	6	17	
Item 8			6	6	6	18	
Item 9			3	2	2	7	
Item 10			7	6	7	20	
Item 11			6	7	7	20	
Item 12			6	6	6	18	
Item 13			7	7	7	21	
Item 14			7	6	7	20	
Total	24	168	48	45	48	141	81%
Clarity and Presentation							
Item 15			7	7	7	21	
Item 16			7	7	7	21	
Item 17			6	7	7	20	
Total	9	63	20	21	21	62	98%
Applicability							
Item 18			6	6	6	18	
Item 19			7	6	6	19	
Item 20			6	2	2	10	
Item 21			5	6	6	17	
Total	12	84	24	20	20	64	72%
Editorial Independence							
Item 22			7	7	7	21	
Item 23			7	7	7	21	
Total	6	42	14	14	14	42	100%
Overall Quality of Guideline Total	3	21	6	6	6	18	83%
Recommendation	(Yes, Yes with modifications, No)		yes	yes	yes	Yes	Yes

NACI Domain Name	Min	Max	Rater 1	Rater 2	Rater 3	Overall Score	Scaled Domain Score
			Score	Score	Score		
Scope and Purpose							
Item 1			6	6	7	19	
Item 2			6	6	7	19	
Item 3			7	6	7	20	
Total	9	63	19	18	21	58	91%
Stakeholder Involvement							
Item 4			5	7	6	18	
Item 5			2	2	1	5	
Item 6			5	5	3	13	
Total	9	63	12	14	10	36	50%
Rigour of Development							
Item 7			3	2	1	6	
Item 8			3	1	1	5	
Item 9			7	7	7	21	
Item 10			6	6	6	18	
Item 11			7	7	7	21	
Item 12			6	5	4	15	
Item 13			4	4	1	9	
Item 14			1	1	1	3	
Total	24	168	37	33	28	98	51%
Clarity and Presentation							
Item 15			6	7	6	19	
Item 16			6	7	6	19	
Item 17			6	6	7	19	
Total	9	63	18	20	19	57	89%
Applicability							
Item 18			2	2	1	5	
Item 19			5	4	4	13	
Item 20			2	1	1	4	
Item 21			2	1	1	4	
Total	12	84	11	8	7	26	19%
Editorial Independence							
Item 22			2	1	1	4	
Item 23			6	7	7	20	
Total	6	42	8	8	8	24	50%
Overall Quality of Guideline Total	3	21	4	4	3	12	44%
Recommendation	(Yes, Yes with modifications, No)		Yes with Modificatio n	Yes with Modification	Yes with Modification	Yes with Modification	Yes with Modification

Appendix F: Applicability and Transferability Worksheet

Factors	Questions	Notes
Applicability (feasibility)		
Political acceptability or leverage STRONG	<ul style="list-style-type: none"> • Will the intervention be allowed or supported in current political climate? • What will the public relations impact be for local government? • Will this program enhance the stature of the organization? <ul style="list-style-type: none"> ○ <i>For example, are there reasons to do the program that relate to increasing the profile and/or create a positive image of public health?</i> • Will the public and target groups accept and support the intervention in its current format? 	<p>No change in the influenza program is being recommended in this report as the two guidelines did not provide a specific influenza coverage target for the general population. There was however emerging evidence in single studies. There it was suggested to ask Public Health Ontario and the Institute for Clinical Evaluative Sciences to conduct a synthesis of single studies on the indirect benefits of influenza immunization.</p> <p>The guidelines put emphasis on reaching people at high risk for serious influenza related complications. It was suggested that PPH:</p> <ul style="list-style-type: none"> • Consider the feasibility of focusing immunization efforts on reaching Peel residents that are high risk for severe outcomes. • Conduct an evaluation to gather data on Peel residents that are immunized through our community influenza clinics. <p>Council approves of careful consideration of identifying the best approach to provide a program or service. Therefore there would be political acceptability for identifying the best approach for Peel Public Health to deliver influenza immunization to the community. The group discussed that council might not support cancelling all flu clinics as this would remove a service that provides a safety net.</p>
Social acceptability	<ul style="list-style-type: none"> • Will the target population find the intervention socially acceptable? Is it 	<p>In years prior to 2011-2012, the ROP has flu clinics before the family doctors and walk ins have the vaccine.</p>

<p>MODERATE</p>	<p>ethical?</p> <ul style="list-style-type: none"> ○ <i>Consider how the program would be perceived by the population.</i> ○ <i>Consider the language and tone of the key messages.</i> ○ <i>Consider any assumptions you might have made about the population. Are they supported by the literature?</i> ○ <i>Consider the impact of your program and key messages on non-target groups.</i> 	<p>Therefore, the idea to redirect clients to other community providers of the influenza vaccine (e.g. Family doctors and community clinics) may only have moderate support. Questions asked by staff were: Will family doctors be able to handle the numbers of patients that would require the flu shot? What will patients of family doctors do who do not administer the influenza immunization have a place to receive the vaccine? If we do decide to target only high risk groups the question was asked, how will this information be disseminated? Many people would not consider themselves to be high risk and therefore may not get vaccinated. The Region of Peel would have to have very clear key messages.</p>
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<p>Available essential resources (personnel and financial)</p> <p>MODERATE</p>	<ul style="list-style-type: none"> • Who/what is available/essential for the local implementation? • Are they adequately trained? If not, is training available and affordable? • What is needed to tailor the intervention locally? • What are the full costs? <ul style="list-style-type: none"> ○ <i>Consider: in-kind staffing, supplies, systems, space requirements for staff, training, and technology/administrative supports.</i> • Are the incremental health benefits worth the costs of the intervention? <ul style="list-style-type: none"> ○ <i>Consider any available cost-benefit analyses that could help gauge the health benefits of the intervention.</i> ○ <i>Consider the cost of the program relative to the number of people that benefit/receive the intervention.</i> 	<p>Changes to the PPH influenza program will need to be determined through the program planning and evaluation process (PPE). The strategy that is decided on will need to be cost neutral with an increase on our Return on Investment. The group discussed that physicians and community providers already provide flu immunization so no training would be required. The authors of this Rapid Review are planning an analysis of OHIP data to gather data on the number of doses of influenza vaccine being administered by physicians in Peel. If it is decided that continuing to have PPH community influenza clinics is beneficial, it would decrease costs if clinics were held in larger venues, such as malls, where we have an excellent uptake as opposed to having numerous small clinics that only service a small number of clients. This decision may not be supported by the residents of Peel as they attend our clinics because they are close to home and there are several of them so they can find a convenient time to attend.</p>
<p>Organizational expertise and capacity</p> <p>STRONG</p>	<ul style="list-style-type: none"> • Is the intervention to be offered in line with Peel Public Health’s 10-Year Strategic Plan (i.e., 2009-2019, ‘Staying Ahead of the Curve’)? • Does the intervention conform to 	<p>Peel Public Health 10 Year Strategic Plan: staying ahead of the Curve confirms the organizations commitment to use resources to maximum effect and demonstrate accountability. In addition, the Region of Peel Strategic Plan recently released a focus on sustainability of programs, stakeholder partnerships and measuring</p>

	<p>existing legislation or regulations (either local or provincial)?</p> <ul style="list-style-type: none"> • Does the intervention overlap with existing programs or is it symbiotic (i.e., both internally and externally)? • Does the intervention lend itself to cross-departmental/divisional collaboration? • Any organizational barriers/structural issues or approval processes to be addressed? • Is the organization motivated (learning organization)? <ul style="list-style-type: none"> ○ <i>Consider organizational capacity/readiness and internal supports for staff learning.</i> 	<p>performance outcomes.</p>
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Transferability (generalizability)																				
Magnitude of health issue in local setting	<ul style="list-style-type: none"> • What is the baseline prevalence of the health issue locally? • What is the difference in prevalence of the health issue (risk status) between study and local settings? <ul style="list-style-type: none"> ○ <i>Consider the Comprehensive Health Status Report, and related epidemiological reports.</i> 	<p>It was a recommendation of the group that Peel surveillance data is gathered on the confirmed cases and deaths in Peel each year to determine if those individuals received a seasonal influenza vaccine that year. In addition, it was also recommended to inquire about the possibility of asking the Manitoba Centre for Health Policy to use their administrative data base to link physician visits, hospitalization, death and influenza immunization.</p> <table border="1" data-bbox="1062 574 1724 883"> <thead> <tr> <th>Episode Year</th> <th># Deaths</th> <th># Confirmed Flu Cases</th> </tr> </thead> <tbody> <tr> <td>2006</td> <td>1</td> <td>249</td> </tr> <tr> <td>2007</td> <td>4</td> <td>265</td> </tr> <tr> <td>2008</td> <td>12</td> <td>466</td> </tr> <tr> <td>2009</td> <td>16</td> <td>1830</td> </tr> <tr> <td>2010</td> <td>7</td> <td>226</td> </tr> </tbody> </table>	Episode Year	# Deaths	# Confirmed Flu Cases	2006	1	249	2007	4	265	2008	12	466	2009	16	1830	2010	7	226
Episode Year	# Deaths	# Confirmed Flu Cases																		
2006	1	249																		
2007	4	265																		
2008	12	466																		
2009	16	1830																		
2010	7	226																		
Magnitude of the “reach” and cost effectiveness of the intervention above	<ul style="list-style-type: none"> • Will the intervention appropriately reach the priority population(s)? What will be the coverage of the priority population(s)? 	<p>There is no recommended intervention set out in this Rapid Review. However, one recommendation is to gather data on the demographics, health insurance and risks of clients at our clinics to identify who we are reaching at the PPH clinics.</p>																		
Target population characteristics	<ul style="list-style-type: none"> • Are they comparable to the study population? • Will any difference in characteristics (e.g., ethnicity, socio-demographic variables, number of persons affected) impact intervention effectiveness locally? 	<p>The focus on this review was the general population. However, the two guidelines focus mostly on high risk populations, not the general population</p>																		

	<ul style="list-style-type: none"> ○ <i>Consider if there are any important differences between the studies and the population in Peel (i.e., consider demographic, behavioral and other contextual factors).</i> 	
<p>Proposed Direction (after considering the above factors):</p>		
<p>Final recommendations of this review are that PPH Vaccine Preventable Disease (VPD) does the following:</p>		
<ol style="list-style-type: none"> 1. Gather additional data on demographic, health insurance and risk factor information associated with Peel residents who attend PPH community influenza clinics prior to implementing any changes to PPH influenza program. 2. Ask Public Health Ontario to conduct a synthesis of single studies on the indirect benefits of influenza immunization. 3. Inquire about the possibility of the Manitoba Centre for Health Policy using their administrative data base to link physician visits, hospitalization, and death with influenza immunization for the purpose of identifying if influenza immunization is decreasing rates of morbidity, hospitalization and mortality. 		
<p>Completed by Susan Hertz</p>		

Appendix G: Key Definitions

1. Vaccine coverage:

Vaccine coverage can be defined in many ways, depending on the data source available. Vaccine coverage can be defined using program data, administrative databases, population survey, or immunization registry.

Peel influenza vaccine program data:

- This method is used in Peel Public Health to estimate of influenza vaccine coverage
- Peel influenza vaccination coverage = $\frac{\text{Doses distributed} - \text{Doses returned}}{\text{Peel Population}}$
- PPH influenza clinics vaccination coverage = $\frac{\text{Doses administered at the clinics}}{\text{Peel Population}}$

2. Herd Immunity:

1. **Herd immunity** is the combined direct and indirect protection that reaches a threshold sufficient to lead to a decline in incidence of disease
2. **Direct protection** is when the vaccine recipient is protected against the disease through immunization
3. **Indirect protection** is when Non- vaccine recipients are also protected against the disease because of reduced incidence and prevalence of infection in the community.

Note:

The threshold to reach herd immunity depends on the infectiousness of the disease

3. Vaccine efficacy:

- Percent reduction in risk, attributable to vaccination, among vaccinated individuals compared to equally exposed non-vaccinated controls. Vaccine efficacy is calculated through randomized controlled trials conducted in ideal conditions.
- The vaccine efficacy changes annually for influenza, depending on how well matched the vaccine influenza strains correlate with the circulating strains of influenza each year

4. Vaccine effectiveness:

- Depends upon vaccine efficacy but is also affected by other factors such as cold chain and proper administration and timing of doses.

- Derived from observational studies (e.g. cohort studies, case-control etc.) where “real world” conditions and populations may differ from the vaccine efficacy trials

5. Stochastic (probabilistic) modeling:

- A model is a simplified version of a complex real-world event or structure
- Stochastic modeling is a type of infectious epidemiology method used to simulate transmission dynamics of infectious diseases, taking into account probabilities of demographic fluctuations, changes in incidence over time, immunity and variations in the mortality of high-risk populations. “Stochastic” refers to random processes.
- This type of modeling is useful for understanding how influenza immunization may alter disease transmission.

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