An Evaluation of the Travel Health and Immunization Services provided to the Population of Central Vancouver Island

Project submitted to MPH Nursing Specialization at LU

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Executive Summary

Background. More and more people are traveling internationally to less industrialized countries and more travellers are now seeking out health advice prior to departure. Central Vancouver Island's Travel Health and Immunization Services is a cost-recovery clinic within the public health system located in Nanaimo, BC.

Methods. A survey was carried out among those travelers returning to the clinic to complete a vaccination series for which the first dose had been given prior to traveling to a developing country. The survey has five questions that ask about the frequency of using the travel clinic services and the frequency of how often the information provided was used. Then another five questions that deal with the attitudes of the traveller towards the travel clinic services and finally an open ended request for comments.

Findings. Findings from the study showed that travelers do use the advice given by the travel clinic services and that information and immunizations provided helped them remain healthier and safer while travelling to a developing country. However, the findings also showed that some residents are not happy with the location of the clinic and would prefer it to be located closer to home. Overall the evaluation showed a positive response to our services but also identified some areas for improvement.

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An Evaluation of the Travel Health and Immunization Services provided to the population of Central Vancouver Island.

Objectives of the study

Two issues related to the health of residents of Central Vancouver Island (CVI) who travel to developing countries are: (1) is the information provided by the travel clinic services useful? and (2) what are the client's attitudes towards the importance of seeking pre-travel consultation? In order to prevent diseases post travel, which becomes a public health related issue, it is important to determine why travelers may or may not seek pre travel advice. Services in Central Vancouver Island (CVI) were previously provided by public health nurses in health units. For the past three years CVI has had a cost-recovery clinic within the public health system located in Nanaimo, BC. The services are provided by public health nurses who specialize only in travel health. It is important for the population of CVI who travel to developing countries to attend our clinic in order for them to stay safe and healthy on their trip.

The objectives for the present study are:

1. To determine how accessible the travel health and immunization services are to the residents of CVI.
2. To determine if the information provided is useful and effective.
3. To determine attitudes of travellers towards seeking or not seeking pre travel immunizations and travel health advice

Background Information

In past years there has been a growing perception of the need for health protection during travel, which has prompted travelers to seek advice on how to prevent disease and stay healthy while on their trip. The main sources consulted

for health information during travel are general practitioners (57.4%), travel clinics (35.3%), travel agents (30.0%), family and friends (27.8%), Internet (24.0%), books/magazines (22.5%), and pharmacists (20.1%; Laverone, Boccalini, Bechini, Belli, Santini, Baretti, S., et al., 2006).

Traditionally, travel clinic services have been provided by health units throughout the province of British Columbia. Many years ago, the Ministry of Health ceased to provide health units with free vaccine for the international traveler. Various historical factors have influenced the ability of health units to provide this service in a consistent, cost effective way, and each region in the province has managed travel preventative health and non-funded vaccine services in different ways. Some of the larger cities have private travel clinics, which provide some or all of the travel service for the community. Health units in those areas no longer have travel clinics. Services in Central Vancouver Island (CVI) were provided by the health units in previous years; however, CVI now has a cost-recovery clinic within the public health system located in Nanaimo, BC. The program has been running for three years and this study is needed to assist in the evaluation of the program.

Conceptual Framework

The Committee to Advise on Tropical Medicine and Travel (CATMAT) for Health Canada defines travel medicine as "the field of medicine concerned with the promotion of health and the prevention of disease or other adverse health outcomes in the international traveler. Travel medicine focuses on health

promotion as a means to maintain the health and well being of travelers." (Canada Communicable Disease Report [CCDR] 1999, p. 2).

According to the Provincial Health Officer's Annual report (1998), in British Columbia, international travel has increased dramatically in the last decade and travel related diseases are becoming more and more common. There are both provincial and national recommendations for travel related immunizations but there is no provincial program to provide travel vaccines free of charge (or publicly funded). "Provision of advice and information related to health risks in international travel is a specialized service, immunization recommendations change frequently and there is no single schedule for immunization" (British Columbia Provincial Health Officer 1998, p. 54). Professionals working in the field of travel medicine require knowledge in major areas such as global epidemiology of health risks to the traveler, vaccinology, malaria prevention, and pre travel counseling designed to maintain the health of the traveling public (Kozarsky, 2006).

Travel clinic services become increasingly important as the globalization of the world economy grows, the travel industry expands, international humanitarian activities increase, and families increasingly live apart in a variety of countries. The capacity to travel so quickly across continents means that viruses and bacteria can also travel quickly as recently experienced with SARS and currently avian influenza. As well, there is H1N1 influenza that has now reached stage 6 on the World Health Organization's (WHO) pandemic scale. Prevention

of accidents, illness related to chronic conditions and problems related to ethical-cultural situations can also be decreased for clients who attend travel clinics.

According to an article published by the International Society of Travel medicine (ISTM) in 2006 "approximately 1 billion people travel internationally on an annual basis, and 50 million people from industrialized countries visit the developing world each year. As the cost of travel becomes more affordable we see travelers visiting more exotic destinations causing an increase of travel related illnesses occurring in approximately 20% to 70% of international travelers . . . Ultimately 1 out of every 100 000 travelers dies because of a travel related disease" (Boggild, Yohanna, Keystone, & Kain, 2006, p. 138). Travel clinic services need to be accessible to the public who travel and promoted as important prevention even though the British Columbia Government does not publicly fund travel vaccines or education.

An understanding of the reasons for using travel health and immunization services is aided by considering the Health Belief model. According to Shah (2003, p. 24), "this model suggests that behaviors undertaken by individuals in order to remain healthy, including the use of preventive services information are a function of a set of interacting beliefs." The traveler must be motivated to take action to prevent travel related illnesses and they must believe that by seeking out travel health and immunization services positive consequences will occur. The traveler's beliefs about the benefits of receiving a travel professional's advice involve consideration of certain barriers such as time, access, cost and

convenience. Events need to occur to stimulate travel health related preventive health behaviors.

The travel health professional must have the ability to pass on information to the traveler in a practical and understandable manner so that the traveler will make use of it, keeping in mind that education is as important to healthy travel as immunizations (Spira, 2003). An example of using the Health Belief Model in the area of travel medicine is depicted in the figure below taken from the article "I Hate Needles and Other Factors Impacting on Travel Vaccine uptake" (Crockett & Keystone, 2005).

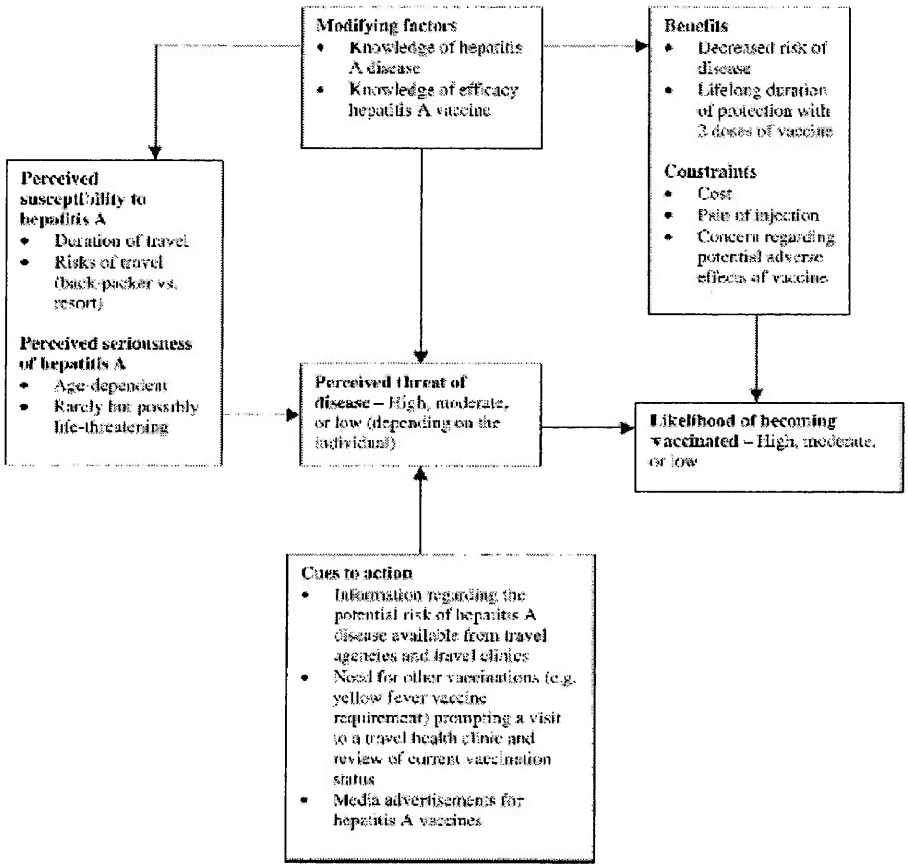

Figure Health Belief Model and increasing hepatitis A vaccine uptake in travelers.

Figure 1:Health Belief Model and increasing hepatitis A uptake in travelers

Literature Review

About Travel Health Clinics

"Medical advice for those traveling abroad has been an important health information source in the UK, Europe, North America and Australasia since the 1990's" (Shaw, 2006). Prior to 1990 people intending to travel relied heavily on their family physician and travel agents for advice but evidence shows that often advice is not offered and when it is, it is inaccurate and not consistent (Shaw, 2006). Therefore travel clinic services need to be specialized and always up to

date. Shaw (2006, p.110) states "clinics that specialize in travel health advice need to provide:

1. Authoritative and current information for the population who travel abroad
2. Pre- and post-travel clinical assistance in the prevention of disease by immunization, personal protective measure, education, prophylaxis and treatment
3. Authoritative sources that provide up-to-date health information. Resources such as WHO, International Society of ravel Medicine (ISTM) and the CDC in Atlanta and CATMAT."

A study done on travel clinics in Quebec indicates that most travel clinics are run by public health: others are private clinics, clinics in hospitals and sometimes in family physicians' offices (Provost, Gagnon, Lonergan & Bui, 2006). The study revealed, as did other studies in other clinics throughout the world that "there is no unique organizational model for travel clinics, whether regarding type of institution, mode of operation (type of staff, schedule and cost), or services offered" (Provost, et al., 2006, p. 230). In Quebec and most other provinces in Canada fees are applied to vaccine and there is often a consult fee, as provincial or federal governments do not publicly fund travel medicine. A survey done by travel clinics in Quebec shows that only a small percentage of intending travelers visit a travel clinic prior to departure. According to stats Canada in the year 2000 about 514,300 Quebecers traveled abroad to high-risk destinations, and based on the survey, on average 80,000 Quebecers seek pre travel consultation, which is about 15% of travelers (Provost et al. 2006). It is essential for travel health

professionals to provide accurate and up to date information for the traveler but how and where this is done is not consistent across Canada nor the world.

How to Prepare the Traveler

In travel medicine, broadly speaking, risk is the likelihood of injury, disease, damage or loss from a real or potential hazard. When making a risk assessment the health professional usually focuses on the probability of harm and the severity of possible consequences of travel and balances these with the probability and the severity of possibly consequences of any interventions (Leggat, 2005). There are four steps to giving the international traveler the foundation for a healthy journey:

1. Assess their health,
2. Analyze their itineraries,
3. Select vaccines, and
4. Provide education about prevention and self-treatment of travel-related diseases (Spira, 2003).

Key elements to the pre travel consult are health risk assessment and health promotion. The health risk assessment consists of the health status of the traveler such as medical conditions, medications and allergies, immunization history and health risks related to type of travel such as the itinerary: country traveling to, rural, urban, accommodation, duration of trip, and anticipated activities. Health promotion topics include responsible personal behavior and safety, vaccine-preventable illness, vector avoidance, malaria prevention, travelers' diarrhea prevention and self-treatment, and environmental illnesses like

altitude, heat, swimming, jet lag, and prevention of deep-vein thrombosis (Hill, 2005).

Pre travel advice must be evaluated and optimized in order to improve the traveler's health and increased attention needs to be considered in the areas of individual risk factors, prevention and therapy of travelers' diarrhea, malaria prophylaxis and personal safety (Rack, Wichmann, Kamara, Gunther, Cramer, Schonfeld, et al., 2005). Basically, the pre-travel visit should minimize health risks specific to the journey, give travelers the capability to handle most minor medical problems, and allow them to identify when to seek local care during the trip (Spira, 2003). Areas that may be covered in a pre-travel consult are shown in figure 2 below.

Table 1 Areas that might be covered in pre-travel preparation.[a]

Advise/discuss	Insects	Repellents, nets, permethrin
	Ingestions	Care with food and water; dental check
	Infections	Skin; environment
	Indiscretions	Sexually transmitted infections, including human immunodeficiency virus
	Injuries	Accident avoidance, safety
	Immersion	Schistosomiasis
	Insurance	Health and travel insurance
		Finding medical assistance abroad
Vaccinate	Always	National immunisation schedule vaccines
	Often	Hepatitis A
	Sometimes	Japanese encephalitis
		Meningococcal disease
		Polio
		Rabies
		Tetanus-diphtheria
		Typhoid
		Yellow fever
		Cholera
	Older travellers	Pneumococcus
		Influenza
Prescribe	Always	Regular medication
	Sometimes	Antimalarial medication
		Standby treatment, e.g. diarrhoeal or malarial self-treatment condoms

Figure 2: Areas that might be covered in a pre-travel consult (Leggat, 2005)

Travel medicine is quickly becoming a specialty area and in 2003 the ISTM introduced the certificate of knowledge examination in travel medicine and they also routinely review the Body of Knowledge for the Practice of Travel Medicine by physicians, nurses and other travel health professionals (Kozarsky, 2006). The travel health professional needs time to prepare the traveler by utilizing a face-to-face discussion as well as providing written material to support the information provided. The health professional must pass on the information in a practical and understandable manner so the traveler feels prepared prior to departure (Spira, 2003). According to the article "Educational Issues and concerns in Travel Health Advice: Is all the Effort a Waste of Time?" Bauer (2005) states "recognizing that poorly informed travelers exist, it is worth examining whether the way travel health advice is given contributes in some form to a less-than-satisfactory outcome in terms of travelers' health preparation" (p. 45). The problems seem to occur in three areas

1. The content of the advice, for example too much too quickly so the traveler will be overwhelmed.
2. The way the information is conveyed, how confident is the health professional about providing travel health information and what is their knowledge base.
3. The effect it has on the recipient (Bauer, 2005).

"Health education is considered a complex process aimed at motivating the traveler to adopt healthy behavior or modify previously compromising behavior" (Bauer, 2005, p. 46). The health belief model by Rosenstock can be

used by health professionals in the travel clinic setting to help prepare the international traveler. "Advice based on this model needs to trigger the occurrence of three events simultaneously

1. The presence of sufficient health concern to make the problem relevant,
2. The belief of susceptibility ("perceived threat"), and
3. The belief that some action can reduce this perceived threat" (Bauer, 2005, p.46).

The health professional who provides the travel health education must have the appropriate medical background and have a considerable amount of theoretical knowledge (Bauer 2005). However, as indicated in the article by Walker, Genasi, Boyne and Redman on the European perspective "the problem throughout Europe is ensuring that those providing advice are well trained and informed" (2005, p.82). Reviewing studies in the area of travel medicine and the preparation of the traveler, Virk and Fischer indicated that "as similarities and differences are explored and documented, it is clear that while travel medicine is truly a global specialty, the specific risks and recourses vary between sites, and these affect the details of a travel medicine practice" (2005, p. 79).

Figure 3: Elements of a travel medicine practice: provider qualifications

Table 2. Elements of a travel medicine practice: provider qualifications.

Category	Element[b]
Knowledge[a]	Geography
	Travel-associated infectious diseases, including epidemiology, transmission, and prevention
	Travel-related drugs and vaccines, including storage and handling, indications, contraindications, pharmacology, immunology, drug interactions, and adverse events
	Noninfectious travel risks, both medical and environmental, including prevention and management
	Recognition of major syndromes in returned travelers (e.g., fever, diarrhea, rash, and respiratory illness)
	Access to travel medicine resources, including texts, articles, internet Web sites, and listserv discussions
Experience	Time spent in a travel clinic managing the cases of travelers who have varying medical conditions and are traveling to diverse destinations with a wide variety of planned activities
Continuing education	Short or long courses in travel medicine
	Membership in specialty society dealing with travel and tropical medicine (e.g., the American Society of Tropical Medicine and Hygiene, the International Society of Travel Medicine, and other national societies)
	Journal subscription and use

[a] See the body of knowledge defined by the International Society of Travel Medicine [33].

(Hill, Ericsson, Pearson, Keystone, Freedman, Kozarsky, et al., 2006)

Risks and Types of Diseases in Travelers

"Immunizations prior to travel contributes to reducing the risk of specific diseases for the traveler as well as the risk of international spread of disease" (Steffen & Conner, 2005, p.26). Risks of disease are based on the traveler's itinerary, duration of visit and reason for travel. According to several expert groups around the world travel vaccines can be grouped into three categories.

1. Required vaccines such as yellow fever and meningococcal vaccine
2. Recommend vaccines such as Hepatitis A, Hepatitis B and Typhoid vaccine

3. Routine vaccines, which are vaccines that are publicly funded as part of the routine schedule of where the potential traveler resides, for example tetanus diphtheria vaccine and MMR vaccine (Steffen & Conner, 2005).

Figure 4: Impact and incidence of vaccine-preventable diseases in travelers to developing countries. CFR= case fatality rate

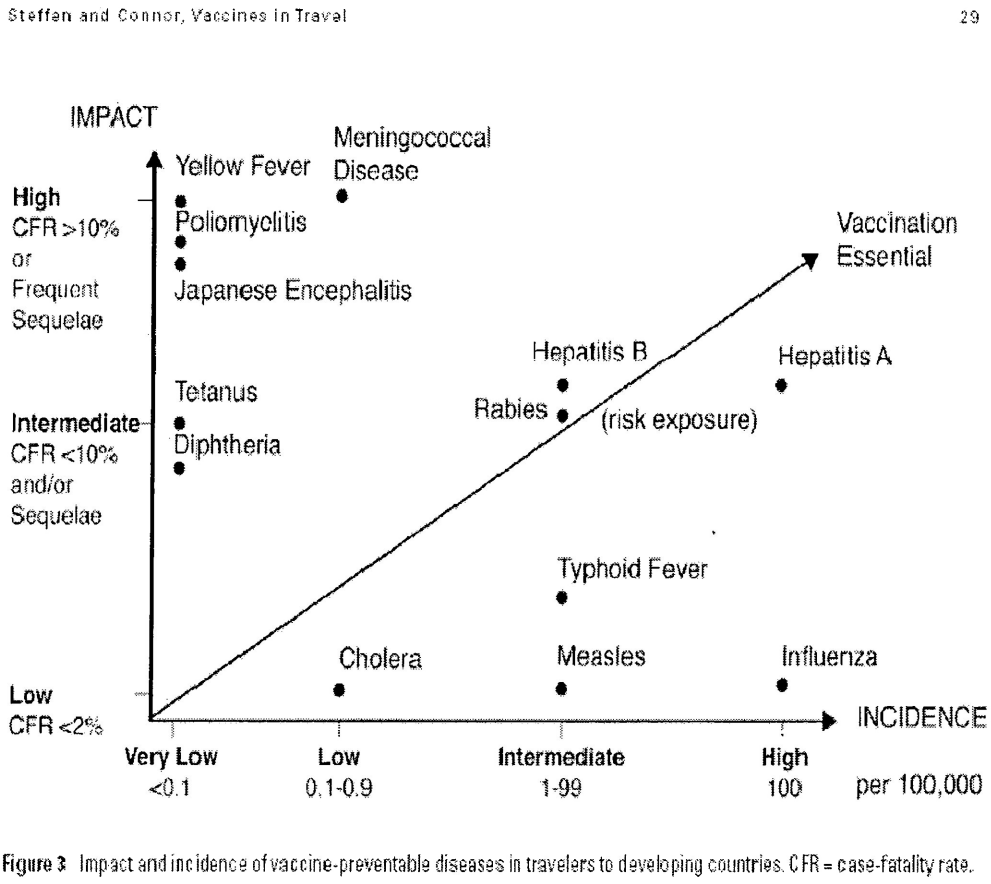

Figure 3 Impact and incidence of vaccine-preventable diseases in travelers to developing countries. CFR = case-fatality rate.

The health-care provider who is providing travel vaccines must understand the epidemiology of the disease in the destination region, the mode of transmission and non-vaccine preventive measures, in order to determine whether the traveler is likely to be at risk during his or her trip. If the risk is deemed sufficient, the appropriate vaccines should be administered to the traveler (Hill, 2005).

Receiving appropriate information about staying healthy while traveling can reduce common health problems in the returning traveler. Such information includes food and water precautions and personal preventive measures like the use of insect repellant and nets. Travelers' diarrhea (TD) is a frequent problem for travelers and access to a safe water supply when traveling is undoubtedly a paramount issue (Leggat & Goldsmid, 2004). Both counseling about food and water precautions, and vaccination are beneficial. On average, 30–50% of travelers to high-risk areas will develop travelers' diarrhea during a 1- to 2-week stay (Lopez-Gigosos, 2007). In one study done in Alberta, information on TD appeared to improve the level of knowledge on its prevention and treatment among travelers (Johnson, McMullen, Hasselback, Louie, & Saunders, 2006). In Africa the cornerstone of malaria prevention in sub-Saharan destinations remains chemoprophylaxis, supported by personal protection measures. Despite this, many travelers arrive poorly protected and local residents and sectors of the travel industry often play down the risk to travelers (Toovey, 2005).

The traveler must be motivated to take action to prevent travel related illnesses and they must believe that by seeking out travel health and immunization services positive consequences will occur. The traveler's beliefs

about the benefits of receiving a travel professional's advice involve consideration of certain barriers such as time, access, cost and convenience. A study to assess the impact of travel health advice on travelers' knowledge about malaria and quality of the outcome of travel consultations was done at the Institute of Hygiene and Tropical Medicine, Portugal and the results concluded that travel medicine consultations increase the knowledge base of travelers but do not achieve 100% correct answers (Teodosio, Goncalves, Atouguia, & Imperatori, 2006). In another study the results showed that those who seek advice usually follow it through. For example from the study population approximately 55% of travelers took malaria prophylactic measures and approximately 69% reported constant attention regarding safe consumption of food and drinks. However 236 cases of travelers' diarrhea were still reported (Laverone et al, 2006).

One of the most common health problems in returning travelers is traveler's diarrhea, occurring in 13.6 to 54.6% of travelers (Rack et al., 2005). According to this study, of all the travelers, 80% did not follow the traditional recommended dietary restrictions (Rack et al., 2005). Risk of malaria is significantly high in those travelers who are visiting friends and relatives (VFRs). The CDC malaria surveillance data for 2002 shows only 10% of reported malaria cases in persons with a known purpose of travel occurred in tourists, while 45% were in VFR travelers (Angell & Cetron, 2005). The studies show that pre travel advice must be evaluated and optimized in order to improve the traveler's health and increased attention needs to be considered in the areas of individual risk

factors, prevention and therapy of travelers' diarrhea, malaria prophylaxis and personal safety (Rack et al., 2005).

Current Trends Among Travelers

According to the World Tourism Organization (WTO) the number of travelers to foreign destinations increased by 10% in 2004, to 760 million, the highest growth in 20 years. Travel has increased in all areas but more so to Asia Pacific area and the Middle East (Connor, 2005). Hence the trend for increased travel has caused an increase in infectious diseases, malaria over 400 cases, dengue fever 50 million cases, yellow fever 200 000 cases and schistosomiasis over 600 million cases (Connor, 2005). Travelers from the industrialized countries are becoming more familiar with these diseases and more feared of them. Although diseases such as SARS, West Nile, Avian and H1N1 Influenza have received extensive media coverage and have appeared to heighten the awareness of risks to travelers, potential travelers still do not always seek or use available preventative measures when traveling abroad (Connor, 2005).

People are traveling for many reasons like immigration, tourism, VFRs and business and the trend is to visit more exotic and developing countries. This travel often leads to illness in returning travelers such as parasitic diseases. A study of parasitic infections in Canadian travelers reviewed the trends of why Canadians are traveling and then showed what percentage of these travelers returned with parasitic diseases (Boggild, Yohanna, Keystone, & Kain, 2006).

Figure 5: Purpose or reason for travel

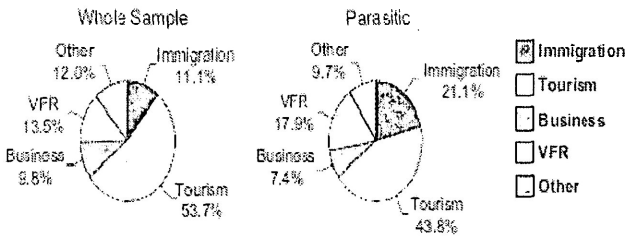

Figure 1 Purpose of travel.

J Travel Med 2006; 13: 138–144

A common trend among potential travelers is that many do not seek out travel health and immunization services prior to travel even though the resources to do so are available to them. For example, "most US travelers to hepatitis B endemic regions do not secure pre travel advice, ...only 31% of respondents visited any health practitioner to obtain pre travel advice" (Connor, Jacobs & Meyerhoff, 2006, p. 273). In another study data was collected from 104 travelers at departure gates for flights to Mexico from Calgary Alberta on their knowledge of travelers' diarrhea (TD) and food risks associated with it. In this study, a slightly higher rate of almost half of the travelers reported they had received some information on travel related diseases and on TD prior to the flight (Johnson, McMullen, Hasselback, Louie, & Saunders, 2006). A study conducted among Australian travelers about pre travel advice and Hepatitis A immunization found that only one third of the travelers interviewed sought health advice prior to departure (Zwar & Streeton, 2007). However, in one study the results were a bit more promising, in that 93.6% of travelers received pre travel health information; although in 41.5% the source of information was from books, 23.3% from the

internet, 22.7 % from general practitioners and only 38.8% from travel medicine clinics (Cabada, Maldonado, Quispe, Serrano, Mozo, Gonzales, et al., 2005). The trend to not seek medical care needs to decrease and effort needs to be made to educate the public about travel health risks and services and appropriately trained staff need to be available and accessible to the potential traveler in all countries of the world.

Barriers to Seeking Pre travel Advice

The travel clinic endures many challenges in order to provide the traveler with the appropriate service. However, even if everything is provided, the travel clinic still faces the barrier of why the potential traveler does not seek pre travel advice. According to Legget, "Three main challenges initially confront the establishment of effective travel medicine practice:

1. Travelers must recognize the need for travel health advice before traveling abroad…
2. Ensuring that travelers seek travel health advice in a timely manner, preferably at least 6-8 weeks before travel
3. Travelers need to obtain travel health advice from a qualified source (2005, p.69)".

As previously mentioned the government does not publicly fund travel health and immunizations services like other healthcare services. The expense to the traveler for pre travel advice can be seen as a barrier to seeking the pre travel information. The results of a study done in Hong Kong indicated that one quarter of the sample were willing to pay a positive amount of less than HK $100,

while about one fifth were willing to pay HK $400 (approximately $50 US). A number of factors to explain people's willingness to pay are age, monthly household income, education level, exposure to material promoting travelers' health protection and having experienced a health problem during their last travel. The study showed that 77% of the sample were willing to pay to avoid health risks. (Yeung, Abdullah, McGhee, & Hedley, 2005). This study was in Hong Kong and there is a lack of research done in the area of economic value of any travel-associated preventive measures elsewhere. The cost of approximately $50 does not seem like very much when you consider a consult fee, and vaccine fees so it would be of interest to see more research on the actual cost a traveler would be willing to pay for service in different countries.

According to Crockett and Keystone (2005) travel vaccines comprise an essential component of pre travel health advice; however many travelers do not take advantage of this preventive health strategy to decrease their risk of travel related illness. "Factors that impact on a traveler's decision on whether or not to be vaccinated are related to the knowledge, attitudes and beliefs of the traveler regarding travel vaccines, vaccine preventable diseases, and other factors" (Crockett & Keystone, 2005, p. S41). Key issues of not receiving travel vaccine are tolerability of vaccination, vaccine efficacy and safety, convenience of administration, rapidity of onset of protection and cost of vaccine (Crockett & Keystone, 2005).

Demographics

The Central Vancouver Island health region consists of six local health areas. The six local health areas are Cowichan, Lake Cowichan, Ladysmith, Nanaimo, Qualicum and Alberni. The travel health and immunization service is located in Nanaimo and residents of CVI receive services at the clinic. Clinics run Tuesday to Saturday in Nanaimo and every other Saturday at an out reach clinic done in Duncan located in the Cowichan health area. Two nurses and one admin support person run the clinic and casuals are used as needed. The latest population statistic for CVI health area is 275,000 people in the year 2006. The land area by square km is 12,212.08 (Stats Canada 2006). In 2007 the travel clinic in Nanaimo saw approximately 8000 travelers, but it is unknown what percent of the traveling population this is (IWR report from CVI travel clinic 2007).

Figure 6: CVI Health Area Map (Vancouver Island Health Authority 2005)

Research Methodology

The literature reviewed has provided evidence that travel health and immunization services are an important aspect of public health and the health of the Canadian traveller. The present study surveyed client's attitudes regarding their pre travel health consultation and its effects on their trip abroad. This in turn will assist in the ongoing evaluation of existing travel health and immunization services in Central Vancouver Island.

Method

The method used was a survey of travelers returning to complete a vaccination series for which the first dose had been given prior to traveling. These follow up appointments took place at the travel clinic in Nanaimo. Follow up appointments are generally at least 6 months from the initial pre travel health consult and vaccine administration, and after they have returned home from their trip to a developing country. A non-probability consecutive sample of 50 participants was used. The time commitment involved on the behalf of the participants was approximately 10 minutes to fill out the survey. The author arranged for participants to be given a package that included a cover letter and survey at their follow up appointments.

Design

The survey contained a set of eleven questions plus demographic information such as gender, age and where the client resides as well as their travel destination. Participants were asked where they reside in CVI to determine whether the travel clinic is being utilized by people from all parts of Central

Vancouver Island or predominantly by only those living in Nanaimo. The survey asks what developing country the participant traveled to in order to determine if they were in a high risk area as well as to get an idea of where CVI residents travel to.

The author derived the questions from the objectives of the proposed study. The first set of questions asks about the frequency of using the travel clinic services and the information provided.

1. How often have you traveled to a developing country? (i.e., countries in central and S. America, Africa, Asia etc.)

The frequency of how often the participant travels helps to determine if the participant has previous experience with travelling and how much they already know about risks and how to protect themselves before travelling.

2. How often have you consulted a travel clinic before you travel to a developing country? (i.e., countries in central and S, America, Africa, Asia etc.)

Consulting a travel clinic prior to departure helps to assist in analyzing the number of clients that are first time visitors to a clinic or clients who return every time they travel to a new country.

3. How often do you check your immunizations are up to date prior to traveling to a developing country?

Checking if immunizations are up to date prior to travel can show that clients are aware of immunization and the need to update them on a regular basis prior to travel.

4. How often did you use the food and water precautions information provided to you at your pre travel consult?

The use of food and water precautions assist in determining if the pre travel consult information was useful to the participant in that it prevented them from contracting vaccine preventable diseases such as Hepatitis A as well as the traveler's diarrhea diseases such as E. coli.

5. How often did you use your personal protective measures (i.e., net, repellents) against insects discussed at your pre travel consult during your trip? (only answer this question if you were in an area at risk of insect transmitted diseases).

If the information provided at the pre travel consult about personal protective measures such as insect repellants and nets was used the client is assumed to be better protected against diseases such as malaria and dengue.

The second set of questions deals with the attitudes of the traveler towards the travel clinic services. The questions assessed barriers to receiving pre travel advice such as accessibility, cost and the perception that immunization and information is not necessary prior to traveling to a developing country.

6. The location of where you had your pre travel counseling and immunization appointment was convenient to where you reside.

The above question about the location of the clinic and if it was convenient helps to determine if the location is appropriate for all residents of CVI. As the travel clinic is a cost recovery business there is only so many costs it can occur in

regards to location and traveling to satellite clinics to be closer to home for the client.

7. The cost of the travel clinic service was what you expected.

The cost of the service and what participants expect to pay is of interest in order to have a balance between making enough money to cover the costs of running the clinic versus charging too much so the clients will not come to the clinic.

8. The information you received at your travel clinic appointment helped prepare you for your trip to a developing country.

The question about the information given at the pre travel appointments determines if the service is providing good useful information and that the advice presumably makes their trip safer and healthier.

9. Did you learn anything new from your visit at the travel clinic?

If the information provided is not effective then the service would have to change in order to be more effective.

10. Do you feel that having attended the travel clinic prior to traveling kept you healthier and safer while in a developing country?

The goal of travel clinics is to help travelers stay healthier and safer while traveling so they can return free of disease and injury.

The last question was an open ended request for comments.

Informed Consent

The evaluation survey was carried out from October 7, 2009 to November 20, 2009 at the Central Island Travel Health and Immunization clinic. All potential participants were given a package that included a cover

letter and the survey (Appendix 1). Simply completing the survey implied consent on the part of the participant. As the survey is for program evaluation, no ethical review was required other than approval by the Clinic Administration, which was obtained.

The survey was given to 50 returning travelers to the clinic who were scheduled to receive a further dose of vaccine after their trip. It is worth noting that the study population represents a self-selected group of travelers who have already attended the travel clinic so are interested in healthy traveling and somewhat compliant. The data from the survey was entered into an excel spreadsheet then analyzed with an SPSS system.

Results

The survey was completed by 50 travelers; 31 male and 19 female. Of those travelers 50% were between the ages of 51 and 70 years, 36% between 31 and 50 years and finally 14% under 30 years. Survey participants resided in 12 different cities/towns located in Central Vancouver Island (Table 1).

Table 1: region of participant residence and frequency

Region	Frequency	%
Cobblehill, Cowichan Bay, Duncan, Millbay	11	22%
Cedar, Ladysmith, Lantzville, Nanaimo,	22	44%
Errington,Nanoose,Parksville, Qualicum Beach,Port Alberni	17	34%
Total	50	100%

Travelers visited 30 different countries. The countries most visited were Peru (7), Phillipines (4) and Costa Rica (4) (Table 2).

Table 2: Continent and frequency visited by travelers

Continent	Frequency	%
South America	13	26%
Asia	13	26%
Central America	13	26%
Africa	9	18%
Total	48	96%

The first five questions asked about the frequency of using the travel clinic services and the information provided. Over 50% of travelers have traveled two or more times to a developing country. Most of the participants consulted a travel clinic before traveling to a developing country sometimes to always. Only 4% said they never consult a travel clinic. With regard to immunizations, most participants, 98%, checked that their immunizations were up to date prior to traveling but only 50% said they always checked. Use of the food and water information provided at the pre travel consult to prevent travelers' diarrhea diseases was practiced to some degree by 96% of participants. Personal protective measures against insects were used in some way by 90% of travelers (Table 3).

Table 3 Percentages for questions 1-5 of survey

Question	Never	Once Only	2-3 times	4 or more times
1.How often have you traveled to a developing country? (i.e. countries in central and S, America, Africa, Asia	2%	40%	26%	32%

etc.)				
	Never	Sometimes	Often	Always
2.How often have you consulted a travel clinic before you travel to a developing country? (i.e. countries in central and S, America, Africa, Asia etc.	4%	36%	24%	36%
3. How often do you check your immunizations are up to date prior to traveling to a developing country?	2%	34%	14%	50%
4.How often did you use the food and water precautions information provided to you at your pre travel consult?	6%	12%	42%	40%
5.How often did you use your personal protective measures (i.e. net, repellents) against insects discussed at your pre travel consult during your trip? (only answer this question if you were in an area at risk of insects transmitted diseases)	10%	26%	32%	26%

Questions six to ten dealt with the attitudes of the traveler towards the travel clinic services (Table 4). Of the participants 85% agreed that the location of the travel clinic was convenient to where they live, while 10% disagreed. In regards to the cost of the travel clinic services to the participant over 50% agreed it was what they expected, and no one disagreed. The majority of survey participants felt the information received at their travel clinic appointment did help them prepare for their trip to a developing country. Only 2% were uncertain and 4% did not answer the question. The question was asked if the participant learned anything new from attending the travel clinic prior to departure and 90% agreed. The majority of participants felt by visiting the travel clinic prior to their departure to a developing country helped them stay healthier and safer while on their trip. Of the participants 90% agreed they were healthier and safer, and no one disagreed.

Table 4 Percentages for questions 6-10 of survey

Question	Strongly agree	Agree	Uncertain	Disagree	Strongly Disagree
6.The location of where you had your pre travel counseling and immunization appointment was convenient to where you reside.	30%	50%	6%	10%	0%
7.The cost of the travel clinic service was what you expected.	10%	44%	26%	0%	0%
8.The information you received at your travel clinic appointment helped prepare you for your trip to a developing country.	50%	44%	2%	0%	0%
9.Did you learn anything new from your visit at the travel clinic?	38%	48%	8%	2%	0%
10.Do you feel that having attended the travel clinic prior to traveling kept you healthier and safer while in a developing country?	58%	32%	6%	0%	0%

The last question was an open ended general comment question. Only 13 out of the 50 participants provided comments. Five of the comments were totally positive, four of the comments contained both suggestions for improvement as well as positive comments, and four comments just offered suggestions for improvement (Table 5).

Table 5 Comments from 16 survey participants

Positive comments
• Fabulous • No, it's excellent • No, you are doing a terrific job • Not really. You are doing a good job • Very good service
Both positive comments and suggestions for improvement
• Ability to consult vaccination records and country profiles online. Overall this is an excellent service and all four of our family have really appreciated the advice and patience of the nurses. Thank you • Staff are great. Location is ok, parking can be awkward. Office needs update. Paint, carpets, lights etc, counter face peeling • Website with clinic hours in "travelling clinics". Very happy to be a "drop in" • Works well perhaps shorter wait period to be seen
Suggestions for improvement
• New location • Make sure patients who come into the clinic and who are waiting to see a nurse are taken care of, Engage them and make sure that they are not waiting too long to see somebody • I would like the process of booking an appointment to be more streamlined (easier to do rather than leaving a message and waiting for a call back • Cost covered by MSP! We are getting the shots to prevent bring anything home

Relationship between gender and questionnaire responses

A relationship was found between gender and question one which stated, "How often have you traveled to a developing country". Males reported traveling to developing countries significantly more often than females did, $t(48) = 3.07$, $p = .003$. From the data 45.2% of males answered they traveled 4 or more times to a developing country whereas only 10.5% of females did. Of those participants who answered they had traveled once only to a developing country 57.9% were females and only 29.0% were males.

Relationship between demographics and questionnaire responses

There was a significant difference for question six, $F(2, 45) = 10.44$, $p < .001$, comparing where participants resided and how they answered the question. Question 6 was "The location of where you had your pre travel counseling and immunization appointment was convenient to where you resided". The cities/towns of where participants lived were divided into 3 regions. In referring to the demographic map previously shown in Figure 6 region one consists of the two health region Cowichan and Lake Cowichan, region two Ladysmith and Nanaimo, and region three Qualicum and Alberni. The mean score for Region 3 (2.91) was significantly higher than the mean score for Region 1 (1.91) and Region 2 (1.48), which did not differ significantly from each other. More participants who resided in region three did not feel the travel clinic was located in a convenient location to where they lived as compared to participants living in regions one or two (see Table 6 for response frequencies for each group).

Table 6 Percentage for question 6 by region of residence

Question 6 The location of where you had your pre travel counseling and immunization appointment was convenient to where you reside		Cobblehill, Cowichan Bay Duncan, Millbay	Cedar, Ladysmith Lantzville, Nanaimo, Nanoose	Parksville, Qualicum Beach, Port Alberni
Strongly agree	Count	4	11	0
	% within Region	36.4%	42.3%	.0%
agree	Count	4	15	6
	% within Region	36.4%	57.7%	54.5%

uncertain	Count	3	0	0
	% within Region	27.3%	.0%	.0%
disagree	Count	0	0	5
	% within Region	.0%	.0%	45.5%

Discussion

This study represents the first attempt by the VIHA Travel Health and Immunization Services to evaluate the behavior and attitudes of travelers who consulted the travel clinic prior to departure to a developing country. The survey was done as an evaluation of the travel clinic services to assist in understanding issues around advise to clients, compliance with the advice given, and attitudes towards the service itself. Receiving appropriate information about staying healthy while traveling can reduce common health problems in the returning traveler and assist public health in the control of infectious diseases.

There are limits to this study as it was done on a sample of clients who already attended the travel clinic, not on a random sample of people who were planning to travel. The evaluation was done on those travelers who are already aware that some format of education and counseling may be necessary prior to traveling. This group of travelers is already motivated to take action to prevent travel related illnesses and they believe that by seeking out travel health and immunization services positive consequences will occur. Therefore this selective sample cannot be looked upon as representing the entire population of Central Vancouver Island who travel to developing countries. Another bias may be the

time that lapsed between travel to a developing country and completion of the survey which would have been 6-12 months.

Having stated these points the analysis of the survey answers does allow us to answer some of our original objectives:

1. To determine how accessible the travel health and immunization services are to the residents of CVI.
2. To determine if the information provided is useful and effective.
3. To determine attitudes of travellers towards seeking or not seeking pre travel immunizations and travel health advice.

Looking at the demographic regions of where participants reside shows us that we are reaching travelers from all over CVI and not just those in Nanaimo where the clinic is located. This is beneficial as the clinic cannot incur costs related to travelling to other venues which would be closer to home for the client. It is satisfactory that the clients are willing to come to the clinic even if it is not in the same community as their home.

Overall the majority of participants regularly consult a travel clinic and check immunization status prior to travelling. This is not always the case according to a European study where only 52.1% of survey respondents departing from European airports had sought travel health specifically and not just general advise about their destination (Van Herck, Van Damme, Castelli, Zuckerman, Nothdurft, Dahlgren, et al., 2004). The answers to question 4 help confirm counselling was effective in inducing travelers to use the food and water precautions information provided at the pre travel appointment. Question 5 also

shows a positive outcome as most travellers used personal protective measures against insects discussed at the pre travel visit to some degree on their trip. These results are comparable to other studies done where over 80% of survey participants followed insect precautions by taking proper prophylaxis (Laverone et al., 2006). These answers assist in confirm objective #2 of the evaluation that the information provided is useful and effective to the traveler.

Overall the majority of participants felt the travel clinic service was appropriate, in a good location and did keep them healthier and safer while in a developing country. However, those clients from more distant regions were significantly more likely to disagree with the location being convenient. Participants who reside in Region 3 of (CVI) were most unhappy with the location. This area distance-wise is the same as for clients who must travel from Region 1. However, the travel clinic has one outreach clinic located in Region 1 every two weeks as the population is greater than in Region 3 and also these clients would potentially travel to Victoria (out of Region) as it is the same distance as traveling to Nanaimo. This would mean a loss in revenue for the clinic if we did not provided this outreach service to Region 1. Nevertheless the present findings suggest that more consideration be given to also holding travel clinics in Region 3.

One suggestion for improvement was to decrease the wait time to be seen by a nurse. The clinic does have set appointments based on the type of trip the client is taking, but like in any health care situation sometimes things run behind. However it can be noted that if things are running behind the clients should be

made aware of the fact. Streamlining how appointments are made is an ongoing process for the clinic. Due to costs and demand there is only one full time administrative support worker who does all the bookings, checks in and checks out clients. Therefore messages are left and call backs are often required. However our policy is that messages are checked at least every half an hour and messages are returned on an ongoing basis and definitely by the end of the working day.

Travel services are not funded by the government (MSP) therefore the clinic is unable to act on this suggestion. We already have a website with clinic hours on it, and there are numerous websites on country profiles and information on what you should do prior to travelling. Vaccination records are not available online because of the freedom of information act. In regards to wait period for appointments we have about a one week wait period unless it is an urgent appointment, in which case the client is fit in to an already booked schedule. In order to decrease wait time the schedule is always assessed and clinics are added if necessary. Appointments are booked in accordance to the departure date of the client's trip. Unfortunately the building does need to be updated and this has been a constant request from staff to managers. Currently there is money for renovations but nothing has started yet.

The evaluation does reveal that participants used our advice and that our counselling was efficacious and the clinic was accessible. Of most benefit is that our study shows that travel medicine clinics can be effective in protecting travellers' health as long as most travellers' seek pre travel consultation. This

evaluation shows us that it is important for the population of CVI who travel to developing countries to attend our clinic in order for them to stay safe and healthy on their trip and consequently reduce the potential of imported infectious diseases and the resulting public health implications. Nevertheless, there are areas in which we should strive for improvements, such as better regional service, and better appointment and wait time services.

Conclusion

The challenge for CVI travel health and immunization services is to provide a specialized travel health and immunization service in a timely and accessible manner by trained and appropriately educated health professionals. Although there are many ways that travel health services can be provided, the literature has supported the need for designated travel clinic services staffed by health care professionals who are experts in the field of travel medicine. In conclusion, it is important to determine why or why not travelers seek pre travel advice in order to prevent diseases post travel, which becomes a public health related issue.

Findings from the study showed that travelers do use the advice given by the travel clinic services and that the consult and immunizations provided helped prevent them from disease and remain healthier and safer while in a developing country. However, the findings also showed that some residents are not happy with the location of the clinic and would prefer it to be located closer to where they live. Overall the evaluation showed a positive response to our services but also identified some areas for improvement.

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Appendix 1

Travel Health & Immunization Services
#8 1599 Dufferin Cr. Nanaimo, B.C. V9S 5L5
Phone: 1-866-533-3391 Fax: (250) 740-6949

Dear Potential Participant:

You are being asked to complete an anonymous survey about the Vancouver Island Travel Health & immunization Services. The program has been running for three years and your input will be valuable to assist in the evaluation of the program.

The intent of this survey is to evaluate the accessibility, quality and effectiveness of the travel health and immunization services provided to the population of Central Vancouver Island from the client's perspective. To accomplish this goal, you are being asked to fill in a survey about the services you received and how these services did or did not affect your trip to a developing country. This will require approximately 10 minutes of your time. Your participation is voluntary and you may stop at any time or choose not to answer one or more of the questions asked in the survey. If you have any questions or concerns, please contact Francine Lewis at 250-739-5967 or Francine.Lewis@viha.ca .

Thank you for your cooperation.

Questionnaire: Travel Health and Immunization Services in Central Vancouver Island

For questions 1-5, please circle the number that most applies:

1. How often have you traveled to a developing country? (i.e. countries in central and S, America, Africa, Asia etc.)

   Never once only 2-3 times 4 or more times

   1 2 3 4

2. How often have you traveled to a developing country? (i.e. countries in central and S, America, Africa, Asia etc.)

   Never once only 2-3 times 4 or more times

   1 2 3 4

3. How often have you consulted a travel clinic before you travel to a developing country? (i.e. countries in central and S, America, Africa, Asia etc.)

   Never sometimes often always

   1 2 3 4

4. How often do you check your immunizations are up to date prior to traveling to a developing country?

   Never sometimes often always

   1 2 3 4

5. How often did you use the food and water precautions information provided to you at your pre travel consult?

   Never sometimes often always

   1 2 3 4

6. How often did you use your personal protective measures (i.e. net, repellents) against insects discussed at your pre travel consult during your trip? (only answer this question if you were in an area at risk of insects transmitted diseases)

Never	sometimes	often	always
1	2	3	4

For questions 6-10, please select the response that most applies:

1. The location of where you had your pre travel counseling and immunization appointment was convenient to where you reside.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1	2	3	4	5

2. The cost of the travel clinic service was what you expected.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1	2	3	4	5

3. The information you received at your travel clinic appointment helped prepare you for your trip to a developing country.

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1	2	3	4	5

4. Did you learn anything new from your visit at the travel clinic?

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1	2	3	4	5

5. Do you feel that having attended the travel clinic prior to traveling kept you healthier and safer while in a developing country?

Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1	2	3	4	5

Question 11 is for your comments

6. Do you have any suggestions of how our services can be improved?

Demographic Information

Age: ____under 30years ____between 31 & 50 years

____between 51 & 70 years _____ over 70 years

Gender: _____ male _____ female

City /Town of residence: _____

Where is the last developing country you traveled to? _____