Encouraging travellers to take preventive measures against travel-related communicable diseases: a rapid review of the literature

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July 12, 2013

Region of Peel
Working for you

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Acknowledgements

Thank you to Pasha Marcynuk for participating in the critical appraisal of this rapid review.

Special thanks to Lori Greco and Rebecca Strange for their endless support through the multiple iterations of our literature search.

Key Messages

1. Peel's rates of travel-related typhoid and paratyphoid fever are four times higher than provincial rates. A proportion of other diseases (e.g. hepatitis A, influenza, sexually transmitted infections) is also related to travel. Peel Public Health has no strategy for communicating information to travellers about disease risks and prevention.

2. There is little synthesized evidence pertaining specifically to communicating with travellers; the broader literature supports the following mechanisms to achieve health behaviour change:

    a. Communication interventions;
    b. Environmental interventions and supports;
    c. Resource interventions;
    d. Multi-component interventions.

3. Communications to encourage travellers to seek pre-travel medical advice, and use preventive measures against communicable diseases should use gain-framed messaging and should be targeted to specific audiences to maximize effectiveness.

4. Prior to implementing any large, multi-component intervention, Peel Public Health should conduct a cost-benefit analysis and gather additional information about the magnitude of the issue and the target audiences.

Executive Summary

What population-level communication interventions will result in health behaviour change among travellers?

Context

International travel among Canadians is increasing rapidly and, in Peel region, the burden of travel-related communicable diseases is significant. Enhanced surveillance of travel-related hepatitis A, malaria, paratyphoid and typhoid fever cases revealed that only 13% of cases sought pre-travel medical advice. This information complements published research, which confirms the underuse of pre-travel medical clinics. Anecdotal and preliminary data also identify travel as a risk factor for sexually transmitted infections.

At least 15 health care sites in Peel region provide travel health services; promoting these services may increase the uptake of preventive measures and reduce travel-related disease.

Methods and Search Results

A systematic search of the literature yielded six relevant papers and one textbook. Two guidelines and one textbook were independently assessed by multiple reviewers and are included in this review: *Behaviour Change at Population, Community and Individual Levels* (NICE Guideline, 2007), *The Practice of Travel Medicine: Guidelines by the Infectious Disease Society of America* (IDSA Guideline, 2006), *Essentials of Public Health Communications* (Textbook, 2011).

Synthesis of Findings

The evidence on specific behaviour change interventions can be grouped into four categories:

1. *Communication interventions* – Messages should be tailored to the target population using gain-framed messaging (unclear quality of evidence and effect).
2. *Environmental interventions and supports* – Visual or auditory prompts/reminders have a positive effect on behaviour (unclear quality of evidence).
3. *Resource interventions* – Incentives may provide a small positive effect on behaviour change (variable quality of evidence).
4. *Multi-component interventions* – This approach has positive effects on behaviour change (good quality evidence).

Recommendations

- ***Collect additional data*** on the magnitude of the issue, the travel patterns of Peel residents, the target populations (e.g., by disease, youth, or VFR), and the effectiveness of prevention methods;
- ***Consider a multi-component intervention***, using gain-framed messaging, audience segmentation, and environmental supports (e.g., communication to physicians, travel agents, use of internet prompts);
- ***Conduct a cost-benefit analysis*** on the potential effect of a large-scale, multi-component intervention in reducing cases and workload.

1 Issue

Residents of Peel region travel routinely to countries that put them at increased risk of travel-related communicable diseases. Many of these diseases are preventable through vaccination, prophylactic medication or personal protective measures.

In 2010, Peel's rates of typhoid and paratyphoid fever averaged four times higher than provincial rates (Table 1). Peel rates of these diseases, along with hepatitis A and malaria, have remained consistently higher than Ontario rates. In 2012, enhanced surveillance of Peel's travel-related cases of hepatitis A, malaria, typhoid and paratyphoid fever revealed that many cases did not seek a pre-travel medical consultation and may not have been aware of the disease risks associated with travel. A proportion of other diseases (e.g., influenza, sexually transmitted infections) is also related to travel and can be prevented through pre-travel planning.

Table 1. Age-standardized incidence per 100,000 of reportable diseases, Peel and Ontario, 2006-2010.[1]

Year	Hepatitis A		Malaria		Typhoid Fever		Paratyphoid Fever	
	ON	PEEL	ON	PEEL	ON	PEEL	ON	PEEL
2010	1.1	1.5	2.1	3.7	0.8	3.5	0.5	2.0
2009	1.0	1.8	1.4	3.1	0.7	2.8	0.4	1.4
2008	1.0	1.7	1.4	3.0	0.9	3.0	0.5	2.1
2007	0.9	1.1	1.4	3.7	0.8	3.0	0.4	1.8
2006	1.7	2.0	1.6	3.0	0.8	2.8	0.4	1.7

Despite the burden of travel-related diseases, Peel Public Health currently has no strategy for communicating information about disease risks and prevention methods to travellers.[i] This review seeks to identify effective communication strategies to encourage travellers to seek pre-travel medical advice, and to use preventive measures against communicable diseases.

2 Context

International travel among Canadians is increasing. From 1972 to 2011, Canadian residents visiting non-United States international destinations rose from 1.1 million to 9.1 million.[2]

Health risks to travellers depend on several factors including their destination, mode of travel, accommodations, activities during their trip, length of trip, and their personal health. In 2012, Peel Public Health initiated enhanced surveillance to collect this information and determine the reason for increased incidence of four travel-related communicable diseases: hepatitis A, malaria, paratyphoid fever, and typhoid fever (Table 2).

For each of the four diseases, the primary purpose of travel was to visit friends and relatives (VFR).[ii] Peel is home to approximately 1.3 million residents and, of these, nearly half (49%) are immigrants, many of whom may be VFRs.[4] The literature identifies the VFR population to be at higher risk for travel-related communicable diseases than other international travellers.[3]

[i] For the purpose of this report, the term "travellers" refers to Peel residents who are planning either domestic or international travel, and not to travellers visiting Peel.

[ii] VFR is defined as "an immigrant, ethnically and racially distinct from the majority population of the country of residence (a higher-income country), who returns to his or her home country (lower-income country) to visit friends or relatives. Included in the VFR category are family members, such as the spouse or children, who were born in the country of residence." (CDC, The Yellow Book (2012))

Reasons for this include: lack of awareness of risk, longer stays, stays in high risk settings, a lower likelihood of seeking pre-travel advice compared to North American and European travellers, and a lower likelihood of complying with preventive recommendations due to a limited ability to pay for vaccines or other medications.[3] VFRs are often unaware that immunity to local diseases while living in their country of origin may have greatly diminished since moving to Canada. While staying in the homes of family or friends, they may be living the local lifestyle which can include exposure to untreated water, undercooked food, and lack of bed nets. The majority of Peel cases reported staying in home accommodations with a long average duration of stay ranging from 30 days to 56 days (Table 1). Increasing awareness among VFRs about their unique risks is important to the Peel context and may increase the uptake of preventive measures.[3]

For Peel cases whose follow-up was completed from January to December, 2012, only nine of 72 cases (13%) sought medical advice prior to travel. This information complements published research which confirms the under use of pre-travel medical clinics.[6] At least 15 health care sites in Peel region provide travel health services; promoting these services may increase the uptake of preventive measures and ultimately reduce cases of travel-related disease.[7]

Promoting the use of pre-travel medical clinics may also be useful in reducing the burden of sexually transmitted infections (STIs) in Peel. Preliminary data identify travel as a risk factor for several STIs. For example, between 2006 and 2009, 18% of infectious syphilis cases in Peel reported travel outside of Ontario as a risk factor.[8] By increasing the use of pre-travel medical

clinics, travellers can be made more aware of their individual disease risk, and appropriate preventive measures (e.g., condom use) can be discussed.

Table 2. Summary of enhanced surveillance data for four travel-related communicable diseases, Peel, 2012.[9]

	Hepatitis A	Malaria	Typhoid Fever	Paratyphoid Fever	Total
Total cases	12	38	39	12	101
Most common country of birth	Canada (42%)	India (37%)	India (54%)	Canada (50%)	India (42%)
Cases with travel info. available[†]	**7**	**21**	**34**	**10**	**72**
Age of cases (years)	Mean: 25 Median: 14 Range: 7-62	Mean: 39 Median: 43 Range: 3-83	Mean: 21 Median: 20 Range: 1-79	Mean: 23 Median: 24 Range: 4-45	Mean: 27 Median: 25 Range: 1-83
Male	43%	81%	41%	80%	58%
Vaccination and prophylaxis uptake	0% vaccinated	5% completed malaria prophylaxis	3% vaccinated	not applicable	3%[††]
Pre-travel consultation	0%	24%	9%	10%	13%
Most common country of travel	Pakistan (57%)	Nigeria (29%)	India (82%)	India (70%)	India (56%)
Visiting friends/relatives as primary purpose of travel	86%	86%	94%	90%	90%
Home accommodation	71%	90%	94%	100%	92%
Average duration of travel	50 days	41 days	56 days	30 days	47 days

[†]Excludes cases who were: lost to follow-up, not Peel cases, new immigrants, or not identified as travel-related. These numbers are used as denominators for subsequent rows.
[††]Excludes paratyphoid fever in denominator of calculation.

As we are seeking an intervention that results in behaviour change among travellers, behaviour change theories may assist in understanding the nature of health behaviours and in developing an intervention.[10]

Based on the evidence presented in this report, Peel Public Health will consider developing a communication intervention to reduce the burden of travel-related communicable disease among Peel residents.

3 Conceptual Framework

A conceptual model (Appendix A) was created to provide a visual depiction of the health issue in question. The model maps the hypothesized relationships between internal (e.g., traveller characteristics and beliefs) and external factors (e.g., trip factors, motivators to action), and the use of preventive measures against travel-related communicable diseases.

4 Literature Review Question

This review aimed to answer the following question: "What interventions are effective in encouraging travellers to seek pre-travel medical advice and use preventive measures against travel-related communicable diseases?" The following PICO format was used to guide the literature search:

Table 3. Original PICO Format – October 2012.

P (Population)	Travellers
I (Intervention)	Interventions encouraging use of preventive measures against travel-related diseases
C (Comparison)	No comparison
O (Outcome)	Pre-travel health behaviours

A second search removed travellers as the sole population of interest to target the broader literature on behaviour change interventions. The broader search asked: "What population-level communication interventions will result in health behaviour change?" (Table 4).

Table 4. Revised PICO Format – December 2012.

P (Population)	None specified
I (Intervention)	Social marketing or communication interventions
C (Comparison)	No comparison
O (Outcome)	Health behaviour change

5 Literature Search

A preliminary search of grey literature sources was conducted in October 2012. Sources included: International Society of Infectious Diseases, the World Health Organization, the Centers for Disease Control and Prevention, and the National Institute for Health and Clinical Excellence (NICE). Experts in the fields of travel medicine and health communication were contacted to assist with additional source identification.

In November 2012, the original PICO question was searched in Global Health, Ovid Healthstar, and Ovid Medline. The search was limited to guidelines and reviews published in English since 2005.

In December 2012, a second search of the same sources was conducted looking at marketing interventions to promote behaviour change. The search was limited to publications in English since 2002. Textbooks relating to public health communication and behaviour change were identified through a search of internet booksellers (Amazon.com and Chapters.Indigo.ca). Health Business Elite and ABI/Inform were also reviewed for social marketing literature related to health behavior change.

The search strategy is illustrated in Appendix C (business literature search not included).

Search Results

The searches, combined, identified a total of 263 articles and five textbooks. No relevant materials were found in the business literature.

Three reviewers independently assessed the titles, abstracts, and textbook table of contents for relevance using the criteria presented in Appendix B. Articles and textbooks were limited to those that assessed the effectiveness of communication interventions. The reviewers discussed and resolved opposing views.

Two guidelines, four syntheses and three chapters of one textbook were deemed relevant to the research question. Four relevant syntheses were excluded because more synthesized evidence was available. In total, two guidelines and one textbook (three chapters) were appraised.

6 Critical Appraisal

The two guidelines were appraised using the AGREE II tool. One guideline was independently appraised by three reviewers, and the second guideline was independently appraised by four reviewers. The textbook was independently appraised by three reviewers using Peel Public Health's textbook assessment tool. Ranking discrepancies were discussed. See Appendix D for tools and ratings.

The studies included in this review, ranked by their quality ratings, are:

1. NICE Guideline: Behaviour Change at Population, Community and Individual Levels (2007) – strong quality rating
2. Textbook: Essentials of Public Health Communication, Chapters 8, 10, 11 (2011) – moderate quality rating
3. IDSA Guideline: The Practice of Travel Medicine: Guidelines by the Infectious Disease Society of America (2006) – weak quality rating

The IDSA guideline was appraised as weak because no information on methodology could be obtained. The guideline has an extensive reference list and uses a grade system to rate the quality of evidence presented; however, not all ratings could be linked to the studies to verify the source and strength of the evidence. The IDSA guideline is included in this report because it provides context directly relevant to communicating with travellers.

7 Description of Included Studies

NICE Guideline: Behaviour Change at Population, Community and Individual Levels (National Institute for Health and Clinical Excellence, 2007)

The NICE guideline provides public health guidance on interventions to support attitude and behaviour change.[11] The guideline is comprised of six evidence reviews, which summarize content from 443 primary and synthesized studies. The relevant reviews looked at:

- The effectiveness of interventions, approaches and models at individual, community and population level that are aimed at changing health outcomes through changing knowledge, attitudes and behaviour (92 studies).

- The effectiveness of road safety and pro-environmental interventions (26 studies).
- The use of the Health Belief Model, the Theory of Reasoned Action, the Theory of Planned Behaviour and the Trans-Theoretical Model to study and predict health related behaviour change (86 studies).
- The influence of social and cultural context on the effectiveness of health behaviour change interventions in relation to diet, exercise and smoking cessation (120 studies).
- Marketing (18 studies).

The NICE guideline provides eight general principles for creating effective interventions for behaviour change and four recommendations for research to address important gaps in the evidence. See Appendix E for details on the objectives and outcomes of the review.

Textbook: Essentials of Public Health Communication (Claudia Parvanta et al., 2011)

Chapter 8: Persuasive Health Communications – The Role of Theory

Chapter 10: The Strategic Health Communication Plan

Chapter 11: It's a Multimedia World

The textbook provides an overview of public health communications, specifically, how to use theories of persuasion and change to create strategic health communication plans and how to implement these plans using traditional and new media. It also provides practical examples of public health communication from theory to strategy to implementation. Each chapter references relevant journal articles, websites and books.

IDSA Guideline: The Practice of Travel Medicine – Guidelines by the Infectious Diseases Society of America (David Hill et al., 2006)

The IDSA guideline provides minimum standards for knowledge, experience, and practice in travel medicine. Its purpose is three-fold: (1) to prevent the traveller from contracting communicable diseases during travel, (2) to ensure the personal safety of the traveller, and (3) to enable the traveller to avoid environmental risks. The guideline focuses on pre-travel preventive care and includes information on how and what to communicate to travellers about disease risk and prevention methods.

See Appendix E for a Data Extraction Table for all three studies.

8 Synthesis of Findings

The literature on interventions that encourage behaviour change indicates that public health interventions should

- clearly identify a behaviour that needs to be changed.[11]
- consider the use of behaviour change theory to explain health behaviours.[11]
- target specific groups.[11]
- obtain information directly from the target audience on what they want in a program or intervention.[10]
- be tailored based on their needs.[11]
- be evaluated for effectiveness.[11]

The evidence on specific behaviour change interventions can be grouped into four categories: communication interventions, environmental interventions and supports, resource

interventions, and those that have multiple components. The effectiveness of each intervention is summarized in Table 5.

Table 5. Evidence summary on the effectiveness of interventions to change health behaviour

Intervention Attribute	Description of Intervention	Effect	Quality of Evidence
Communication Interventions: Includes advertising, mass media campaigns, and social marketing.			
Message Content[3]	Effect of tailoring topics of health education based on travel itinerary.[3]	Not given - presumed positive	A-II
Message Design[10,11]	Effect of message tailoring to address the context, needs and behaviours of the target audience.[11]	Not given - presumed positive	Not given
	Effect of message framing on how the target audience processes message content.[10]	Not given - presumed positive	Not given
	Effect of tailored information compared to general information in promoting conservation and increasing energy saving behaviours.[11]	Tailoring is more effective	Unable to score Study 1: 3, unclear Study 2: 3, unclear
Message Delivery[10]	Effect of using social groups and personal media preferences to reach target audience.[10]	Not given - presumed positive	Not given
Partner-based Segmentation[10, 11]	Effect of partner-based segmentation to connect to social groups, simplify logistics, and minimize cost.[10]	Not given - presumed positive	Not given
	Effect of faith-based settings in communicating with those who are not easily reached by traditional mediums.[11]	Positive	Weak quality Study 1: 2-
	Effect of culturally specific health behaviour change interventions on ethnic minorities.[11]	Not given - presumed positive	Not given
Channel-based Segmentation[10, 11]	Effect of traditional media, internet, social media, and viral marketing.[10]	Not given - varies by channel type	Not given
	Cost-effectiveness of targeted internet-based services to support health behaviour change.[11]	Moderate	Limited quality Study 1: 1- Study 2: 2+
Mass Media[10, 11]	Effect of traditional media, such as television, radio, magazines and newspapers to reach a large audience.[10]	Not given - presumed positive	Not given
	Effect of mass media interventions on preventing young people from starting to smoke.[11]	Positive	Good quality Study 1: 1++
	Effect of community-wide mass media interventions on physical activity.[11]	Positive	Variable quality Study 1: 2-

Intervention Attribute	Description of Intervention	Effect	Quality of Evidence
	Effect of mass media campaigns on reducing alcohol-impaired driving and crashes.[11]	Positive	Variable quality Study 1: 2-
Environmental Interventions and Supports: Includes environmental design or the use of prompts.			
Behavioural Supports[11]	Effect of removing social, financial or environmental barriers, and developing social approval for health-enhancing behaviours on supporting positive behaviour change.[11]	Not given - presumed positive	Not given
Environmental Design[11]	Effect of environmental design strategies, such as increasing the proximity of litter bins, on littering behaviour.[11]	Positive	Unable to score Study 1: 3, unclear
	Effect of visual or auditory prompts on littering behaviour and recycling behaviour.[11]	Positive	Unable to score Study 1: 3, unclear Study 2: 3, unclear
Resource Interventions: Includes incentives and point-of-sale promotions (e.g., free condoms)			
Incentives[11]	Effect of incentives on population-based smoking cessation programs.[11]	Small positive effect	Variable quality Study 1: 1&2-
	Effect of "Quit and Win" contests on community prevalence of smoking.[11]	Small positive effect	Good quality Study 1: 1&2+
	Effect of monetary rewards on energy conservation behaviour.[11]	Short-term positive effect	Unable to score Study 1: 3, unclear
	Effect of monetary rewards and lotteries on recycling behaviour.[11]	Positive	Unable to score Study 1: unclear
Multi-component Interventions: A combination of communication, technological, resource, and policy interventions.			
	Effect of media campaigns combined with tobacco control programs on smoking prevalence.[11]	Strong effect	Variable quality Study 1: 2-
	Effect of education, in combination with legislation and financial incentives, on cycle helmet use by children and young people.[11]	Positive	Study 1: 2+ good quality Study 2: 1&2- variable quality
	Effect of HIV risk reduction interventions on sexual risk taking in young people.[11]	Positive	Good quality Study 1: 1+
	Effect of sexual health promotion interventions on condom use, frequency of sex and number of sexual partners in adolescents.[11]	Positive	Good quality Study 1: 1&2++
	Effect of behavioural and social sexual risk-reduction interventions on sexual risk behaviour of sexually experienced adolescents.[11]	Positive	Variable quality Study 1: 1&2-
	Effect of sexual risk reduction on sexual risk behaviour of adolescents.[11]	Mixed (positive and negative)	Variable quality Study 1: 1&2-

COMMUNICATION INTERVENTIONS

Message Content and Design

Tailoring the message to address the context, needs and behaviours of the target audience is more effective than providing general information.[11] Incorporating meaningful references, such as demographics, culture, media, or location, may also engage the target audience.[10]

Framing messages appropriately has a positive impact on how the message content is processed by the target audience.[10] A gain-framed message, which states the advantages of taking an action, can effectively promote prevention behaviours for health maintenance.[10] A loss-framed message, which states the disadvantages of not taking an action, can effectively promote detection behaviours for illness.[10] Testing framed messages with the target audience is recommended as the audience's risk perception will impact how the information in a framed message is received.[10]

Message Delivery

The target audience should be able to easily access the message. Market segmentation data may be useful in finding the most appropriate medium for communication.[10]

Audience segmentation is an effective way of reaching a particular group of people.[10] The most effective communication channels to reach the target audience are determined by their social groups, and their personal media preferences.[10]

Partner-based segmentation, that is, partnering with organizations that are associated with the target audience, is one effective way to connect to social groups, simplify logistics, and minimize cost.[10] While the evidence is not strong, faith-based settings may be effective in communicating with individuals who are not easily reached by traditional mediums.[11] Similarly, ethnic minorities may benefit from culturally-specific health behaviour change interventions; however, robust research evidence does not exist.[11]

Channel-based segmentation is based on knowing the target audience's personal media preferences. Traditional media, earned media coverage, public service announcements, entertainment education, internet, social media, and viral marketing are some of the marketing channels available, with varying levels of effectiveness.[10] For those who are able to access the internet, two studies showed that targeted internet-based services can support health behaviour change cost-effectively (quality: 1-, 2+).[11]

Although said to be on the decline, traditional media, such as television, radio, magazines and newspapers, still reach a large audience.[10] Radio, in particular, is one of the most customizable media available, effectively targeting different markets.[10] In general, mass media interventions have demonstrated a small to moderate effect in changing knowledge, attitudes and behaviour for tobacco use, physical exercise, alcohol-impaired driving and healthy eating (quality: 1++, 2-, 2-, 2-).[11]

ENVIRONMENTAL INTERVENTIONS AND PROMPTS

Environmental Design

If the target audience already intends to perform the behaviour, the intervention should be focused on environmental factors that may hinder behaviour change.[10] Overall, environmental design strategies have demonstrated a positive effect on behaviour change. As an example, increasing the proximity of litter bins reduced littering behaviour (quality: 3).[11] In two other studies, using auditory or visual prompts reduced littering behaviour (quality: 3) and increased recycling behaviour (quality: 3).[11]

RESOURCE INTERVENTIONS

Incentives

Incentives show a small positive effect in population-based smoking cessation programs (quality: 1&2-).[11] "Quit and Win" contests show a small positive effect on community prevalence of smoking (quality: 1&2+).[11] Monetary rewards have a short-term positive effect on energy conservation (quality: 3).[11] Monetary rewards and lotteries are effective strategies to improve recycling behaviour (quality: unclear).[11]

MULTI-COMPONENT INTERVENTIONS

Multi-component interventions, which include a combination of communication, technological, resource, and policy interventions, have an overall positive effect on behaviour change. Two studies demonstrated that education, in combination with legislation and financial incentives, had a positive effect on increasing cycle helmet use by youth (quality: 2+, 1&2-).[11] Multi-

component interventions have had mixed effects in areas of communicable disease prevention, such as HIV risk reduction, sexual health promotion, and behavioural and social sexual-risk reduction interventions effect (quality: 1+, 1&2++, 1&2-, 1&2-).[11]

ROLE OF THEORY IN DEVELOPING AN EFFECTIVE INTERVENTION

Evidence is limited on the efficacy of using behaviour change theories to develop an intervention that results in a change in knowledge, attitudes or behaviour.[11] However, the Theory of Reasoned Action and the Theory of Planned Behaviour have been shown to explain observed health behaviour with greater effect than the Health Belief Model.[11]

Behaviour change theory can help determine the appropriate message design and effective channels for health communication. One way of understanding the motives behind the intended behaviour change is to identify individuals who are already performing the desired behaviour and learn why they perform this behaviour (benefits) and how they have overcome barriers.[10] The Elaboration Likelihood Model is a behaviour theory which states that an individual who does not have an expressed interest in a topic will need meaningful references, such as music or cultural references incorporated in the message design, in order to be receptive to a message related to that topic.[10] The message can be delivered through specific television channels or print media that the individual accesses frequently.

INCLUSION OF TRAVEL-RELATED CONTENT IN THE INTERVENTION

The best available evidence suggests that health advice directed to travellers should be precise, clear, and consistent (quality: A-II).[3,iii] Information presented in both verbal and written form can increase compliance with preventive measures (quality: A-II).[3, iv]

Health education for travellers should be tailored based on travel itinerary. Topics include[3, v]:

- vaccine-preventable illness.
- avoidance of insects.
- malaria chemoprophylaxis.
- prevention and self-treatment of traveller's diarrhoea.
- responsible personal behaviour.
- sexually transmitted infections and safety.
- travel medical insurance.
- access to medical care during travel.

Most travel medicine care should be performed by trained physicians in a specialized travel clinic, especially for travellers who have complex itineraries or complex medical conditions, or are very young or very old (quality: C-III).[3, vi] Non-specialists can advise travellers who are in good health, visiting low-risk destinations, and participating in planned activities.[3, vii] Travel medicine specialists should aim to interact collaboratively with the traveller to enhance retention of preventive health knowledge.[3, viii] Travel medicine specialists are discouraged from providing advice by telephone or email as it may open them to medical-legal issues.[3, ix]

[iii] An A-II quality rating was given to this statement; however, no reference was provided in the IDSA guideline.
[iv] An A-II quality rating was given to this statement; however, no reference was provided in the IDSA guideline.
[v] An A-II quality rating was given to this statement; however, no reference was provided in the IDSA guideline.
[vi] A C-III quality rating was given to this statement; however, no reference was provided in the IDSA guideline.
[vii] No reference was provided in the IDSA guideline for this statement.
[viii] No reference was provided in the IDSA guideline for this statement.
[ix] No reference was provided in the IDSA guideline for this statement.

Any travel-related health advice given to the public should be general, rather than specific (quality: B-III).[3, x] A health communications message should include information on the benefits of pre-travel health care with travellers, healthcare providers, and the travel industry.[3, xi]

9 Applicability and Transferability

Peel Public Health staff involved in case management of travel-related communicable diseases met on May 22, 2013 to discuss the applicability and transferability of the results presented in this report.

Applicability

Political acceptability or leverage

- Peel surveillance data show most cases of travel-related communicable diseases did not seek pre-travel medical advice, thereby providing a compelling argument in favour of an intervention.
- An intervention would align with Peel Public Health's Communication and Ethno-cultural diversity strategic priorities. Given the Corporate Diversity Strategy, Regional Council will likely support an intervention as long as it is cost-effective.

Social acceptability

- The message must be framed in such a way that will not create negative associations with any particular country or target group (e.g., youth, VFRs).

[x] A B-III quality rating was given to this statement; however, no reference was provided in the IDSA guideline.
[xi] For this statement, the IDSA guideline references an article which was appraised as weak by the authors of this review.

- The perspective of the target audience needs to be understood. What will make the message relevant to them? What will have impact? What are their barriers or enablers?
- Gain-framed messaging, which states the advantages of taking an action, will help the target audience to view the message positively.
- Information on the effectiveness and cost of prophylactic measures and effectiveness of a pre-travel consult in ensuring compliance with preventive measures should be considered in developing an intervention.
- Creating a simple, easy-to-use tool, such as a travel checklist, may be beneficial.
- Interventions should be pilot-tested with the target audience to gauge acceptability and impact.

Available essential resources (personnel and financial)

- Peel can use existing resources (evaluation specialist, physician outreach specialist, website committee, Information Technology) to develop a multi-component intervention.
- Any intervention should be cost-effective and fall within the public health mandate.

Organizational expertise and capacity

- Cases of travel-related communicable disease are managed by Peel staff. During case management, Peel staff have an opportunity to educate cases on preventive measures that may be considered for their next trip.
- Some interventions (e.g., partnering with airlines for pop-up messaging at the time of booking) may be out of Peel's reach, but Peel can request the Ministry of Health and Long-Term Care or Public Health Agency of Canada to pursue initiatives that have a provincial or national scope.

Transferability

Magnitude of health issue in local setting

- Public Health Inspectors and Public Health Nurses spend a large amount of time on case follow-up. So far, some work has been done to document staff time.
- The proportion of Peel's cases of communicable disease attributed to travel is known for four selected diseases (Table 2). The full magnitude of travel-related communicable diseases in Peel is not known.

Magnitude of the reach and cost effectiveness of the intervention

- The cost-effectiveness and magnitude of reach of a multi-component intervention needs to be studied.
- Partnering with neighbouring health units may expand the magnitude of reach.

Target population characteristics

- Suggested target populations include youth (e.g., for STIs) and VFRs (e.g., for typhoid fever, hepatitis, and malaria).
- More information on Peel's target population is required.

10 Recommendations

To encourage travellers to use preventive measures against travel-related communicable diseases, Peel Public Health should:

1. **Determine the magnitude of the issue.**

Peel Public Health should create a data collection plan to determine the gaps in surveillance knowledge and where this information can be obtained. Local data can be collected during management of travel-related cases. Additional data on the number of Peel travellers and their destination will assist in quantifying the risk related to travel to certain areas. Peel Public Health could consider partnering with the travel industry, the Canadian Border Services Agency, or the Ministry of Revenue to obtain additional information on traveller characteristics.

2. Understand the target audience.

The VFR and youth populations are at risk of contracting travel-related communicable diseases. More information is required to understand the risk awareness, enablers and barriers of these populations.

3. Review research on the effectiveness of prevention methods.

More information on the effectiveness of a pre-travel consult in increasing uptake of preventive measures is required before determining that it will be the focus of the message.

4. Design a multi-component intervention that includes both communications strategies and environmental supports aimed at the target audience.

A gain-framed message should be used to successfully promote uptake of new behaviours such as taking vaccines or prophylactic medications.

The VFR population may best respond to cultural references. Peel Public Health could consider both partner-based segmentation, reaching the audience through cultural organizations such as SAPNA (South Asian Professional Network for Health Awareness), as well as channel-based segmentation, reaching the audience through ethnic media. As the youth population may best

respond to popular culture references, Peel Public Health could consider channel-based segmentation.

Other potential partners in Peel include travel medicine clinics, general practitioners, and travel agents/airlines. An intervention may include collaborating with these partners to share knowledge about travel-related communicable diseases with their patients/clients. Peel Public Health should investigate the consultative role and patient volume of the 15 yellow fever vaccination centres in Peel, and any strategies they use to promote uptake of travel vaccines or other preventive measures. In addition, Peel Public Health can investigate the use of internet-based prompts at the time of booking a trip with travel agents/airlines; however, this initiative may need to be pursued by the Ministry of Health and Long-Term Care or Public Health Agency of Canada if there is a provincial or national scope.

5. Conduct a cost-benefit analysis of doing any intervention.

Peel surveillance data showed that there were 101 cases of typhoid fever, paratyphoid fever, malaria and hepatitis A in 2012. The number of cases is likely an under-estimate of the overall burden of travel-related communicable diseases. Any intervention should address the broader spectrum of communicable disease risks during travel, including STIs, to increase cost-effectiveness.

References

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Appendices

Appendix A: Concept Model

Appendix B: Search Strategy

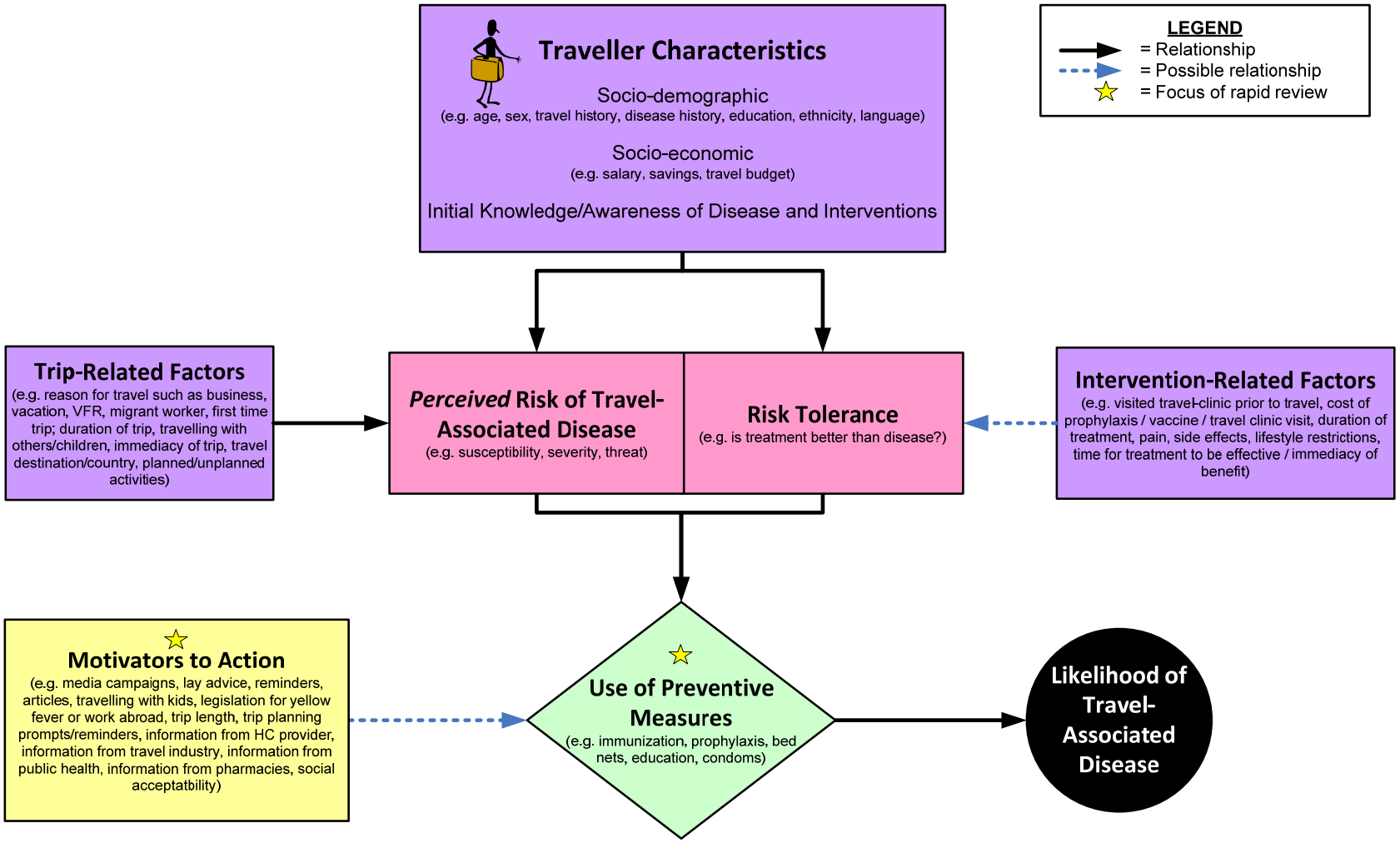
Appendix C: Literature Search Flowchart

Appendix D: Critical Appraisal Tools and Literature Rankings

Appendix E: Data Extraction Tables

Appendix F: Applicability & Transferability Worksheet

Appendix A: Concept Model: *Factors Affecting Travellers' Uptake of Prevention Measures Against Communicable Disease*



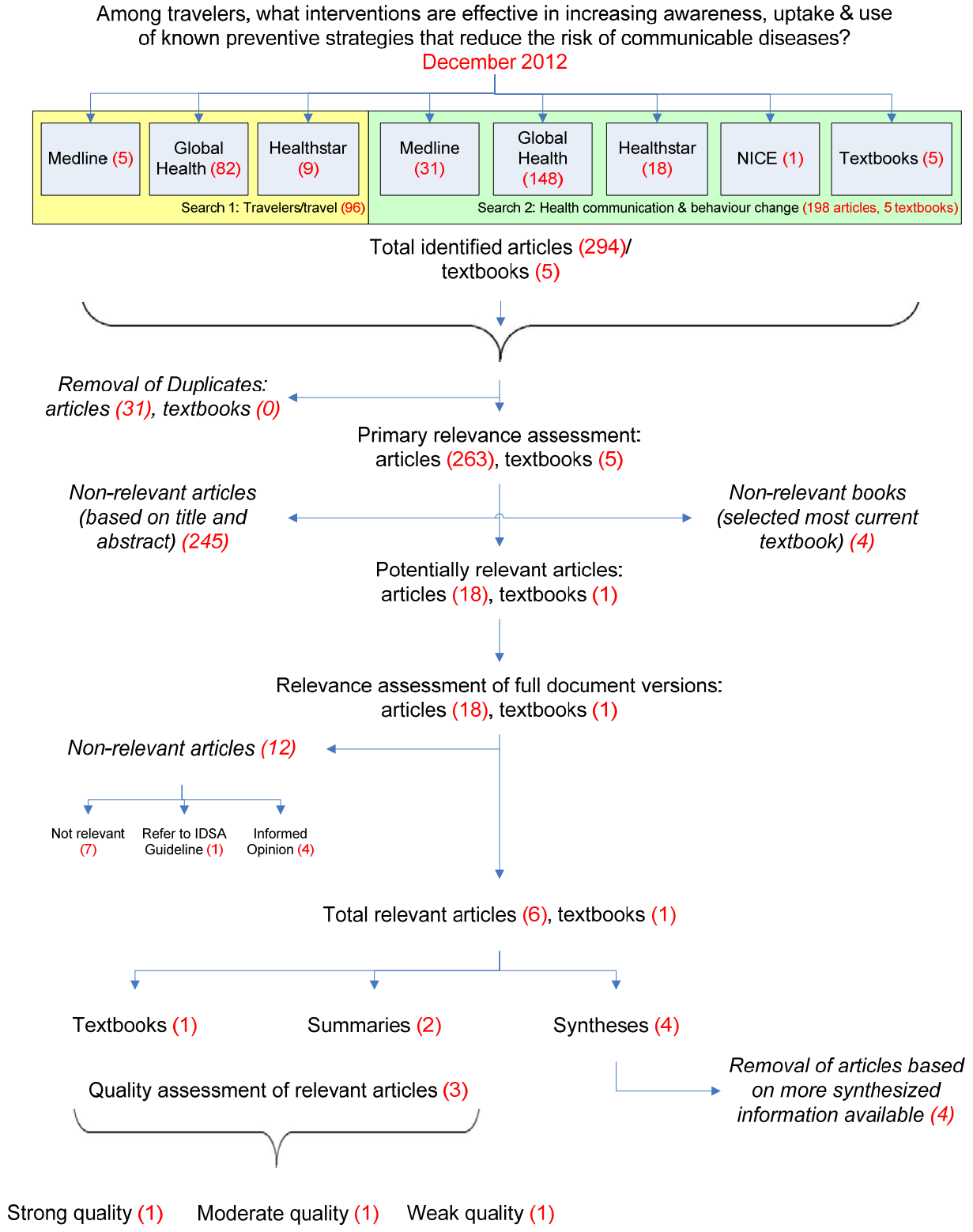
Appendix B: Search Strategy

Date	Database(s)	Search Terms	Relevancy Criteria
Nov 23, 2012 *Travel focus [2]*	Global Health <1973 to October 2012>, Ovid Healthstar <1966 to October 2012>, Ovid MEDLINE(R) <1946 to November Week 3 2012>, Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations <November 21, 2012>	1 Travel Medicine/ (1701) 2 exp Travel/ (39062) 3 travel medicine.tw. (2683) 4 2 and 3 (1314) 5 1 or 4 (2619) 6 systematic review*.tw. (82232) 7 guideline*.tw. (342216) 8 6 or 7 (416840) 9 5 and 8 (235) 10 travel medicine.ti. (685) 11 1 or 4 or 10 (2679) 12 8 and 11 (239) 13 remove duplicates from 12 (179) 14 limit 13 to english language (141) 15 limit 14 to yr="2005 -Current" (96)	*Include:* Travel/traveller CD Pop'n/community health intervention All years All languages VFR North American research Communication interventions *Exclude:* Specific population focus (e.g. gender, MSM-only, sex workers only) Non-generalizable results (e.g. disease-specific) Clinical guidelines only Individual-level interventions only Pregnancy focus Tx/diagnosis/epi of disease Disease reporting Duplicates
Dec 19, 2012 *Commun-ication focus [5]*	Global Health <1973 to November 2012>, Ovid Healthstar <1966 to November 2012>, Ovid	1 persuasive communic*.tw. (251) 2 behaviour change*.tw. (4434) 3 behavior change*.tw. (11277) 4 health behaviour*.tw. (10015) 5 health behavior*.tw. (19210) 6 social market*.tw. (2725) 7 health communication strateg*.tw. (78) 8 1 or 2 or 3 or 4 or 5 or 6 or 7 (41137)	*Include:* PH communication or strategies Community intervention *Exclude:* Physician

	MEDLINE(R) <1946 to November Week 3 2012>	9 disease prevent*.tw. (58876) 10 immuniz*.tw. (182670) 11 immunis*.tw. (15959) 12 9 or 10 or 11 (246058) 13 8 and 12 (1932) 14 meta-analys*.ti. (50002) 15 review*.ti. (403692) 16 14 or 15 (442035) 17 13 and 16 (52) 18 limit 13 to (english language and yr="2002 - 2013") (1387) 19 from 18 keep 42 (1) 20 review*.tw. (2009918) 21 meta-analys*.tw. (92975) 22 20 or 21 (2058130) 23 13 and 22 (262) 24 limit 23 to (english language and yr="2002 -Current") (197) 25 17 or 24 (208) 26 remove duplicates from 25 (169) 27 limit 26 to english language (168)	development Aging Population-specific (not reflecting Peel population) Duplicates
Dec 19, 2012 *Behav. change focus [6]*	Ovid MEDLINE(R) <1946 to November Week 3 2012>	1 persuasive communic*.tw. (125) 2 behaviour change*.tw. (1650) 3 behavior change*.tw. (4827) 4 health behaviour*.tw. (2543) 5 health behavior*.tw. (7097) 6 social market*.tw. (1136) 7 health communication strateg*.tw. (33) 8 1 or 2 or 3 or 4 or 5 or 6 or 7 (16238) 9 disease prevent*.tw. (7411) 10 immuniz*.tw. (98127) 11 immunis*.tw. (8525) 12 9 or 10 or 11 (113422) 13 8 and 12 (342) 14 meta-analys*.ti. (21654) 15 review*.ti. (217613) 16 14 or 15 (234322) 17 13 and 16 (6) 18 limit 13 to (english language and yr="2002 - 2013") (179) 19 from 18 keep 42 (1)	*As above*

		20 review*.tw. (1042943) 21 meta-analys*.tw. (42704) 22 20 or 21 (1064974) 23 13 and 22 (49) 24 limit 23 to (english language and yr="2002 -Current") (26) 25 17 or 24 (29)	
Dec 24, 2012	NICE	Guidance → Public Health → Behaviour Change	*Include:* Communication Behaviour Change *Exclude:* Works in progress
Dec 14, 2012 *Comm'n/ behav. change textbooks [8]*	Amazon.com Chapters.indigo.ca	*In textbooks:* Public Health Marketing Behaviour Change Health Marketing Public Health Communication Population Health Communication Population Health Marketing Public Health Behaviour Change	*Include:* PH Communication strategies Newest textbook *Exclude:* Duplicates

Appendix C: Literature Search Flowchart



Appendix D: Critical Appraisal Tools and Literature Rankings

AGREE II: Critical Appraisal 25-Jan-13

NICE Guideline: Behaviour change at population, community and individual levels

Domain-Q'n	Question	Reviewer 1	Reviewer 2	Reviewer 3	Sum	Min.	Max.	Max-Min	Overall Score
1-1	The overall objective(s) of the guideline is (are) specifically described.	7	7	7	61	9	63	54	96%
1-2	The health question(s) covered by the guideline is (are) specifically described.	7	7	7					
1-3	The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.	7	6	6					
2-4	The guideline development group includes individuals from all relevant professional groups.	5	6	6	55	9	63	54	85%
2-5	The views and preferences of the target population (patients, public, etc.) have been sought.	6	6	6					
2-6	The target users of the guideline are clearly defined.	6	7	7					
3-7	Systematic methods were used to search for evidence.	7	7	6	149	24	168	144	87%
3-8	The criteria for selecting the evidence are clearly described.	7	7	7					
3-9	The strengths and limitations of the body of evidence are clearly described.	5	6	6					
3-10	The methods for formulating the recommendations are clearly described.	7	7	7					
3-11	The health benefits, side effects, and risks have been considered in formulating the recommendations.	7	7	7					
3-12	There is an explicit link between the recommendations and the supporting evidence.	2	3	2					
3-13	The guideline has been externally reviewed by experts prior to its publication.	7	7	7					
3-14	A procedure for updating the guideline is provided.	7	7	7					
4-15	The recommendations are specific and unambiguous.	5	6	7	57	9	63	54	89%
4-16	The different options for management of the condition or health issue are clearly presented.	6	6	6					
4-17	Key recommendations are easily identifiable.	7	7	7					
5-18	The guideline describes facilitators and barriers to its application.	4	4	4	62	12	84	72	69%
5-19	The guideline provides advice and/or tolls on how the recommendations can be put into practice.	5	6	6					
5-20	The potential resource implications of applying the recommendations have been considered.	5	5	6					
5-21	The guideline presents monitoring and/or auditing criteria.	6	6	5					
6-22	The views of the funding body have not influenced the content of the guideline.	4	6	3	28	6	42	36	61%
6-23	Competing interests of guideline development group members have been recorded and addressed.	5	5	5					
OVERALL-1	Rate the overall quiality of this guideline.	6	6	6					
OVERALL-2	I would recommend this guideline for use.	Yes	Yes	Yes					

Critical Appraisal of Textbooks, Textbook Chapters
APPRAISAL WORKSHEET

Source: Essentials of Public Health Communication

Date of Appraisal: January 25, 2013

Criteria	Questions	Reviewer 1 (MH)	Reviewer 2 (PM)	Reviewer 3 (AR)	Notes
1. Initial Appraisal Appraise a source by first examining the bibliographic citation – this can help determine the usefulness of the source. Bibliographic citations characteristically have three main components: author, title, and publication information					
Author - Consider the author's credentials, institutional affiliation, past writings and experience	Is the book/chapter written on a topic that is the author's area of expertise?	Y	Y	Y	CH 8 & 11: Claudia Parvanta/Sarah Parvanta CH 10: Claudia Parvanta Have found other textbooks with CP as an author.
	Have you seen the author's name cited in other sources or bibliographies?	N	Y	N	
	Is there a declaration of any conflict of interest for each author?	N	N	N	
Date of Publication	When was the source published?	2011	2011	2011	Contains some older references (e.g. 1980s). Information in chapters are current but will quickly become out-of-date (e.g. MySpace comments) as technology evolves.
	Is the source current (C) or out-of-date (O) for your topic?	C	C	C	
Edition or Revision - (Note: Further editions indicate a source has been revised and updated to reflect changes in knowledge, include omissions, and harmonize with its intended reader's needs). Many printings or editions may indicate that the work has become a standard source in the area and is reliable.	Is this a first edition of this publication?	Y	Y	Y	
	Does the author discuss who reviewed previous editions or the process used to revise more recent editions? (e.g. in Preface, Foreword, or elsewhere in the text)	N	N	N/A	

Publisher - If the source is published by a university press, it is likely to be scholarly. Although a source from a reputable publisher does not necessarily indicate quality, it does suggest that the publisher has a high regard for the source being published.	Is this a reputable publisher?	Y	Y	Y	This text is an American Public Health Association publication. Published by: Jones & Bartlett Learning (Division of Ascend Learning). Jones & Bartlett (Burlington, Massachusetts) is a "world-leading provider of instructional assessment & learning-performance management solutions for the secondary, post-secodary and professional markets" (www.jblearning.com)
Criteria	**Questions**	Reviewer 1	Reviewer 2	Reviewer 3	**Notes**
2. Content Analysis Examine the body of the source. Scan the table of contents and the index to obtain an overview of the material it covers. Read the chapters that specifically address your topic.					
Intended Audience - What type of audience is the author addressing?	Is the publication aimed at a specialized (S) or a general (G) audience?	S	S	S	The intended audience of this text is students & public health professionals. While some concepts are elementary, it provides a good foundation of knowledge of the topic area.
	Is this source too elementary (E), too technical (T), too advanced (A), or just right (JR) for your needs?	JR	JR	T	
Use of Bibliography - Note whether bibliographies are included. (The presence and quality of a bibliography at the end of a chapter may reflect the care with which the authors have prepared their work.)	Are bibliographies included?	Y	Y	Y	References influde a mix of sources (e.g. single studies, textbooks). Without appraising them all, it is difficult to determine their level of quality. However, given that some highly synthesized references are used (e.g. textbooks), it appears that these, at least, may be of decent quality. Some references are current, while others are older. As the reviewers are not familiar with experts in the field of public health communications, this question was difficult to asses; however, they do seem to reference groups such as the CDC, that are involved in health communications.
	Are the references cited of high quality?	UNK	Y	UNK	
	Are the references current?	SOME	SOME	Y	
	Do the references include work from the experts in the field or topic of interest?	UNK	Y	UNK	
Objective Reasoning	Is the information covered opinion (O) or fact (F)? (Facts can usually be verified, opinions evolve from the interpretation of facts).	O/F	O/F	F	It is not always clear if the information is fact or opinion. The text - at times - uses emotion-arousing words that may indicate bias; not all statements seem to be impartial.
	Is the author's point of view objective and impartial?	Y	Y	Y	
	Is the language free of emotion-arousing words and bias?	N	N	Y	
	Does the information appear to be valid (V) and well-researched or is it questionable (Q) and unsupported by evidence?	V	V	V	
	Are the ideas and arguments advanced more or less in line with other works you have read on the same topic?	SAME	UNK	Y	

Coverage - (Primary sources are the raw material of the research process. Secondary sources are based on primary sources)	Is the material primary (P) or secondary (S) in nature?	S	S	S	
	If primary, does the work update other sources, substantiate other materials you have read, or add new information?	N/A	N/A	N/A	
Usefulness/Practicality	Does the content provide a complete description of the topic?	Y	Y	Y	Includes chapters on planning/implementation/evaluation.
	Does the author identify outstanding issues which are not covered?	N	N	N	
	Does the textbook consider factors specific to the practical aspects of public health practice? (In other words, does it balance theory with practice?)	Y	Y	Y	
Writing Style	Is the publication organized logically?	Y	Y	Y	
	Are the main points clearly presented?	Y	Y	Y	
	Is the author's argument repetitive?	N	N	N	
Criteria	Questions	Reviewer 1	Reviewer 2	Reviewer 3	Notes
3. Evaluative Reviews Locate critical reviews of books in a reviewing source (such as Book Review Index, Book Review Digest or ProQuest Research Library)					
Published Evaluative Reviews	Is the review positive?	N/A	N/A	N/A	One short review is available on amazon.ca, which recommends the text.
	Does the reviewer identify other books that are more appropriate? If so, locate these sources for more information on your topic.	N/A	N/A	N/A	
	Do various reviewers agree on the value or attributes of the book or has it aroused controversy among the critics?	N/A	N/A	N/A	
Recommendation from Scholars and Peers	Is the book considered a valuable contribution to the field by practitioners and academics?	Y	Y	Y	Part of the APHA book series; through the endorsement, it is assumed that this text is considered a valuable contribution.
4. Citations Conduct a citation search on the textbook/chapter (such as gopubmed.org)					
Citation Search	How many other texts or articles cite the text or chapter?	UNK	UNK	UNK	Unable to determine. The textbook may be published too recently to be cited.
5. OVERALL RATING Based on the foregoing appraisal, provide an overall rating of this Textbook or Chapter (S = Strong; M = Moderate; W = Weak) and any rationale.					

Rating	How would you rate the text or chapter?	M	M	M	Not all aspects of this tool were assessed for this textbook review. However, with the information we were able to obtain, we find this textbook to be of moderate quality. The textbook is based on evidence, with theory clearly outlined and supported by public health examples.

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AGREE II: Critical Appraisal 26-Nov-12

The Practice of Travel Medicine: Guidelines by the Infectious Diseases Society of America

Domain-Q'n	Question	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4	Sum	Min.	Max.	Max-Min	Overall Score
1-1	The overall objective(s) of the guideline is (are) specifically described.	4	7	7	6	53	12	84	72	57%
1-2	The health question(s) covered by the guideline is (are) specifically described.	2	6	4	2					
1-3	The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.	2	5	6	2					
2-4	The guideline development group includes individuals from all relevant professional groups.	4	4	3	2	47	12	84	72	49%
2-5	The views and preferences of the target population (patients, public, etc.) have been sought.	1	2	4	1					
2-6	The target users of the guideline are clearly defined.	6	7	7	6					
3-7	Systematic methods were used to search for evidence.	1	1	1	1	77	32	224	192	23%
3-8	The criteria for selecting the evidence are clearly described.	1	1	1	1					
3-9	The strengths and limitations of the body of evidence are clearly described.	3	2	3	2					
3-10	The methods for formulating the recommendations are clearly described.	2	2	1	2					
3-11	The health benefits, side effects, and risks have been considered in formulating the recommendations.	5	7	6	5					
3-12	There is an explicit link between the recommendations and the supporting evidence.	5	3	4	4					
3-13	The guideline has been externally reviewed by experts prior to its publication.	2	2	3	2					
3-14	A procedure for updating the guideline is provided.	1	1	1	1					
4-15	The recommendations are specific and unambiguous.	6	5	6	6	71	12	84	72	82%
4-16	The different options for management of the condition or health issue are clearly presented.	6	7	6	6					
4-17	Key recommendations are easily identifiable.	6	4	7	6					
5-18	The guideline describes facilitators and barriers to its application.	4	4	5	5	46	16	112	96	31%
5-19	The guideline provides advice and/or tolls on how the recommendations can be put into practice.	2	4	6	4					
5-20	The potential resource implications of applying the recommendations have been considered.	2	2	2	2					
5-21	The guideline presents monitoring and/or auditing criteria.	1	1	1	1					
6-22	The views of the funding body have not influenced the content of the guideline.	3	3	5	2	32	8	56	48	50%
6-23	Competing interests of guideline development group members have been recorded and addressed.	4	6	6	3					
OVERALL-1	Rate the overall quiality of this guideline.	4	4	4	3					
OVERALL-2	I would recommend this guideline for use.	With mod.	With mod.	With mod.	With mod.					

Appendix E: Data Extraction Tables

Items Reviewed	Guideline #1 of 2 (Dillon et al., NICE, 2007)
General Information and Quality Rating for Review	
1. Author(s) and date	National Institute for Health and Clinical Excellence, October 2007 (Executive Lead, NICE project team: Andrew Dillon)
2. Country	United Kingdom
3. Quality rating	Strong
4. Objectives of guideline	1. To provide public health guidance on the most appropriate interventions to support attitude and behaviour change at population and community levels. 2. To provide principles for planning, delivering and evaluating public health activities aimed at changing health-related behaviours.
Details of Review	
5. Number of primary studies included	Total = 443 Review 1 – A review of the effectiveness of interventions, approaches and models and individual, community and population level that are aimed at changing health outcomes through changing knowledge, attitudes and behaviour (Effectiveness of Interventions): 92 Review 2 – Review of the effectiveness of road safety and pro-environmental interventions (Effectiveness of Interventions): 18+8 Review 3 – Resilience, coping and salutogenic approaches to maintaining and generating health: a review (Resilience/Coping): 101 Review 4 – A review of the use of the Health Belief Model, the Theory of Reasoned Action, the Theory of Planned Behaviour and the Trans-Theoretical Model to study and predict health related behaviour change (Review of Behavioural Change Models): 86 Review 5 – The influence of social and cultural context on the effectiveness of health behaviour change interventions in relation to diet, exercise and smoking cessation (Social/Cultural Context & Effectiveness): 120 Review 6 – Marketing Review (Social Marketing): 18
6. Types of studies	Overall = Mostly meta-analyses, systematic reviews

(*N.B.* only reviews relevant to our question are presented here)	Review 1 (Effectiveness of Interventions): Meta-analyses, systematic reviews **(pg 6)** Review 2 (Effectiveness of Interventions): Meta-analyses, systematic reviews, other reviews **(pg 13)** Review 4 (Review of Behavioural Change Models): Meta-analyses, systematic reviews, narrative papers **(appendix 4, pg 95)** Review 5 (Social/Cultural Context & Effectiveness): Mainly meta-analyses or systematic reviews of RCTs or non-RCTs (a handful of non-analytic studies e.g. case reports/series) **(appendix 7, pg 136)** Review 6 (Social Marketing): grey literature marketing information, and primary studies and other articles on marketing effects (pg 8,10-12 , 97-109)
7. Search period (*N.B.* only reviews relevant to our question are presented here)	Overall = 1980/90s – 2006 Review 1 (Effectiveness of Interventions): 1995 – February 2006 Review 2 (Effectiveness of Interventions): 1995 – April 2006 & 1995 – June 2006 Review 4 (Review of Behavioural Change Models): 1990 - March 2006 Review 5 (Social/Cultural Context & Effectiveness): 1995 – January 2006 Review 6 (Social Marketing): 1980 – June 2006
8. Number of databases searched (*N.B.* only reviews relevant to our question are presented here)	See individual reviews for databases searched Review 1 (Effectiveness of Interventions): page 6 Review 2 (Effectiveness of Interventions): page 14, 20 Review 4 (Review of Behavioural Change Models): page 28 Review 5 (Social/Cultural Context & Effectiveness): page 47-8 Review 6 (Social Marketing): page 10
9. Inclusion and exclusion criteria (*N.B.* only reviews relevant to our question are presented here)	See individual reviews for detailed inclusion/exclusion criteria Review 1 (Effectiveness of Interventions): page 6 Review 2 (Effectiveness of Interventions): page 15, 21 Review 4 (Review of Behavioural Change Models): page 29 Review 5 (Social/Cultural Context & Effectiveness): page 48-9 Review 6 (Social Marketing): page 11
Details of Interventions	
10. Description of Interventions (*N.B.* only reviews and	Review 1 looks at: • Effectiveness of mass media campaigns for: 1) Smoking and tobacco use interventions; 2) Physical activity interventions, 3) Alcohol misuse

interventions relevant to our question are presented here)	• Effectiveness of sexual-risk taking interventions (e.g., risk reduction interventions, behavioural and social interventions, primary prevention interventions, school-based abstinence programs, and counselling) to reduce or prevent HIV or other STIs, and to reduce or prevent teen pregnancies Review 1 also looks at the effectiveness of different models/theoretical approaches in changing behaviour, attitudes or knowledge including the Health Belief Model, the Theory of Planned Behaviour and the Trans-theoretical Model. Review 2 looks at: • Effectiveness of education, legislation and financial incentives on cycle helmet ownership use, seatbelt/child restraint within motor vehicles, education of child pedestrians, effectiveness of graduated license systems and driver education, drink driving interventions, traffic calming, and safety cameras • Effectiveness of rewards, prompts, commitment, tailored information and environmental design on recycling, conservation of resources, and litter reduction Review 4 examines the use of theory to predict health related behaviour change in terms of knowledge, attitude, intention and behaviour. • The Health Belief Model has most frequently been used for health service uptake issues (e.g. immunization acceptance, compliance with medical treatment). • The Theory of Reasoned Action and Theory of Planned Behaviour are more general frameworks which can be applied in the analysis of most health behaviours and, to a lesser extent, in predictive investigations and design of health interventions. Areas of application include: o Exercise intentions and behaviours o Weight gain prevention and eating behaviours o Addiction related behaviours such as smoking and alcohol use o HIV prevention and condom use o Maintenance of oral hygiene o Clinical screening programs o Driving behaviour analysis

	• Transtheoretical model-related evidence was linked to studies examining: o Smoking cessation & prevention o Dietary change o Exercise and activity promotion o Sexually transmitted disease and pregnancy prevention o Breast cancer screening o Alcohol use control o Treatment adherence Review 5 looks at how the social and cultural context in which people live influences the effectiveness of interventions to change health knowledge, intentions and behaviour. The review looks at effectiveness of interventions based on life course, gender, income and social positioning, and ethnicity. Interventions relevant to this rapid review include those looking at effectiveness by: Adolescents, Adults, Elderly, Gender, Ethnicity, Social Position Adolescents: • Diet: school based interventions, "whole school" interventions • Weight control & reduction: school interventions (with or without additional educational and other inputs), dietary interventions, medical interventions coupled with diet and exercise support, family involvement • Physical activity: school based interventions, interventions of varying activity duration • Smoking prevention & cessation: community interventions, school based interventions (with or without additional community programs), youth groups, nicotine replacement therapy, college/university based interventions, individual level cessation support, environmental interventions (e.g. smoke free building policies), health promotion interventions, peer delivered health behaviour change initiatives Adults: • Healthy eating & weight control: interventions aimed to improve cardiovascular disease risk profile (e.g. reduce salt/fat intake, increase fruit/vegetable/fibre consumption), dietary interventions in workplace settings (versus healthcare settings, with or without environmental modifications and individually oriented support), interventions with

	family/partner involvement, ethnically and culturally specific interventions • Physical activity (PA): PA programs complemented with healthy eating strategies, group exercise interventions (coupled with smoking cessation), exercise promotion, supportive interventions, home/normal daily living interventions (versus special centre based activities), varying activity intensity interventions (e.g. walking versus higher intensity exercises), telephone prompts, worksite exercise interventions, promotion of PA in general practice & other primary care settings (brief advice, intensive counselling), physician advice, written materials, exercise referral schemes, public health (versus individual care) interventions, targeted behaviour change programs (e.g. promote walking/cycling instead of car use), publicity campaigns, cycle lane interventions. • Smoking reduction & cessation: interventions provided by health care professionals (versus nurses, pharmacists), brief and intensive advice interventions, workplace delivered interventions, group therapy, individual counselling, pharmacological treatments (i.e. nicotine replacement therapy), partner support, telephone support, self help materials, smoking bans, increasing cigarette prices & banning their advertising, biomedical risk assessments (e.g. carbon monoxide and cotinine levels), "Quit & Win" contests, community level interventions Elderly: • Dietary interventions: special meals services in home or in day centre or other institutional settings, nutritional interventions in communal settings or in the community, targeted social marketing campaign, individual and group interventions • Physical activity: general practice/primary care interventions, centre based programs (versus home based programs), clinic based or other special services interventions for those with particular needs, interventions aimed at facilitating more active normal daily lives, behavioural modification techniques, education, mediated approaches (media assisted programs versus face to face contacts), unsupervised and leisure time interventions (versus supervised and formalized activities) Gender & health behaviour change: • Prevention of cardiovascular disease in women through smoking diet and activity

	behaviours, community interventions, social support networks, behaviour strategies (self-monitoring, feedback), lifestyle-related interventions (versus structured programs), education Income, social position: • Public health strategies (increasing the cost of smoking, education), funding of smoking cessation programs (full, partial, consumer out of pocket payments) Ethnicity & health behaviour change: • Physical activity promotion to less advantaged groups, interventions targeting particular ethnic groups, culturally tailored one to one or small group or adult class interventions, telephone counselling (in combination with targeted advertising) Review 6 seeks to address whether and how commercial marketing and social marketing can influence behaviour. The objectives of the review are to determine the effects of: • Marketing and social marketing on behavioural change • Marketing on low-income consumers. • Food promotion to children in developed and developing countries.
11. Theoretical frameworks	Behaviour change concepts including: resilience, coping, self-efficacy, planned behaviour, structure and agency, 'habitus' and social capital provided a foundation for several interventions included in this guideline. Review 1 in particular evaluated the effectiveness of interventions based on models of health behaviour, including the trans-theoretical model, on changing knowledge, behaviour and attitudes towards tobacco use, physical activity, drink driving and healthy eating.
12. Target groups	The audience of this guideline is National Health Service (NHS) and non-NHS professionals and others who have a direct or indirect role in helping people change their health-related knowledge, attitudes and behaviour. The target population includes all those who are supported through attitude and behaviour change at the population and/or community level.

Results of Evidence Reviews	
13. Results of evidence reviews (*N.B.* only reviews and outcomes relevant to our question are presented here)	Review 1: <u>Mass Media</u> *Mass media interventions show a small to moderate effect overall* • Evidence of good quality (level 1++,A) which shows that mass media interventions have a positive effect on preventing the uptake of smoking in young people. (**Body of evidence:** one systematic review. **Effect size:** None given.) • Evidence of variable quality (2-,C) that media campaigns and concurrently implemented tobacco control programs have a strong effect on the reduction in smoking prevalence. (**Body of evidence:** one review. **Effect size:** This review found that two well-funded state-wide campaigns reduced net smoking prevalence by 6% to 12% in the general population. Two smaller state-wide campaigns found a net decline of 4% and 5%.) • Evidence of variable quality (2-,A) that shows an effect of community wide mass media interventions on increasing physical activity. (**Body of evidence:** one review with eight included studies. **Effect size:** None given.) • Evidence of variable quality (2-,B) that found a positive effect of mass media campaigns on reducing alcohol impaired driving and crashes. (**Body of evidence:** one review with eight included studies. **Effect size:** The review reported the median decrease in alcohol related crashes was 13%.) <u>Incentives</u> • Variable quality evidence (1&2-,C) that shows a small effect of the use of incentives in population-based smoking cessation programs. (**Body of evidence:** One systematic review included 17 studies. **Effect size:** One study stated the quit rates for its program ranged from 13% to 45%.) • Good quality evidence (1&2+,C) that shows a small effect of 'Quit and Win' contests on community prevalence of smoking. (**Body of evidence:** one systematic review included four studies. **Effect size:** Three of the four included studies demonstrated high quit rates (8% to 20%) compared to the control group.) <u>Multi-component interventions to decrease sexual risk-taking in young people</u> • There is evidence of good quality (1+,C) which shows a positive effect of HIV risk reduction interventions for sexual risk taking in young people (**Body of evidence:** one

	systematic review of 22 RCTs [5,356 participants]. **Results summary:** Of the 23 interventions, 13 achieved a statistically significant reduction in risk. Eight studies reported on the contraction of STIs [reduction in 29% of studies]. Fifteen studies reported on the number of sexual partners [reduction in 27% of studies]. Fifteen studies reported on condom use [improved in 53% of studies]. Seven studies reported on frequency of unprotected sex [reduced in 75% of studies]. Seven studies reported on abstinence [increased by 14% in one study]. Four studies reported on delayed onset of sex [increase in 50% of studies]. Twelve studies reported on the frequency of sex [reduced by 42%].). • There is evidence of good quality (1&2++,C) which shows a positive effect of sexual health promotion interventions on improving condom use and reduction in both frequency of sex and number of sexual partners in adolescents to protect against STIs (**Body of evidence:** one review of 24 RCTs and clinical controlled trials [34,281 participants]; rated as 'moderate' (4 studies) and 'weak' (20 studies). **Results summary for school, clinic and community-based programs:** non-significant and significant results in initiation of sexual intercourse or abstinence (moderately & weak-rated study, respectively). 8 studies found a significant improvement in condom use (3 studies rated as 'moderate'). 4 studies (one 'moderate')_found a significant reduction in the number of sexual partners. 3 studies (one 'moderate') demonstrated a reduction in the frequency of sexual partners. 5 studies (two 'moderate') found significant reduction in the frequency of unprotected sexual intercourse. None of the moderately rated studies measured diagnosed cases of STIs. • There is evidence of variable quality (1&2-, C) which shows a positive effect of behavioural and social sexual risk-reduction interventions on the sexual risk behaviour of sexually experienced adolescents, particularly the risk of having unprotected sex. (**Body of evidence:** one review of 20 studies (random and non-random assignment to intervention/control); 16 studies included in the meta-analysis. **Effect size:** sex without condoms was less likely in the sexual risk reduction intervention than control group (13 studies, OR=0.66, 95% CI: 0.55-0.79, p<0.001). Intervention also had a positive protective effect on the mixed behavioural risk index (2 studies, OR=0.66, 95% CI: 0.50-0.88, p<0.01) and the composite behavioural risk outcome (16 studies, OR=0.65, 95% CI:

	0.50, 0.85, p<0.01). Intervention was not associated with having fewer sexual partners in comparison with the control group (OR=0.89, 95% CI: 0.76-1.05) or with reduced STI incidence (2 studies, OR=1.18, 95% CI: 0.48-2.86). There was a significant protective effect of sexual risk-reduction interventions, both in and out of the classroom, on sexual risk behaviour, primarily the risk of having sex without condoms.) • There is evidence of variable quality (1&2-, C) which shows mixed effects (both positive and adverse effects) of sexual risk reduction interventions on the sexual risk behaviour of adolescents. (**Body of evidence:** one systematic review of 24 RCTs and non-randomized studies [27,978 participants]. **Results summary:** condom use (8 of 12 studies) was affected most consistently. Delayed initiation of sexual intercourse (4 of 11 studies) was affected least consistently. Three studies reported negative findings: (a) increased likelihood of males in the intervention group engaging in sex within the last month relative to the control group; (b) increased reports of pregnancy and STD; (c) less contraceptive use at most recent sex among females who were sexually inexperienced at baseline; or (d) less contraceptive efficiency (*i.e.* an index measure combining the consistency of contraceptive use and effectiveness of the selected method of contraception) among females in the intervention group. Programs with positive effects most commonly employed interactive and participatory educational strategies.) <u>Use of Theory for behaviour change</u> • Insufficient evidence to evaluate the trans-theoretical model in relation to smoking cessation interventions. Evidence of variable quality (1&2-,C). (**Body of evidence:** one systematic review with 16 included studies. **Effect size:** None given). • Good quality evidence (1&2+,A; 2-,A) which shows that the trans-theoretical model demonstrated effectiveness in the short term when applied to interventions promoting physical activity. (**Body of evidence:** two systematic reviews. **Effect size:** One review stated the largest effect was evident in preparation for action [d=0.85] and small to moderate increases in physical activity were evident from pre-contemplation to contemplation [d=0.34]).

	Review 2: <u>Legislation & Incentives</u> • Good quality evidence (2+ A) that community-based interventions using education, legislation and incentives in various combinations increase cycle helmet wearing by children and young people. (**Body of evidence:** one review with seven included studies. **Effect size:** One study found that observed helmet use increased from 0.75% to 50.2% after establishing an interest group and running a media awareness campaign. Another study found that an awareness campaign with mass media events, resource book and promotional posters increased observed helmet use from 0% to 45% in four years). • There is evidence of variable quality (1&2-, A) that education combined with financial incentives and/or legislation can increase children's bicycle helmet use. (**Body of evidence:** one review with 12 included studies. **Effect size:** One study found that school-based education plus financial incentives increased helmet use in high income groups from 4% to 36% but no significant difference was found in low income groups). • Evidence of low quality (2- B) that monetary rewards are moderate predictors of inclination to recycle. (**Body of evidence:** One review with 31 experiments and 9 relevant to the research question. **Effect size:** In one experiment, one school recycled 17 times more newspaper when hamburger vouchers were given to classes compared with the control group. The treatment effect size was 2377 lbs per week). • Evidence of unscoreable quality (B) that monetary rewards/lotteries are effective in getting people to recycle. (**Body of evidence:** one review. **Effect size:** None given). • Evidence of unscoreable quality (3 B) that monetary rewards have a positive effect on energy conservation, though changes are usually short-term. (**Body of evidence:** one review. **Effect size:** None given). <u>Prompts</u> • There is evidence of unscoreable quality (3 B) that the use of prompts can increase recycling behaviour. Prompts are information about recycling that is provided to participants before the program begins. (**Body of evidence:** One review with 12 studies relevant to the research question. **Effect size:** The effect size for two included studies are d'=0.28 and d'=4.7).

	• There is evidence of unscoreable quality that prompting can reduce littering. (**Body of evidence:** one review with 59 included studies, 12 relevant to the research question. **Effect size:** In one study, written prompts in a university cafeteria reported a 33% reduction in percentage of people who littered. In another study, verbal prompts in a school increased the percentage of pupils that did not litter by 40 to 60%). <u>Message tailoring</u> • Mixed evidence of unscoreable quality (3 B) that tailored interventions are more effective than general information in promoting energy conservation. (**Body of evidence:** one review. **Effect size:** One study showed that households that received a home energy audit subsequently used 21% less energy than the control group). • Evidence of unscoreable quality (3 B) that providing people with feedback about their energy use can increase energy saving behaviours. (**Body of evidence:** one review. **Effect size:** One study showed that daily feedback on the costs of electricity use produced a decrease of 4% among intervention households.) • Environmental design strategies like increasing the proximity of litter bins had a positive effect on littering behaviour. Unscoreable quality (3 B). (**Body of evidence:** one review. **Effect size:** None given). Review 4: • The Theory of Reasoned Action and the Theory of Planned Behaviour can predict health related behaviour with greater effect than the Health Belief Model (**Body of evidence:** four systematic reviews (includes 3 meta-analyses); **NICE Quality Ratings:** 2-A, 2+B, 2-B(2); **Results summary:** TRA explained 34% of observed health behavioural variance, compared to 24% for the HBM; TPB explains 20-30% of observed variance among adults). • Changes in health knowledge can contribute to individual and population behaviour changes over time (e.g., smoking cessation, exercise, diet and HIV risk control have reduced mortality and morbidity from conditions such as lung cancer, cardiovascular disease and AIDS) (**Body of evidence:** six systematic reviews (includes 2 meta-analyses); **NICE Quality Ratings:** 1++A, 2+A, 2-A, 2++B, 2-B(2); **Effect size:** none stated).

	Review 5: • Lack of robust research evidence on the extent to which ethnic minorities can benefit from culturally specific health behaviour change interventions. • There is relatively weak evidence that faith-based interventional settings may facilitate effective communication with groups less easily reachable via other routes (**Body of evidence:** one narrative synthesis; **NICE Quality Rating:** 2-B; **Effect size:** none stated). • There is limited quality evidence that targeted internet based services can provide a cost-effective means of supporting health behaviour change amongst those sections of the population able and motivated to use this channel (**Body of evidence:** two systematic reviews; **NICE Quality Ratings:** 1-B, 2+B; **Effect size:** from one review, small to moderate effect sizes were recorded in a range of knowledge improvement and behavioural change dimensions (11 studies: range of effects from 0.01-0.47)). Review 6: • Develop a marketing strategy that utilizes various elements of the marketing mix (e.g. promotion, price, place, product) and is tailored to the specific requirements of the target group. • Identify barriers to behaviour change and consider how to remove/minimize its influence. • Consider the use of positively framed and upbeat messages. • Convenience is especially important among the low-income market. Bring messages to this group through local communities, engaging in grassroots marketing and providing a range of services under one roof (**Body of evidence:** two non-studies). • Repeated exposure increase advertising effectiveness.
Guideline Recommendations	
14. Guideline Recommendations (*N.B.* only results relevant to our question are presented here)	General Information on Interventions 1. Interventions can be divided into four main categories: policy (e.g., legislation), education or communication (e.g., media campaigns), technologies (e.g., seat belts), and resources (e.g., free condoms). Transition periods (e.g., entering the workforce) present an important opportunity for behaviour-change interventions.

	2. These mechanisms are successful in some circumstances to influence behaviour: a. Mass media campaigns; b. Social marketing; c. Point of sale promotions. ***PLANNING*** **Principle 1: planning interventions & programs** 3. Work in partnership with individuals, communities, organizations and populations to plan interventions to change health-related behaviour. Understand their needs and context, and address potential barriers to change. 4. Prioritize interventions based on best available evidence, can be tailored and use key transition periods. 5. Help to develop social approval for health-enhancing behaviours, in local communities and whole populations. 6. Interventions should be based on a sound knowledge of community needs and should build upon the existing skills and resources within a community. 7. When planning an intervention, be clear about the behaviours that need to be changed, any relevant contextual changes that also need to be made, and the level at which the intervention will be delivered. Be specific about the content, what is done, to whom and in what social and economic context, and make it clear which underlying theories will help make explicit the key causal links between actions and outcomes. **Principle 2: assessing social context** 8. Identify and attempt to remove social, financial and environmental barriers that prevent people from making positive changes in their lives. 9. Consider in detail the social and environmental context and how it could impact on the effectiveness of the intervention/program. 10. Support structural improvements to help people who find it difficult to change, or who are not motivated. These improvements could include changes to the physical environment or to service delivery, access and provision. 11. Effective interventions target specific groups and are tailored to meet their needs.

	Effective interventions take account of the social, cultural and economic acceptability of the intervention and the target group's attitudes toward the behaviour. Effective interventions specify their program theory, that is, the reason why particular actions are expected to have particular outcomes. By working closely with communities over time and using needs assessments, relevant local and cultural information can be gathered. **Principle 3: education & training (N/A)** ***DELIVERY*** **Principle 4: individual-level interventions (N/A)** **Principle 5: community-level interventions** 12. Invest in interventions that identify and build on the strengths of individuals and communities and the relationships within communities. **Principle 6: population-level interventions** 13. Deliver population-level policies, interventions tailored to change specific, health-related behaviours. These should be based on information gathered about the context, needs and behaviours of the target population(s). They could include: a) fiscal and legislative interventions; b) national and local advertising and mass media campaigns; c) point of sale promotions and interventions. 14. Ensure population-level interventions aiming to change behaviour are consistent with those delivered to individuals and communities. 15. Ensure interventions are based on the best available evidence of effectiveness and cost-effectiveness. 16. Ensure the risks, costs and benefits have been assessed for all target groups. ***EVALUATION*** **Principle 7: evaluating effectiveness** 17. Ensure that, wherever possible, the following elements of behaviour change interventions/programs are evaluated using appropriate process or outcome measures: effectiveness, acceptability, feasibility, equity, and safety. **Principle 8: assessing cost effectiveness** 18. Collect data for cost-effectiveness analysis. Where practicable, estimate the cost

	savings (if any) when researching or evaluating behaviour change interventions/programs.
15. Comments/limitations	This guideline provides general advice on behaviour change to policy makers and service providers and can be applied to the question of how to encourage travellers to seek a pre-medical consultation.

Quality Rating: NICE evidence scoring and likelihood of bias

Classification	**Types of Evidence**
1	Systematic reviews of RCTs
2	Systematic reviews of non-RCTs: case control studies, cohort studies, controlled before and after, interrupted time series, and correlation studies.
1&2	Systematic review of both RCT and non-RCT studies
3	Narrative review of non-RCT studies
	Likelihood of Bias
++	High quality, lowest level of bias.
+	Good quality, low level of bias.
-	Variable quality with greater degree of bias.

Items Reviewed	**Textbook #1 of 1 (Essentials of Public Health Communication, 2011)**
General Information	
1. Author, Title, Year	Parvanta, C., et al. Essentials of Public Health Communication (1st Edition), 2011.
2. Overall Rating (from Appraisal)	Moderate
3. Intended Audience/Target Group	Public Health Students, Public Health Professionals
Details	
4. Number of chapters dedicated to topic	Three: Chapter 8: Persuasive Health Communications: The Role of Theory

	Chapter 10: The Strategic Health Communication Plan Chapter 11: It's a Multimedia World
5. Objectives of text	▪ Provide an overview of public health communications, planning, and informatics. ▪ Describe communication challenges and methods to provide information in a clear and unbiased manner. ▪ Present theories, planning models, and examples of effective strategies for influencing groups of people to adopt healthy behaviours. ▪ Frame a fact for persuasive purposes (i.e. gain-framed versus loss-framed messaging). (Chapter 8) ▪ Grasp the fundamentals of social marketing (i.e. audience segmentation, targeting, benefits-barriers-competition, doer versus non-doer analysis). (Chapter 8) ▪ Describe key theories of behaviour change used most commonly in public health communication (i.e. Health Belief Model, Transtheoretical Model, Precaution Adoption Process Model, Social Cognitive Theory, Integrative Model). (Chapter 8) ▪ Choose among, and provide examples of, practice strategies (e.g. entertainment education, risk communication, tailoring, behavioural targeting) for a health communication intervention. (Chapter 10) ▪ Use a systematic and data-based approach for selecting media channels to reach a target population. (Chapter 11) ▪ Choose among multiple media options and approaches for a health communication plan. (Chapter 11)
Public Health Communication Technique ("Intervention")	
6. What topics were well-covered by this text?	▪ Theories of persuasion and change ▪ Creating a strategic health communication plan ▪ Traditional and new media ▪ Examples of public health communication from strategy development to implementation
7. What topics were not well-covered by this text?	The textbook provided a general overview of change theories. A more in-depth look at determining which change theory is applicable to your audience would be helpful.
8. How well does this text step you through the process of public health	The text describes health communication theory (knowing your audience), health communication strategy development (matching your practice strategy to the theory that would work best with your audience) and implementation of a health communication campaign

communication?	(knowing which mediums to use to reach your audience).
Practicality ("Results")	
9. What does this text suggest in terms of message?	<u>Message content</u> ▪ The consumer's perspective of the product or service, its attributes, benefits and barriers, is central to an effective health communication strategy. Public health communicators must learn to ask the consumer what he/she likes or wants in a product. (Chapter 8) ▪ Doer vs. non-doer analysis / positive deviance: interview individuals who are already performing the desired behaviour to determine why they have chosen this behaviour. (Chapter 8) ▪ Integrative model: if your audience already intends to perform the behaviour, it is not their beliefs, attitudes or self-efficacy preventing them; instead, environmental factors are likely precluding their behaviour change. Therefore, rather than focusing on behaviour change, you may need to focus on changing policies that affect the population's opportunities to perform the behaviour. (Chapter 8) <u>Framing messages</u> ▪ Health Belief Model: perceived susceptibility, perceived severity, perceived benefits of interventions, perceived barriers, cues to activate behaviour change and self-efficacy either motivate or discourage health behaviours ▪ Gain-framed appeals are more effective in promoting prevention behaviours for health maintenance, while loss-framed appeals are more effective in promoting detection behaviours for illness. As risk perception moderates the impact of framed appeals, framing should be tested during the formative research phase with target audiences. (Chapter 8) ▪ Audience segmentation is an effective way of reaching and speaking to a particular group of people who will likely be interested in the message. ▪ Elaboration Likelihood Model: attract the specific audience member by focusing on a topic in which they have already expressed interest, or by using demographic, cultural, media choice, place-based, or other references which they find meaningful. (Chapter 8) ▪ Transtheoretical / Stages of Change model: individuals must receive differently tailored interventions or communications according to their present stage of change (precontemplation, contemplation, preparation, action, maintenance). (Chapter 8)

	▪ Develop SMART (specific, measurable, attainable, realistic, time bound) objectives to ensure a health communication campaign achieves results. (Chapter 10)
10. What does this text suggest in terms of medium?	▪ Intervention mapping: Match practice strategies with theories of behaviour change to determine the appropriate channels for health communication. (Chapter 10) ▪ Practice strategies include entertainment education, social marketing, branding, demographic targeting, behavioural targeting, tailoring, interpersonal communication and patient navigation. ▪ Traditional media, earned media coverage, public service announcements, entertainment education, internet, digital media (e.g., twitter) and viral marketing are some of the channels available for you to use. ▪ The most effective channels to reach your audience depend on the behaviour of your target audience. Determine who is engaging in which channels and when, then estimate the channels' cost against its efficiency and credibility. (Chapter 11) ▪ Although said to be on the decline, traditional media, such as television, radio, magazines and newspapers, still reaches a large audience. (Chapter 11) ▪ Channel segmentation is based on personal media preferences. Radio is one of the most customizable media short of tailoring, allowing you to reach your target market effectively. (Chapter 11) ▪ Local health departments can work through government agencies to access tools of market segmentation and analysis. (Chapter 8)
Concerns about when to use, when not to use ("Comments")	
11. Comments (strengths/limitations)	This textbook describes health communication theories, strategies and application. It provides tools to determine the best strategy to communicate a travel health-related message to the public.

Items Reviewed	Guideline #2 of 2 (Hill et al., ISDA, 2006)
General Information and Quality Rating for Review	
1. Author(s) and date	Hill et al. 2006.
2. Country	United States
3. Quality rating	Weak (due to inability to access methodology from authors) The guideline has an extensive reference list and uses a grade system to rate the quality of evidence presented; however, not all ratings could be linked to the studies to verify the source and strength of the evidence.
4. Objectives of guideline	1. To define the minimum standards for knowledge, experience and practice in travel medicine. 2. To review major content areas in the field, including: vaccine in the use of travel, the management of traveller's diarrhoea, and the prevention of malaria. 3. To prevent infectious diseases during travel, ensure the personal safety of the traveller and enable the traveller to avoid environmental risks. 4. To focus on pre-travel preventive care.
Details of Review	
5. Number of primary studies included	Unable to assess (methodology not available from the authors)
6. Types of studies	Unable to assess (methodology not available from the authors)
7. Search period	Unable to assess (methodology not available from the authors)
8. Number of databases searched	Unable to assess (methodology not available from the authors)
9. Inclusion and exclusion criteria	Unable to assess (methodology not available from the authors)
Details of Interventions	
10. Description of Interventions	The guideline describes pre-travel interventions (e.g. vaccination, prophylaxis) and post-travel medical care (e.g. for disease diagnosis). General information on communicating to travellers about disease risk and prevention methods is spread throughout the guideline.
11. Intervention Settings	Specific settings for disseminating pre-travel advice are not identified in this guideline. The authors note, however, that most travel medicine care should be performed in a specialized travel clinic by persons who have training in the field. General practitioners (i.e. non-specialists) should, however, be able to advise healthy travellers to low-risk areas.

12. Theoretical frameworks	Theoretical frameworks are not explicitly mentioned in this guideline, however, provision of specific advice relies on individualized risk communication to achieve behaviour change.
13. Target groups	This guideline is to be used by healthcare providers who practice travel medicine and is to be applied to North American travellers to foreign countries.
Outcome Measurements in Review	
14. Primary outcomes	Not available
15. Secondary outcomes	Not available
Results of Review	
16. Main results of review	**Type of clinic** 1. Primary care physicians and non-specialists should be able to advise travellers who are in good health and visiting low-risk destinations with standard planned activities; however, most travel medicine care should be performed in a specialized travel clinic by persons who have training in the field, particularly for travellers who have complex itineraries or special health needs (quality: C-III). **Target audiences** 2. Acceptance of advice and willingness to comply with it are often determined by a cultural understanding of risk. 3. When families are traveling together, it is advisable to see them as a unit to provide consistent advice, medications, and immunizations to each person. **Important aspects of pre-travel consultation** 4. The key element of the pre-travel visit is a health risk assessment of the trip (e.g. health of traveller vs. details of the planned trip) (quality: A-II). 5. Topics of health education and advice that should be covered for all travellers include: vaccine-preventable illness, avoidance of insects, malaria chemoprophylaxis, prevention and self-treatment of traveller's diarrhoea, responsible personal behaviour, sexually transmitted infections and safety, travel medical insurance, and access to medical care during travel (quality: A-II). **Communicating to travellers** 6. Advice from a travel medicine specialist should be consistent and clear advice and provided in both verbal and written form to help increase traveller compliance with preventive measures (quality: A-II).

	7. It is the task of the travel medicine provider to inform and educate; it is the responsibility of the traveller to act upon the information once the potential risks of travel are understood. The travellers should assume a degree of responsibility for self-education but the practitioner needs to provide them with or direct them to the appropriate resources. 8. Providing advice via telephone or email is controversial, time-consuming, and may open one to medical-legal issues. Any verbal or written advice given to the public should be general, rather than specific (quality: B-III). 9. An improved effort needs to be made to inform travellers, health care providers, and the travel industry of the benefits of pre-travel health care.
17. Comments/limitations	Although this study was appraised as *weak* because the methods section was not available, it provides context that is specific to travel health.

Quality Rating: IDSA system for ranking recommendations in clinical guidelines

Category, grade	Definition
Strength of recommendation	
A	Good evidence to support a recommendation for use
B	Moderate evidence to support a recommendation for use
C	Poor evidence to support a recommendation for use
D	Moderate evidence to support a recommendation against use
E	Good evidence to support a recommendation against use
Quality of evidence	
I	Evidence from ≥1 properly randomized, controlled trial
II	Evidence from ≥1 well-designed clinical trial, without randomization; from cohort or case-controlled analytic studies (preferably from >1 center); from multiple time-series; or from dramatic results from uncontrolled experiments
III	Evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees

Appendix F: Applicability & Transferability Worksheet

Factors	Questions	Notes
Applicability (feasibility)		
Political acceptability or leverage	• 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? o *For example, are there reasons to do the program that relate to increasing the profile and/or creative a positive image of public health?* • Will the public and target groups accept and support the intervention in its current format?	• Is this the right time for more messaging? • There should be supported on efficiency (estimate cost of follow up by PPH staff) • Will there be uptake by target audience? • Stature is not the primary reason to do the program • Targeting prevention of travel-related disease likely to be supported by Regional Council which has a diversity strategy • Using targeted messaging in various languages, media etc likely to be supported by target audience • Target audience perspective must be well researched and understood

Social acceptability	• Will the target population find the intervention socially acceptable? Is it ethical?
	  o *Consider how the program would be perceived by the population.*
	  o *Consider the language and tone of the key messages.*
	  o *Consider any assumptions you might have made about the population. Are they supported by the literature?*
		• Socially acceptable and ethical, though may be some variation across diseases/populations
		• May be pushback from target group – need to engage them somehow
		• Numbers are small – cost?
		• Target audience might be unaware of risk and not self-identify
		• Identifying travel behaviours of target audience

	o *Consider the impact of your program and key messages on non-target groups.*	needed – more in depth analysis will help target messages • May choose a broader message (e.g. in internet pop-up messaging at time of booking, "visit a travel clinic before you go", Peel website update to include clinics, target travellers at passport offices while renewing), or may choose a more targeted approach (e.g. ask all physicians to vaccinate their patients who travel frequently against Hepatitis A & B) • Make it a positive message. Have a clean and simple checklist like a vaccine schedule for schools. Have a vaccine schedule for travellers and highlight diseases prevalent in destination • Messaging needs to be appropriate and culturally sensitive. Care must be taken not to create or enforce stereotypes.
Available essential resources (personnel and financial)	• 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? o *Consider: in-kind staffing, supplies, systems, space requirements for staff, training, and technology/administrative supports.* • Are the incremental health benefits worth the	• Costs of intervention and of reaching audience are not included • Hard to determine without knowing costs • List of clinics specializing in travel available; really unknown what primary care MDs/practices providing • PPH has prevention mandate • Small # of cases in any year – likely underestimated but balance cost against prevention • If broaden beyond 4 diseases may extend benefit

	costs of the intervention? o *Consider any available cost-benefit analyses that could help gauge the health benefits of the intervention.* • *Consider the cost of the program relative to the number of people that benefit/receive the intervention.*	of program e.g. STIs • Simple strategies. Website • Have many drop ins where people come to HS clinics looking for travel clinic for vaccinations or they ask for Hep A injections but don't meet the criteria for being sexually active. We could be doing more collaborative work with travel clinics. • Can leverage existing resources and partner with other public health units for broader communication
Organizational expertise and capacity	• 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 existing legislation or regulations (either local or provincial)? • 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)? o *Consider organizational capacity/readiness and internal supports for staff learning.*	• Yes • Yes • Yes – ethnocultural diversity; efficient and effective service • EH and CDC both need programming to lower travel related diseases • PPH has mandate for travel related CDC • Definitely overlap internally • Many important key messages to travellers • Consider many different target audiences (infant, youth, adult, senior) and then risk/exposure • Synergies can be created with the communication and ethnocultural diversity strategic priorities • Possible barrier: a new program would require a business case and resources

Transferability (generalizability)		
Magnitude of health issue in local setting	• 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? • *Consider the Comprehensive Health Status Report, and related epidemiological reports.*	• Table 2 has baseline information • EH – costly to follow-up S. typhi and S. paratyphi • STI – expensive to follow-up syphilis • Some data on travel-related infections • Look at travel patterns for Peel residents
Magnitude of the "reach" and cost effectiveness of the intervention above	• Will the intervention appropriately reach the priority population(s)? • What will be the coverage of the priority population(s)?	• More analysis need to understand the magnitude of the problem
Target population characteristics	• 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? • *Consider if there are any important differences between the studies and the population in Peel (i.e., consider demographic, behavioural and other contextual factors).*	• VFR is a general term. Will have to tailor to ethnicities living in Peel.

Proposed Direction (after considering the above factors):

PPE process might be helpful to understand bigger travel issues. In meantime, need to segment audience to drive travellers to care.

Potential actions that were discussed include:

- mass media campaign – consider 680 News (or other radio) as it is cost-effective; be aware of appropriate time of year to advertise
- partner with airlines/travel agents for pop-up reminder at time of booking (or advocate for MOHLTC or PHAC to do this); alternatively, consider a Peel IP address pop-up to avoid partnering with airlines

- through physician outreach program, vaccinate all those who travel regularly against Hepatitis A & B
- update Peel website to include link to PHAC yellow fever centres; include travel pages & also update health professionals page; monitor website "hits"
- make a travel list, which includes visiting a travel clinic and/or taking preventive measures (e.g. pack condoms)
- consider using case management as opportunity for additional education on precautions that can be used for the client's next trip
- advertising campaign at passport offices to target those renewing
- conduct user acceptability testing on any intervention being considered prior to roll-out
- partner with other local health units to reach larger audience; consider Vancouver Coastal health as well
- reconnect with travel specialist, Dr. Jay Keystone
- conduct a cost-benefit analysis for interventions being considered prior to roll-out
- collect more travel-info on Chlamydia/gonorrhoea? Are we importing gonorrhoea resistance into Canada?
- advocate for Panorama I/OM module to have better fields for tracking enhanced surveillance data than our current notes field
- seek better data on Peel-specific travellers (what is our baseline?) – connect with Dr. Khan (Bio.Diaspora), travel industry, StatsCan; Eileen de Villa may have some ideas on data sources
- pull HIV report done by summer student to look at HIV travel data
- consider partnering with PHAC/UGuelph for more projects/research on this topic
- consider the role of Peel contact centres (tier I/II)

Form Completed by: Monali Varia, Abidah Ratansi, Maureen Horn, Dr. Megan Ward, Paul Callanan, Roxanna Gruescu, Liz Haydu, Farrah Garrett, Isabelle Mogck, Crystal Frenette

Worksheet adapted from: Buffet C., Ciliska D., and Thomas H. National Collaborating Centre for Methods and Tools. November 2007. *Can I Use this Evidence in my Program Decision? - Assessing Applicability and Transferability of Evidence*.