

**NURSE-LED HEPATITIS C INTEGRATED PREVENTION
AND CARE PROJECTS**

**PARTNERSHIP AND POPULATION OUTCOME RELATIONSHIPS
IN FOUR NURSE-LED HEPATITIS C INTEGRATED
PREVENTION AND CARE PROJECTS**

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ABSTRACT

Purpose: To examine four nurse-led integrated hepatitis C prevention and care projects on selected variables and their interrelationships: program development and composition, client/population reach and partnership structure and functioning.

Methods: A multi-method, descriptive comparative study of four projects from 2001 to 2007. Data were obtained from historical documents, a survey of project partners and two administrative datasets. Study assumptions were based on literature reviews and the study's conceptual model.

Results: Between 2001 and 2004, four nurse-led projects were initiated in small urban/rural areas in BC. Project nurses, recruited from public health, provided a continuum of services by expanding their scope of practice and partnering with 216 professionals in health services, public health and ancillary services. The projects were similar in the type and number of services provided; the populations reached, and partner diversity and quality of functioning. Nurse-partner paired ratings for each project revealed high agreement indicating relationship stability. Significant differences between the four partnerships were found for the number of partners, mean depth of involvement (integration), and differences between expected minus observed involvement. The youngest project had the fewest partners (n= 29) and the greatest partner involvement while the oldest project evidenced the opposite characteristics (n= 68).

Analysis of 2512 client records revealed that 72-80% attended for assessment; of those 26-32% initiated therapy, 12% withdrew because of adverse effects and 57-76% achieved a sustained viral response. Unadjusted estimates indicated three of the four projects reached 25% of the infected population while adjusted estimates indicated 29-42% population reach.

Conclusions: This is the first Canadian study to describe the relationship between nurse-led integrated services, interprofessional partnerships and population reach. Client/population outcomes were similar to or better than those reported in the literature. This study extends knowledge of nurse leadership to front-line nurses working in community settings. Future studies should expand measurement approaches to include input from care recipients and managers at participating organizations. Policy makers should consider expanding the role of public health nurses to include disease management for those with chronic infectious diseases where disease management services are underdeveloped.

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GLOSSARY OF TERMS AND DEFINITIONS

Dependent variable - Target or response variable that is measured because it's what the investigator thinks will be affected during the experiment

HCV - Hepatitis C virus infection

Health services integration - In the context of this thesis refers to interprofessional partnerships formed to reach and provide coordinated care to clients in need of services

IDU - Illicit drug user

Independent variable - Explanatory or predictor variables that the investigator thinks will affect the dependent variable

IP - Interprofessional partnerships are defined as virtual interorganizational structures formed around client/population needs through formal and/or informal relationships of front-line service providers from various organizations

Partnership function - Defined by indicators that measure the quality of partnership processes

Partnership structure - Defined by indicators comprising the number and type of partners and the strength of their linkages

Partner types - Partners were classified according to the sectors in which they provided services (i.e., public health, personal health services, integrated public health and personal health services, and ancillary services). The project nurse leader partners were classified as integrated public health and personal health services as they provided services traditionally associated with both sectors

Population reach - Defined as the percentage of hepatitis C antibody positive individuals living in the geographic area served by the demonstration project that were referred to the project's clinical services

RHA - Regional Health Authority

SVR - Sustained virological response is defined as the absence of detectable HCV six months after therapy completion

Years of operation - Defined as the total time since the projects began providing client services to December 31, 2007, the administrative data cutoff date

“There is a real paradox in our business, which is that the more popular a notion becomes, the less agreement there seems to be on exactly what it means. Services integration has now reached that stature ...(p2).”

(Shields, 1999)

1 INTRODUCTION

Partnerships have currency in the literature as a primary means to increase capacity for comprehensive chronic illness prevention and care. Although the rationale for partnerships is logical, the literature lacks a solid theoretical and empirical base. To increase our understanding of how nurses and other community-based practitioners partner to build capacity, studies are required that describe how partnerships form and the relationship between partnership characteristics and client/population outcomes. The purpose of this dissertation is to describe the demonstration projects and to measure and determine the relationship of partnership structure and functioning to population outcome measures of population reach in four, nurse-led hepatitis C integrated prevention and care demonstration projects that differ in years of operation and geographic location. This dissertation proposes a theory-derived model of front-line interprofessional partnership and draws on the assumption that interprofessional partnerships (IP) arise through the provision of client/population-centred services. In the literature, the terms partnership, collaboration, and teamwork are used interchangeably to “reflect the idea of individuals coming together for a mutually accepted goal or mission” (Boswell & Cannon, 2005). In this dissertation, interprofessional is the term used to describe the process of multiple disciplines working together, while the term partnership is used to indicate the collaborative nature of the process.

In response to the epidemic proportions of viral hepatitis in BC, the provincial Ministry of Health funded the formation of BC Hepatitis Services at the BC Centre for Disease Control in 2001. The funding was provided for the development and implementation of a provincial approach for integrated viral hepatitis prevention and care. The concept of integrating the needs of populations (prevention) and individuals (care) recognized the paradox of trying to address the needs of affected individuals while serving the needs of the population. This dissertation focuses on a major initiative in BC Hepatitis Service’s response to the hepatitis C (HCV) epidemic through partnerships with Regional Health Authorities.

Through partnerships with Regional Health Authorities (RHA) and nursing leadership, demonstration projects were established in four geographic areas with high HCV prevalence rates: Campbell River, Kamloops, Prince George and Surrey. The aim of the demonstration projects was to expand the reach of hepatitis C services to small urban and rural areas throughout BC. The implementation of these demonstration projects was staged over three years, from 2001 to 2004.

1.1 Statement of the Problem

1.1.1 Why study partnerships?

Within Canadian healthcare systems the development of IP partnerships is being explored for the provision of comprehensive community-based chronic illness care to decrease costs, reduce gaps and improve services for an increasingly long-lived population where chronic illness forms the major burden of care (Epping-Jordan, Pruitt, Bengoa, & Wagner, 2004; Marriott & Mable, 2002; Naylor, 1999). Chronic illness care requires a collaborative approach with multiple professionals contributing specialized and complementary knowledge to meet the diverse client/population needs (Curry & Hollis, 2002; Weaver, 2001; Zaccaro, Rittman, & Marks, 2001; Zigurs, 2003). Chronic illness responses require interprofessional linkages between providers in public health and personal health services sectors (Epping-Jordan, 2005). Although both sectors share the goal of a healthy population (Lubetkin et al., 2003), their difference in focus (i.e., prevention vs. care), has produced parallel systems with weak collaboration and linkages (El Ansari, Russell, Spence, Ryder, & Chambers, 2003; Public Health Agency of Canada, 2004; Shaw, Ashcroft, & Petchey, 2006). Personal health services, usually provided in primary and tertiary care settings, are organized around a curative model largely confined to the biological and individual aspects of health (St-Pierre, Reinharz, & Gauthier, 2006) whereas public health utilizes a population-based preventative approach that includes the social and environmental aspects of health (Shaw et al., 2006). Adequate prevention and management of chronic illnesses requires a mix of these perspectives.

Technological advances in communication that permit rapid information sharing within and between organizations open up new possibilities for the development of IP beyond the traditional approach in which membership is largely constrained to a particular organization (Rayport & Sviokla, 1995). Technological advances enable interprofessional services that include coordination of providers working for multiple autonomous organizations through the use of electronic communication devices such as telephones, faxes, e-mail, e-bulletin boards, chat lines and groupware such as Share Point and First Class (Townsend, DeMarie, & Hendrickson, 1998). IP of providers from multiple organizations can be developed through formal or informal mechanisms and at different levels of the system. For example, partnerships can be formed through formal negotiations between managers in the various organizations as well as through informal collaborations between front-line providers during the planning and provision of chronic illness care (Sorrells-Jones & Weaver, 1999a). The initiation of informal IP by front-line staff utilizes leadership that is based on influence and trust rather than power and control (Sorrells-Jones & Weaver, 1999b). Nurses, as core front-line providers in public health and primary care, are well-positioned to develop and coordinate front-line IP but little is known about the nurse's role in community settings (Ciliska, Underwood, Ahluwalia, & King, 2007). There is evidence that nurses with basic as well as graduate level preparation provide leadership in the prevention and management of HCV in the community especially regarding the provision of antiviral therapy (Ahern, Imperial, & Lam, 2004; Leone, 2002).

1.2 Why study partnerships in the target population?

Chronic disease management approaches are applicable to HCV as the illness course is slow and progressive even in the advanced stages which include liver failure (Alter et al., 1992; Seeff et al., 2000). Features of chronic disease management programs such as interprofessional and inter-sectoral partnerships, population/client engagement, trust-building and peer support have been identified as applicable to HCV (Naffah, 2007; Zevin, 2007). As HCV is a relatively new disease, first identified in 1989 (Lauer & Walker, 2001; Lindenbach & Rice, 2005), service delivery systems are still developing and professional service delivery mechanisms are not yet entrenched in the various sectors. Since HCV is both a chronic and highly-infectious disease spread by blood-to-blood contact and there is no preventative vaccine, care of those infected requires interventions that bridge the public health and personal health services sectors. HCV provides an ideal test case for examining IP because no single service modality or sector can address the complex needs associated with HCV and therefore it is thought that partnerships must be used to provide effective services.

IP that bridge sectors afford opportunities to try new approaches to controlling the disease spread, reducing service gaps and applying lessons learned by others as we attempt to meet the need and increase access and capacity for this new disease. For example, although HCV care was initially considered as a tertiary care specialist model (Commonwealth Department of Health and Aged Care, 2000; Herrera, 2007) it is now clear that specialists cannot meet the demand for services or provide for the comprehensive management of what for most is a chronic illness (Myers, Liu, & Shaheen, 2008; Zevin, 2007). Approaches that include public health, primary care and specialist services are called for to reduce the burden of HCV (Wong & Lee, 2006). In addition, interprofessional inter-sectoral partnerships increase the communication pathways required to assist providers to keep current with developments in the emergent and ever changing field of HCV.

A summary of the state of knowledge of HCV, its management and associated issues is useful to illustrate the intertwining of current issues for providers in public health and personal health services. As diagnostic testing for this small, single-stranded RNA virus, has been available only since 1990 (Clark & Ghalib, 1999; Pearlman, 2004) and population-based testing has yet to occur, prevalence rates are based solely on estimates (Remis, 2004). Estimates may be low as they do not include data on some populations at high risk for acquisition of HCV such as the homeless and incarcerated (Edlin & Carden, 2006). However, present figures reveal that HCV is the second most common chronic viral infection in the world affecting about 3% of the population or 170 million people (Perz, Farrington, Pecoraro, Hutin, & Armstrong, 2004). Annually, 100,000 deaths are attributed to HCV and the rate is expected to triple by 2020 (Davis, Albright, Cook, & Rosenberg, 2003).

In Canada approximately 250,000 individuals, including 60,000 British Columbians are chronically infected with HCV (Armstrong, 2003; Murray & Lopez, 1997; Poynard, Yuen, Ratziu, & Lai, 2003; Remis, 2004; Remis, Hogg, Krahn, Preiksaitis, & Sherman,

1998) and only two-thirds of infected individuals have been identified (Remis, 2004). Across Canada, the highest rates of infection are in BC followed by Ontario and Quebec (Remis, 2004). Costs associated with HCV in Canada are \$500 million per year but are expected to reach \$1 billion by 2010 (Leigh, Bowlus, Leistikow, & Schenker, 2001). The increasing burden on the health care system points to the need for strategies to prevent HCV infection and reduce the disease impact by increasing access to services including provision of antiviral therapies (Myers, Liu, & Shaheen, 2008).

Engaging those affected by HCV requires knowledge of the modes of transmission and the differing populations affected. In developing nations, the major risks for HCV transmission are from the unsafe administration of therapeutic injections and transfusions from unscreened donors (Shepard, Finelli, & Alter, 2005). In developed countries illicit drug use accounts for 60 to 75% of infections and 15% from contaminated blood products prior to donor testing for HCV in 1990 (Chou, Clark, & Helfand, 2004; Remis, 2004; Remis et al., 1998; Zou, Tepper, & El Saadany, 2000). The remaining risk factors are associated with high-risk sexual activity, and perinatal and occupational transmission (Remis, 2004; Shepard et al., 2005). HCV prevalence rates are highest among illicit drug users ranging from 50%-95% (Patrick et al., 2001), meaning that this group is most at-risk for ongoing transmission. In Canada, 50-70% of existing infections are attributed to illicit drug use (Patrick et al., 2001; Zou, Tepper, & Giulivi, 2000). Data from the Public Health Agency of Canada national enhanced surveillance system suggest illicit drug use accounts for 65-93% of newly acquired HCV infections (Hong-Xing et al., 2006).

Knowledge of exposure risks is important for case-finding as those newly-infected with HCV, even if they have access to health services, will infrequently be diagnosed through clinical presentation. Most individuals are asymptomatic with only 15-30% of individuals reporting mild flu-like symptoms within 5-12 weeks of exposure that last for 2-12 weeks (Marcellin, 1999; Orland, Wright, & Cooper, 2001). Of those infected 15-40% will spontaneously clear the infection within 6 months (Alter, 1993; Jauncey et al., 2004). Those with HCV infection beyond 6 months, 55 to 85% of those infected (Seeff & Hoofnagle, 2002) are considered chronically infected. The majority of individuals with chronic HCV are thought to remain asymptomatic unless liver damage occurs, at which point their symptoms can be clearly linked to the disease. The most commonly reported symptoms, regardless of the stage of liver disease, are fatigue, difficulty with memory and concentration ("brain fog"), and chronic muscle and joint pain leading to disabilities and reduced quality of life (Forton, Taylor-Robinson, & Thomas, 2003; Hussain et al., 2001; Poynard et al., 2002). Lack of acknowledgement or dismissal of these symptoms by health care providers has led to those affected feeling alienated and stigmatized (Golden, Conroy, Marie O'Dwyer, Golden, & Hardouin, 2006; Zickmund, Ho, Masuda, Ippolito, & LaBrecque, 2003).

The issues associated with HCV discussed extend beyond the disease. Populations affected by HCV are often stigmatized, have multiple health issues, are difficult to reach and engage, and have concurrent social and economic needs (Butt, Paterson, & McGuinness, 2008; Paterson, Butt, McGuinness, & Moffat, 2006). However, there are disease specific issues that must be considered in the response to the epidemic. Research

has identified that progressive liver fibrosis, leading to cirrhosis, end-stage liver disease and hepatocellular carcinoma will be experienced by 5% to 20% of individuals after multiple decades of infection (Seeff & Hoofnagle, 2002; Strader & Seeff, 1996). Emerging research links diseases such as those associated with auto-immune dysfunction such as arthritis, mixed cryoglobulinemia and lymphoma to HCV (Craxi, Laffi, & Zignego, 2008).

Once HCV is diagnosed a number of factors must be considered in predicting progressive liver disease. The factors associated with increased progression of liver disease include younger age at infection (Alberti, Noventa, Benvegna, Boccato, & Gatta, 2002; Poynard, Bedossa, & Opolon, 1997; Thomas et al., 2000), male gender (Poynard et al., 1997), co-infection with HIV (Benhamou et al., 1999; Darby et al., 1997; Eyster, Fried, Di Bisceglie, & Goedert, 1994; Garcia-Samaniego et al., 2001; Graham et al., 2001; Kim, Gross, Poterucha, Locke, & Dickson, 2001; Lesens, Deschenes, Steben, Belanger, & Tsoukas, 1999; Monga et al., 2001; Pol et al., 1998; Ragni & Belle, 2001; Soto et al., 1997), non-alcoholic steatohepatitis (Adinolfi et al., 2001; Hui et al., 2003) and heavy alcohol consumption (Coelho-Little et al., 1995; Corrao & Arico, 1998; Fong et al., 1994; Ostapowicz, Watson, Locarnini, & Desmond, 1998; Pessione et al., 1998). Untreated, progressive liver disease from chronic HCV infection is associated with significant morbidity and premature death (Seeff & Hoofnagle, 2002; Strader & Seeff, 1996). For some, the availability of antiviral therapy is an important means of clearing the virus and reducing the impact of liver disease and its complications. Viral clearance following therapy has been shown to improve liver histology and prognosis (Lauer & Walker, 2001; Manns et al., 2001; Niederau et al., 1998; Shepard et al., 2005), improvement in health related quality of life (Bernstein, Kleinman, Barker, Revicki, & Green, 2002), decreased likelihood of developing hepatocellular carcinoma (Hung et al., 2006) and improved survival (Yoshida et al., 2002). Overall, antiviral therapy has been shown to be cost-effective for reducing disease mortality and morbidity (Manns, 2004; Wong, 2006).

Although treatment could potentially cure ~55% of individuals with HCV, it is estimated that only a small proportion of those infected have ever been referred for specialist consultation and follow-up (Dalgard, Jeansson, Skaug, Raknerud, & Bell, 2003; Mele et al., 2000). In addition, only 30% of people who are infected are eligible for treatment (Falck-Ytter et al., 2002; Fleming, Craven, Thornton, Tumilty, & Nunes, 2003). Of those who are eligible, many will refuse or find treatment intolerable because of its debilitating side effects (Pearlman, 2004). Presently, most of those infected will experience the impact of HCV as a chronic illness for decades and probably for life (Richmond, Dunning, & Desmond, 2004).

For the small proportion of individuals who access current therapy, pegylated interferon and ribavirin, a cure, defined as a sustained viral response (SVR) 24 weeks after end of treatment, is possible. About 50% of individuals infected with the most common genotype (type 1) and up to 80% in those infected with genotypes 2 and 3 (Strader, Wright, Thomas, & Seeff, 2004) can attain a SVR. The standard course of therapy is 48 weeks for those with genotype 1 and 24 weeks with genotype 2 and 3.

However, this therapy is relatively new so optimal dosing and therapeutic duration has yet to be fully determined. Shorter durations of therapy could improve tolerability, enhance compliance and reduce the likelihood of premature discontinuation of therapy. Factors associated with the decision to undergo and/or complete antiviral therapy are: the duration of therapy, the complexity of the therapeutic regime (which requires intense laboratory and clinical monitoring), the likelihood of side effects requiring dosage reduction and or treatment cessation (Falck-Ytter et al., 2002; Fleming et al., 2003; Zeuzem et al., 2004), and the social and financial hardships which often accompany treatment.

Those that embark on therapy require a great deal of support and close monitoring due to the variety of extra effects from the drugs and the associated difficulties of coping with added stressors. There are multiple extra effects from peginterferon with flu-like symptoms, muscle and joint pain and fatigue the most common (Fried et al., 2002; Hadziyannis et al., 2004; Manns et al., 2001). Neuropsychiatric side effects including depression, anxiety, irritability, sleep disturbance and difficulty concentrating frequently occur irrespective of a history of mental health disorders (Ho et al., 2001; Mulder et al., 2000; Trask, Esper, Riba, & Redman, 2000). Other extra effects include cytopenia, anorexia, skin rash, headache, dizziness, and paresthesia. The most frequent extra effect from ribavirin requiring dosage reduction is anemia (Fried et al., 2002; Hadziyannis et al., 2004; Manns et al., 2001). Additionally, since ribavirin is teratogenic, adherence to birth control measures is required for both men and women receiving this drug. The frequency of occurrence of extra effects and the complexity of their clinical management adds to the clinical time required with each client to successfully manage their individual therapeutic regime.

In summary, there are many facets to the burden of disease presented by HCV and much is yet to be discovered. HCV is a disease of heterogeneous presentation and unclear symptomology. Those affected are largely disenfranchised groups, who have multiple needs associated with the disease and their life circumstances. A fragmented system creates additional barriers to meeting their diverse needs. Approaches to the HCV epidemic thus require consideration of important aspects of lifestyle and other social determinants of health as well as disease specific aspects such as transmission and prevention, stages of illness, symptoms, prevention of progression, and options for antiviral therapy (Zevin, 2007, Naffah, 2007). Prevention strategies are based on increasing knowledge of disease transmission modes within the population as well as changing and maintaining client behaviour to prevent further transmission. In addition, although HCV infection may clear either spontaneously or through antiviral therapy there is no lasting immunity and reinfection can occur requiring continual reinforcement of prevention education and vigilance (Farci et al., 1992).

1.2.1 Interprofessional Partnerships for HCV prevention and care

To situate and enable comparison of integrated services in the demonstration projects, a search of the research literature was undertaken to determine the nature and extent of the research on IP for HCV prevention and care and outcome indicators. The search

Table 1.1: Search strategy

Timeframe	1989-2008	
Key words and terms combined (in all text unless as noted)	“hepatitis C” and “chronic hepatitis C” and “health service delivery” (mapped to subject heading “delivery of health care, integrated” and as keyword in MEDLINE) and “integration” or “integrated”	
Inclusion criteria	English language, peer reviewed systematic reviews quantitative and qualitative research	
Databases searched and results returned	Database	Results
	Cochrane Database of Systematic Reviews	0
	Clinical Evidence	0
	MEDLINE ¹	99
	CINAHL ²	108
	PsycINFO ³	24
	PubMed ⁴	253
	PAIS International ⁴	1
	ProQuest ⁵	2
Types of literature	Nursing, medicine, social sciences and psychology	
Other search strategies	To ensure completeness, reference sections were hand searched and the “find similar” option was used	

Notes:

¹MEDLINE/Ovid. "Hepatitis C" and "chronic hepatitis C" were mapped to subject headings choosing the explode option. The results of this search were combined with a search for the term "integrated" which mapped to subject heading "delivery of healthcare, integrated" and was also used as a keyword. The intersection of these two searches resulted in 99 results.

²CINAHL + Academic Search Complete. The term “hepatitis C” was searched in all text and combined with “service delivery” which listed 18 results. Another search using “program” and “integrated” as a variation of service delivery yielded 90 results. Searching for “hepatitis C” as a subject term with “integration” or “integrated” yielded no returns.

³PsycINFO. The term “hepatitis C” in combination with “health service delivery” got no results. “Hepatitis C” and “integrated” or “integration” returned 24 results.

⁴PubMed and PAIS International. “Hepatitis C” and “integrated” or “integration” returned 254 results

⁵ProQuest. “Hepatitis C” and “health service delivery” yielded 1 return while “integration” or “integrated” returned 2.

strategy method and inclusion criteria are summarized in Table 1.1. A total of 487 articles were identified, each title and abstract was reviewed for relevance. Seventeen articles were deemed relevant and retrieved for full review and data extraction. All but three of the studies were performed in the US. The results summarized in Table 1.2 reveal that research regarding HCV service configurations has emerged mainly since 2005. These results are consistent with a similar search by Stringari-Murray, Clayton & Chang (2003) covering 1998-2002 which failed to yield any articles. All the studies were descriptive accounts of new or augmented health services for those with HCV and/or HCV/HIV coinfection. The majority of studies covered short time periods of a year or less. As the studies were descriptive in nature it was expected that theoretical frameworks would have been employed to guide identification of indicators and interpretation of results however this was not the case.

No cohort or other types of comparison studies were found. Only one study included a 2-month before and 2-month after cross-over design to allow for comparison of usual practice, HIV testing only, with a new practice, combined HIV and HCV testing (Stopka, Marshall, Bluthenthal, Webb, & Truax, 2007). Studies that involved more than one site reported only aggregate results so no between-site comparisons were obtained (Arora, Thornton, Jenkusky, Parish, & Scaletti, 2007; Gunn et al., 2005; Heseltine & McFarlane, 2007; Hill, Butt, Alvarez, & Krajden, 2008; Klein et al., 2007; Kresina, Bruce, Cargill, & Cheever, 2005; Stopka et al., 2007; Stringari-Murray et al., 2003; Zimmerman, Finley, Rabins, & McMahon, 2007).

Most studies provided descriptive accounts of service augmentation by interprofessional teams within single organizations with the main focus on improvements in the process of care (e.g., improved case finding). Two studies reported IP comprised of professionals from autonomous organizations (Arora et al., 2007; Hill et al., 2008). No studies attempted to measure the structure or quality of the interprofessional processes as an indicator of integration effectiveness. A few studies described professionals' attitudes towards the provision of the new services but the comments were focused on demands emanating from program changes that increased work loads (Heseltine & McFarlane, 2007; Stopka et al., 2007).

Most studies described programs that integrated individual client-based HCV prevention services into existing clinics where those at high risk for HCV were thought likely to be found such as HIV (Clanon et al., 2005; Kresina et al., 2005; Stopka et al., 2007; Stringari-Murray et al., 2003; Taylor, 2005), STD (Gunn, Murray, Ackers, Hardison, & Margolis, 2001; Subiadur, Harris, & Rietmeijer, 2007; Zimmerman et al., 2007), addiction services (Fahey, 2007; Gunn et al., 2005; Litwin et al., 2007; Sylvestre & Zweben, 2007), correctional facilities (Klein et al., 2007), and general practice (Arora et al., 2007). Prevention services included case finding through HCV antibody testing, education on transmission prevention and risk reduction, hepatitis A and hepatitis B vaccination, and advisement to seek medical evaluation and care.

Table 1.2 – Summary of Hepatitis C Integrated Services and Study Indicators

Author, Year, Country & study period	Study type & setting	Target Population	What is Integrated	Indicators measured
Augmented Screening & Prevention Services				
1. Stopka, et al., 2007 US; CA 4 months	Before & after 2 mo. cross-over design Multi-sites in 5 health jurisdictions	HIV testing & counseling programs targeting IDUs	Standard care, HIV test & education, for 2 mo. followed by addition of HCV antibody test for 2 mo. Determined if HCV testing increased number of clients served	# offered testing, # tested for HIV, HIV & HCV, # returned for test results
2. Gunn, et al., 2005 US; San Diego, CA 1999-2002	Descriptive Alternate sentencing drug rehabilitation program	IDUs	HBV test & vaccination; HCV antibody test, written information on meaning of test results, other preventative services- STD screening, HIV test & counseling	# clients participating, # tested, # positive, # vaccinated (HBV only)
3. Heseltine & McFarlane, 2007 US; Texas 2000-2005	Descriptive State HCV screening & prevention program	At-risk adults	HCV client education & HCV antibody test for at-risk adults HCV education to staff providing HCV services through STD, HIV & addictions clinics	# tests, # positive, # IDU transmission source
4. Subiadur, et al., 2007 US: Denver 2000-2005	Descriptive Urban STD clinic	STD clinic clients	HAV & HBV vaccination; HCV antibody test, client education, client's testing positive referred to HCV specialty services	# client visits, # accepting referral for vaccination, # vaccinations, # HCV tests, # positive results, # referred for specialty care who attended appointment (<20%)
5. Gunn et al., 2001 US; San Diego	Descriptive Pilot project	STD clinic clients	HAV & HBV vaccination; HCV antibody test & client education, client's testing positive given guide for referral to	# tests, # positive, # returned for test results, 8mo. post-service # had medical evaluation, # of sex

Author, Year, Country & study period	Study type & setting	Target Population	What is Integrated	Indicators measured
County 1 year (1998)	STD clinic		HCV services	or drug partners had been or planned to be tested
6. Zimmerman, et al., 2007 US; Illinois 2000-2005	Descriptive 6 urban STD clinics	STD clinic clients	HCV antibody test & client education, HAV & HBV vaccination, client's testing positive given referral information for HCV services	# clinics participating, # clients, # vaccinations, # tests, # positive
Augmented Screening, Prevention & Interprofessional Disease Management Services				
7. Kresina, et al., 2005 US No timeframe	Descriptive HIV community & specialty clinics & substance abuse programs	HIV & HIV/HCV coinfecting drug users	HIV & HCV tests & client education, HAV & HBV vaccination, HCV treatment provided only for HIV/HCV coinfecting	Not described
8. Stingari-Murray, et al., 2003 US; County of Marin, CA 1998-2003	Descriptive HIV/AIDS program	Uninsured at-risk groups	1. Screening & surveillance program at multiple outreach sites, HCV antibody test & referral of positive cases for medical evaluation HAV, HBV vaccination; client & staff education 2. Medical services at HIV specialty clinic augmented to include HCV mono and coinfecting clients. HCV specialist nurse service added to meet	# clients, # tests, # positive tests, # referred for medical evaluation # treated

Author, Year, Country & study period	Study type & setting	Target Population	What is Integrated	Indicators measured
			demand. Services included client assessment, education & preparation for physician consult, treatment management using a protocol & specialist consult as required. Added contracted case management service to assist with obtaining benefits, finding housing & medical referrals to mental health & addictions services.	
9. Taylor 2005 US; Providence, Rhode Island First yr operation (2001)	Descriptive HIV clinic	HIV & HIV/HCV coinfecting drug users	HCV antibody test, client education, HAV & HBV vaccination. Provided HCV assessment & treatment only for HIV/HCV coinfecting. Included linkages with mental health & addictions for illness care & supportive services such as peer support.	# referred, # seen, # biopsied, # attending education sessions, # treated, # SRV
10. Sylvestre & Zweben, 2007 US; Oakland CA No timeframe	Descriptive Inner city addictions clinic offering HCV services	Uninsured former/ current drug & alcohol users	Peer support group co-led with medical provider to engage, educate & test IDUs for HCV Regular support group attendees offered HCV treatment	# tests, # treated, # SVR
11. Fahey, 2007 UK; West Yorkshire 2003-2006	Descriptive Drug & alcohol addictions service	IDU	Screening & prevention & disease management (note: also provider education) Nurse-led HCV service that provided client & staff education, HCV tests, HBV vaccination, HCV support group, client assessment & treatment management using clinical pathway	# tested, # treated

Author, Year, Country & study period	Study type & setting	Target Population	What is Integrated	Indicators measured
			& protocols (following specialist referral)	
12. Litwin, et al., 2005 US; Bronx, NY No timeframe	Descriptive Pilot Addictions service	Current & former IDU	HAV & HBV vaccination; HCV tests, client education & support group, HCV assessment (included psychiatric screening), care management & treatment	Not described
13. Hill et al, 2008 CA; BC 2001-2005	Descriptive 4 demonstration site community-based clinics	Populations at-risk & individuals infected	Nurse-led HCV interprofessional prevention & specialty care service with specialist physician & other provider partners. HCV tests, HAV & HBV vaccinations, client & provider education, HCV assessment, referral to mental health & ancillary services, & HCV treatment.	Aggregated data from all sites: # referred, wait times, # assessed (& as proportion of HCV infections in catchment area), # treated, # SVR
Interprofessional Medical Service Integration				
14. Knott, et al., 2006 US; Minneapolis, MN 1 year	Retrospective chart review evaluation Veteran's HCV clinic	At-risk adults	HCV assessment & treatment clinic added screening for psychiatric & substance use disorders, established a new Psychiatric nurse specialist role for referral of those testing positive who didn't have an established provider	Differences in treatment outcomes of those who attended psychiatric care vs no psychiatric care # with at least 1 positive screen for psychiatric problem/substance use, # positive substance use, # with or without established provider, # refusing psychiatric referral, # recommended for treatment, # treated, # dropouts, # responding at specific treatment time points, # SVR
15. Arora, et	Descriptive	HCV clients	Using electronic information &	# clinics conducted, # clients, #

Author, Year, Country & study period	Study type & setting	Target Population	What is Integrated	Indicators measured
al., 2007 US; New Mexico June 2003- Dec 2006	Pilot project		communication, clinicians from academic, public health, rural community clinics & correctional facilities collaborated to improve HCV specialty care & expand access. Included primary-care provider education & tertiary specialist consultation for managing complexities of HCV care	treated, # education credits issued & on-site hours of training, dollar value of donated drugs provided to uninsured clients
16. Clanon, et al., 2005 US; Alameda County, CA 2001-2005	Descriptive HIV services	HCV/HIV coinfectd	Added HCV treatment for coinfectd only; HCV education for clinicians, & HCV nurse specialist to manage treatment & support group	# treated, # SVR
17. Klein, et al., 2007 US; NY State 1 year	Descriptive Corrections	Inmates on HCV treatment needing therapy on release	Coordination of service continuation for corrections residents being released during HCV treatment course Partnered with hospital-based AIDS programs for therapy continuation while client's health insurance coverage pending	# clients served, # of health-care facilities accepting former corrections residents on treatment

Ongoing medical services, although integral to HCV care, were found to be difficult to access. Medical services were reported to be most accessible for those with HCV who were coinfectd with HIV due to special funding mechanisms for HIV services. For those with HCV infection alone some programs provided linkages to medical care by giving clients written information on how to access medical services (Gunn et al., 2001; Zimmerman et al., 2007), while others attempted to facilitate referrals directly (Subiadu et al., 2007). One program reported a novel approach to increasing capacity for medical assessment and treatment by electronically linking medical specialists with generalist physicians in rural areas (Arora et al., 2007). The specialists provided education and consultation services remotely using telemedicine techniques.

Three studies reported that in addition to prevention services they were able to provide HCV specialty assessment, illness management and treatment through the addition of nursing positions and consultative support from specialists (Fahey, 2007; Hill et al., 2008; Stringari-Murray et al., 2003). The nurses provided initial assessments, education and support services to clients. For those on antiviral-therapy the nurses independently monitored and managed the therapeutic regime including the management of adverse effects, dosage adjustment and laboratory monitoring. These nursing practices were supported by evidence-based therapeutic protocols and specialist consultations as required. Both baccalaureate and masters prepared nurses performed these expanded roles.

Study indicators and their analyses comprised counts of service utilization for new client services. Counts of positive antibody tests and information on the source of infection were reported as indicators and also for surveillance purposes. The most frequently reported prevention service indicators included the number of clients seen, vaccinations given, and antibody tests performed. While six studies reported on the number of antibody positive tests (Gunn et al., 2005; Gunn et al., 2001; Heseltine & McFarlane, 2007; Stringari-Murray et al., 2003; Subiadur et al., 2007; Zimmerman et al., 2007) only three studies reported on the number of clients who attended for a second visit to receive their test results (Gunn et al., 2001; Stringari-Murray et al., 2003; Subiadur et al., 2007). Indicators for clinical management of HCV mainly captured the number of clients who received services or those provided with antiviral therapy. Five studies included the number who achieved a sustained viral response following therapy (Clanon et al., 2005; Hill et al., 2008; Knott et al., 2006; Sylvestre & Zweben, 2007; Taylor, 2005). Overall, six studies reported on-site staff education as a new service but no statistics were provided (Arora et al., 2007; Clanon et al., 2005; Fahey, 2007; Heseltine & McFarlane, 2007; Hill et al., 2008; Stringari-Murray et al., 2003). One study reported the number of education credits issued for formal off-site education (Arora et al., 2007). This particular study was the only one that included costs of antiviral therapies that were accessed from pharmaceutical companies for underinsured clients. No indicators were found related to cost-effectiveness of the new services.

The applicability of the US studies to the Canadian context is constrained due to differences in healthcare systems. Central to the need for surveillance and case-finding services in the US was the issue that the populations targeted were mainly underinsured

and lacked the financial resources to obtain the services. Study funds were used mainly to cover the costs of laboratory tests. Similar financial barriers also limited accessibility to physician services. The identification of financial barriers precipitated questions on the appropriateness of screening populations for whom services are not accessible (Heseltine & McFarlane, 2007; Subiadur et al., 2007; Zimmerman et al., 2007). Although access to HCV services regardless of geographic location is an issue in Canada (Myles, Wang, Krahn, & Mugford, 2008) the reasons are not associated with those of a private health care system as Canada provides universal health care for its population. For example, laboratory testing for HCV is free for users and readily available. Testing patterns in BC indicate that high-risk populations actually test frequently for HCV antibodies (Dr. M. Krajden, personal communication, June 16, 2008). In summary, there is a dearth of theory-based research and little published evidence to help describe, compare or evaluate integrated HCV models of care and almost none that is appropriate for the Canadian healthcare context.

1.3 Rationale for this study

The findings from the literature review of HCV service integration are similar to those from studies of service integration for other diseases. There is a lack of comparative research to assist our understanding of what type of service integration, in which context, results in improved client/population outcomes (Ouwens, Wollersheim, Hermens, Hulscher, & Grol, 2005; Soto, Bell, & Pillen, 2004). Whether integrated care is more cost effective than traditional care is yet to be demonstrated (Fireman, Bartlett, & Selby, 2004). It is uncommon for models of integrated care to be replicated for comparison so information on what components of integrated models are unique to the local context and what could be more widely applied are unknown. The uniqueness of the local configurations along with the complexity of integrated care models compounds the challenges for evaluation of their effectiveness (Pawson & Tilley, 2003). This type of research requires multiple methods, is time consuming and, given the newness of the field of inquiry, may add to our theoretical understanding but lacks definitive or clear results.

The measurement of HCV integration would be advanced by the use of a common framework for evaluation based on a shared understanding of integration and consistent use of selected performance measures (Ward & Fenton, 2007). In recognition of the context-specific nature of integration, the proposed research is grounded in a theory-based model for the evaluation of integrated care in the context of IP within autonomous organizations at the front-line service provider level. The model provides the basis from which the results can be interpreted. Application of the study methods to four geographically-dispersed programs and comparison of the results will increase our understanding of what aspects of interprofessional service integration are unique and which are similar regardless of local circumstances.

1.4 Theoretical perspective

In this study, a theoretical perspective and the partnership context are both assumed to be required elements to understanding IP. To provide the theoretical base for the exploration and measurement of IP of front-line staff a conceptual model was developed and used to validate tools to measure IP functioning. The model is grounded in complexity theory, a contemporary form of systems theory. Complexity theory has been applied for some time in the biological and physical sciences and more recently to the science of health services (Capra, 1996; McDaniel & Driebe, 2001; Prigogine, 1997). Complexity theory approaches require exploration of the system's parts as well as the pattern of relationships among the parts (Cilliers, 1998; Wheatley, 1992). The conceptual model details the salient attributes of IP processes, an important focus of measurement in this study, and identifies interrelated moderating factors and outcomes. A full description of the model constitutes Chapter Two.

1.5 Study Purpose

This multi-method, descriptive comparative study was designed to describe the development of the projects and explore the nature of the structure, function and outcomes of front-line staff partnerships created to provide comprehensive HCV prevention and care services in four communities. A secondary purpose was to explore the relationship of partnership structure and function to outcome measures of reach in four nurse-led hepatitis C integrated prevention and care demonstration projects that differ in years of operation and geographic location. Reach includes measures at the individual clinical service and population level.

1.5.1 Objectives

The following specific objectives were developed for the study:

1. Describe how the four integrated HCV prevention and care developed in each regional health authority.
2. Describe and contrast the partner structure in each of the four demonstration projects.
3. Describe and contrast the partnership functioning in each of the four demonstration projects.
4. Describe and compare the outcomes of population reach in the four demonstration projects by year of operation.
5. Describe the relationship between measures of structure, function and population reach.

1.5.2 Research Questions:

On the basis of the literature review and the IP conceptual model, questions were developed to explore the relationship between the dependent variables, partnerships structure and processes and specific population outcomes, and the independent variables, the setting and the years of operation.

1. How were the four demonstration projects developed and what services do they provide?
2. Is there a difference among the demonstration projects and the outcomes related to population reach when compared by year of operation?
3. Is there a difference in the structure (number, type of the partners and the strength of their linkages) in each of the four demonstration projects?
4. Is there a difference in measures of partnership functioning in each of four demonstration projects?
5. Is there a relationship among the demonstration projects and the variables structure, function and years of operation?
6. Is there a relationship among the demonstration projects and the variables structure, function, years of operation and population reach?

1.5.3 Research Assumptions:

The study's assumptions are derived from the theoretical model and the literature review:

1. Integration of services through IP of front-line staff increases reach
2. The number and type of partners is context specific (i.e., dependant on the specific HCV client needs and the local resources)
3. The number and diversity of partners will be larger in demonstration projects that have been in operation for greater lengths of time
4. Partnerships will extend beyond the geographic referral area served by the demonstration project
5. Less difference or greater congruence between the expected minus the observed scores on the IHSM indicates partners achieved what they expected.
6. Stronger linkages, indicated by higher scores on the IHSM, will predict higher synergy scores on the PSAT
7. Use of services is reflective of the need for services

1.6 Study Design:

This research was designed as a multi-method, descriptive comparative study of four demonstration projects. Its aim was to collect and describe specific data about the partners involved in the four integrated prevention and care demonstration projects and to compare relationships between the independent and the dependent variables described below in 1.6.1. The study is presented from an insider perspective as the researcher was directly involved with and responsible for initiating the negotiations for the development of the demonstration projects and facilitating communication between the demonstration projects and the financial sponsor, BC Hepatitis Services, since inception.

The study has three distinct but interrelated components:

1. A historical document review to determine how the hepatitis C prevention and care projects developed in each of the four RHA and what services they provide,
2. An analysis of administrative data to determine the population reach of each of the four demonstration projects, and

3. A survey, given to the partners in each of the four demonstration projects, which included questionnaires to measure partnership structure and functioning.

1.6.1 Study variables for components 2 and 3 above

The dependent variables of this study consist of selected characteristics of the demonstration project partnerships (structure and function), and the population reach of each project. The independent variables comprise the setting and the number of years of operation.

1.7 Limitations of the study

The results, while specific to the four demonstration projects, may be of interest to others planning partnership-based service delivery models with consideration of the following limitations. The study was limited to the four demonstration projects within regional health authorities in BC and as such may not be generalizable to other regions or programs. Generalizability of the results was also limited by the lack of comparative research and rigorously tested models to underpin the implementation and evaluation of IP of front-line staff in community-based integrated care. As the partnership survey was completed at one point in time the results could not provide insights into changes in each project's partnership structures and functions over time.

1.8 Dissertation Plan

This dissertation contains five chapters including this introductory chapter. The second chapter presents the conceptual model that serves as the theoretical guide for this research study of IP of front-line service providers of HCV prevention and care. A previous version of the model was published in the *International Journal of Integrated Care* (Butt, Markle-Reid, & Browne, 2008). Chapter three describes the study methods. Chapter four contains the results organized in the following sequence: a historical review of the project development and services, a summary of the project's population reach including demographics of the populations served and selected clinical outcomes for each year of operation, a summary and comparative analysis of the survey data of each project's partnership structure and functioning. Chapter five, the final chapter, concludes the thesis with a discussion of the major findings and their relevance to policy and practice. Included is a discussion of revisions to the IP model presented in chapter two.

2 CONCEPTUALIZING AND TESTING PARTNERSHIPS IN HEALTH CARE SETTINGS

Partnerships are increasingly used to enhance health service delivery in response to an explosion in chronic disease prevalence. Although partnerships will ultimately redefine how health services are configured and delivered, little is known about how these partnerships function and their impact on outcomes (Polivka, Dresbach, Heimlich, & Elliott, 2001; Weiss, Anderson, & Lasker, 2002). The focus of this chapter is on the conceptualization and measurement of interprofessional partnerships (IP) at the front-line, service provider group level. In the literature, the terms partnership, collaboration, and teamwork are used interchangeably to “reflect the idea of individuals coming together for a mutually accepted goal or mission” (Boswell & Cannon, 2005). However, in this analysis, interprofessional is the term used to describe the process of multiple disciplines working together. Partnership is used to indicate the collaborative nature of the process.

The multiple and often complex needs of populations affected by the epidemic of chronic illnesses require approaches that include both health and social services, and extend beyond traditional acute episodic health care and the services of any single organization (Barr et al., 2003; Conrad, 1993; Fleury & Mercier, 2002; Nasmith et al., 2004; Wagner, Austin, & von Korff, 1996; World Health Organization, 2005). In response, healthcare policies in Canada, as in other Western countries, require services to be integrated, often through partnerships to meet increased demands (Department of Health, 1998a, 1998b; Glouberman & Zimmerman, 2002; Romanow, 2002; World Health Organization, 2005). Support for IP is so strong in the UK that the National Health Service has legislation requiring mandatory health and social service partnerships to break down traditional disciplinary barriers to collaboration (Department of Health, 1997; Glendinning, 2003). The span of IP can include anything from the coordination of individual clinical care by front-line staff to the management of medical and social support services for specific populations through the creation of large health care organizations (Leutz, 1999). Goals common to all approaches are to provide the best quality, most appropriate and effective services, and reduce overlap, duplication and gaps in care (Leatt, Pink, & Guerriere, 2000; van Eyk & Baum, 2002).

Research on coordination of individual care demonstrates that proactive and comprehensive care that includes health and social services improves health outcomes (Browne et al., 2001; Hay et al., 1999). The quantity, type and source of comprehensive care will vary according to the needs and resources of the client at particular points in time (Browne et al., 2001; Browne et al., 1999). For example, clients with chronic hepatitis C, a chronic infectious illness spread by blood-to-blood contact, present with multiple and changing needs associated with the disease and compounded by social, economic and psychological factors (Butt et al., 2008; Paterson et al., 2006). Responses to these needs increase partnership linkages, through social services, to other human services representing the broad determinants of health such as welfare, employment, and wage replacement (Leatt, 2002).

2.1 Interprofessional Partnerships: History and Function

IP in health care have a long history (Mackay, Soothill, & Webb, 1995; Rawson, 1994), as both public and not-for-profit agencies have worked together to coordinate services, pool resources and achieve shared goals (Alter & Hage, 1993; Herman, Wolfson, & Forster, 1993). The public health literature contains many descriptions of IP and guidelines for their formation (Bolton, Georges, Hunter, Long, & Wray, 1998; Lezau, Kingsbury, Lenz, Nelson, & Voehl, 1993). IP are initiated through formal and/or informal relationships in and across organizations and based on a common value, a holistic person-centred approach to care (Pirkis et al., 2001). Nurses, as core providers in the provision of chronic illness care, frequently coordinate IP (Sibbald, Laurant, & Reeves, 2006). Communication can occur in-person or through a variety of means such as phone, fax, e-mail and internet portals. IP function in ways that transcend organizational boundaries (Provan, Nakama, Veazie, Teufel-Shone, & Huddleston, 2003) resulting in the emergence of virtual interorganizational structures (Durbin, Rogers, Macfarlane, Baranek, & Goering, 2001). IP are defined in this paper as virtual interorganizational structures formed around client needs through formal and/or informal relationships of front-line service providers from various organizations who collaborate to provide comprehensive and integrated care and support services to those with chronic conditions.

Although partnerships are widely embraced, research on the factors that influence their collaborative processes and outcomes is not well established (Polivka et al., 2001; Weiss et al., 2002) and evidence of effectiveness is lacking (Butterfoss, Goodman, & Wandersman, 1993; Morris, 1996; Zwarenstein & Reeves, 2000). There is evidence that partnerships frequently fail (Kreuter, Lezin, & Young, 2000), they are complex to administer, time consuming to establish, require investment of scarce resources and have a potential for loss of decision-making control (Alter, 1993; Cheadle et al., 1997; Wandersman, Goodman, & Butterfoss, 1997). The increased emphasis on health system performance improvement through partnerships and the concomitant need to demonstrate that partnerships are functioning efficiently underscores the need to review partnership measurement issues, develop an IP conceptual model and identify measurement tool(s) for its evaluation (Halliday, Asthana, & Richardson, 2004).

2.2 Methods: Search and Data Analysis

To conceptualize IP and evaluate measurement tools, a literature review was performed on published papers from Canada, USA, UK, Europe and Australia retrieved through three interrelated searches (Table 2.1). The literature was searched to identify: 1) issues associated with the measurement of partnerships, 2) the salient attributes of IP processes at the front-line staff level and the interrelated contextual factors of importance for measurement, 3) tools to measure IP functioning at the front-line service provider group level. The second search did not aim to identify literature for the development of a predictive model with weighted criteria.

The search method was iterative starting with broad searches of online databases and the authors' personal libraries, selecting relevant articles, identifying the articles' main

Table 2.1: Search strategies

Timeframe	1990-2007
Key words and terms combined for Search 1: Partnership measurement & Search 2: Partnership characteristics	'Partnership' and 'interprofessional' and 'measurement'. Search 2 dropped measurement term. Synonyms and variations of keywords were employed in the first 2 searches to expand and refine the search scope. Synonyms included: 'patient care team', 'collaboration', 'interdisciplinary', 'multidisciplinary', 'delivery of health care' and 'evaluation'.
Search 3: Partnership measurement tools	'Partnership' or 'teamwork' or 'patient care team', and 'scales', 'tools' and 'questionnaires'.
Restrictions	English language, peer reviewed systematic reviews, primary research, conceptual articles, government research reports and books
Databases searched	Cochrane Database of Systematic Reviews, Clinical Evidence, MEDLINE, CINAHL, EMBASE, PsychINFO, & Health and Psychosocial Instruments, Google, Google Scholar
Hierarchy of evidence	In ascending order systematic review articles (e.g., syntheses of research, concept analysis), single studies, articles and books.
Types of literature	Nursing, medicine, social sciences and psychology (including selected references from organizational development)
Other documents added to the literature review	Seminal works added as required to complete writers' understanding of the concepts. Reference sections were hand searched to ensure completeness.

Mesh Headings, and repeating the electronic search using refined terms and, for selected articles, using the online “find similar” reference feature. Hand searching reference sections of selected articles and electronic searches of leading authors was also conducted.

The thematic analysis (Charmaz, 2002) of the literature retrieved was guided by complexity theory which is further discussed in section 2.4. For example, complexity theory was used to guide the selection of attributes to be measured, cluster the attributes into themes and conceptualize the pattern of interrelationships within the context of an IP as a complex adaptive system (Anderson & McDaniel Jr., 2000).

The literature obtained from search one was analyzed to identify the issues and gaps of partnership measurement. The literature from search two was analyzed to identify the salient attributes of IP processes at the front-line staff level and the interrelated contextual components of the conceptual framework. Salient attributes were defined as the recurrent

characteristics of the concept of IP found within systematic reviews and concept analyses (Rodgers, 2000). All articles were read several times by the author to identify and code the themes. Qualitative analysis software, NVivo 7, was used to facilitate inquiry, refine the coding structure and organize the thematic relationships. The process was repeated by a trained research assistant to ensure that consensus was achieved.

Tools to measure partnership functioning identified in search three were required to meet all of the following criteria to be considered for full review: a) the purpose of the instrument is to assess partnership processes at the level of the group, b) the tool has good theoretical concordance with our conceptualization (i.e., the salient attributes and theory base), c) there is at least one published reliability and validity assessment, d) the instrument is suitable for self-report and, e) is currently available for use. The criteria were applied in ascending order and tools were rejected at the first failed criteria point. This process was necessary to ensure that the most robust and well-developed tools would be located and evaluated (Streiner & Norman, 2003) and would fit with the chosen theoretical framework of complexity theory.

Review of the selected instruments, guided by criteria identified by Streiner and Norman (2003), included a description of the tool, the history of development, theoretical relevance, ease of use, reliability, and validity. Reliability included appraisal of test-retest and internal consistency and sensitivity. Assessments of validity included a review of face, content, construct, predictive, criterion, and discriminant validity.

2.3 Issues Associated with the Measurement of IP

IP measurement is complicated by the fact that there is no standard interpretation of the concept of partnerships (Ahgren & Axelsson, 2005). Other challenges involve variations in form, content and change over time. Partnerships occur in numerous forms, vary in depth of involvement, number and diversity of members (including diverse views and agendas), and are established through a process of negotiation (Halliday et al., 2004). Even if the members remain constant their relationships can change over time (Goldberg & Comins, 2001). Comparing the findings from partnership research is problematic due to the conceptual variation, the variety of research methods used and the tendency of disciplines to work within their respective research paradigms and theoretical perspectives with little crossover or mutual recognition (evidenced through lack of cross-discipline citations) (Ahgren & Axelsson, 2005; Alexander et al., 1996; Bolland & Wilson, 1994; Lasker & Weiss, 2003a). Additionally, different stakeholders may attach different weights to success criteria (Boyne, Farrell, Law, Powell, & Walker, 2003; Glendinning, 2002; Sullivan & Skelcher, 2002). The diverse views associated with partnerships and their measurement has added breadth to the field but a consensus view of partnerships has not yet emerged.

There is an abundance of support for partnerships and rhetoric on their advantages in the literature but the evidence-base is lacking (Butterfoss et al., 1993; Morris, 1996; Zwarenstein & Reeves, 2000). Partnerships have been evaluated in a few studies that measured outcomes in client or population health and the quality of the group's

collaborative process but the results are inconclusive (Bickman, 1996; Lehman, Postrado, Roth, McNary, & Goldman, 1994; Provan & Milward, 1995). Aside from methodological deficiencies, an explanation for the lack of positive clinical outcomes is that these outcomes may take years to realize and would fall outside most study timeframes (Provan et al., 2003). Partnership process outcomes, on the other hand, occur earlier and can be measured at different time points. However, the literature on front-line staff collaborative processes focuses on relationships with clients, largely ignoring relationships with colleagues (Robinson, 2005). The research on healthcare teams has focused on single elements that have been studied individually within the context of formal meetings (Cott, 1997). Collaboration that occurs outside meetings is unstudied.

For the purposes of this analysis, the assumption is made that collaborative processes may not be sufficient to improve health outcomes, but that quality interprofessional collaborative processes are necessary precursors to improved services and outcomes for individuals and populations with chronic conditions. Thus, the measurement of interprofessional collaborative processes is a necessary step in understanding whether quality processes contribute to better health outcomes.

2.4 Applying complexity theory to IP functions

IP are complex adaptive systems as conceptualized through complexity theory (Anderson, Crabtree, Steele, & McDaniel, 2005). As such, IP were considered as self-organizing interorganizational systems that experience change within the group and are influenced, but not controlled by factors external to the group. For example, as nursing and other providers self-organize in response to the needs of those with chronic illness, IP are created through increases in connectivity (number of partners), diversity (type of partners) and interactions (frequency of interactions). The increase in information flow and feedback loops precipitate mutual adjustment of, for example, behaviours, beliefs, or plans in response to changing demands. Mutual adjustment occurs through learning that allows for creativity, reflection and evaluation. Mutual adjustment is a type of change process in which the outcomes are unpredictable and small changes can have large effects by changing the context for others in the partnership (Plsek & Greenhalgh, 2001). The culmination of change through mutual adjustment is termed ‘adaptation’ otherwise referred to as emergence, innovation and synergy (Holden, 2005; Lasker & Weiss, 2003b). Thus the complexity of chronic illness management requires IP be responsive to unpredictable changes in clients’ chronic condition/problems (Rowe, Jacobs, & Grant, 1999). Adapting plans and practices to changing conditions requires responsive and flexible partnership processes in order to produce the desired outcomes and impact (Capra, 2002; Wheatley, 1999).

2.5 Identification of Salient Attributes and Conceptual Model of IP

The analysis began with review papers in accordance with the hierarchy of evidence in Table 2.1. The papers from which the salient attributes of IP were primarily selected were reviews of empirical studies of the determinants of interprofessional collaboration (Center for the Advancement of Collaborative Strategies in Health, 2006; Curran, 2004;

San Martin-Rodriguez, Beaulieu, D'Amour, & Ferrada-Videla, 2005), a review of theory and research on interagency collaboration in the public sector (Hudson, Hardy, Henwood, & Wistow, 1999), and concept analyses of health care partnerships (Bidmead & Cowley, 2005; D'Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005; Hook, 2006; San Martin-Rodriguez et al., 2005).

The attributes of IP to be measured that were selected from the data are itemized in Table 2.2 within four thematic areas; 1) agreement of the need to partner, which was the most frequently recurring theme in the literature, 2) collegial relationships, a theme which contains items related to interprofessional communication, 3) interdependency, a theme that is stressed in the literature as central to group functioning and, 4) a final cluster, entitled power and leadership, which represents attributes consistent with shared power and leadership through influence.

The attributes selected are congruent with complexity theory (i.e., attributes which contribute to self-organization, connectivity, diversity and interactions). Agreement of the need to partner is a necessary, if not sufficient, requirement for self-organization. It affects the number and diversity of partners and the frequency of their interactions. Collegial relationships impact the information flow of a system, affecting the level of mutual adjustment and resulting interdependency. Attributes of leadership and power are characteristic of a self-organizing system as they emphasize a shared process that occurs through influence rather than a position of power and control.

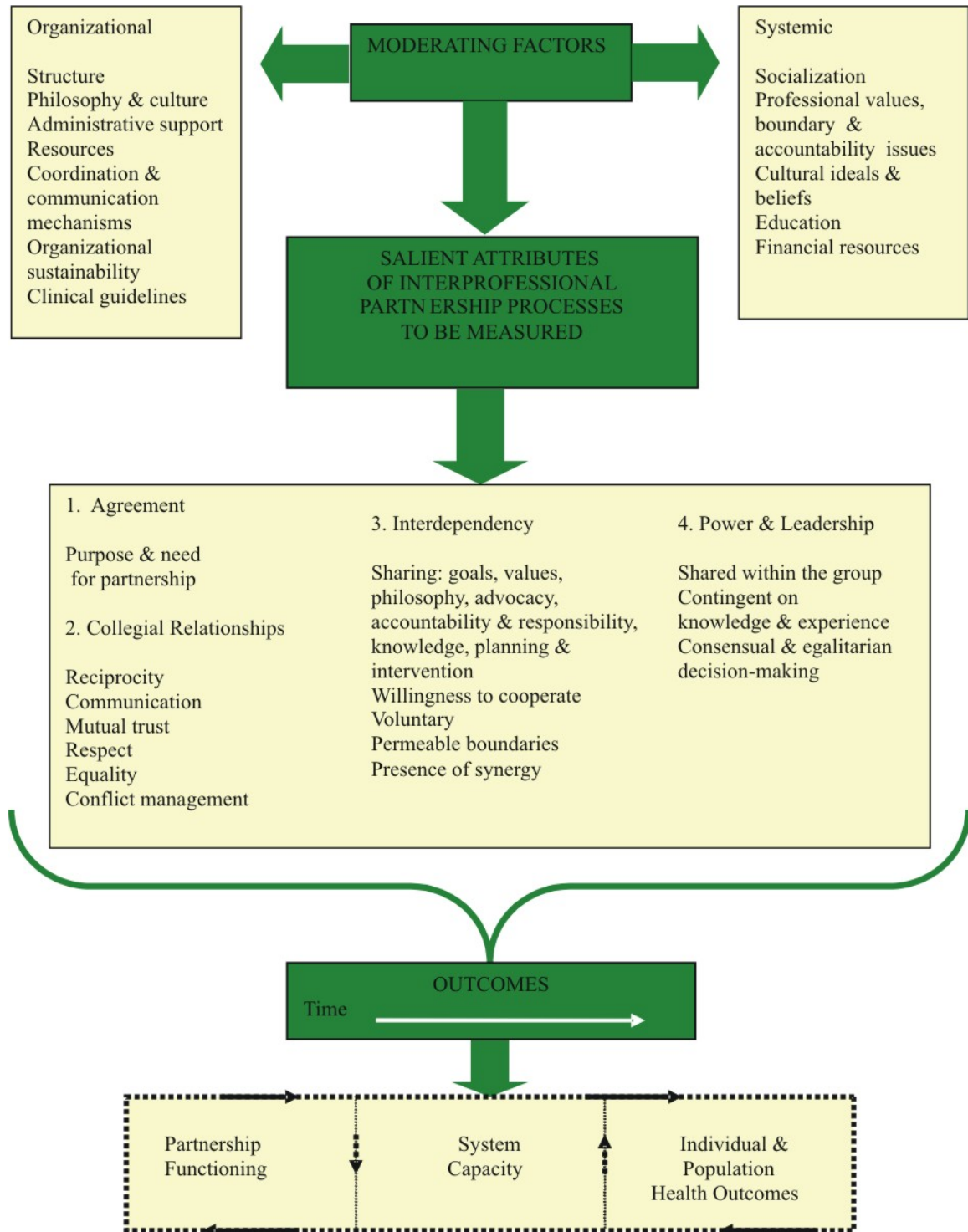
Figure 2.1 displays the conceptualization of the attributes of interprofessional collaborative processes to be measured situated within the interorganizational system that contains external influences or moderating factors and outcomes. The processes within and between the components of the system are dynamic but displayed as linear for the purposes of heuristic simplicity. The external factors that influence IP member's participation found in the literature are termed 'organizational' and 'systemic' factors, detailed in Table 2.2 and displayed in Figure 2.1. Organizational and systemic influences are conceptualized as moderating or influencing factors as they can act as both barriers as well as enhancing factors (El Ansari, Phillips, & Hammick, 2001). Finally, outcomes of interprofessional processes complete the conceptual model in Figure 2.1 and are presented under the categories of Partnership Functioning, System Capacity and Individual/Population Health Outcomes. These outcomes are interrelated and assumed to be time dependent with quality partnership processes leading initially to beneficial outcomes for the partnership. Feedback loops within the system could result in changes in the moderating factors such as benefits to the partner's parent organization or changes in wait time policies. Outcomes related to moderating factors are termed 'system capacity' in Figure 2.1. The final category, Individual and Population Health Outcomes, includes partnership outcomes such as client satisfaction, improved health and quality of life, and reduced incidence of disease.

Table 2.2: Salient attributes, moderators, and outcomes of IP

IP Feature	Theme	Description or Sub-Themes
I. Salient Attributes	1. Agreement	Recognize and accept the need for partnership
	2. Collegial relationships	Reciprocity- mutually beneficial, mutual support, encouragement and feedback Communication- transparent, open, and honest, understanding of how discipline's work contributes to goals and able to communicate that contribution to others, constructive negotiation of goals, plans, and boundaries, compromise, active listening, face-to-face or virtual Mutual trust- trust depends on skills, knowledge and experience and confidence in one's professional role, confidence in each other Respect- aware of and values the contributions and perspectives of others Equal status Conflict management
	3. Interdependency - between two or more professionals	a. Sharing - goals, philosophy, values, advocacy, accountability, knowledge (professional, community resources), responsibility, planning and intervention b. Willingness to cooperate rather than compete, enthusiasm c. Voluntary - sharing time, resources, energy d. Permeable boundaries - recognize areas of interdependence and respect areas of independence, flexibility
	4. Power & leadership - through influence	e. Presence of synergy a. Shared within the group b. Based on knowledge and experience c. Consensual and egalitarian decision-making
II. Moderating factors - organizational	Structure	a. hierarchical emphasis on power and control b. horizontal or decentralized emphasis on flexible structures and teamwork
	Philosophy and culture Administrative support	c. community vs. hospital setting Values participation and interdependence

IP Feature	Theme	Description or Sub-Themes
II. Moderating factors - systemic	Resources	vs. dominance Rules and procedures for collaboration
	Coordination & communication mechanisms Sustainability	Funding mechanisms, human resource sharing, diverse and competing commitments
	Clinical guidelines 1. Social, professional, culture, educational & resources	Conflicts with organizational self-interests, domain, autonomy
		a. Socialization - hierarchies (i.e., power differences between professions, gender stereotypes, differences in social status) b. Professional - jurisdictional, regulatory and medico-legal factors (individual vs. collective accountability), values and ideologies, job security, terminology c. Cultural - individualism, autonomy, territoriality, specialization, control d. Educational- limited knowledge, understanding and valuing of the roles of other disciplines, e. Financial resources - professional compensation mechanisms (collective agreements, fee-for-service, organization bound vs. individual), institutional and intersectoral funding
III. Outcomes	Partnership functioning System capacity Individual & population health outcomes	

Figure 2.1: Conceptual Model Showing the Salient Attributes of IP Within the Interorganizational System.



2.6 Evaluation of Tools to Measure IP Functioning

A total of 171 instruments were screened for review, of which, 168 were rejected because they did not have an explicit theory base from which to determine concordance with the conceptual model as required by the second inclusion criteria. Of the remaining 3 instruments, one instrument—the Task Force Member survey—was grounded in theory but rejected as I was unable to obtain the instrument or a history of its development and testing (McMillan, Florin, Stevenson, Kerman, & Mitchell, 1995). Thus, only two instruments met the stringent selection criteria, the Partnership Self-Assessment Tool (PSAT) (Center for the Advancement of Collaborative Strategies in Health, 2006), and the Team Climate Inventory (TCI), (Anderson & West, 1998).

The Partnership Self-Assessment Tool (PSAT), was developed by public health specialists for practical use by groups working to promote health and well-being in their communities (Weiss et al., 2002). It measures partnership synergy and other related dimensions of the partnership process (Lasker, Weiss, & Miller, 2001). This self-administered tool takes 20 minutes to complete and contains 11 domains and 67 clearly written and easily understood items. Seventeen items employ a dicotomous yes/no scale and 50 use a 5-point Likert scale. The originators caution that the PSAT is not intended for use by external evaluators to avoid the social desirability bias inherent when evaluations are perceived to be tied to funding decisions.

The Team Climate Inventory (TCI), a self-administered measure of team innovativeness, was rigorously developed by organizational psychologists Neil Anderson and Michael West (Anderson & West, 1994). It was developed for research and practical use to evaluate team functioning at the level of the group (Anderson & West, 1994).

The TCI has three versions, with 61, 38 or 14 clearly written and easily understood items that are scored on 5 to 7-point Likert scales (Anderson & West, 1998). The 38-item scale which contains an additional six items inserted to measure social desirability bias (Mathisen, Einarsen, Jørstad, & Brønnick, 2004) is referred to in this paper as a 38-item scale. It is the most frequently reported version, is available for purchase (starter kit \$495 USD, group norms and scoring software provided), and requires only 15 minutes to complete. The level of analysis is the group (permanent or semi-permanent) within an organization.

The items in both the PSAT and TCI exhibit concordance with the salient attributes of IP as illustrated in Table 2.3. The TCI does not have an item match in theme 1, Agreement (agreement to participate is a basic assumption of their theory), while the PSAT had item matches in all themes. Item matching of the TCI with the PSAT, shown in Table 2.4 with the identified attributes of IP, reveals that the TCI matches are mainly related to group synergy which is in accordance with the stated purpose of the tool.

Both measures have well-described theoretical frameworks that are consistent with complexity theory as both take a complex adaptive systems perspective toward group

Table 2.3: Concordance of the Partnership Self-Assessment Tool (PSAT) and the Team Climate Inventory (TCI) with the identified attributes of IP

Conceptual Model	PSAT Item #	TCI Item #
Salient Attributes		
1. Agreement	53	
2. Collegial Relationships	14, 15, 16, 17, 24, 32, 59, 60, 62, 63	12, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26,
3. Interdependency	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 18, 19, 22, 23, 25, 26, 28, 31, 49, 63, 65, 66, 67	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 24, 25, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38
4. Power & Leadership Through Influence	10, 12, 42, 43, 44, 57, 64	13, 14
Moderating Factors	21, 33-41, 56, 58, 61	
Outcomes	20, 27, 45-48, 50-52, 54-55	32

Table 2.4: Team Climate Inventory (TCI) item matched with Partnership Self-Assessment Tool (PSAT) items

PSAT Items (n=67)	TCI Items (n=38)
Synergy Items 1-9 (9 items)	Items 1-5, 7-11, 24, 27-31, 36 (17 items)
Leadership Items 10-20 (11 items)	Items 12-13, 16-17, 25-26 (6 items)
Efficiency Items 21-23 (3 items)	No matches
Administration and Management Items 24-32 (9 items)	Items 15, 18, 20-22, 33-35, 37-38 (10 items)
Non-Financial Resources Items 33-38 (6 items)	No Matches
Financial and Other Capital Resources Items 39-41 (3 items)	No Matches
Decision Making Items 42-44 (3 items)	Item 14 (1 item)
Benefits of participation Items 45-55 (11 items)	Item 32 (1 item)
Drawbacks of Participation Items 56-62 (7 items)	No matches
Satisfaction with Participation Item 63-67 (5 items)	Item 6, 19, 23 (3 items)

process. The PSAT is based on partnership synergy theory (Lasker & Weiss, 2003a; Weiss et al., 2002). Synergy is defined as “the breakthroughs in thinking and action that are produced when a collaborative process successfully combines the complementary knowledge, skills and resources of a group of participants” (Lasker & Weiss, 2003b). Attributes of improved thinking include creativity, invention, challenging the status quo and innovative problem-solving (Gray, 1989; Richardson & Allegrente, 2000). The theory considers synergy a proximal outcome of good quality partnership processes (Lasker et al., 2001).

The concept of synergy, as used in the PSAT, is a surrogate for the concept of adaptation in complexity theory. Both concepts are assumed to represent the ultimate proximal outcome of successful partnership processes. Additionally, successful processes require the ability of partners to interact effectively in order to understand and address complex problems and sustain interventions. Success is related to who is involved (number and diversity of members) and how they are involved which includes fluent and frequent interactions and shared leadership (a bottom up, self-organized approach to problem-solving).

The TCI is based on the four-factor theory of climate for innovation (West, 1990), a well-studied model of team innovation (Mathisen et al., 2004). This theory assumes teams are the principal means in which a climate of sharing grows, through active social construction, and becomes embedded within the organization (Hosking & Anderson, 1992; West, 1995). Three criteria determine a team: 1) work interactions occur at least infrequently, 2) a common goal or outcome serves as the impetus for collective action, and 3) interdependent tasks require the group members to develop a shared understanding and expected patterns of response (Hosking & Anderson, 1992; West, 1995). Climate for innovation is defined as, “the manner of working together that the team has evolved” (Anderson & West, 1994). Innovation is defined as “the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to specifically benefit role performance, the group, the organization or the wider society” (West & Farr, 1989). Creativity is considered to be part of the innovation process (Amabile, 1996).

Innovation, as described in the four-factor theory, is synonymous with the concept of adaptation within complexity theory (i.e., the introduction and application of new ideas or processes that benefit the group, organization or society). Climate is presented as a collective level phenomena requiring self-organization, connectivity and feedback loops as precursors to innovation. For example, task interdependence leads to shared understandings and expected levels of behaviour. Interactions are participatory and new ideas are encouraged in congruence with a bottom up approach. A common goal or attainable outcome (agreement of the need to collaborate, an assumption in their model) unites individuals to collective action (feedback loops).

Both the PSAT and TCI have reported measures of reliability and validity which are summarized in Table 2.5. The PSAT is in the early stages of testing with the data

Table 2.5: Comparison of Partnership Self-Assessment Tool (PSAT) and Team Climate Inventory (TCI) reliability and validity

Dimensions	Criterion	PSAT	TCI
Background:	History since	2002	1994
	# Items	67	38
	Purpose	Practical use & self-evaluation by groups	Research & practical use
	Target group	Generic community-based health partnerships	Generic organization-based professional teams
Reliability:	Measures of stability of instrument		
Test-retest	Ability to produce the same results on short-term repeated measures - up to 6 weeks	No data	No data
Internal consistency	Tests for internal consistency should indicate items are moderately correlated with each other (α -coefficients between .20 & .80) & well-correlated with the total score (α -coefficients between .70 and .90) (Henson, 2001; Streiner & Norman, 1991)	1 study, items within each factor are highly-correlated, α -coefficients between .83-97 (Weiss et al., 2002)	Three studies, consistently yield results within advised ranges (Anderson & West, 1998; Agrell, 1994; Loo & Loewen, 2002)
Sensitivity	Ability of instrument to measure change on repeated measures (e.g., before & after an intervention)	No data	1 study - did not show change (Loo & Loewen, 2002)
Validity:	Degree to which tool items measure concept		
Face & content	Literature review, interviews & expert review determine items appear to measure all the important	Rigorously established (Weiss et al., 2002)	Rigorously established (Anderson & West, 1994)

Dimensions	Criterion	PSAT	TCI
Construct	components of the concept		
	Tests to determine the relationship between multiple variables (i.e., exploratory & confirmatory factor analysis)	1 study of exploratory factor analysis with positive results (Weiss et al., 2002)	Three studies reporting positive results of exploratory & confirmatory factor analysis (Anderson & West, 1998; Kivimäki et al., 1997; Ragazzoni et al., 2002)
Predictive	Degree to which the test scores are predictive of a desired criterion	No data	Demonstrated in three studies (Agrell, 1994; Anderson & West 1996; Forrester, 1995)
Criterion	Scores on the tool are compared to results of external evaluators or other related tools	2 studies: 1 compared to tools with more & less relatedness, results confirmed hypothesized relationship (Browne et al., 2004; Weiss et al., 2002)	Five studies compared TCI scores to external evaluators, results positively correlated (Mathisen et al., 2004; Agrell, 1994; Anderson & West, 1996; Burningham & West, 1995; West et al., 1998)
Discriminant validity	Extent to which tools can distinguish between different types of groups	Demonstrated in 1 study (Weiss et al., 2002)	Demonstrated in two studies (Bain, Mann, & Pirola-Merlo, 2001; Williams & Laungani, 1999)

confined to the originators (Weiss et al., 2002) and one mention of criterion validity by Browne and colleagues (2004). Establishment of face and content validity during development of the PSAT items was rigorous. It included data from qualitative interviews with members of community health promotion partnerships, an extensive review of relevant literature and measures, as well as input from a panel of experts (Weiss et al., 2002). Items were constructed at the group level and pretested in 2 series (N=11x2) of cognitive (think-aloud) interviews to be sure the items were relevant, clear and consistently interpreted, reduce the likelihood of measurement error, improve content validity and minimize the burden on participants (Forsyth & Hubbard, 1992; Streiner & Norman, 2003).

The PSAT was tested in 63 health-related partnerships in operation at least 18 months in urban, suburban or rural areas in the US (Weiss et al., 2002). Reliability testing of

internal consistency of the scales with the total score as measured by Cronbach's α (.82 to .97) was good. Construct validity through factor analysis of the nine items on the synergy scale (.742 to .893) indicated good internal construct validity. Between group discriminant validity evaluated by one-way analysis of variance tests indicated that the PSAT adequately discriminates between groups. Criterion validity demonstrated through comparison of the PSAT with two more and less related measures evidenced that the PSAT measures different but related constructs. The closely related measure showed a moderate correlation of .71 ($p < .01$). Exploratory factor analysis of the items in each tool revealed each had a major and distinct factor, synergy for the PSAT and collaborative group performance for the comparator (Weiss et al., 2002). The PSAT had a low correlation ($r = .13$ to $.36$) with the less related measure of partnership structure (Browne et al., 2004).

The TCI has performed well on reliability and validity testing in several countries and organizational cultural contexts including community-based health and social services settings. Face and content validity were established through a rigorous process of initial scale development (Anderson & West, 1994). For example, items were selected from the literature and other published measures of climate only if they were relevant to the four-factor theory and occurred at the group level.

Reliability tests of internal consistency have consistently been within recommended ranges. The items are moderately correlated with each other (α coefficient 0.35 to 0.62) (Anderson & West, 1998). Internal consistencies of tool scores are consistent across countries. For example, an α -coefficient of 0.84-0.94 in the UK (Anderson & West, 1998), 0.86-0.91 in Sweden (Agrell & Gustafson, 1994) and an α -coefficient of 0.84 to 0.90 in Canada (Loo & Loewen, 2002). Only one study has reported on the TCI's ability to measure change (sensitivity) (Loo & Loewen, 2002). Measures taken 9 weeks apart on both the 38-item and 14-item TCI showed high positive correlations between the scores on the scales at both administrations (α .61 to .87). However, it was predicted that a sensitive measure would show a change as the teams were given training to increase team work at the beginning of the project. It is possible that change occurred but the TCI was not sensitive or the study timeframe was too short for significant change to occur within the newly formed teams.

Criterion validity tested through comparison with the Team Production Questionnaire showed a positive correlation of 0.14 to 0.51 but the power of the sample ($N=16$ teams) was small and not all correlations were statistically significant indicating that the TCI may be measuring similar as well as different constructs. However, several studies have compared external evaluations of innovativeness of the teams with the TCI scores and found good concordance evidencing criterion validity (Agrell & Gustafson, 1994; Anderson & West, 1996; Burningham & West, 1995; Mathisen et al., 2004; West, Smith, Feng, & Lawthom, 1998).

Construct validity of the 61 and 38-item versions of the TCI tested through exploratory and confirmatory factor analysis by several researchers has produced mixed results on whether the TCI contains four or five factors. Exploratory factor analysis on

the longer version in the UK indicated there are five interrelated factors (Anderson & West, 1998). Confirmatory factor analysis completed in the UK on the 38-item version of the TCI was equivocal for the four and five factor model (Anderson & West, 1998). The authors chose the five factor version to maximize the predictive utility. Ragazzoni et al. (2002) confirmed five factors in the 38-item Italian version. Testing by Kivimäki et al. (1997) on a Finnish sample of 2,265 local government employees indicated that the five factor version performed better than the four factor version in work groups with high job complexity while the four factor version was adequate for those with low job complexity. The findings indicate that the five factor scale is the most relevant for IP due to the complexity of their work.

Between-group discriminant validity was adequate. Williams & Laungani (1999) demonstrated the TCI distinguished primary health care teams from three other types of health care teams and Bain, Mann & Pirola-Merlo (2001) showed the TCI discriminated between research and development teams (N= 38).

Several studies have shown the TCI is predictive of team innovation (Agrell & Gustafson, 1994; Anderson & West, 1996; Forrester, 1995). For example, Anderson and West (1996) found that the factor, support for innovation, predicts overall innovation (accounting for 46% of the variance) and innovative novelty. The factor, participative safety, best predicts the number of innovations and team self-reports of innovativeness while task orientation predicts administrative effectiveness.

2.7 Summary of the PSAT and TCI evaluation

The PSAT and TCI theoretical frameworks were compatible with the conceptual model. The PSAT items demonstrated a better fit with the entire model while the TCI items exhibited a fit specifically with the salient attributes. Both tools have rigorously demonstrated face and content validity. The PSAT is relatively new and has had minimal reliability and validity testing. The TCI is a mature tool that has performed well on a diverse array of tests, in many cultures and contexts. Both measures are appropriate for health and social services groups. Neither measure has demonstrated utility as a longitudinal measure of change. Both could be used for IP measurement research.

2.8 Discussion of the Conceptual Model and Selection of the Measurement Tool

A broad and diverse literature review highlighted the issues relevant to the measurement of IP of front-line staff within an interorganizational context. IP were presented as necessary for the delivery of services to individuals and populations with chronic conditions in order to meet changing client needs. A new conceptual model was presented that assumes interrelatedness between the salient attributes of group process, the external factors that influence group process and outcomes. The conceptual model contains both a theoretical perspective and the partnership context as necessary elements (Granner & Sharpe, 2004). This model addresses limitations pointed out by Allen and Hecht in their review of the effectiveness of organizational teams “the organizational context in which teams operate is rarely considered even though context is quite likely to influence team success” (Allen & Hecht, 2004, p.452).

The complexity theory-bound conceptual model may be useful for IP that go beyond the front-line staff level as reviews of empirical research in the UK suggest that partnerships have common principles regardless of the organizational level (Halliday et al., 2004). Refinement and testing of the model from multiple perspectives would improve the theoretical formulation and could lead to a mid-range theory to ground research and clinical practice.

The evaluation of two tools, the PSAT and TCI, provided evidence of their validity for IP process measurement. While both tools have a good theoretical fit with the model and the salient attributes of IP only the PSAT included measurement of contextual influences. The TCI would require supplementation with qualitative research to uncover effects of contextual influences. The evaluation also included consideration of the instruments' psychometric properties. There was ample evidence that the TCI has strong psychometric properties while knowledge of the PSAT's performance is limited. However, the best tool is one that matches the partnership model, the community context, needs and goals of the partnership members and other stakeholders and the goals of the researcher (Granner & Sharpe, 2004). In consideration of the above, the PSAT was chosen as the instrument to test partnership functioning in four IP comprised of members from several agencies dedicated to providing care to those with chronic hepatitis C in small urban environments.

3 METHODS

A multi-method approach was employed that utilized both qualitative and quantitative methods for the three distinct study components: historical document review, statistical analysis of administrative data and of partner survey data. Qualitative data from historical documents and the two open-ended questions on the IHSM (partner survey measure) were subjected to thematic analysis (Charmaz, 2002; Sandelowski, 2000; Thorne, Kirkham, & MacDonald-Emes, 1997). Quantitative data obtained from the two survey measures (IHSM and PSAT) and administrative data housed at the BC Centre for Disease Control were subjected to descriptive analytic techniques for parametric and non-parametric data. The data collection periods for each component of the study overlapped. The timeframes for data collection are reported separately for each component.

3.1 Data Sources and Timeframes

3.1.1 Historical Documents and Reports

The historical data were contained in written documents from 2001 to 2007. The documents included program descriptions, annual reports, manuscripts and information presented at yearly meetings in which representatives from the projects, mainly front-line project nurses and their managers, and BCHS shared and compared their progress and experiences.

3.1.2 Administrative Data

Administrative data, housed at the BCCDC, were obtained as secondary data through exports from the demonstration project data set that contained non-nominal client information and service outcomes (e.g., treatment outcomes), as well as exports of non-nominal hepatitis C surveillance data contained in the public health information system (iPHIS). The researcher did not access client specific identifiers, to maintain confidentiality of the HCV population studied. The timeframes for administrative data exports were: 1) From the initiation of client services at each site to December 31, 2007 for the demonstration project data set and 2) from 1992 when HCV reportability began to December 31, 2007 for iPHIS.

Data from the demonstration project data set were captured prospectively in a custom database that was used by each project. Standardized data were collected on demographic variables, disease characteristics (co-morbid diseases, genotype, etc.), mode of HCV acquisition (i.e., transmission route), and clinical interventions provided. The duration and nature of clinical interventions, and the type of the provider, client status and outcomes of therapy were also collected. Medical parameters, such as liver biopsy or laboratory test values, were not collected. Anonymized data (i.e., without personal identifying information) were exported to the BCCDC quarterly, and each client record was assigned a unique case number. Algorithms incorporated in the database helped to improve data accuracy by identifying missing and out-of-sequence data, so that corrections could be made at source by each project. Since the implementation of the projects was staged from 2001 through 2004, data were grouped by operations year (i.e.,

year 1, year 2, etc.) to ensure that comparisons across projects reflected their years of experience. No partial years were included in the analysis.

3.1.3 Partner Survey

Subsequent to approvals from relevant ethics review boards the nurses at each project developed a list of inter- and intra-agency partners with whom they had contact within six months. The 216 partners identified (includes the project nurses) were mailed a self-administered survey package between May 30 and June 4, 2007, and a reminder letter June 15 and June 30. As the survey ran into the summer vacation period participants were afforded up to 6 weeks to complete the 20-minute survey to allow for interruptions in availability.

3.2 Partner Survey Measures

The structure and function of the partnerships was measured using two previously developed instruments: the Integration of Human Services Measure (IHSM) (Browne, Kingston, Grdisa, & Markle-Reid, 2007; Browne et al., 2004; Browne, Roberts, & Loney, 2007) and the Partnership Self-Assessment Tool (PSAT) (Center for the Advancement of Collaborative Strategies in Health, 2006). These tools were developed for descriptive and evaluative purposes. Published information on their reliability and validity is summarized in Table 3.1. Although the tools are based on a systems perspective each measures a distinct partnership dimension; structure for the IHSM and function for the PSAT. Measurement of both dimensions is necessary for the comprehensive description and evaluation of partnerships (Browne et al., 2007; Donabedian, 2005). Both measures are relatively new with reliability and validity evaluations limited to the instrument originators as would be expected in area of where a focus on empirical evaluation is just beginning to emerge.

Integration of Human Services Measure: The IHSM was developed specifically to list the partners from autonomous organizations that comprise the partnership and to measure the strength or depth of their linkages. The user friendly measure allows for calculation of the strength of the observed (present) and expected (desired) linkages at the individual and group level. Content, face and discriminate validity are reported by the originators (Browne et al., 2004). This tool is being used in a large scale study tracking integration in AIDS services organizations in Ontario (G. Browne, personal communication, June 2006).

All identified partner members are listed on the IHSM and the members are asked to rate the observed and expected strength of their linkages with each partner on a 5-point Likert scale ranging from: 0 = No awareness (your service is not aware of the other service); 1 = Awareness (you have knowledge of the other service although no effort is taken to organize activities according to any principles except those that conform to individual agency/service missions); 2 = Communication (you and the other service have an active program of communication and information sharing); 3 = Cooperation (you and the other service each use your knowledge of the other's service to guide and modify your own service planning to obtain a better set of links between services); 4 = Collaboration

Table 3.1: Summary of Partnership Self-Assessment Tool (PSAT) and Integrated Human Services Measure (IHSM) Reliability and Validity

Dimensions	Criterion	PSAT	IHSM
Background:	History since	2002	2004
	# Items	67	
	Purpose	Practical use & self-evaluation by groups	Research & practical use
	Target group	Generic community-based health partnerships	Generic health, social services, and community partnerships
Reliability:	Measures of stability of instrument		
Test-retest	Ability to produce the same results on short-term repeated measures - up to 6 weeks	No data	No data
Internal consistency	Tests for internal consistency should indicate items are moderately correlated with each other (α -coefficients between .20 & .80) & well-correlated with the total score (α -coefficients between .70 and .90) (Henson, 2001; Streiner & Norman, 1991)	1 study, items within each factor are highly-correlated, α -coefficients between .83-97 (Weiss et al., 2002)	No data
Sensitivity	Ability of instrument to measure change on repeated measures (e.g., before & after an intervention)	No data	No data
Validity:	Degree to which tool items measure concept		
Face & content	Literature review, interviews & expert review determine items appear to measure all the important	Rigorously established (Weiss et al., 2002)	Established (Browne et al, 2004)

Dimensions	Criterion	PSAT	IHSM
	components of the concept		
Construct	Tests to determine the relationship between multiple variables (i.e., exploratory & confirmatory factor analysis)	1 study of exploratory factor analysis with positive results (Weiss et al., 2002)	No data
Predictive	Degree to which the test scores are predictive of a desired criterion	No data	No data
Criterion	Scores on the tool are compared to results of external evaluators or other related tools	2 studies: 1 compared to tools with more & less relatedness, results confirmed hypothesized relationship (Browne et al., 2004; Weiss et al., 2002)	No data
Discriminant validity	Extent to which tools can distinguish between different types of groups	Demonstrated in 1 study (Weiss et al., 2002)	Demonstrated in Browne et al, 2004

(you and the other service jointly plan the offering of service and actively modify service activity based on advice and input from mutual discussions); and, N/A = Service is not applicable to your service. To provide contextual information two open-ended questions complete the measure: a) What helps you when collaborating with other agencies? Why? b) What hinders you from collaborating with other agencies? Why?

Partnership Self-Assessment Tool: This tool measures the functioning of the partnership, at the level of the group, in terms of the sharing of perspectives, knowledge and skills. The questionnaire contains 67 items organized into 11 domains or categories. Nine categories comprise 5-point Likert scales and 2 have yes/no dichotomous scales. The responses are summed for each category to provide total category/domain scores. This tool is complementary to but not duplicative of the Integration of Human Services Measure as indicated by a weak correlation of $r = 0.13$ (Browne et al., 2004). Internal consistency (Cronbach's alpha) of the six constructs measured by scales is adequate (range from 0.83-0.97) (Weiss et al., 2002). A complete description and evaluation of the measure was provided earlier in Chapter 2.

3.2.1 Partner survey inclusion criteria and participant recruitment

The survey aimed to utilize the total population of partners participating in the demonstration projects rather than a selected or random sample. The convenience sample was composed of the front-line nursing staff at each of the 4 demonstration projects and the partners they nominated as partners in the provision of HCV prevention and care services. The inclusion criteria required partners be able to read English. Those listed were mailed a survey package which contained information on the voluntary nature of participation, the purpose of the study, the measures (IHSM and PSAT) and a self-addressed stamped return envelope (see APPENDICES). The survey package contained information on the right to withdraw at any time and details of how their information would be removed from the records. All partners were identified on the IHSM by their agency or service name with the exception of physicians, whose service was associated with their name

3.3 Data Analysis

3.3.1 Data management

Qualitative data from electronic versions of historical documents and electronically transcribed data from the two open-ended survey questions on the IHSM were housed in an NVivo 7 software folder.

Administrative data exported from the demonstration projects was housed in Excel folders. Survey data were double entered by two research assistants onto a customized electronic entry form using Access data base software, verified for accuracy, and all discrepancies rectified to reach 100% agreement. The verified survey data were then exported to an Excel folder.

The following criteria were employed for handling missing survey data:

For the PSAT, if a response was missing for half or fewer questions of a subscale (e.g., leadership, satisfaction), the mean of the other questions for that subscale was substituted. If more than half of the responses on a subscale were missing the respondent data were subjected to pair-wise deletion in the subscale analysis.

For the IHSM, scoring criteria were developed through discussion with the originators (Browne, Roberts & Gafni, personal communication, November, 28, 2008):

1. If a response was missing from either the Observed or Expected column, the missing data point was replaced with the same value available in the other column
2. If both Observed and Expected data points were missing it was interpreted to mean 'no relationship' and the missing data points were replaced with zero, with a few exceptions that are covered in #3.
3. When a partner was part of a group from a single agency and did not rate the partners from that agency (because the instructions stated that the partner should not rate their agency) then a "4" replaced the missing data point. The rationale is that if a partner was part of the same agency they worked closely together and were already collaborating.

3.3.2 Qualitative Data Analysis

Historical documents and responses to the two IHSM open-ended questions were analyzed using thematic analytic techniques (Sandelowski, 2000; Thorne et al., 1997). Thematic analysis requires familiarization with the data by reading and rereading the data sources, coding or organizing the data into themes, and rereading to refine the thematic structure. The software package NVivo 7 was used to facilitate coding and sorting of data into themes.

3.3.3 Quantitative Data Analysis

Quantitative data from the survey and the administrative dataset were analysed using Excel, and/or exported to a Statistical Package for the Social Sciences (SPSS) or Statistical Analysis Software (SAS[®]) as required. Questionnaire items were scored as a single summary score and, where applicable, as composite scores of domains represented by the questionnaire. Analysis included descriptive statistics (counts, means, frequencies, percentages) and inferential statistics (e.g., correlation, chi-square or Fisher's exact test, t-test and ANOVA). Selected data were analysed and displayed on a map of BC using Geographic Information Systems (GIS) techniques and ArcInfo[®] version 9.0 software (Environmental Systems Research Institute-ESRI). GIS is a multi-dimensional computer system that is capable of storing, layering and analyzing geographically-referenced information. GIS allows the user to view multiple layers of information simultaneously, thereby allowing the user to see complex relationships between entities such as the partners in this study. The current study used GIS in two ways: 1) to illustrate the geospatial relationships between partners and selected measures of their linkages and; 2) to illustrate the populations affected by hepatitis C and those reached by the projects in their referral areas (surveillance data). Surveillance and partner data were geocoded using postal code and located on a map of the region. All displayed data were imported into the GIS application, ArcInfo[®] version 9.0. The data files were used by ArcInfo to create base maps of each region. The demonstration project sites were used as the central reference point for each regional map. Due to overlapping addresses for data, the true geographic location was slightly altered or disaggregated for visual clarity.

3.4 Ethical Considerations/Consent:

Ethics approvals were obtained from the University of British Columbia and the relevant institutional review board in each Regional Health Authority. No individuals were identified in the results of this research or the dissemination of the findings. The investigator and project research assistants had access to the questionnaire responses. Instructions were provided to all members of the research team regarding confidentiality and the proper handling and storage of data.

In accordance with British Columbia's FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT and the Tri-Council Policy Statement regarding disclosure and storage of confidential information, study documents are kept in a locked filing cabinet in the locked office of the writer at BCCDC. All study computer files were password protected. Data will remain securely stored for ten years. Electronic

questionnaire data will be erased at the end of that time using a program to ensure complete removal of all data. Any paper documents of data will be shredded.

All subjects invited to participate in the research will be mailed a summary of the research findings regardless of whether they participated or not.

3.5 Expected Contributions of this study

The results will contribute to the refinement of the conceptual model for IP measurement developed for the study and described in Chapter 2. A thorough description of the demonstration project services and outcomes may foster portability to other geographical areas where care is provided for hepatitis C and perhaps to other chronic illnesses. Further benefits associated with this research may derive from knowledge generated that could identify areas where partnerships could be strengthened thereby increasing the provision of accessible, appropriate, comprehensive, continuous and effective hepatitis C prevention and care. This could lead to an increase in system capacity to provide hepatitis prevention and care. There were no known risks associated with this research.

4 RESULTS

Since multiple analyses were employed in the study, the results are organized in the following sequence:

Section 4.1 describes the development of the four demonstration projects and the services they provide.

Section 4.2 describes the demonstration projects' clinical outcomes as dependent variables with years of operation as an independent variable (administrative data). The clinical outcomes presented are those related to reach.

Section 4.3 describes the results of the analysis of the partner survey data from the IHSM and PSAT.

To facilitate the analysis of the IHSM and PSAT, their results are organized as follows:

Section 4.3.1 describes the results from the thematic analysis of the response to the open-ended questions on the IHSM.

Section 4.3.2 describes the results of the analysis of the quantitative data from the IHSM, a measure of the number and type of partners and the strength of their linkages, as a dependent variable, for the four demonstration projects. Geographic location and years of operation are independent variables.

Section 4.3.3 describes the analysis of the PSAT, a measure of partnership functioning at the level of the group, as a dependent variable, for the four demonstration projects.

4.1 Development and program structure of the four demonstration projects

This section presents a summary of the analysis of historical documents from 2001 to 2007. The review was completed to address the first study question: How were the four integrated hepatitis C prevention and care projects developed and what services do they provide?

4.1.1 How the four integrated prevention and care projects were developed

In 2001, HCV knowledge was advancing rapidly, health care providers had difficulty keeping up and misinformation to clients was common. Effective drug therapy for HCV was emerging that could potentially cure some clients and/or improve their liver function. In recognition of the emerging needs associated with HCV as a new disease, and the fact that 60,000 British Columbians who were infected, BC Hepatitis Services (BCHS) was established at the BC Centre for Disease Control to coordinate a multifaceted and integrated approach to rapidly build provincial capacity for HCV prevention and care services through partnerships. Multiple facets that required coordination were: surveillance for new acute and chronic infections, research (e.g., self care and advocacy), policy development (e.g., practice guidelines for diagnosis and laboratory monitoring of response to treatment), healthcare professional and consumer education and capacity development for integrated prevention and care services. Initial strategies were targeted at two key but interconnected areas: 1) education of health care professionals, and 2) development of locally accessible integrated prevention and care services. These strategies were executed in collaboration with British Columbia's five geographically-

defined regions, termed Regional Health Authorities (RHA). The RHA are responsible for the provision of health services including public health, acute and long term care.

At that time, major health care access points for those with HCV were public health nurses throughout the RHA and a few specialist physicians at the provincial tertiary referral centre in Vancouver. Public health nurses received laboratory reports of all positive HCV tests in their jurisdiction, determined if the results represented new cases, documented new cases into the integrated public health surveillance system (iPHIS) and sent letters to the ordering physicians informing them that their clients and those in the client's social network who were at-risk of HCV infection were eligible to receive hepatitis A and B vaccines free of charge from public health. The provision of vaccines provided public health nurses opportunities to engage those with or at-risk of HCV, gain an understanding of their needs, and provide prevention and health promotion education. Thus public health nurses throughout BC provided an important primary health care access point for those with HCV but their services were limited in scope.

In order to expand HCV services, BCHS worked with public health decision-makers in four RHA (Interior Health, Vancouver Island, Northern Health and Fraser Health Authority) and interested local physicians to develop HCV integrated prevention and care demonstration projects in their jurisdictions. To support the educational needs of the health care provider partners in the demonstration projects and others, BCHS worked with the fifth RHA, Vancouver Coastal, to develop an interdisciplinary mentorship and training program on Viral Hepatitis. The program included clinical mentorships and an annual intensive 3-day interdisciplinary workshop on viral hepatitis prevention and care for participants in the demonstration projects, general and specialist physicians, public health physicians and nurses, Aboriginal community health nurses, nurse clinicians, social workers, advocacy leaders, pharmaceutical industry representatives and laboratory scientists. The workshop content was provided by experts from multiple disciplines, using large-group lectures and small-group problem-based discussion sessions. The content included epidemiology and prevention, liver physiology and histology, laboratory testing, clinical assessment, the experience of living with HCV as a chronic illness, HCV treatment and side effects, and end stage liver disease. The workshop content is updated annually and registration continues to exceed attendance targets each year.

The four integrated prevention and care demonstration projects were established in geographic areas with moderate (81-160 cases per 100,000) to high (>160 cases per 100,000) HCV prevalence rates. Implementation was staged over three years starting with Kamloops (155.7/100,000) in Interior Health in 2001, Campbell River (182.1/100,000) in Vancouver Island Health, Prince George (122.5/100,000) in Northern Health Authority in 2002, and Surrey (76.6/100,000) in Fraser Health Authority in 2004. In the case of Surrey, although the HCV rate for the city is low, the target region included several areas with high rates (223.9/100,000) housing correctional facilities as well as an inner city population whose HCV rate could not be calculated separately but was reported to be high.

The staging of project implementation facilitated a rapid change/quality improvement approach to program design. BCHS facilitated inter-project communications to support knowledge exchange and process improvements. The projects received a \$25,000 start-up grant to help defray planning and implementation costs and \$75,000 in annual funding from BCHS. The projects used their annual funding for dedicated nursing staff and other personnel as displayed in Table 4.1. The project nurses were mainly public health nurses with experience in communicable disease prevention. Three projects had two nurses working part-time for a total of .8 full-time equivalents (FTE) while Kamloops had three nurses working part-time for .9 FTE. In Kamloops, two of the nurses provided clinical services while the third concentrated on community education/development. Both Campbell River and Surrey dedicated .2FTE for mental health and addictions services. In Campbell River these services were provided onsite at the project's clinic while in Surrey the services were provided offsite at a mental health and addictions clinic.

Table 4.1: Funding utilization per site

Kamloops	Campbell River	Prince George	Surrey
3 PHNs each at .3 FTE .1 FTE Clerical support	1 PHN & 1 hospital outreach nurse each at .4 FTE, 1 mental health & addictions counsellor, .2 FTE In-kind clerical support	2 PHNs each at .4 FTE In-kind clerical support 1Physician session/ month	2 PHNs each at .4 FTE 1 mental health & addictions counsellor, .2 FTE .2 FTE clerical support

* PHN= public health nurse * FTE= full time equivalent

Some projects, received small grants from pharmaceutical industry partners to sponsor community education events and/or purchase additional nursing hours. All other personnel and administrative resources including physical space were provided through in-kind contributions of partners. For example, an administrative database was collaboratively developed together with BCHS to collect information on demographics, risk factors, transmission routes, diagnostic procedures, client status in the program and treatment outcomes. The database was also designed to assist the nurses in monitoring complex hepatitis C treatment regimes, ensure laboratory testing protocols were followed and document the client's progress. BCHS administers the database and receives monthly non-nominal data from each site to compile statistics and produce reports.

BCHS brings the project nurses and their managers together yearly to exchange lessons learned and plan the following year's objectives. In 2004, BCHS funded a qualitative project review (Butt, Barichello, Trustham, & Hill, 2004) which described the projects' progress, accomplishments, lessons learned and made recommendations for future directions. In 2007, BCHS analysed the treatment outcomes of all those who

received antiviral therapy with pegylated interferon and ribavirin and found outcomes which were comparable to clinical trials (Hill et al., 2008).

4.1.2 Services provided by the four projects

Although each project developed their own program, the commonalities are striking. The common theme within their goal statements was to enhance the capacity of individuals, communities, and health and social service agencies to prevent and manage hepatitis C using partnerships and the addition of dedicated nursing resources. The services at each location comprised individual client services as well as community development/ education. To facilitate easy access to client services and maintain confidentiality of diagnosis each project established a 'liver clinic'. Kamloops, Prince George and Surrey each established their clinic in a public health unit while Campbell River located their clinic in the hospital outpatient area.

The individual-based clinical services were developed and provided by the project nurses in collaboration with the physician specialists and other agency/professional partners. Clients accessed services through self or physician referral. The project nurses worked within an expanded scope of practice providing comprehensive client assessments and follow-up, client/family education, intensive monitoring and support during antiviral therapy and palliation. Nurse assessments and interventions were instigated prior to medical consultations to assist the clients to learn about HCV and important aspects of self-management, stabilize their life situation, initiate lifestyle changes, and/or prepare for the psychological and physical side effects of antiviral drug therapy. Some clients with end stage liver disease were unable to undergo therapy, but required close monitoring and support as they awaited transplantation or other tertiary care services. For clients on treatment the nurses provided training in self-injection, monitored their response to antiviral therapy through clinical observation and laboratory tests, managed side effects and adjusted drug dosages in consultation with physicians, and supported client adherence to the management plan. Nurse services were provided by phone and in person at the project's clinic site. The nurses worked closely with referring physicians and the physician consultants, who visited the project sites two to four times a month to provide HCV medical consultations and determine which clients to start on treatment. Physician consultants also worked collaboratively with the nurses to develop and update their clinic protocols especially those used to assist the nurses with monitoring clients during their six to twelve month complex antiviral therapy regimes. Physician consultants varied by site and included specialists in gastroenterology, internal medicine, infectious disease and a general practitioner experienced in HCV and addictions medicine. In addition to physician consultations, the nurses linked clients with other health professionals or ancillary services and coordinated care in order to assist clients in meeting their multiple and complex needs. For example, individuals were referred to housing agencies to stabilize their living arrangements, public health communicable disease clinics for immunizations (hepatitis A, B, pneumonia and influenza), or mental health and addictions counsellors for behaviour therapy.

4.1.3 Community-based awareness/education

The project nurses worked with a variety of partners to build community awareness and knowledge of HCV. Community awareness and education of HCV was accomplished through educational presentations to health and social service providers, staff in addictions support agencies, residents and/or staff in correctional facilities, advocacy groups, and the public. For example, in one site the nurses developed a skit to present HCV health promotion and prevention messages that were well received in a variety of cultural contexts, age groups and educational backgrounds.

Public health was a key partner in community-based projects due to their experience in partnership work and community development. For example, a public health partner with expertise in Geographic Information Systems (GIS) mapped socio-economic indicators associated with vulnerability to HCV and other demographic data to determine areas of the city where vulnerable populations lived. This information was subsequently used strategically to plan the content and location for educational activities.

In one site, a project nurse partnered with local businesses, law enforcement and municipal government officials to develop a community-owned harm reduction program. As part of the program, an education campaign taught citizens how to safely pick up discarded needles and syringes in parks and downtown areas. To improve child safety, the campaign included development of pamphlets and posters to teach children to alert adults when they found discarded needles and syringes. The program included placement of needle deposit boxes in affected parks and training of local merchants and municipal workers in the safe removal and replacement of the needle deposit boxes. Thus, while the nurse facilitated the project the community owned and maintained it.

Summary: Four integrated prevention and care demonstration projects were initiated in small urban/rural areas between 2001 and 2004 to meet the needs of those with HCV and improve local access and capacity. The projects were initiated through partnerships, sharing of resources and the expansion of nursing services. The project nurses extended the partnerships through the provision of individual clinical and community-based services. Although the projects started at different times and are located in geographically distinct regions they have common goals and provide similar services with some local variations. Each project has a clinic site where client services are provided by project nurses in close partnership with visiting consultant physicians. Campbell River is the only project with a visiting mental health and addictions counsellor. Other professional services are obtained through referrals coordinated by the project nurses.

4.2 Demonstration Projects Outcomes and Administrative Data Results

This section addresses the second study question: Is there a difference among the demonstration projects and the outcomes which are related to population reach when compared by year of operation? The clinical outcomes of the demonstration projects are viewed as dependent variables with years of operation as an independent variable. The clinical indicators selected are those related to two study assumptions: 1) use of services reflects the need for services and, 2) integration of services increases population reach.

The administrative database contained information of 2651 clients; however, 139 clients were removed prior to analysis (118 referrals after operational year cutoff, 10 referrals prior to project initiation, and 11 clients with no referral date). The remaining 2512 client records from 2001 to 2007 were grouped and analyzed by operations year for a total of 20 years of operations (i.e., Kamloops 6yrs., Campbell River 5yrs., Prince George 5yrs., and Surrey 4 yrs). Table 4.2 provides a summary of the number of clients referred to each project, demographics, disease characteristics, and referrals to other services on intake. The largest number of referrals occurred in Year 1 for all projects and declined slowly thereafter. Most clients (72%) were in the 40-59 age groups; the majority were White (83%) or Aboriginal (11%). The second most frequent ethnicity varied by project; Surrey had 18 % East Indian clients, Prince George, Campbell River and Kamloops had 21%, 13%, and 7% Aboriginal clients respectively. On referral, 40% of clients were married, only 40% were employed full or part-time and large proportions were on disability (18%) or not employed (19%). The overall proportion of clients at each project who were on disability or not employed was: Kamloops 36%, Prince George 33%, Campbell River 42%, and Surrey 31%. Of the 8% of HCV clients with a secondary diagnosis, 46% had advanced liver disease (e.g., cirrhosis, liver cancer, and end-stage liver disease), 23% had diabetes and 16% were co-infected with HIV. Of the 92 clients reported to have advanced liver disease Campbell River had the greatest proportion (n= 48, 65%).

The majority of clients had HCV genotype 1, (65%). Approximately 10% (248/2512) of referred clients (or 13% of assessed clients) were referred to other services after their first visit. Mental health and addictions accounted for the majority (87.1%) of these referrals. Eighty-two percent of the 216 referrals to mental health and addictions originated in Campbell River, where a mental health and addictions professional visited the project clinic to provided onsite services. Although the Surrey project dedicated funding for mental health and addictions services similar to Campbell River they accounted for only 8% of the 216 referrals. Surrey referrals were identical to Kamloops where no funding was dedicated to mental health and addictions resources. The disparity in referral rates may be related to accessibility (i.e., client reluctance to engage with unfamiliar staff in an unfamiliar location).

There was slight variation in the proportion of referred clients who attended for clinic services: 72% Prince George, 74%, Kamloops and Surrey, and 80% Campbell River. Clinic visits could consist of either a nurse assessment, physician consultation or both. Table 4.3 reveals that most clients received both with some variation between projects but little variation by operations year. Interestingly, 21-43% of clients received services exclusively from the nurse.

Mean times from referral to first assessment were calculated for all clients and two client sub-groups: those who received anti-viral therapy and those who received only education and support. A surprising observation for each year of operation was a shorter mean time from referral to first clinic visit for clients who received antiviral therapy than those who received solely education/support as shown in Table 4.4.

Table 4.2: Client characteristics and demographic profiles on referral.

	Kamloops		Prince George		Campbell River		Surrey		Total	
	N	%	N	%	N	%	N	%	N	%
Client Referrals										
Year 1	198	(26.4)	158	(28.9)	260	(30.0)	124	(35.5)	740	(29.5)
Year 2	137	(18.2)	86	(15.8)	204	(23.6)	71	(20.3)	498	(19.8)
Year 3	111	(14.8)	118	(21.6)	157	(18.1)	72	(20.6)	458	(18.2)
Year 4	110	(14.6)	93	(17.0)	136	(15.7)	82	(23.5)	421	(16.8)
Year 5	105	(14.0)	91	(16.7)	109	(12.6)	–	–	305	(12.1)
Year 6	90	(12.0)	–	–	–	–	–	–	90	(3.6)
<i>Total</i>	<i>751</i>	<i>(100.0)</i>	<i>546</i>	<i>(100.0)</i>	<i>866</i>	<i>(100.0)</i>	<i>349</i>	<i>(100.0)</i>	<i>2512</i>	<i>(100.0)</i>
Age Group										
01-19	3	(0.4)	3	(0.5)	–	–	–	–	6	(0.2)
20-29	31	(4.1)	33	(6.0)	39	(4.5)	15	(4.3)	118	(4.7)
30-39	86	(11.5)	95	(17.4)	98	(11.3)	60	(17.1)	339	(13.5)
40-49	218	(29.0)	140	(25.6)	219	(25.3)	100	(28.9)	677	(27.0)
50-59	347	(46.2)	235	(43.0)	409	(47.2)	136	(38.9)	1127	(44.9)
60-69	49	(6.5)	33	(6.0)	91	(10.5)	29	(8.3)	202	(8.0)
70-79	14	(1.9)	7	(1.3)	8	(0.9)	9	(2.6)	38	(1.5)
80+	3	(0.4)	–	–	2	(0.2)	–	–	5	(0.2)
<i>Total</i>	<i>751</i>	<i>(100.0)</i>	<i>546</i>	<i>(100.0)</i>	<i>866</i>	<i>(100.0)</i>	<i>349</i>	<i>(100.0)</i>	<i>2512</i>	<i>(100.0)</i>
Ethnicity										
Aboriginal	50	(6.7)	92	(20.5)	89	(12.9)	15	(5.2)	246	(11.3)
Asian	17	(2.3)	6	(1.3)	14	(2.0)	13	(4.5)	50	(2.3)
Black	–	–	2	(0.4)	2	(0.3)	2	(0.7)	6	(0.3)
East Indian	1	(0.1)	1	(0.2)	2	(0.3)	52	(18.1)	56	(2.6)
White	679	(90.8)	348	(77.5)	581	(84.1)	203	(70.5)	1811	(83.2)
Other Ethnicity	1	(0.1)	–	–	3	(0.4)	3	(1.0)	7	(0.3)
<i>Total</i>	<i>748</i>	<i>(100.0)</i>	<i>449</i>	<i>(100.0)</i>	<i>691</i>	<i>(100.0)</i>	<i>288</i>	<i>(100.0)</i>	<i>2176</i>	<i>(100.0)</i>
Marital Status										
Divorced	104	(13.9)	50	(9.7)	108	(14.1)	36	(10.9)	298	(12.6)
Married or common law	273	(36.4)	224	(43.4)	326	(42.6)	126	(38.3)	949	(40.2)
Single	186	(24.8)	131	(25.4)	242	(31.6)	74	(22.5)	633	(26.8)
Widowed	9	(1.2)	10	(1.9)	17	(2.2)	13	(4.0)	49	(2.1)
Unknown	177	(23.6)	101	(19.6)	73	(9.5)	80	(24.3)	431	(18.3)
<i>Total</i>	<i>749</i>	<i>(100.0)</i>	<i>516</i>	<i>(100.0)</i>	<i>766</i>	<i>(100.0)</i>	<i>329</i>	<i>(100.0)</i>	<i>2360</i>	<i>(100.0)</i>
Employment Status										
Disability	142	(19.0)	49	(9.5)	177	(23.4)	59	(18.0)	427	(18.2)
Full-time or part-time	258	(34.4)	229	(44.4)	332	(43.8)	134	(40.9)	953	(40.5)
Not employed	129	(17.2)	123	(23.8)	144	(19.0)	43	(13.1)	439	(18.7)
Retired	26	(3.5)	9	(1.7)	33	(4.4)	15	(4.6)	83	(3.5)
Unknown	194	(25.9)	106	(20.5)	72	(9.5)	77	(23.5)	449	(19.1)
<i>Total</i>	<i>749</i>	<i>(100.0)</i>	<i>516</i>	<i>(100.0)</i>	<i>758</i>	<i>(100.0)</i>	<i>328</i>	<i>(100.0)</i>	<i>2351</i>	<i>(100.0)</i>

	Kamloops		Prince George		Campbell River		Surrey		Total	
	N	%	N	%	N	%	N	%	N	%
Diagnosis Secondary to HCV										
Advanced Liver Disease	20	(41.7)	17	(27.4)	48	(64.9)	7	(43.8)	92	(46.0)
Diabetes	16	(33.3)	11	(17.7)	14	(18.9)	4	(25.0)	45	(22.5)
Fatty Liver	2	(4.2)	8	(12.9)	8	(10.8)	2	(12.5)	20	(10.0)
HBV	2	(4.2)	5	(8.1)	4	(5.4)	1	(6.3)	12	(6.0)
HIV+	8	(16.7)	21	(33.9)	–	–	2	(12.5)	31	(15.5)
<i>Total</i>	<i>48</i>	<i>(100.0)</i>	<i>62</i>	<i>(100.0)</i>	<i>74</i>	<i>(100.0)</i>	<i>16</i>	<i>(100.0)</i>	<i>200</i>	<i>(100.0)</i>
Genotype Group										
Non Type 1	189	(38.1)	156	(35.5)	215	(29.8)	123	(40.5)	683	(34.8)
Type 1	307	(61.9)	284	(64.5)	506	(70.2)	181	(59.5)	1278	(65.2)
<i>Total</i>	<i>496</i>	<i>(100.0)</i>	<i>440</i>	<i>(100.0)</i>	<i>721</i>	<i>(100.0)</i>	<i>304</i>	<i>(100.0)</i>	<i>1961</i>	<i>(100.0)</i>
Referrals to Services on Intake										
Mental Health/Addictions	18	(81.8)	3	(15.8)	177	(95.7)	18	(81.8)	216	(87.1)
Family Physician	–	–	4	(21.1)	–	–	–	–	4	(1.6)
Liver Transplant Clinic	–	–	–	–	5	(2.7)	4	(18.2)	9	(3.6)
Nutritional Consults	4	(18.2)	12	(63.2)	3	(1.6)	–	–	19	(7.7)
<i>Total</i>	<i>22</i>	<i>(100.0)</i>	<i>19</i>	<i>(100.0)</i>	<i>185</i>	<i>(100.0)</i>	<i>22</i>	<i>(100.0)</i>	<i>248</i>	<i>(100.0)</i>

To determine if there was a difference between and within the four projects in the wait time from referral to the first clinic visit, analysis with ANOVA and the Tukey *a* (for post hoc testing) was pursued on 1829 clients seen within 360 days of referral. Excluded from the analysis were 615 referred clients who never attended the clinics, 27 clients whose assessment date occurred before the referral data and 41 clients who delayed their initial visit beyond 360 days.

Using ANOVA there was a significant difference, $p = < .001$, in wait times between projects, and the Tukey *a* identified wait times for Prince George, $M = 35$ days, were significantly shorter than for Campbell River, $M = 48$ days, or Kamloops, $M = 50$ days, when all years of operation were considered. In order to account for the variation in years of operation among the projects, the analysis was repeated to include only years for which all four projects had comparable data (years 2, 3 and 4). Year 1, the start up year, was excluded as the projects had wide variation in the amount and type of nursing resources and a pent up need for services. Years 5 and 6 were excluded as not all projects were operational in those years. Data analyzed on 996 eligible clients revealed similar pattern of significant differences between the projects $p = < .001$, with wait times for Prince George, $M = 37$ days, significantly shorter than for Campbell River, $M = 52$ days, or Kamloops, $M = 56$ days, when these three years of operation were considered. To further explore differences between projects, separate analyses were completed for years 2, 3 and 4 for each project. For Year 2, wait times for Prince George, $M = 37$ days, and Kamloops, $M = 44$ days were significantly shorter than Campbell River, $M = 65$ days. In Year 3, wait

Table 4.3: Nurse assessments and physician consultations by operations year.

Kamloops								
	Nurse		Physician		Both		Total	
	N	%	N	%	N	%	N	%
1	31	(19.6)	12	(7.6)	115	(72.8)	158	(28.6)
2	21	(21.9)	5	(5.2)	70	(72.9)	96	(17.4)
3	24	(34.8)	3	(4.3)	42	(60.9)	69	(12.5)
4	18	(20.9)	14	(16.3)	54	(62.8)	86	(15.6)
5	23	(27.4)	5	(6.0)	56	(66.7)	84	(15.2)
6	11	(18.3)	10	(16.7)	39	(65.0)	60	(10.8)
Total	128	(23.1)	49	(8.9)	376	(68.0)	553	(100.0)

Prince George								
	Nurse		Physician		Both		Total	
	N	%	N	%	N	%	N	%
1	25	(20.8)	17	(14.2)	78	(65.0)	120	(30.7)
2	6	(11.1)	18	(33.3)	30	(55.6)	54	(13.8)
3	20	(23.0)	11	(12.6)	56	(64.4)	87	(22.3)
4	25	(34.2)	1	(1.4)	47	(64.4)	73	(18.7)
5	16	(28.1)	4	(7.0)	37	(64.9)	57	(14.6)
6	–	–	–	–	–	–	–	–
Total	92	(23.5)	51	(13.0)	248	(63.4)	391	(100.0)

Campbell River								
	Nurse		Physician		Both		Total	
	N	%	N	%	N	%	N	%
1	63	(28.3)	1	(0.4)	159	(71.3)	223	(32.2)
2	90	(52.0)	3	(1.7)	80	(46.2)	173	(25.0)
3	49	(39.5)	0	(0.0)	75	(60.5)	124	(17.9)
4	52	(51.5)	0	(0.0)	49	(48.5)	101	(14.6)
5	43	(59.7)	0	(0.0)	29	(40.3)	72	(10.4)
6	–	–	–	–	–	–	–	–
Total	297	(42.9)	4	(0.6)	392	(56.6)	693	(100.0)

Surrey								
	Nurse		Physician		Both		Total	
	N	%	N	%	N	%	N	%
1	10	(10.9)	6	(6.5)	76	(82.6)	92	(35.4)
2	6	(11.8)	4	(7.8)	41	(80.4)	51	(19.6)
3	17	(29.8)	2	(3.5)	38	(66.7)	57	(21.9)
4	22	(36.7)	1	(1.7)	37	(61.7)	60	(23.1)
5	–	–	–	–	–	–	–	–
6	–	–	–	–	–	–	–	–
Total	55	(21.2)	13	(5.0)	192	(73.8)	260	(100.0)

Table 4.4: Mean Time from Referral to Assessment (in weeks)*

Location	Group	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Grand Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Kamloops	Ed/support**	108	10.0	64	8.4	48	11.4	58	13.3	57	6.9	40	6.8	375	9.6
	Tx***	49	5.4	32	5.5	21	7.0	27	5.5	25	4.8	15	3.7	169	5.4
	Total	157	8.5	96	7.4	69	10.1	85	10.8	82	6.3	55	6.0	544	8.3
Prince George	Ed/support	66	12.3	29	19.0	57	9.5	62	5.1	49	4.5			263	9.3
	Tx	53	9.6	25	7.3	30	3.6	11	2.6	7	3.8			126	6.8
	Total	119	11.1	54	13.6	87	7.5	73	4.7	56	4.4			389	8.5
Campbell River	Ed/support	151	10.6	125	14.4	84	8.8	83	6.9	64	6.1			507	10.1
	Tx	70	11.2	46	7.8	36	5.0	16	4.3	8	3.7			176	8.1
	Total	221	10.8	171	12.6	120	7.6	99	6.5	72	5.8			683	9.6
Surrey	Ed/support	55	6.9	31	10.3	36	4.8	52	6.9					174	7.1
	Tx	36	4.9	17	7.0	20	5.0	7	2.3					80	5.2
	Total	91	6.1	48	9.1	56	4.8	59	6.3					254	6.5
Grand Total		588	9.5	369	11.0	332	7.6	316	7.2	210	5.6	55	6.0	1870	8.5

*Assignments of clients to operations year assignment is based on year the client referral was received, not the year that tx was initiated.

** Ed/support defined as clients who receive education and support but not anti-viral therapy

***Tx defined as any client who initiated Hepatitis C interferon+ribavirin antiviral therapy

times for Campbell River, M= 38 days and Surrey, M=34 days were significantly shorter than Kamloops, M= 60 days. In Year 4, wait times for Prince George, M=28 days were significantly shorter than Kamloops M=65 days. Overall, when the projects were compared by years of operation, Prince George consistently evidenced shorter mean wait times. Significantly longer wait times occurred in Campbell River and Kamloops. The significant difference in Campbell River mean wait times occurred in Year 2, in contrast to Kamloops where significant differences occurred in both Years 3 and 4.

To explore differences within projects similar analyses were completed for Years 2, 3 and 4 for each project. Campbell River had significantly longer mean times from referral to first visit in Year 2 (M=65 days) than Year 3 (M=38 days) or Year 4 (M=46 days). Surrey also had significantly longer mean times from referral to first visit in Year 2 (M=64 days) than Year 3 (M=34 days) or Year 4 (M=44 days). While Kamloops had the opposite experience with a significantly shorter mean times for Year 2 (44 days) compared only to Year 4 (M=65 days) and Prince George had no significant differences $p=0.15$ in mean times. Overall, Prince George had the most consistent mean wait times from referral to first visit for Years 2, 3 and 4. Campbell River and Surrey have experienced a reduction in the mean times, while Kamloops has experienced an increase.

There is variation between and within the four projects in the mean time from referral to first visit. Prince George has the shortest mean wait times and the least variation by comparable operations years. The differences may be related to differences in referral volumes, client populations and fluctuations in availability of project nursing staff due to extended absences and staff changes that require service reductions during the intensive orientation and training period. On discussion of the variations in wait times at a recent meeting, the project nurses (personal communication, March, 06, 2009) reported that they adjust appointments based on client preferences and urgency so that clients can have ready access to services. For example, clients who received anti-viral therapy may have been more motivated to access services and this could account for their shorter wait times.

Table 4.5 provides a summary of treatment end-points and therapy outcomes (non-responder or responder) for clients with genotype 1 and genotype non-type 1. Treatment end-points were: adverse events, no EVR (early virological response at week 12, genotype 1 only), patient choice (not due to adverse events), and course of therapy completed. The majority (76%) of those initiating therapy completed the full course of therapy. However, for genotype 1, which requires 48 weeks of therapy, 65% of clients completed therapy. For genotype non-type 1, a 24-week course of therapy, 87% of clients completed therapy. Adverse events accounted for 12 % of the overall stopping reasons and this also was higher in genotype 1 (15%) vs. genotype non-type 1 (9%). For genotype 1, EVR was evaluated at week 12 to identify clients for whom further therapy was futile (18%). Overall, 62% of those who entered therapy obtained a sustained virological response (SVR). The response rate for genotype 1 clients was 48%, and for genotype non-type 1, 78%. Response rates calculated for each of the four projects for a subset of clients (operations years 2 and 3) and reported in Table 4.6 reveal wide variation in response rates between projects especially for genotype 1 clients (max 69%,

Table 4.5: End points of antiviral therapy for non- responders and responders.

	Non-responder	Responder****	Total	
	N	N	N	%
Overall				
Adverse event	23	8	31	12.3%
No EVR*	24		24	9.5%
Patient choice**	5	2	7	2.8%
Rx Completed***	44	147	191	75.5%
Total	96	157	253	100.0%
Genotype Type 1				
Adverse event	15	5	20	14.9%
No EVR	24		24	17.9%
Patient choice	2	1	3	2.2%
Rx Completed	29	58	87	64.9%
Total	70	64	134	100.0%
Genotype Non Type 1				
Adverse event	8	3	11	9.2%
No EVR	n/a	n/a	n/a	n/a
Patient choice	3	1	4	3.4%
Rx Completed	15	89	104	87.4%
Total	26	93	119	100.0%

*EVR defined as early virological response to therapy at week 12 (genotype 1 only)

** Patient choice (not due to adverse event)

***Rx completed defined as completion of full course of therapy

**** Responder defined as sustained viral response 6 months post therapy cessation

min 37%) even though the overall response rates are identical to that reported above. As the number of treated clients is small these differences may be related to variation in the population.

Although there was no standardized method for recording cause of death, projects endeavoured to obtain the cause of death and annotate the client's record. Death was recorded for 58/2512 (2%) clients (Table 4.7). Liver disease was the most commonly observed cause of death (33%), followed by unknown causes (26%), heart disease (10%), and suicide (9%). To calculate population reach, the community of origin was recorded in the administrative database for each referral, as well as the number of hepatitis C antibody positive individuals reported in each community in iPHIS. Population reach was therefore calculated as the number of individuals referred divided by the number of reported HCV cases and expressed as a percentage. To simplify analysis, cases whose origins were from metropolitan areas of the province (e.g., Vancouver, Victoria, etc.) that were not serviced by the project sites were excluded from the analysis and cases where the total number of clients referred to the clinic was less than three. A GIS map was produced showing the percentage population reach in the geographic area (Figure 4.1).

Table 4.6: Response to pegylated interferon+ribavirin HCV therapy for clients initiating therapy in operations years 2 and 3*.

		Kamloops		Prince George		Campbell River		Surrey		Grand Total	
		N	%	N	%	N	%	N	%	N	%
Genotype non-Type 1	non responder**	5	17.2%	6	25.0%	10	21.7%	5	21.8%	26	21.8%
	responder	24	82.8%	18	75.0%	36	78.3%	15	78.2%	93	78.2%
	Total	29		24		46		20		119	
Genotype Type 1	non responder	8	30.8%	20	51.3%	27	62.8%	15	52.2%	70	52.2%
	responder	18	69.2%	19	48.7%	16	37.2%	11	47.8%	64	47.8%
	Total	26		39		43		26		134	
Grand Total		55		63		89		46		253	

*Based on year client initiated therapy, not referral year.

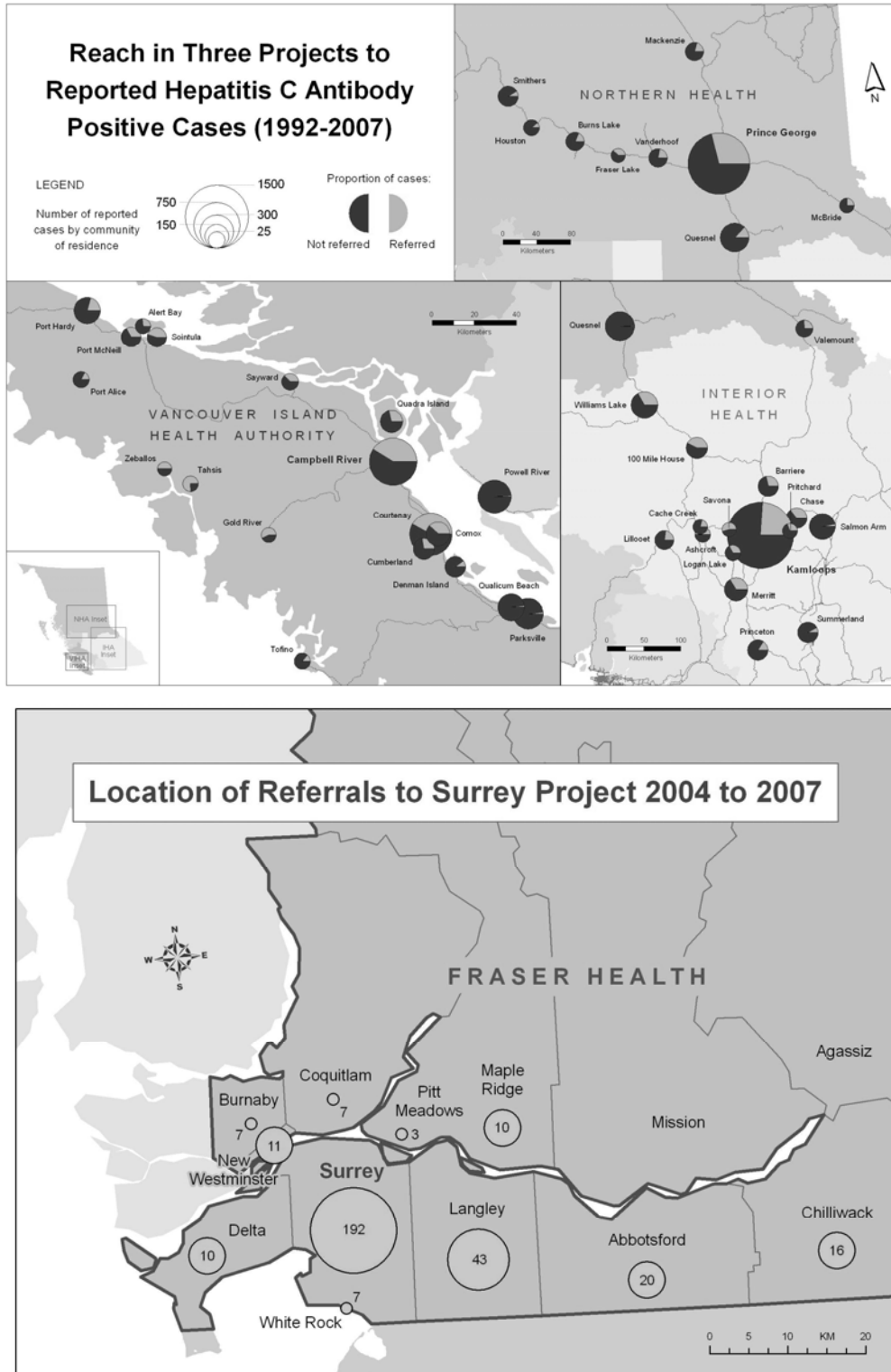
**Non responder category includes dropouts

Table 4.7: Causes of Death

Cause of Death	Kamloops	Prince George	Campbell River	Surrey	Grand Total
accident		2	1		3
drug overdose	1		2		3
heart disease	2		4		6
homicide		1			1
liver disease	8	4	6	1	19
lung disease	2				2
pancreatic disease	1				1
suicide	1	1	3		5
trauma		1	1	1	3
unknown	7	1	5	2	15
Grand Total	22	10	22	4	58

The map shows that three project sites, Kamloops, Prince George and Campbell River have assessed, on average, 25% of all HCV cases reported in their catchment areas from 1992-2007. At these sites, the map demonstrates extensive reach into rural and remote locations, one of the main objectives of the projects. When population reach is calculated by individual communities within a project site's catchment area, there are a few communities that have had over 50% of reported cases referred for assessment. In contrast, the Surrey location reached 2% of all reported cases. However, it must be noted

Figure 4.1: a) Reach in three projects to reported Hepatitis C antibody positive cases (1992-2007). b) “Location of referrals to Surrey project 2004 to 2007.



that the Surrey location focuses on an inner-city special population, and its catchment includes a large geographic area with several metropolitan centres and correctional facilities.

Table 4.8 shows the number and proportion of clients referred from the community in which the project clinics are located. The table shows that Kamloops, Prince George and Campbell River begin their operations with a high proportion of clients that reside in the project clinic community. These proportions decline over time, indicating increasing reach over time to more remote communities, as illustrated in the GIS maps (Figure 4.1). This pattern is reversed in Surrey, where the proportion of clients residing in Surrey increases over time, likely related to their project's goal to focus on inner-city populations.

Table 4.8: Number and proportion of referred clients living in the project site community by year of operations.

	Kamloops		Prince George		Campbell River		Surrey	
	N	%	N	%	N	%	N	%
Referrals from site community								
Year 1	118	(60)	127	(80)	203	(78)	54	(44)
Year 2	83	(61)	71	(83)	155	(76)	36	(51)
Year 3	53	(48)	103	(87)	106	(68)	39	(54)
Year 4	61	(55)	78	(84)	110	(81)	63	(78)
Year 5	62	(59)	64	(70)	79	(72)	-	-
Year 6	50	(56)	-	-	-	-	-	-
<i>Total/Average%</i>	427	(57)	443	(81)	653	(75)	192	(55)

Summary: The administrative data analysis revealed that all four projects were being accessed by the target population, individuals with hepatitis C. The projects had similar patterns of referrals with the greatest number of referrals in the first year of operation suggesting a pent up demand for services. Although the Prince George project had shorter wait times from referral to assessment than Campbell River and Kamloops, all projects had a gap in uptake of services in that 20-28% of those referred did not attend for services. Population reach measures were also similar for three of the four projects, (i.e. Prince George, Campbell River and Kamloops). The geographic catchment and population base for Surrey was much larger than the other projects resulting in a significantly smaller proportion reached. This may reflect a shortcoming of applying this method of calculating population reach in urban regions where special populations are targeted but are also difficult to quantify.

4.3 Survey Results

This section describes the results of the survey that was completed to explore the structure and functioning of the partnerships in each of the four projects. The IHSM, a measure of structure, contained qualitative and quantitative data while the PSAT, a measure of group functioning, contained only quantitative data. Data from the IHSM were analysed to address the third study question: Is there a difference in the structure (number, type of the partners and the extent/depth of their linkages) in each of the four demonstration projects? The PSAT data were analysed to deal with the fourth question: Is there a difference in measures of partnership functioning in each of four demonstration projects? Finally, relationships between the IHSM and PSAT data were examined in response to question five: Is there a relationship among the demonstration projects and the variables structure, function and years of operation?

4.3.1 Survey results for the quantitative data from the IHSM

This section contains the results from the analysis of the quantitative data from the IHSM, a measure of the number and type of partners and the depth or extent of their linkages, as a dependent variable, for the four demonstration projects. Geographic location and years of operation of the projects are independent variables.

The objective of the analysis was to describe: 1) the characteristics (number, type and location) of the partners at each of the four sites, 2) the depth or extent of the linkages between the project nurses and their partners and finally, 3) the depth of the linkages amongst all the partners as a group. The depth of linkages was determined using partner ratings on a scale where no linkage, was indicated by 0=no awareness, and a linkage was indicated on an increasing depth of involvement scale of 1-4, where 1= awareness; 2=communication; 3= cooperation; 4=collaboration.

The survey data analysis and interpretation were guided by three study assumptions: 1) The number and type of partners is context specific; 2) The number and diversity of partners will be larger in demonstration projects that have been in operation for greater lengths of time; 3) Partnerships will extend beyond the geographic referral area served by the demonstration project, and 4) Less difference or greater congruence between the expected minus the observed scores on the IHSM indicates partners achieved what they expected.

1) Characteristics of the partners at each of the four sites

Assumption-based characteristics investigated included the number and type of service providers and the relationship to local context, including the years of operation of the project, and the geographic dispersion of the partners.

Prior to the partner survey, the nurses at each of the four projects provided information on their partners including the number of partners, the service/agency name and their location. The number of partners at each project ranged from 29-68 as summarized in Table 4.9. The three projects operational for >5 years had the greatest number and diversity of partners. The partners represented a broad range of services/

Table 4.9: Identified Partners in each of Four Projects (n= 216)

Partner Category	Partners	Kamloops (n=68)	Prince George (n=51)	Campbell River (n=68)	Surrey (n=29)
A) Health Services	Aboriginal Services	2 (3%)	2 (4%)	5 (7%)	--
	Chronic Disease Service	1 (1%)	--	--	--
	Diagnostic Services	12 (18%)	7 (14%)	10 (15%)	2 (7%)
	HIV Services	--	--	1 (1%)	--
	Home Care	--	--	2 (3%)	--
	Liver Services	3 (4%)	3 (6%)	3 (4%)	1 (3%)
	Mental Health/Addictions	4 (6%)	3 (6%)	17 (25%)	1 (3%)
	Nutritionist	1 (1%)	1 (2%)	1 (1%)	--
	Outpatient Services	--	2 (4%)	1 (1%)	--
	Pharmacists	11 (16%)	8 (16%)	6 (9%)	--
	Physician	6 (9%)	2 (4%)	3 (4%)	8 (28%)
	Registered Nurse	--	--	1 (1%)	--
B) Public Health	Administration	--	--	--	1 (3%)
	BC Hepatitis Services	1 (1%)	1 (2%)	1 (1%)	1 (3%)
	Manager	--	--	1 (1%)	1 (3%)
	Nutritionist	1 (1%)	--	--	--
	Public Health Nurses	3 (4%)	9 (18%)	2 (3%)	4 (14%)
C) Integrated Health Services & Public Health	Campbell River*	1 (1%)	1 (2%)	1 (1%)	1 (3%)
	Kamloops*	1 (1%)	1 (2%)	1 (1%)	1 (3%)
	Prince George*	1 (1%)	1 (2%)	1 (1%)	1 (3%)
	Surrey*	1 (1%)	1 (2%)	1 (1%)	1 (3%)
D) Ancillary Services	AIDS Service Org.	2 (3%)	1 (2%)	3 (4%)	--
	BC Pharmacare	1 (1%)	1 (2%)	1 (1%)	1 (3%)
	Cdn Assn Hepatol Nurses	--	--	1 (1%)	1 (3%)
	Community Action Ptnr	9 (13%)	--	--	--
	Consumer Advocacy	--	2 (4%)	1 (1%)	--
	Corrections	1 (1%)	3 (6%)	--	--
	Financial Support	2 (3%)	2 (4%)	1 (1%)	1 (3%)
	Interpretation Services	--	--	--	1 (3%)
	Nutritional Support	1 (1%)	--	--	--
	Pharmaceutical Rep	3 (4%)	--	2 (3%)	2 (7%)
	Recreation	--	--	1 (1%)	--

* Project nurses

agencies and were classified, in accordance with the type of service they provided, as public health, health services, integrated public health and health services, or ancillary services. Project nurses, who provided both public health and health services, were categorized as integrated health services and public health. Ancillary services included supportive services such as income support, nutritional supplement services, professional organizations and correctional services.

The geographic location of each project site and their partners was displayed on a map of BC using GIS mapping techniques (Figures 4.2 to 4.5). While the majority of partners are located near each project site, several partners are located at some distance

Figure 4.2: Partner Characteristics (Kamloops)

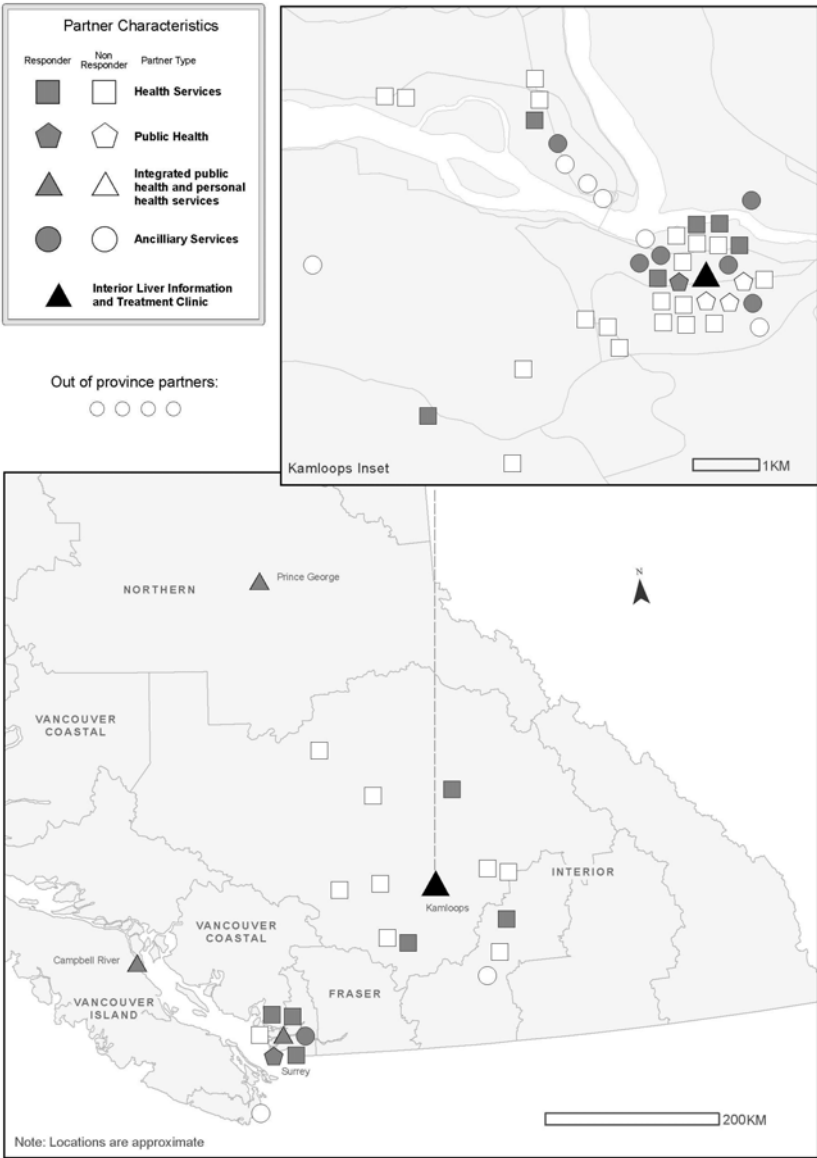


Figure 4.3: Partner Characteristics (Prince George)

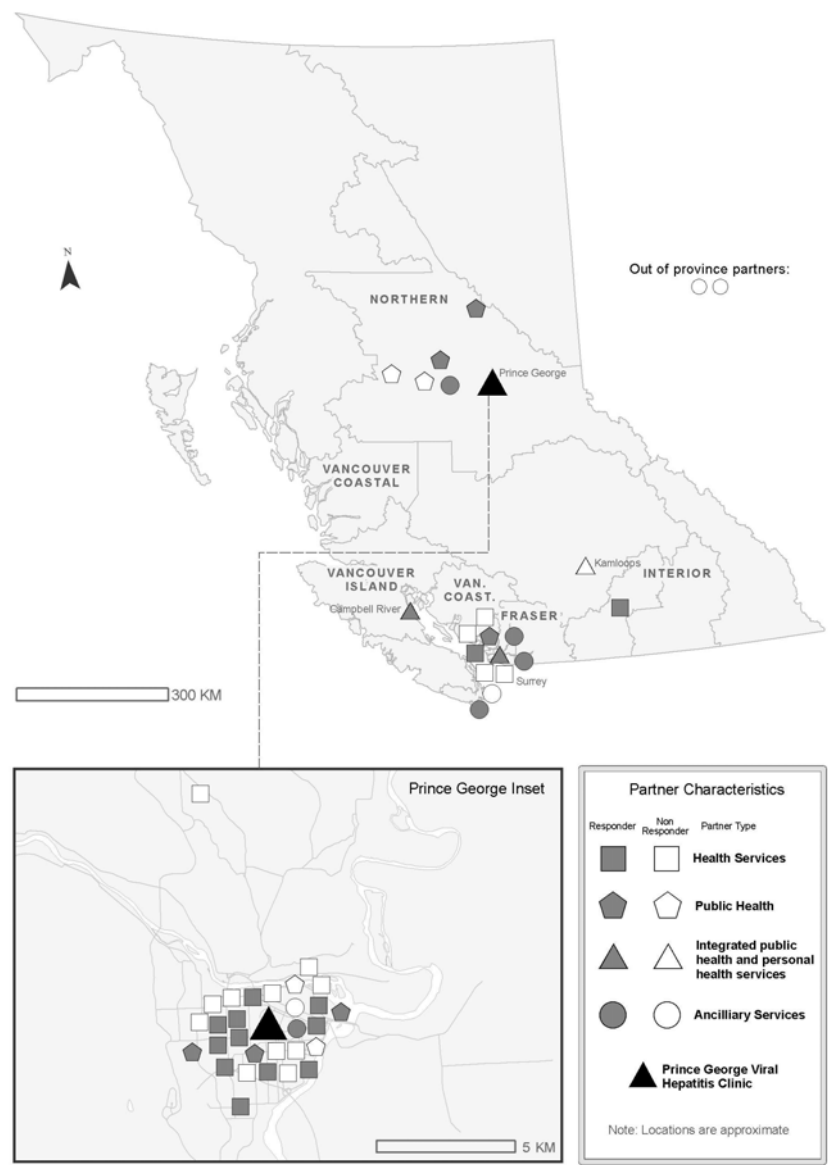


Figure 4.4: Partner Characteristics (Campbell River)

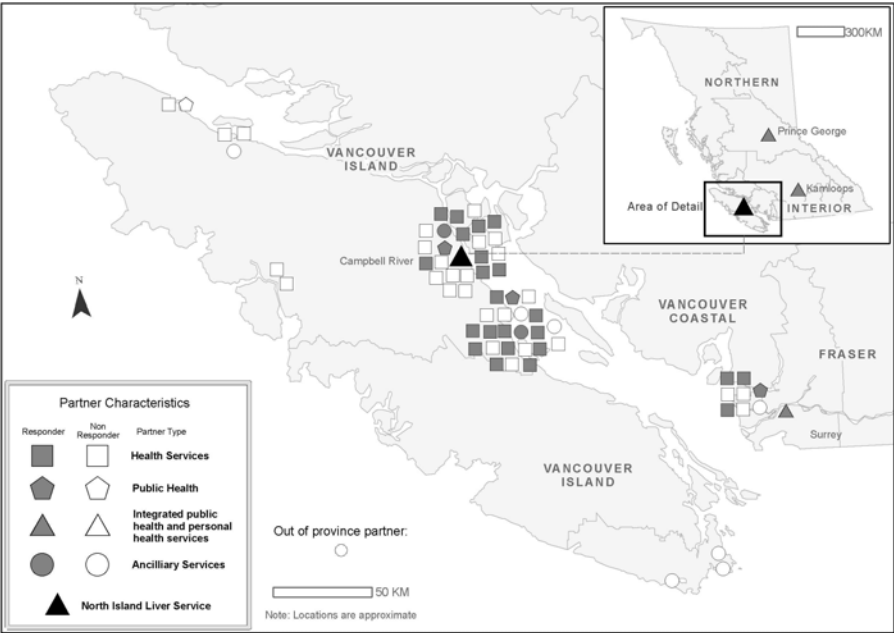
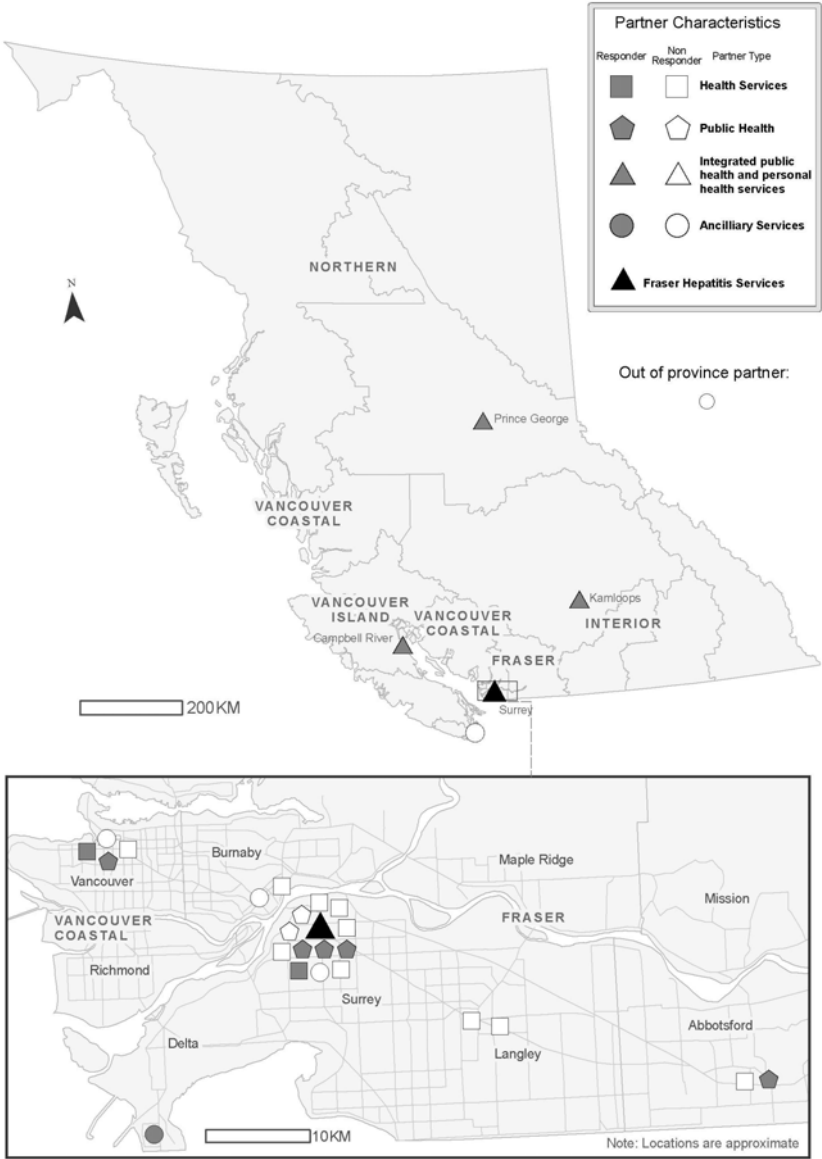


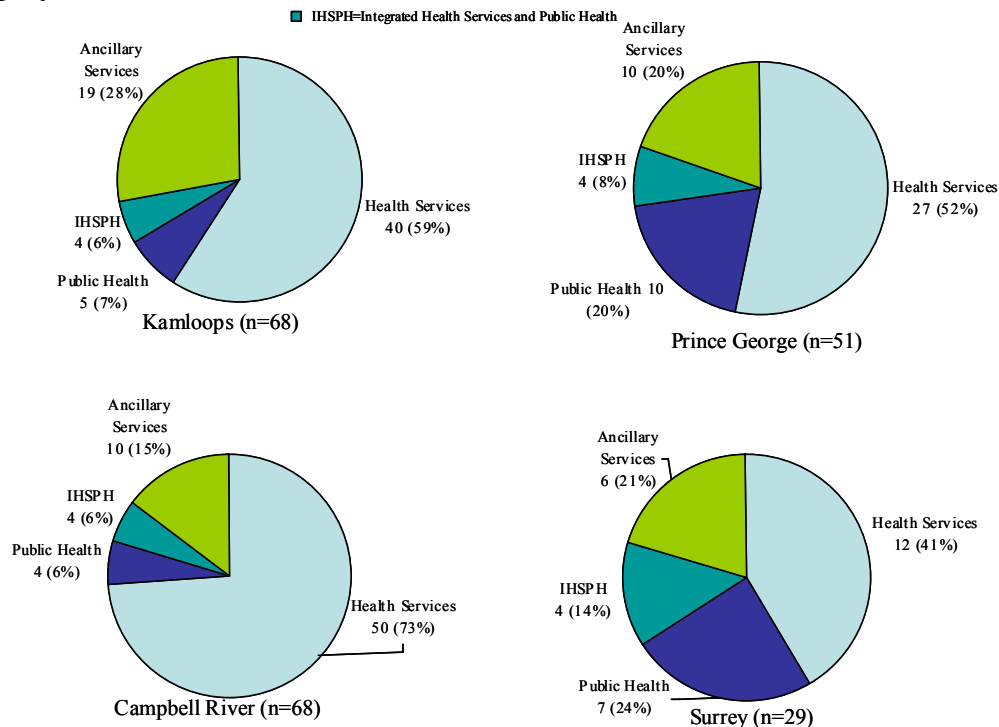
Figure 4.5: Partner Characteristics (Surrey)



from the sites within the particular project's RHA as well as within other RHAs. Partners located beyond each project's RHA were mainly partners in common between the projects including the nurses at the four projects and agencies with provincial or national scope.

The distribution of the 216 partners within the four partner categories is displayed in Figure 4.6. Since the population focus of the clinics was on those already infected with hepatitis C, it was not unexpected that health services comprised the majority of partners (41% to 73%) at each of the four projects. To understand the configurations at each of the projects, Fisher's exact test was used. There were significant differences in the proportion of partners classified as Health Services $p=0.018$ and Public Health $p=0.014$. Pair-wise testing revealed a significantly higher proportion of Public Health partners in Surrey (7/29=24%) than both Kamloops (5/68=7%), $p=0.04$, and Campbell River (4/68=6%) $p=0.02$. Prince George also had a higher proportion of public health partners (10/51=20%) than Campbell River (4/68=6%), $p=0.04$. In contrast, Campbell River had a significantly greater proportion of Health Services partners (50/68=74%) than Surrey (12/29=41%), $p=0.005$. This was the only difference between the projects that remained significant, $p=0.03$ when the results were adjusted for multiple comparisons with the Bonferroni correction.

Figure 4.6 Distribution of Partners in the Demonstration Projects by Partner Category



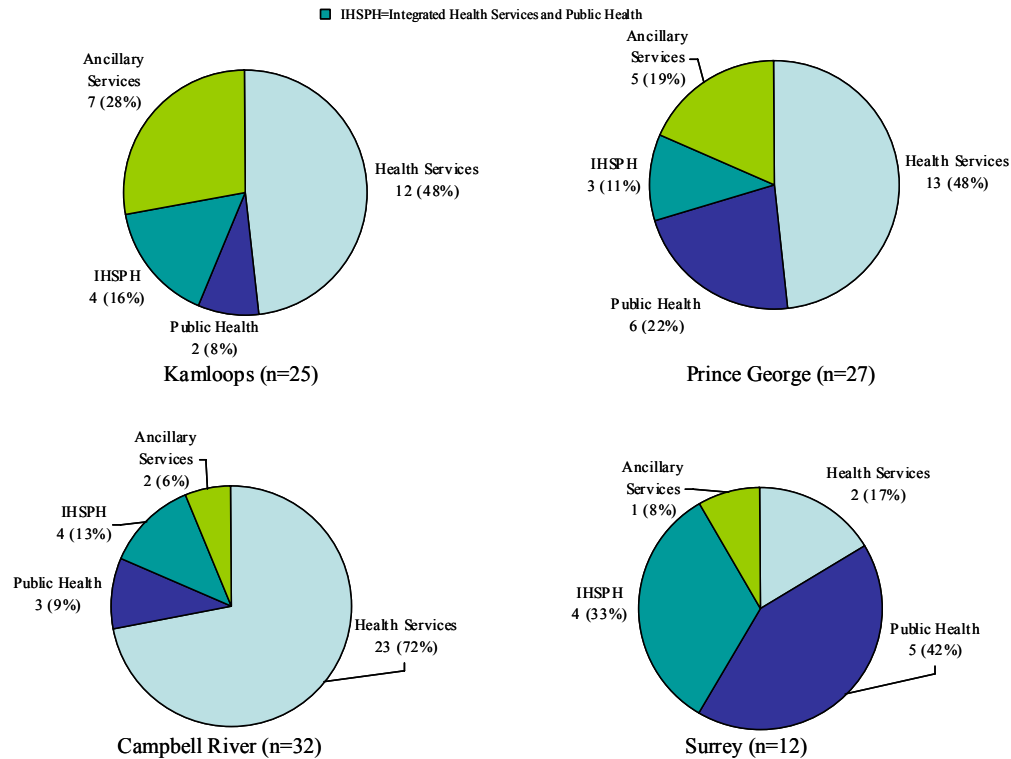
These results indicate that although the number of partners varies, each project has a similar proportion of partners within the four partner categories with one exception. The proportion of health services partners was significantly greater in Campbell River than Surrey. One possible contextual reason for this observed difference is that Surrey's client population, an inner-city vulnerable population, is traditionally focused on by public health leading to more interactions and partnerships with public health staff than with health services staff. Another possible explanation is that Campbell River's program was situated in a hospital and one of the project nurses also worked in diabetes outreach, placing them in more direct contact with health services personnel. In addition, Campbell River had a high proportion of clients with advanced liver disease likely requiring more health services linkages.

On completion of the survey, response rates were calculated for each questionnaire in the survey package and reported separately in the results section. The IHSM had the highest response rate of the two questionnaires. The response rate was (96/216, 44%) and distributed by site as follows: Kamloops (25/68, 37%), Prince George (27/51, 53%), Campbell River (32/68, 47%), and Surrey (12/29, 41%). The proportion of survey respondents compared to the non-respondents in each partner category was examined to see if there were differences in the representation at each of the four projects. The distribution of respondents and non-respondents are displayed in Table 4.10 and Figure 4.7. Each project had 40% or higher response rates in all partner categories, with the following exceptions: health services response rates were 30% in Kamloops and 17% in Surrey and ancillary services response rates were 37% in Kamloops, 20% in Campbell River and 17% in Surrey. Tests for statistical significance were not conducted due to the fact that some partner categories had a small number of members and there were a small number of respondent partners in some sites (e.g., Surrey). Overall, the perspectives of each partner category are represented in all four projects. As expected, the highest participation rates were among the Integrated Health Services and Public Health partners, since this group was comprised of the project nurses.

Table 4.10: Distribution of Respondent and Non-respondent Partners by Project and Partner Category

Partner Category	Health Services			Public Health			Integrated Health Services & Public Health			Ancillary Services		
	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total
Kamloops (N=68)	12 (30%)	28 (70%)	40 (100%)	2 (40%)	3 (60%)	5 (100%)	4 (100%)	0 (0%)	4 (100%)	7 (37%)	12 (63%)	19 (100%)
Prince George (N=51)	13 (46%)	15 (54%)	28 (100%)	6 (60%)	4 (40%)	10 (100%)	3 (75%)	1 (25%)	4 (100%)	5 (56%)	4 (44%)	9 (100%)
Campbell River (N=68)	23 (46%)	27 (54%)	50 (100%)	3 (75%)	1 (25%)	4 (100%)	4 (100%)	0 (0%)	4 (100%)	2 (20%)	8 (80%)	10 (100%)
Surrey (N=29)	2 (17%)	10 (83%)	12 (100%)	5 (71%)	2 (29%)	7 (100%)	4 (100%)	0 (0%)	4 (100%)	1 (17%)	5 (83%)	6 (100%)

Figure 4.7: Distributions of Partners Responding to the IHSM in the Demonstration Projects by Partner Category



2) Analysis of the depth or extent of the linkages between the project nurses and each of their respondent partners

In the conceptual model it was assumed that front-line staff (the project nurses) would instigate partnerships with multiple service providers in order to meet the complex needs of clients/populations. During the historical review it was evident that the project nurses were instrumental in developing interprofessional relationships. It follows then that each partner would, at a minimum, have some level of involvement or linkage with a project nurse. Measurement of individual relationships was not considered a priori in the methods section. However, the IHSM provides a mechanism for each partner to rate their relationship with every other partner so it was possible to isolate these particular ratings and examine the depth of each nurse-partner linkage for all respondents (i.e., how the nurse and the partner rated each other).

Tables 4.11 to 4.14 summarize the project nurse and corresponding respondent partner ratings from each project. The ratings include: 1) observed (i.e., their observed depth of involvement), 2) expected (i.e., what they perceived their depth of involvement should be) and, 3) the difference between the expected minus observed ratings. The nurse's ratings of respondent partners at each of the four projects indicated a level of interaction from '1' to '4' on the IHSM scale for all partners with the exception of three

Table 4.11: Descriptive Statistics for Kamloops Nurse-Partner Ratings

Partner Category	Summary Statistics	Integration Score Summaries					
		Observed		Expected		Exp - Obs	
		Nurse	Partner	Nurse	Partner	Nurse	Partner
Ancillary Services	n	7	7	7	7	7	7
	Mean	0.9	0.9	0.9	1.1	0.0	0.3
	SD	0.7	1.6	0.7	1.5	0.8	0.5
	Median	1.0	0.0	1.0	1.0	0.0	0.0
	Range	(0, 2)	(0, 4)	(0, 2)	(0, 4)	(-1, 1)	(0, 1)
Health Services	n	12	12	12	12	12	12
	Mean	1.3	1.1	2.0	1.8	0.7	0.7
	SD	0.7	1.1	1.1	1.3	1.2	0.8
	Median	1.0	1.0	2.0	1.5	0.0	1.0
	Range	(0, 2)	(0, 3)	(1, 4)	(0, 4)	(0, 3)	(0, 2)
Integrated Health Services & Public Health	n	3	3	3	3	3	3
	Mean	2.0	4.0	2.0	4.0	0.0	0.0
	SD	0.0	0.0	0.0	0.0	0.0	0.0
	Median	2.0	4.0	2.0	4.0	0.0	0.0
	Range	(2, 2)	(4, 4)	(2, 2)	(4, 4)	(0, 0)	(0, 0)
Public Health	n	2	2	2	2	2	2
	Mean	3.5	4.0	3.5	4.0	0.0	0.0
	SD	0.7	0.0	0.7	0.0	0.0	0.0
	Median	3.5	4.0	3.5	4.0	0.0	0.0
	Range	(3, 4)	(4, 4)	(3, 4)	(4, 4)	(0, 0)	(0, 0)
Total	N	24	24	24	24	24	24
	Mean	1.5	1.6	1.8	2.1	0.3	0.5
	SD	0.9	1.7	1.1	1.6	1.0	0.7
	Median	1.0	1.0	2.0	2.0	0.0	0.0
	Range	(0, 4)	(0, 4)	(0, 4)	(0, 4)	(-1, 3)	(0, 2)

Table 4.12: Descriptive Statistics for Prince George Nurse-Partner Ratings

Partner Category	Summary Statistics	Integration Score Summaries					
		Observed		Expected		Exp - Obs	
		Nurse	Partner	Nurse	Partner	Nurse	Partner
Ancillary Services	n	5	5	5	5	5	5
	Mean	1.8	1.8	2.0	2.6	0.2	0.8
	SD	0.8	0.8	0.7	0.9	0.8	0.4
	Median	2.0	2.0	2.0	2.0	0.0	1.0
	Range	(1, 3)	(1, 3)	(1, 3)	(2, 4)	(-1, 1)	(0, 1)
Health Services	n	13	13	13	13	13	13
	Mean	2.5	2.0	2.8	2.8	0.3	0.8
	SD	1.2	1.4	0.9	1.4	1.1	0.8
	Median	3.0	2.0	3.0	3.0	0.0	1.0
	Range	(1, 4)	(0, 4)	(1, 4)	(1, 4)	(-1, 2)	(0, 2)
Integrated Health Services & Public Health	n	2	2	2	2	2	2
	Mean	2.5	3.0	2.0	3.0	-0.5	0.0
	SD	0.7	0.0	1.4	0.0	0.7	0.0
	Median	2.5	3.0	2.0	3.0	-0.5	0.0
	Range	(2, 3)	(3, 3)	(1, 3)	(3, 3)	(-1, 0)	(0, 0)
Public Health	n	6	6	6	6	6	6
	Mean	3.2	2.0	2.8	2.2	-0.4	0.2
	SD	1.2	1.5	1.0	1.5	0.8	0.4
	Median	3.5	2.0	2.5	2.5	-0.5	0.0
	Range	(1, 4)	(0, 4)	(2, 4)	(0, 4)	(-1, 1)	(0, 1)
Total	N	26	26	26	26	26	26
	Mean	2.5	2.0	2.6	2.6	0.1	0.6
	SD	1.1	1.2	0.9	1.2	1.0	0.7
	Median	3.0	2.0	2.5	3.0	0.0	0.0
	Range	(1, 4)	(0, 4)	(1, 4)	(0, 4)	(-1, 2)	(0, 2)

Table 4.13: Descriptive Statistics for Campbell River Nurse-Partner Ratings

Partner Category	Summary Statistics	Integration Score Summaries					
		Observed		Expected		Exp - Obs	
		Nurse	Partner	Nurse	Partner	Nurse	Partner
Ancillary Services	n	2	2	2	2	2	2
	Mean	2.5	2.0	3.0	3.0	0.5	1.0
	SD	0.7	0.0	1.4	0.0	0.7	0.0
	Median	2.5	2.0	3.0	3.0	0.5	1.0
	Range	(2, 3)	(2, 2)	(2, 4)	(3, 3)	(0, 1)	(1, 1)
Health Services	n	23	23	23	23	23	23
	Mean	2.7	2.8	3.5	3.2	0.8	0.4
	SD	0.6	1.3	0.7	1.2	0.5	0.6
	Median	3.0	3.0	4.0	4.0	1.0	0.0
	Range	(2, 4)	(0, 4)	(2, 4)	(0, 4)	(0, 2)	(0, 2)
Integrated Health Services & Public Health	n	3	3	3	3	3	3
	Mean	3.0	2.7	3.0	2.7	0.0	0.0
	SD	0.0	0.6	0.0	0.6	0.0	0.0
	Median	3.0	3.0	3.0	3.0	0.0	0.0
	Range	(3, 3)	(2, 3)	(3, 3)	(2, 3)	(0, 0)	(0, 0)
Public Health	n	3	3	3	3	3	3
	Mean	2.7	3.0	3.3	3.3	0.6	0.3
	SD	1.2	1.0	0.6	1.2	0.6	0.6
	Median	2.0	3.0	3.0	4.0	1.0	0.0
	Range	(2, 4)	(2, 4)	(3, 4)	(2, 4)	(0, 1)	(0, 1)
Total	N	31	31	31	31	31	31
	Mean	2.7	2.8	3.4	3.1	0.7	0.3
	SD	0.6	1.2	0.7	1.1	0.5	0.6
	Median	3.0	3.0	4.0	4.0	1.0	0.0
	Range	(2, 4)	(0, 4)	(2, 4)	(0, 4)	(0, 2)	(0, 2)

Table 4.14: Descriptive Statistics for Surrey Nurse-Partner Ratings

Partner Category	Summary Statistics	Integration Score Summaries					
		Observed		Expected		Exp - Obs	
		Nurse	Partner	Nurse	Partner	Nurse	Partner
Ancillary Services	n	1	1	1	1	1	1
	Mean	3.0	4.0	3.0	4.0	0.0	0.0
	SD	--	--	--	--	--	--
	Median	3.0	4.0	3.0	4.0	0.0	0.0
	Range	(3, 3)	(4, 4)	(3, 3)	(4, 4)	(0, 0)	(0, 0)
Health Services	n	2	2	2	2	2	2
	Mean	3.0	2.5	3.0	3.5	0.0	1.0
	SD	1.4	0.7	1.4	0.7	0.0	0.0
	Median	3.0	2.5	3.0	3.5	0.0	1.0
	Range	(2, 4)	(2, 3)	(2, 4)	(3, 4)	(0, 0)	(1, 1)
Integrated Health Services & Public Health	n	3	3	3	3	3	3
	Mean	2.7	2.7	2.7	2.7	0.0	0.0
	SD	0.6	0.6	0.6	0.6	0.0	0.0
	Median	3.0	3.0	3.0	3.0	0.0	0.0
	Range	(2, 3)	(2, 3)	(2, 3)	(2, 3)	(0, 0)	(0, 0)
Public Health	n	5	5	5	5	5	5
	Mean	3.0	3.6	3.0	3.8	0.0	0.2
	SD	1.0	0.5	1.0	0.4	0.0	0.4
	Median	3.0	4.0	3.0	4.0	0.0	0.0
	Range	(2, 4)	(3, 4)	(2, 4)	(3, 4)	(0, 0)	(0, 1)
Total	N	11	11	11	11	11	11
	Mean	2.9	3.2	2.9	3.5	0.0	0.3
	SD	0.8	0.8	0.8	0.7	0.0	0.5
	Median	3.0	3.0	3.0	4.0	0.0	0.0
	Range	(2, 4)	(2, 4)	(2, 4)	(2, 4)	(0, 0)	(0, 1)

partners in Kamloops who were rated as '0' indicating no interaction. Since the project nurses developed the list, a '0' rating was unexpected. This rating was likely due to staff changes between the time the partner list was developed and completion of the questionnaire. The nurse who completed the questionnaire was new to the group and had not yet developed relationships with all the partners (M.Triggs, personal communication, June 30, 2007).

The corresponding respondent partner ratings of project nurses at each of the four projects showed a similar level of interaction from '1' to '4' on the IHSM scale with the exception of seven partners in Kamloops and two in Campbell River who indicated '0', (i.e., no interaction). These two projects had the greatest number of partners (68 each). Possible explanations for the "no interaction" rating include: the partner was new to the project or the person completing the questionnaire was not the person at the agency familiar with the project. In Kamloops, individual-based clinical and community-based services were separated, each with its own dedicated nursing staff. Although the project nurses submitted a composite partner list it is possible that they each had partners who were unique to their service. Combining the partners as one group may have caused confusion that is reflected in the "0" ratings.

To determine if significant differences existed between the project nurse's ratings and corresponding partner observed and expected ratings, paired t-tests were performed using non parametric procedures with the Wilcoxon Signed Ranked Test. This technique showed no significant difference except for the 'observed' ratings in one project, Prince George, where the median nurse-to-partner 'observed' rating of '3' was 1-point higher than the partner-to-nurse median rating of '2' ($p=0.022$). Overall, these results indicate a high level of agreement between the nurse and partner ratings of their partnership (Table 4.15).

The difference between the observed and expected ratings of the project nurses and their partners was calculated to gain insight into whether there were expectations for change in the relationships. Table 4.16 and Table 4.17 contain the percentage frequencies for all paired data. The differences ranging from zero to a 1-point difference were assumed to indicate that there is no perceived need for change. In contrast, differences greater than 1-point were assumed to mean change was desired. Overall, the project nurses most frequently rated "no change" (0 to 1-point difference) 88% to 100% of the time, while the corresponding project partner rated no change 89% to 100% of the time. This indicates that the depth of nurse-partner involvement is expected to remain stable at the observed, or present, level of involvement.

3) Analysis of the observed and expected ratings of Respondent Partners for all other partners (aggregated to the level of the group).

Having examined the nurse-to-partner ratings, it is important to explore whether and to what extent the partner-to-partner linkages extended beyond the project nurses to include other partners. According to the conceptual model, even though the partners initially interacted with the project nurse, eventually through frequent communication

Table 4.15: Paired t-test for Project Nurse rating vs. Partner's rating

Variables: Nurse to Partner vs Partner to Nurse	Kamloops	Prince George	Campbell River	Surrey
Observed	p=0.537	p=0.022*	p=0.845	p=0.453
Expected	p=0.360	p=0.985	p=0.150	p=0.109

*significant p<0.05

Table 4.16: Project nurses ratings for change in respondent partners involvement

Difference between (EXP & OBS) ratings	Project Site			
	Kamloops	Prince George	Campbell River	Surrey
'0' no change	16 (67%)	12 (46%)	10 (32%)	11 (100%)
1-point change	6 (25%)	11 (42%)	20 (65%)	0 (0%)
2-point change	0 (0%)	3 (12%)	1 (3%)	0 (0%)
3-point change	2 (8%)	0 (0%)	0 (0%)	0 (0%)
Total	24 (100%)	26 (100%)	31 (100%)	11 (100%)

Table 4.17: Respondent partners ratings for change in project nurses involvement

Difference between (EXP & OBS) ratings	Project Site			
	Kamloops	Prince George	Campbell River	Surrey
'0' no change	15 (63%)	14 (54%)	21 (68%)	8 (73%)
1-point change	7 (29%)	9 (35%)	9 (29%)	3 (27%)
2-point change	2 (8%)	3 (12%)	1 (3%)	0 (0%)
3-point change	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	24 (100%)	26 (100%)	31 (100%)	11 (100%)

and feedback loops the various partners would become interconnected thus forming a virtual group. As the project nurses and partners did not have a formal mechanism for meeting as a composite group, it was important to confirm if inter-partner relationships existed and to examine the depth of involvement. Measurement of the depth of inter-partner involvement was the primary target of the planned analysis of IHSM data.

The data were examined from two rating perspectives called “self” and “group”. “Self” ratings included the sum of all ratings given by a respondent partner for all listed partners. “Group” ratings included the sum of all ratings provided for each partner, whether or not they were a respondent partner. These ratings were expressed as averages (means).

To understand how each partner viewed their linkages (i.e., the depth of their involvement with every other partner), mean ‘self’ ratings were calculated for each partner (i.e., the sum of the ratings given by the particular partner for all other partners divided by the total number of partners). To elucidate the perceived depth of involvement ascribed to a partner by all other partners, mean ‘group’ ratings for each partner were calculated (i.e., the sum of the ratings given by the other partners for the respective

partner divided by the total number of partners). To simplify presentation of the data, mean scores were calculated for ‘self’ and ‘group’ ratings within each of the four partner categories in order to display a category score and a composite score (grand total). The mean, standard deviation, and median for the depth of self and group observed and expected linkages at each of the four projects within the preceding categories are displayed in Table 4.18 ‘self’ and Table 4.19 ‘group’. The category means for the depth of observed linkages range from < 1 to 2.0 ‘self’ and ‘group’ < 1 to 2.4 and the means for expected linkages range from 1.1 to 3.5 ‘self’ and <1 to 2.7 ‘group’. Overall, the partner groups at each of the four projects rated ‘expected’ higher than ‘observed’ indicating an expectation to increase the depth of their linkages within the composite group as well as within each of the four partner categories. Table 4.18 and Table 4.19 contain a summary of the differences between the mean observed and expected scores for each of the four partner categories. The display shows Campbell River and Kamloops with the most congruence or least difference (0.4) between the total mean observed and expected ratings indicating little expectation for change.

The mean differences between the projects were compared using ANOVA to determine if differences were statistically significant. The results summarized in Table 4.20 reveal significant differences on all but one of the partner rating variables (i.e., the mean difference between projects on ‘self’ expected minus observed ratings). To determine the source of significant variance, Bonferroni post-hoc comparisons were calculated for the four projects on all statistically-significant variables revealing the following:

Observed self ratings for both Surrey (M= 1.5, SD .63) and Campbell River (M= 1.3, SD.63) were significantly higher, $p = .01$ and $.043$ respectively, than for Kamloops (M= .91, SD.39). Expected self ratings for Surrey (M=2.13, SD .7) were significantly higher ($p=.003$) than for Kamloops (M=1.28, SD .56).

Observed group ratings for both Surrey (M= 1.5, SD .78) and Campbell River (M= 1.3, SD .48) were significantly higher $p < .001$ (for both) than Kamloops (M= .90, SD.41). Surrey ratings were also significantly higher ($p < .001$) than those for Prince George (M= 1.08, SD .29). The expected group rating for Surrey (M= 2.14, SD .62), Campbell River, (M= 1.65, SD .51), and Prince George (M= 1.58, SD .4), was significantly higher $p = < .001$, $< .001$, and $.005$ respectively, than for Kamloops, (M= 1.28, SD .47). Surrey ratings were also significantly higher, than those for Campbell River ($p = < .001$) and Prince George ($p = < .001$).

Mean difference between the observed and expected group ratings for Surrey (M= .62, SD .25) were significantly higher than for Campbell River (M= .35, SD .17, $p = < .001$), Kamloops (M= .37, SD .18, $p = < .001$) and Prince George (M= .49, SD .18, $p = .023$), while ratings for Prince George were significantly higher than Campbell River ($p = .0002$) or Kamloops ($p = .003$).

Table 4.18: Self Observed and Expected Descriptive Statistics for Respondents at Each Project by Partner Category.

Project		Partner Category														
		Ancillary Services			Health Services			Integrated Health Services & Public Health			Public Health			Total		
		Obs	Exp	Diff	Obs	Exp	Diff	Obs	Exp	Diff	Obs	Exp	Diff	Obs	Exp	Diff
Kamloops	n	7	7	7	12	12	12	4	4	4	2	2	2	25	25	25
	Mean	0.6	1.2	0.6	0.7	1.1	0.4	1.2	1.3	0.1	1.6	2.5	0.9	0.8	1.3	0.5
	SD	0.3	0.6	0.6	0.4	0.5	0.4	0.2	0.3	0.2	0.3	0.6	0.2	0.4	0.6	0.4
	Median	0.7	1.0	0.3	0.7	1.1	0.3	1.1	1.2	0.0	1.6	2.5	0.9	0.8	1.2	0.3
Prince George	n	5	5	5	13	13	13	3	3	3	6	6	6	27	27	27
	Mean	0.9	2.0	1.1	1.0	1.5	0.5	1.3	1.4	0.1	1.2	1.6	0.4	1.1	1.6	0.5
	SD	0.3	0.5	0.3	0.4	0.7	0.5	1.1	1.0	0.1	0.5	0.7	0.4	0.5	0.7	0.5
	Median	0.9	2.2	1.0	1.0	1.5	0.4	0.7	0.9	0.2	1.1	1.5	0.3	1.0	1.5	0.4
Campbell River	n	2	2	2	23	23	23	4	4	4	3	3	3	32	32	32
	Mean	1.2	1.9	0.7	1.6	2.0	0.4	1.2	1.3	0.1	1.7	2.1	0.4	1.5	1.9	0.4
	SD	0.2	0.3	0.2	0.8	0.8	0.4	1.0	1.4	0.4	1.1	1.2	0.4	0.8	0.9	0.4
	Median	1.2	1.9	0.7	1.8	2.1	0.3	0.8	0.6	0.0	1.2	1.6	0.5	1.3	2.0	0.3
Surrey	n	1	1	1	2	2	2	4	4	4	5	5	5	12	12	12
	Mean	1.2	3.5	2.3	1.3	2.1	0.8	2.0	2.2	0.1	2.0	2.6	0.6	1.8	2.4	0.6
	SD	--	--	--	1.0	1.0	0.0	0.6	0.6	0.2	0.7	0.5	0.4	0.7	0.7	0.7
	Median	1.2	3.5	2.3	1.3	2.1	0.8	1.9	2.1	0.0	1.7	2.4	0.8	1.7	2.4	0.6

Table 4.19: Group Observed and Expected Descriptive Statistics for Respondents at Each Project by Partner Category.

Project		Partner Category														
		Ancillary Services			Health Services			Integrated Health Services & Public Health			Public Health			Total		
		Obs	Exp	Diff	Obs	Exp	Diff	Obs	Exp	Diff	Obs	Exp	Diff	Obs	Exp	Diff
Kamloops	n	7	7	7	12	12	12	4	4	4	2	2	2	25	25	25
	Mean	0.6	1.0	0.4	0.7	1.2	0.5	1.1	1.5	0.4	2.0	2.4	0.4	0.8	1.3	0.4
	SD	0.3	0.4	0.2	0.3	0.3	0.2	0.4	0.4	0.1	0.2	0.2	0.0	0.5	0.5	0.2
	Median	0.6	0.9	0.3	0.6	1.2	0.5	0.9	1.3	0.4	2.0	2.4	0.4	0.7	1.2	0.4
Prince George	n	5	5	5	13	13	13	3	3	3	6	6	6	27	27	27
	Mean	1.0	1.6	0.6	1.0	1.6	0.6	1.3	1.6	0.4	1.2	1.8	0.6	1.1	1.6	0.5
	SD	0.2	0.4	0.3	0.3	0.3	0.2	0.7	0.9	0.2	0.2	0.3	0.2	0.3	0.4	0.2
	Median	1.0	1.5	0.6	1.0	1.6	0.5	0.9	1.2	0.3	1.1	1.8	0.6	1.0	1.6	0.6
Campbell River	n	2	2	2	23	23	23	4	4	4	3	3	3	32	32	32
	Mean	1.6	2.0	0.4	1.5	1.9	0.4	1.4	1.7	0.3	1.7	2.0	0.3	1.5	1.9	0.4
	SD	0.3	0.3	0.0	0.5	0.5	0.1	0.9	0.9	0.1	0.3	0.2	0.1	0.5	0.5	0.1
	Median	1.6	2.0	0.4	1.8	2.1	0.4	1.0	1.3	0.3	1.7	2.0	0.3	1.7	2.1	0.4
Surrey	n	1	1	1	2	2	2	4	4	4	5	5	5	12	12	12
	Mean	2.4	2.7	0.4	1.4	2.0	0.6	2.1	2.6	0.5	1.7	2.4	0.8	1.8	2.4	0.6
	SD	--	--	--	1.2	1.0	0.2	0.7	0.6	0.2	0.9	0.7	0.3	0.8	0.6	0.3
	Median	2.4	2.7	0.4	1.4	2.0	0.6	1.8	2.4	0.5	1.2	2.3	0.7	1.7	2.3	0.6

Table 4.20: Comparison of total mean self and group ratings at four projects

ANOVA results for ‘Self’ Ratings (3 degrees of freedom, n= 92, α = .05)		
Rating	F	p
Observed	4.51	.005
Expected	4.48	.006
Difference observed-expected	1.56	.205
ANOVA results for ‘Group’ Ratings (3 degrees of freedom, n= 212, α = .05)		
Observed	14.46	<.001
Expected	22.01	<.001
Difference observed-expected	18.58	<.001

The analysis reveals that Surrey, the youngest project, operational for four years, had partner ratings of involvement that were consistently higher than those of Kamloops, the oldest project operational for six years, on all ‘self’ and ‘group’ ratings. There were no differences on Surrey ‘self’ ratings compared to Prince George and Campbell River. However, Surrey ‘group’ ratings for observed or current involvement were significantly higher than those for Prince George while ‘group’ expected and the difference between ‘group’ expected minus observed ratings were higher than those of Campbell River and Prince George.

Kamloops, had consistently lower depth of involvement scores compared to the other projects and the least expectation for change (i.e., increased partner involvement). The two projects operational for 5 years, Campbell River and Prince George, had intermediate results. Similar to Surrey, Campbell River partners indicated greater partner involvement and an expectation for change on expected minus observed scores compared to Kamloops. However, the differences between expected minus observed ratings indicated a much greater expectation for change in Surrey than Campbell River. In contrast, Prince George results were similar to Surrey in that the difference between observed and expected ratings indicated an expectation for change or greater involvement compared to Kamloops and Campbell River.

Overall these results point to the greatest partner expectations for change or increased involvement are in Surrey, followed by Campbell River and Prince George. Kamloops project partners indicate little expectation for change in their depth of involvement. The Surrey results (higher ratings and expectations for change) may be related to the younger age of the Surrey project and a need for partners who focus on vulnerable inner city populations to work more closely together.

As the above results included self and group ratings for partners whether or not they responded to the survey, it was necessary to examine whether there was any consistency in the ratings given for respondents vs. non-respondents. Paired t-tests were run for each

of the four projects to determine if there was a difference in the mean self rating scores provided for partners who responded to the survey (responder group) and those who did not respond (non responder group). Analysis included the mean differences for observed, expected and the differences between expected minus observed ratings. Partners did not know if a particular listed partner responded to the survey and were therefore blinded to the respondent status. The results summarized in Table 4.21 indicate that mean self ratings for responders were significantly higher than scores for non-responders for both ‘observed’ and ‘expected’ ratings in Surrey ($p=.01$, $.007$) and Campbell River ($p<.001$, $.001$) but not in Kamloops or Prince George. The differences between observed minus expected self ratings was significantly higher for responders vs. non-responders only for Prince George ($p=.04$) and Kamloops ($p=.02$). The t-test results comparing differences in the mean group ratings of respondents vs. non-respondents are summarized in (Table 4.22) and show a reversed effect. The Campbell River non-respondent mean scores were

Table 4.21: Differences on Self Ratings for Respondents vs. Non Respondents

	Observed Differences				Expected Differences				Difference of expected - observed			
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Surrey (n= 12)	.52	.58	3.11	.01*	.5	.53	3.29	.007*	-.01	.26	-.18	.86
CR (n= 32)	.44	.53	4.68	<.001*	.46	.49	5.28	<.001*	.02	.17	.58	.57
Kamloops (n= 25)	-.11	.36	-1.5	.15	-.02	.4	-.19	.85	.09	.19	2.45	.02*
PG (n= 27)	.03	.26	-.54	.59	.08	.33	1.24	.23	.11	.25	2.22	.04*

* $p<.05$

Table 4.22: Differences on Group Ratings for Respondents vs. Non Respondents

	Observed Differences				Expected Differences				Difference of expected - observed			
	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Surrey (n= 29)	-.52	.75	-1.83	.78	-.5	.58	-2.3	.03*	.02	.25	.15	.89
CR (n= 68)	-.44	.43	-4.18	<.001*	-.46	.45	-4.16	<.001*	-.02	.17	-.43	.67
Kamloops (n= 68)	.11	.41	1.05	.3	.02	.47	.13	.897	-.09	.17	-2.12	.04*
PG (n= 51)	.03	.30	.33	.74	-.08	.4	-.7	.485	-.11	.18	-2.14	.04*

* $p<.05$

significantly higher than respondent mean scores for both observed ($p < .001$) and expected ($p < .001$) ratings. Surrey non-respondent mean scores were significantly higher than respondent mean scores only for expected ratings. Kamloops and Prince George ratings were statistically significant only for the mean difference between expected minus observed ratings, which were significantly higher for non-respondents $p = .04$ and $p = .04$, respectively.

The t-test results were equivocal. On self measures, (i.e., how respondent partners rated their relationship with other all partners), partner responders in Surrey and Campbell River rated a greater current and expected depth of involvement with other partner responders than with non-responder partners. Although on the preceding measures the relationship did not hold for Prince George and Kamloops, the difference between expected minus observed involvement was higher for responders than non-responders. However, on group measures, (i.e., how a particular partner was rated by all other respondent partners), the opposite relationship (non-responder involvement greater than responder) was observed for Campbell River on both observed and expected measures and only on expected measures for Surrey. This reversal was also evident for Prince George and Kamloops, in that the difference between expected minus observed involvement was higher for non-responders than responders.

In summary, the results of the analysis of the IHSM data indicate that each project has a similar structure with partners represented in each of the four partner categories albeit in slightly different proportions. There are differences in the number of partners and the depth of partner involvement at each of the four projects. The greatest partner expectations for change or increased involvement are in Surrey, followed by Campbell River and Prince George. Kamloops project partners indicate little expectation for change in their depth of involvement.

4.3.2 Survey results of the thematic analysis of the IHSM

There were 81/96 responses to the questions ‘what helps you when collaborating with other agencies? Why?’ and ‘what hinders you from collaborating with other agencies? Why?’ The analysis revealed that for the most part the responses to ‘what enhances collaboration’ had a matching negative corollary within the ‘what hinders collaboration’ responses. For example, sharing client information was an enhancing factor while refusing to share client information was a hindering factor.

Three major thematic categories emerged during the analysis: awareness or willingness to collaborate, interdependency and relationship building. Agreement or willingness to collaborate stressed that this was a necessary if not determining feature for partners to be able to work together. Interdependency was facilitated through common organizational and professional values and a culture that supports permeable boundaries between agencies. Permeable boundaries were considered crucial to facilitate access to the desired professionals, sharing of information and client management. Building and maintaining collegial relationships was associated with the use of various methods to create and sustain communication, having adequate resources such as time to dedicate to learning about other partners and their services and fostering these linkages, leadership

by front-line staff, and support from management. These themes are consistent with the conceptual model for front-line interprofessional partnerships presented in Chapter 2.

4.3.3 Survey results from the PSAT

The section contains the analyses of the PSAT, a measure of partnership functioning at the level of the group, as a dependent variable, for the four demonstration projects (partnership survey). Partnership functioning in this case relates to how well each partner interacts with every other partner as a group. Of the 96 survey packages returned, 82 contained completed PSAT questionnaires resulting in an $82/216 = 41\%$ response rate. All available data in the 82 questionnaires were included in the analysis. It is interesting that $82/96 = 85\%$ of respondent partners (who were in an informal relationship and had never met as a composite group) conceptualized themselves functioning as a group as evidenced by completion of the PSAT and hypothesized in this study's conceptual model presented in chapter 2.

Results (Table 4.23) describe each project's ratings on fifty PSAT items, measured on a 5-point Likert scale, summarized by domain including: mean ratings, standard deviation, number eligible for analysis, and number of scale items. Overall, the mean ratings ranged from 2.9 to 4.2 out of 5, the moderate and higher ranges of the scale. The range of mean ratings varied between the projects as follows: Kamloops 3.0-4.2, Prince George 2.9-3.8, Campbell River 3.0-4.2 and Surrey 2.9 to 4.2. To determine if the variation was statistically significant between-site, comparisons of mean ratings on each domain were completed using ANOVA (parametric) and Kruskal-Wallis tests (non-parametric). These analyses revealed no significant differences between sites.

Table 4.23: Descriptive Statistics of PSAT Likert Scale Domains for Each Project

Likert Scale Domains	Scale Items (N)	Eligible for Analysis (N)	Kamloops			Prince George			Campbell River			Surrey		
			n	M	SD	n	M	SD	n	M	SD	n	M	SD
Synergy	9	81	21	3.3	0.7	22	3.2	0.7	27	3.3	0.7	11	3.3	0.8
Leadership	11	78	21	3.2	0.9	20	3.3	1.1	26	3.2	1.0	11	3.3	1.1
Efficiency	3	66	17	3.5	0.9	17	3.2	0.9	23	3.1	0.9	9	3.9	1.0
Effectiveness	9	70	19	3.0	0.9	18	2.9	0.9	22	3.0	0.9	11	2.9	1.2
Sufficiency Non-Financial	6	75	20	3.5	0.4	20	3.2	0.5	25	3.4	0.5	10	3.2	0.7
Sufficiency Financial	3	70	20	3.2	0.9	18	3.2	0.8	22	3.1	0.9	10	3.1	1.1
Decision Making	3	76	20	3.7	0.8	20	3.5	0.8	25	3.8	0.7	11	3.5	0.9
Compare Benefits & Drawbacks	1	81	22	4.2	0.7	22	3.8	1.1	26	4.2	0.7	11	4.2	0.9
Satisfaction	5	81	21	3.7	0.8	22	3.2	1.1	27	3.7	0.8	11	3.5	1.1

Table 4.24 summarizes the percentage “yes” responses for the two PSAT dichotomous domains containing 17 items about benefits and drawbacks of the partnership. Test for differences of two independent proportions revealed significant differences in the between Campbell River and Prince George ($p < 0.01$, CI: [-0.24, -0.05]) with Campbell River responses being highly positive compared to Prince George.

Table 4.24: Descriptive Statistics for PSAT Dichotomous Domains for each Project

Dichotomous Domains (Y/N)	Scale Items (N)	Eligible for Analysis (N)	Kamloops		Prince George		Campbell River		Surrey	
			n	%	n	%	n	%	n	%
Benefits	11	82	22	72.73%	22	66.94%*	27	81.48%*	11	76.86%
Drawbacks	6	81	22	30.30%	22	34.85%	26	26.28%	11	22.73%

Overall, the analyses of the PSAT data from the respondent partners support the assumption that the partners functioned as a group. Group functioning scores on the synergy and related domains of the PSAT ranged from moderate to moderately high. Between project comparisons indicated the projects had similar levels of group functioning.

4.3.4 Correlation of the IHSM and the PSAT

Comparison of the IHSM and PSAT scores was necessary to explore the assumption that higher scores on the IHSM will have a positive correlation to higher scores on the PSAT particularly within the synergy domain. The analysis focused on the correlation between the partner self ratings of the depth of their involvement with other partners on the IHSM and partnership functioning as measured by nine domains (synergy and associated domains) of the PSAT using Spearman’s correlation coefficient (r_s).

The results indicate significant positive correlations for Campbell River and Surrey on several domains. For Campbell River, significant moderate positive correlations (0.4-0.7) between the depth of observed linkages and Synergy $r_s(27) = .41$, $p = .03$; Effectiveness $r_s(22) = .44$, $p = .04$; Decision Making $r_s(25) = .42$, $p = .04$ and Satisfaction $r_s(27) = .57$, $p = .002$. For Surrey, significant moderate (0.4-0.7) to high (>0.7) positive correlations were found for the following PSAT domains: Leadership $r_s(11) = .81$, $p = .002$; Effectiveness $r_s(11) = .77$, $p = .006$; Decision Making $r_s(11) = .60$, $p = .05$ and Benefits $r_s(11) = .72$, $p = .01$.

Positive correlations on several of the PSAT domains were observed in the two projects that had the highest mean scores on the IHSM (i.e., Campbell River and Surrey). Campbell River positive correlations included synergy and three associated domains while Surrey had positive correlations with four synergy associated domains. The high levels of correlation between the two measures indicate that the instruments are likely

measuring conceptually related facets of partnership. For example, in Surrey, high scores on the Leadership and Effectiveness domains about quality of functioning correlated with high scores with IHSM depth of collaboration scores. This denotes a relationship between the facets of partnership measured in those domains and the concepts of cooperation and collaboration used to indicate stronger depth of involvement on the IHSM. These results provide support for the assumption that higher scores on the IHSM will have a positive correlation to higher scores on the PSAT.

4.4 Results Summary and Interpretation

This section brings together the qualitative and quantitative study data. It addresses the study purpose and final study question by describing the relationship among the demonstration projects and the variables structure, function, years of operation and population reach? Relationships are identified through a review of the commonalities and differences described in the preceding results sections and explanations are provided.

Table 4.25 provides a summary of indicators and results obtained through the historical review, administrative data analysis and partner survey of the four integrated prevention and care demonstration projects. The projects were initiated within the context of a supportive environment that included partnerships at the Provincial (BCHS) and local (public health decision-makers and interested local physicians) level. The projects were developed consecutively in areas with moderate to high hepatitis C rates in BC between 2001 and 2004. Kamloops, the first project, established the nurse-led collaborative practice model of service provision. It was replicated with only minor variations in three other jurisdictions. The projects have similar goals and services, including individual-based clinical and group-based community development/education services. The project nurses, recruited from public health units, expanded their scope of practice beyond the traditional public health focus on prevention and community development. The expanded practice role included leadership in service provision (e.g., assessment, monitoring and managing complex anti-viral therapy, and partnership development). The nurses augment services in response to client needs through partnerships with autonomous health and support agencies or professionals. In Kamloops, different nurses are assigned to clinical and community services while the three other projects do not separate the roles.

The three projects operational for more than five years, Kamloops, Prince George and Campbell River, concentrate their reach efforts on circumscribed areas within their larger RHA. These projects have reached 25% of those diagnosed with hepatitis C in their catchment area. Over the years, their reach has increasingly extended beyond their project sites' urban centres to more rural and remote areas. In contrast, Surrey, the youngest project, operational for 4 years, considers the entire RHA their catchment area but also concentrates on inner city populations. This project has reached about 2% of the diagnosed population due partly to the larger catchment area and because it takes longer for health and social care professionals throughout a large RHA to become aware of

Table 4.25: Summary of indicators and results

Source or Measure	Indicator	Kamloops	Prince George	Campbell River	Surrey
Historical Review					
Document review	Hepatitis C Rate	High	High	High	Moderate
	Target Populations/Area	Kamloops Area	Prince George Area	Northern Vancouver Is.	Inner city populations
	Nursing Resources (FTE/each)	3 PHN (.3)	2 PHN(.4)	1 PHN & 1 HSN(.4)	2 PHN(.4)
	Nurse Assignment: Clinical & Community Services	Separate	Combined	Combined	Combined
Administrative Data					
Admin Database	Completed Operations Yrs/Start Yr	↑6 (2001)	5 (2002)	5 (2002)	↓4 (2004)
	Avg # New Referrals/yr	125	109	↑173	↓87
	Proportion of Referred Clients who Attended the Clinic	74%	↓72%	↑80%	74%
	Clients Receiving Education/Support	69%	↓68%	↑74%	69%
	Clients Receiving Antiviral Therapy (tx initiated)	31%	↑32%	↓26%	31%
	Therapy Outcomes: SVR Rate (genotypes combined)	↑76%	59%	58%	↓57%
Admin Dbase & iPHIS	Population Reach in Catchment Area (referrals/cases)	↑25%	↑25%	↑25%	↓2%
GIS maps	Most Partners w/in High Density Referral Area	Yes	Yes	Yes (2 areas)	Yes
Partner Survey					
IHSM	Total # of Partners	↑68	51	↑68	↓29
	Health Services Partners (% of all partners)	59%	52%	↑73%*	↓41%*
	Nurse Mean Rating of Partners (Observed)	↓1.5	2.5*	2.7	↑2.9
	Partner Mean Rating of Nurse (Observed)	↓1.6	2.0*	2.8	↑3.2
	Nurse Mean Rating of Partners (Expected)	↓1.8	2.6	↑3.4	2.9
	Partners Mean Rating of Nurse (Expected)	↓2.1	2.6	3.1	↑3.5
	Self Observed (mean)	↓0.8*	1.1	1.5*	↑1.8*
	Self Expected (mean)	↓1.3*	1.6	1.9	↑2.4*
PSAT	Synergy Domain (mean)	↑3.3	↓3.2	↑3.3	↑3.3
	% Reporting Benefits from Partnership	73%	↓67%	↑81%	77%

↑ = highest of four projects, ↓=lowest of four projects; * denotes statistically significant

their services. Surrey's reach to inner city populations is evidenced through the increasingly larger proportion of clients from the project's larger urban centre, Surrey.

Among the projects, 20-28% of clients referred did not attend for services within 12 months of the referral date. The Campbell River project had the highest referral and clinic attendance rates and the lowest percentage rate for provision for anti-viral therapy. Variation in anti-viral therapy success rates (57 to 76%) among the projects were likely due to different genotype case proportions. For example, where larger proportions of clients with genotype type 1 are treated compared to genotype non-type 1 the overall response rates will be lower.

All projects had partners representing health services, public health and ancillary services. However, Surrey, the youngest project, had approximately half as many partners as the other projects and significantly fewer health services partners than Campbell River. Mapping of project partner and referred client locations revealed that the majority were located in the urban centre in which the clinic was located with the exception of Campbell River which had a second cluster of clients and partners in a nearby urban centre.

Paired nurse-partner ratings consistently indicated the greatest depth of nurse-partner involvement occurred in Surrey, the youngest project, and lowest in Kamloops, the oldest project. Paired nurse-partner ratings for the expected depth of involvement were also lowest for Kamloops but highest for both Surrey and Campbell River. When depth of involvement among all the partners was considered, Kamloops again exhibited the lowest ratings and Surrey the highest. Separation of the clinical and community development services in Kamloops may partially explain why their partners were weakly-involved with each other, and therefore had the lowest depth of involvement in comparison to the other projects. Alternately, Kamloops as the most mature project, may have reached a stage in which the partners no longer expect to change their depth of involvement from the current state. This may mean that depth of involvement decreases over time, an idea which merits additional investigation.

In regard to how well the partners functioned as a group, partners at each project provided similar ratings (3.2 to 3.3) on the PSAT synergy scale, indicating moderate levels of group collaboration. There were differences in the ratings for partnership benefits. Prince George partners reported the least percentage benefit (67%) from the partnership and Campbell River the most (81%). However, all projects reported greater benefits than drawbacks. The two projects with the greatest depth of partner involvement, Surrey and Campbell River, evidenced significant positive relationships between high levels of partner involvement and group synergy or factors related to group synergy.

Integration of the themes in the contextual and numeric data reveal that the four projects provide similar services through front-line nurse leadership and multiple partnerships with autonomous agencies/professionals. Striking similarities were observed among the projects in terms of the clients reached, the types of partners and the quality of partnership functioning. The projects varied in the number of partners and the depth of partner involvement. The youngest project had the fewest partners and the greatest depth

of involvement while the oldest project showed the opposite pattern. Where differences have been observed contextual explanations were offered. Even though the results revealed local differences in the level of partner involvement all projects evidenced good treatment success rates and three of the projects have reached 25% of the population in their referral areas. These results suggest that provision of care for clients with chronic hepatitis C may not require all partners to know or be highly involved with each other. As partnerships were initiated through the project nurses, it would be interesting to investigate whether certain factors present at the initiation of these nurse-partner relationships, would lead some partners to become more involved than others.

5 DISCUSSION

The purpose of this multi-method study was to describe four nurse-led hepatitis C integration projects in small urban/rural settings in BC and investigate the relationships between context, partnership structure and functioning and client/population outcomes. This study makes several contributions to the service integration literature. In accordance with complexity theory, the study included exploration of system components (e.g., partnership variables and service variables), as well as the pattern of relationships among the components (Cilliers, 1998; Wheatley, 1992). The study design expanded the literature by adding consideration of the context in which the partnerships operate since contextual elements can influence outcomes (Allen & Hecht, 2004). Comparison of multiple dimensions of the four projects increases our understanding of their similarities and how variations result from the local context. In addition, the study extends knowledge of interprofessional relationships beyond the present focus on aspects of group functioning in formal meetings to include a rich description of multiple dimensions of informal relationships (Cott, 1997).

This is the first Canadian study of its kind to describe relationships between integrated service delivery mechanisms (i.e., nurse leadership and interprofessional partnerships), and client/population reach in four locations. This dissertation provides evidence regarding the leadership role of front-line nurses in four community settings working to integrate hepatitis C prevention and care services through partnerships. The results support the assumption that IP arise to address the needs of those with chronic illness, which in this case was hepatitis C and associated issues. These locally-led hepatitis C services were able to increase reach beyond Vancouver to smaller urban and rural areas throughout BC within a relatively short period of time. Clinical outcomes similar to or better than those reported in the literature were demonstrated.

This study extends nursing knowledge beyond descriptions of nursing leadership in academic and management positions largely within hospital settings (Ahern et al., 2004; Ciliska et al., 2007; Leone, 2002). The study provides a novel account of leadership of front-line nurses working in community settings. In support of calls by McKeown and Gibson (2007) for political action by nurses in hepatitis C care, the research findings demonstrated that nurses at the front-lines exerted influence in key areas of practice and service development. Project nurses stepped beyond their traditional roles and confronted barriers to comprehensive care in their practice environment. They expanded their scope of practice and developed IP with providers from autonomous organizations to meet diverse client needs.

The projects were initiated during a period when there was a high demand for hepatitis C services, potentially curative anti-viral therapies were emerging and professional service delivery systems were underdeveloped. In the global context, there was a corresponding change in health care policy that emphasized integration of professional services to improve chronic illness care and reduce service gaps. This study provided a detailed example of how this policy emphasis was adopted at the micro (front-line) level of service delivery in a Canadian province.

Analysis determined that the project nurses' partners represented diverse sectors (e.g., public health, health services and ancillary services), and affirms the study's conceptual underpinnings that identified the need for diverse partnerships to provide comprehensive chronic illness care. In contrast to evidence that community coalitions often fail, it is notable that all four project partnerships continue to function (Kreuter, Lezin & Young, 2000). Congruent with the findings of Provan and colleagues (2005), partnership measurement was useful for demonstrating the partner linkages and the highlighting the agencies and sectors that were part of the structure. The study employed both the IHSM and PSAT in a new context, informal front-line staff partnerships where most communication is through electronic or "virtual" means. As no identical programs were found in the literature, the study serves as a baseline for future studies, and highlights the need for continued research in this area.

The projects have experienced consistent demand for service, which confirms the need for locally-available hepatitis C prevention and care resources. Reach of 25% of the infected population (i.e. percentage of hepatitis C antibody positive individuals referred to the projects) in three of the projects is a good indicator of success. If population reach was adjusted to account for the 15-40% of the infected population that may have cleared the virus naturally the percentage reach would be 29- 42% (Alter, 1993; Jauncey et al., 2004). In addition, those who were infected but not referred to the projects may have received specialty services elsewhere. The reach of the projects is remarkable since it is estimated that even though referral rates vary according to the setting only a small proportion of those infected with hepatitis C have ever been referred for specialist consultation and follow-up (Dalgard et al., 2003; Irving et al., 2006; Mele et al., 2000).

There are a number of interesting contrasts between the populations served in the projects compared to those reported in the literature. Among the projects 72-80% of those referred attended for services in comparison to other integrated hepatitis C programs that reported 20-50% (Gunn et al., 2005; Subiadur et al., 2007). Estimates indicate that only 30% of people who are infected are likely to be eligible for treatment (Falck-Ytter et al., 2002; Fleming et al., 2003). Of the populations assessed in the projects 26-32% initiated anti-viral therapy in contrast to other community-based programs that reported only 5-10% of those assessed received treatment (Stringari-Murray et al., 2003; Zevin, 2007). In terms of treatment efficacy, clinical trials report overall sustained viral response rates of 55% (Fried et al., 2002). The projects reported rates of 57 to 76%. Additionally, the projects reported that only 12% of those who started treatment withdrew because of adverse effects, which is comparable to clinical trials (Braga et al., 2006; Escudero et al., 2008; Fried et al., 2002; Zeuzem et al., 2000). What makes these results impressive is that the projects service 'real world clients' yet their results are similar to clinical trials where clients may be carefully selected to ensure maximum compliance with therapy and optimal response rates. These positive outcomes may be related to the expanded role of the project nurses which includes management of antiviral therapy since it is reported that client education and close monitoring by nurses during therapy are major contributors to successful completion of hepatitis C therapy (Leone, 2002; Strinko, Di Bisceglie, &

Hoffman, 2004; Zeuzem, 2004). These results imply that the partnerships function effectively in reaching and providing services to the targeted populations.

5.1 Strengths and Limitations

This study had several strengths and limitations. The study was able to address variations in form, content and change over time in the projects by incorporating years of operation as an independent variable. However, it was not possible to explore whether the length of time that individual partners were involved might have affected their scores on the two partnership measures in the cross-sectional survey component of this research. The statistical power of the analysis was limited as there were only four projects (N=4) from which to relate variables to reach measures.

A major strength of the study was the use of administrative data to identify relevant clinical/population outcomes of the partnerships. Administrative data has been shown to minimize data collection biases found in clinical trials such as selective recall, non response, the Hawthorne effect and the healthy volunteer bias (Baron & Weiderpass, 2000; Iezzoni, 1997; Leake & Werneck, 2005; Price, Estrada, & Thompson, 2003). The readily available administrative dataset enabled identification of client characteristics, patterns of service use and clinical outcomes while minimizing data acquisition costs. Since the data were anonymized, ethical review was expedited and client confidentiality was ensured. Given that data were electronically stored it was easily extracted for analysis and just as easily exported to a GIS system in order to overlay several layers of data to simplify display of data relationships. In addition, the data were longitudinal and included the entire population enabling between project comparisons over time.

Administrative data can constrain the researcher to information that is useful mainly from an administrative perspective, limiting the scope of important health questions and constraining inquiries (Iezzoni et al., 1996). In this case the researcher was an insider, associated with the projects since inception, and provided input into the database design (i.e., how variables were defined, collected and entered). Quarterly quality control measures embedded in the system provided checks for missing and inaccurate data so that corrections could be made in a timely manner. However, since data entry was done in the field and subject to severe time restraints, data fields were limited to the individual-based client services not allowing for tracking or analysis of community-based education or development activities.

The conceptual model and research assumptions were helpful for guiding the inquiry and focusing the analysis. However, during the analysis a limitation of the conceptual model became evident. Although it was assumed that front-line staff partnerships are self-forming structures that arise out of the provision of chronic illness care the model did not include assumptions on whether any particular partner was central to the formation of the partnerships or what form the initial partner formations would take. Through the historical review it was evident that the project nurses were central to partnership development and that partnerships were formed through development of multiple nurse-to-partner relationships. The measurement of these hub and wheel type of relationships

was not considered a priori. It was fortunate for the researcher that the data collected for the IHSM, although originally intended for aggregated measurement of the composite partner group, could be employed to analyse specific nurse-partner linkages. However, it was not appropriate to employ the PSAT to explore the quality of functioning of these dyadic relationships. These findings point to the need to revise the conceptual model and consider other methods of measurement to better understand partners with a hub and wheel formation that over time becomes an interconnected group as presented in the model and confirmed in the study results.

This study provided an extensive description of the functioning and achievements at the front-lines of service delivery (micro level). For those wishing to replicate aspects of these projects, at the provincial (macro level) and regional health authority (meso) levels further exploration is required to determine what impact provincial coordination through BCHS, and local support from public health decision-makers and physician specialists had on the success and sustainability of the projects.

5.2 Implications for research

The conceptual model outlined that IP are expected to impact three constituent groups: the partners, service recipients and the partners' respective organizations. Outcomes of IP may vary depending on the perspectives of those who are surveyed (Boyne et al., 2003; Glendinning, 2002; Sullivan & Skelcher, 2002). This study demonstrated the feasibility of measuring partner perspectives and client-based clinical outcomes. Future research should include measurement of perspectives of service recipients (clients) and partner organizations. Since the study results illuminated the effectiveness of an expanded nursing practice role to increase capacity for specialty services in small urban/rural areas future studies should include a cost-effectiveness analysis.

A clinically important finding is that a significant number of individuals with hepatitis C who are referred for specialty assessment do not attend for services. The reasons for and impact of these decisions requires further investigation. In addition, studies of the characteristics of populations referred vs. those not referred could inform whether outreach efforts should be intensified.

5.3 Implications for education and practice

There is an enormous body of knowledge on leadership but the issues surrounding leadership of virtual partnerships are just beginning to emerge (Avolio, Kahai, & Dodge, 2000; Zigurs, 2003). Nurses need to understand and act on the clinical and educational implications of leadership in virtual partnerships, which cross disciplinary and jurisdictional boundaries. Such IP are especially critical in rural areas where there are fewer health and social care resources, a small number of agencies, and less diversity and specialization because half of all Canadians live in rural communities, that is, communities with less than 100,000 people (Polivka et al., 2001; Statistics Canada, May 2005). In addition, for the case of hepatitis C, the complexity of care combined with the changing knowledge of the disease, its impact and treatments, requires front-line staff to

base their practice on emerging evidence rather than established protocols. This requires education that supports strong skills in critical appraisal of research, clinical practice and leadership at the front-lines.

5.4 Implications for Policy

Underlying the policy emphasis on IP is the assumption that this form of service delivery will ultimately save the system money. Using a theoretical framework, the present study demonstrated that four projects initiated within public health achieved important population outcomes through IP and minimal new funding. Policy makers should consider adapting the conceptual framework advanced in this study to assist in the evaluation of policy outcomes.

According to Niessin and colleagues (2000) health policy and services should be developed based on systematically collected data on the effects of interventions that are grounded in the health and social sciences. Based on this research and public health's history of and mandate for disease prevention and control, policy makers could consider expanding the role of public health nurses to include disease management for those with chronic infectious diseases where such services are underdeveloped as in the small urban and rural areas of BC. This research demonstrated that such an approach is feasible, acceptable and appropriate.

5.5 Conclusion

This is the first Canadian study of its kind to describe relationships between nurse leadership, IP and client/population outcomes. Although the literature contains an abundance of conceptualizations for service integration there is little evidence to guide practice. This study provides support for the synergistic effects of nurse leadership and IP on health outcomes in the context of an emerging disease and scarce health care resources. The benefits of IP were demonstrated on multiple levels, with clear implications for policy, research, education and practice. Future research should be directed at refining the conceptual model and extending partnership measurement approaches to include hub and wheel partnership relationships and expanding participant recruitment to include all the constituent groups: care providers, recipients and participating organizations.

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APPENDICES

Appendix 1

THE UNIVERSITY OF BRITISH COLUMBIA



School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada
V6T 2B5

Tel: (604) 822-7417
Fax: (604) 822-7466

Information Letter to Pilot Site Collaborators

Dear _____,

As you know, in collaboration with yourselves and the Hepatitis Division of the BC Centre for Disease Control, I am conducting a project to identify the scope, depth and quality of service integration and its outcomes within each of the four systems-integration pilot projects for hepatitis C prevention and care. As agreed, this research will also access the anonymized portion of our shared database, which is housed at BCCDC. Further information regarding the project is contained in the attached information sheet.

As part of the project you are invited to complete a survey containing two short questionnaires designed to examine how you think your service is currently working with the other programs/services in your area and how you would like to be working. The survey will require about 20 minutes of your own time to complete and can be returned using the stamped, self-addressed envelope provided. We would appreciate your response by __ (date) _____.

Participation is voluntary; you may choose not to participate or to withdraw from the study at any time. By completing and returning your questionnaire you are assumed to have given your consent for participation.

A summary of the survey results will be provided to all who have been invited to participate shortly after gathering the feedback from each of the services. The results will contribute useful information for your planning and evaluation efforts.

Feel free to telephone or email me, Gail Butt, (telephone: **604-660-4724**, email: **gail.butt@bccdc.ca**), if you have any questions.

Thank you,

Gail Butt, Principal Investigator
Adjunct Professor, UBC School of Nursing
Associate Director, BC Hepatitis Services

Appendix 2

THE UNIVERSITY OF BRITISH COLUMBIA



School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada
V6T 2B5

Tel: (604) 822-7417
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Letter to Service Providers Nominated by the Pilot Sites

Dear _____,

In collaboration with (insert: name of pilot site program in the corresponding Health Authority) and the Hepatitis Division of the BC Centre for Disease Control, I am conducting a project to identify the scope, depth and quality of service integration and its outcomes within each of the four systems-integration pilot projects for hepatitis C prevention and care in BC. Further information regarding the project is contained in the attached information sheet.

The staff at (insert pilot project program name) have identified your service/agency as a participating partner in providing hepatitis C care. As part of the project you are invited to complete a survey containing two short questionnaires designed to examine how you think your service is currently working with the other services/agencies in your area and how you would like be working. The survey will require about 20 minutes of your own time to complete and can be returned using the stamped self-addressed envelope provided. We would appreciate your response by ____ (date)_____.

Participation is voluntary; you may choose not to participate or to withdraw from the study at any time. By completing and returning the questionnaires, you provide your consent to participate. A summary of the survey results will be provided to all who have been invited to participate shortly after gathering the feedback from each of the services. The results will provide useful information that will assist you in your planning and evaluation efforts.

Feel free to telephone or email me, Gail Butt, (telephone: **604-660-4724**, email: **gail.butt@bccdc.ca**), if you have any questions.

Thank you,

Gail Butt, Principal Investigator
Adjunct Professor, UBC School of Nursing
Associate Director, BC Hepatitis Services

Appendix 3

THE UNIVERSITY OF BRITISH COLUMBIA



School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada
V6T 2B5

Tel: (604) 822-7417
Fax: (604) 822-7466

Information Sheet

Background

Since 2001 BC Hepatitis Services has coordinated a project in partnership with the Regional Health Authorities to build local capacity and develop best practices for integrated prevention and care for those at risk, infected or affected by hepatitis C. A significant achievement of this collaboration has been the development of four systems-integration pilot projects for hepatitis prevention and care. The projects were implemented using a collaborative community-oriented and staged approach with Interior Health (Kamloops) starting in July 2001, Vancouver Island Health (Campbell River) and Northern Health (Prince George) in 2002, and Fraser Health (Surrey) in 2003. The staging method facilitated a process that allowed each program design to emerge according to local needs while facilitating exchange of ideas and learning within the project sites thus embedding a rapid change/quality improvement approach. An important part of the pilot projects is their partnerships with local services/agencies. The purpose of the survey is to obtain information to better understand and describe the quality and outcomes of the local partnerships. The results of the survey will be provided to all partners to facilitate future planning both locally and provincially.

What Will the Study Involve?

You are asked to complete a survey containing two questionnaires, The Human Services Measure and the Partnership Self-Assessment Tool. The survey will take about 20 minutes to complete. The survey will provide information on the type and extent of service integration among partner agencies and the processes that assist or hinder collaboration.

Who Will Be Asked to Participate in the Study?

Staff and managers of the 4 pilot sites and those services/agencies with which they work will be asked to participate in the survey. Participation is entirely voluntary and confidential. You will not be asked to identify yourself except to provide the name of the agency and the health authority where you work. Participation or non-participation in

this research will not affect BC Hepatitis Services funding or support for the pilot projects or their partners. You may withdraw your participation at any time.

How Will the Research Findings Be Used?

All invited, whether they choose to participate or not, will receive a summary of the survey results shortly after gathering the feedback from each of the services. The results will help the pilot projects, their partners and BC Hepatitis Services to identify areas of strength and weakness, identify barriers and facilitators for effective collaboration and service integration, and will enhance planning. No individuals will be named or otherwise identified in any publication of the data.

If you have any further questions, please contact the Gail Butt, Principal Investigator, at BC Hepatitis Services, 604-6604724 or email at gail.butt@bccdc.ca

Appendix 4

THE UNIVERSITY OF BRITISH COLUMBIA



School of Nursing
T201- 2211 Wesbrook Mall
Vancouver, B.C. Canada V6T
2B5

Tel: (604) 822-7417
Fax: (604) 822-7466

Cover Letter

Title of Research Project: A Description of the Relationship Between Service Integration and
Need, Capacity, and Access in Four Nurse-Led Clinical Service Networks

Principal Investigator: Gail Butt, RN, MHSc
Adjunct Professor, School of Nursing
University of British Columbia
Associate Director, BC Hepatitis Services
BC Centre of Disease Control
Telephone (604) 660-4724

Co-investigator: Dr. Mel Krajden, MD, FRCPC
Associate Professor,
Pathology & Laboratory Medicine
UBC Faculty of Medicine,
Director
BC Hepatitis Services, BC Centre for Disease Control
Telephone (604) 660-6044

Co-investigator: Dr. Warren Hill, PhD,
Research Analyst
BC Hepatitis Services, Centre for Disease Control
Telephone (604) 660-1784

You are being invited to participate in a survey as part of a research study designed to describe the scope, depth and quality of service integration and its outcomes in four pilot projects for integrated hepatitis C prevention and care. The survey consists of two questionnaires that measure the degree and quality of integration among service providers

in your specific pilot project area (areas include: Vancouver Island Health Authority, Northern Health Authority, Fraser Health Authority, and Interior Health Authority). The survey takes 20 minutes to complete at one time only.

Participation in the study is voluntary. You may withdraw from the study at any time or refuse permission to use your questionnaire responses. You are being invited to participate in this research project because you are a staff member or manager in the pilot project or because you have been nominated by the staff or managers as a member of the network of service providers in the pilot site area and you are able to read and write in English. You understand that, if you do not wish to participate in the study, it will not affect your job or your provision of care to people with hepatitis C.

If you agree to take part in the study, your consent will be assumed upon receipt of your completed questionnaires. You can complete the questionnaires at any time in the four weeks following the invitation to participate. The questionnaires ask you to rate your level of integration with other participating agencies or services. You will also be asked to answer two questions about what helps you to collaborate with other agencies and what hinders you from collaborating.

You will be asked only to identify your service/agency and your health authority on the questionnaires. Your name will not be used in the tabulation of the survey data. Only the research team will have access to the survey responses; the responses will be stored in a locked filing cabinet to which only the Principal Investigator has a key. Computer files associated with the project will be password protected. Paper copies of survey responses will be shredded in ten years following the completion of the study. Any electronic data files will be destroyed using software to ensure complete destruction of the data. The findings of the research may be published but your name will not be associated with the study.

There are no known risks to the research. If you agree to participate, you will contribute information that will help to develop a model that explains and describes how the network of partnerships in the hepatitis C pilot projects provides integrated prevention and care. This knowledge could strengthen partnerships to provide more accessible and effective care. You will receive a summary of the results of the research upon its completion. You are encouraged to contact the Principal Investigator, Gail Butt, if you have any questions regarding the study. She will attempt to answer any questions you might have prior to, during or following the study.

If you agree to participate in the study, you can complete the survey during non-work hours. You may also contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598 if you have any questions or concerns about your rights or treatment as a research subject.

By completing and mailing in the questionnaires it is assumed that you have read and decided to participate in the research study described above. Submitting your questionnaire response provides your permission for the information you have given in the survey to be used for publication in research articles/journals/books and/or teaching materials. This research is not funded and the research findings may be used by the Principal Investigator, Gail Butt, in the completion of her PhD dissertation. Her supervisor, Dr. Gina Browne, at McMaster University, will have access to the research data.

Appendix 5

INTEGRATION OF HUMAN SERVICES MEASURE©

Project Title: A Description of the Relationship between Service Integration and Need, Capacity, and Access in Four Nurse-Led Clinical Service Networks

Date: _____

Position: _____ Agency Name: _____

To what extent are you (your service) involved with the following services?		PROGRAM/SERVICE Do not rate your own service – leave blank.	To what extent should you (your service) be involved with the following services?		
Rating Scale	Col.#1 Rate (0-4)		Col.#2 Rate (0-4)	Rating Scale	
<p>0 = No awareness: Your program/agency is not aware of the other service</p> <p>1 = Awareness: You have knowledge of the other service although no effort is taken to organize activities according to any principles except those that conform to individual agency/service missions.</p> <p>2 = Communication: You and the other service have an active program of communication and information sharing.</p> <p>3 = Cooperation: You and the other service each use your knowledge of the other's service to guide and modify your own service planning in order to obtain a better set of links between services.</p> <p>4 = Collaboration: You and the other service jointly plan the offering of service and actively modify service activity based on advice and input from mutual discussions.</p> <p>N/A = Not applicable: Service is not applicable to your service.</p>				<p>0 = No awareness: Your program/agency should not be aware of the other service</p> <p>1 = Awareness: You should have knowledge of the other service although no effort is taken to organize activities according to any principles except those that conform to individual agency/service missions.</p> <p>2 = Communication: You and the other service should have an active program of communication and information sharing.</p> <p>3 = Cooperation: You and the other service should each use your knowledge of the other's service to guide and modify your own service planning in order to obtain a better set of links between services.</p> <p>4 = Collaboration: You and the other service should jointly plan the offering of service and actively modify service activity based on advice and input from mutual discussions.</p> <p>N/A = Not applicable: Service is not applicable to your service.</p>	

The Integration of Human Services Measure, Oct 5, 2006 used with permission from the System-Linked Research Unit on Health and Social Service Utilization, McMaster University

Agency Name: _____

Rating Scale		Rating Scale
0 = No awareness: Your program/agency is not aware of the other service		0 = No awareness: Your program/agency should not be aware of the other service
1 = Awareness: You have knowledge of the other service although no effort is taken to organize activities according to any principles except those that conform to individual agency/service missions.		1 = Awareness: You should have knowledge of the other service although no effort is taken to organize activities according to any principles except those that conform to individual agency/service missions.
2 = Communication: You and the other service have an active program of communication and information sharing.		2 = Communication: You and the other service should have an active program of communication and information sharing.
3 = Cooperation: You and the other service each use your knowledge of the other's service to guide and modify your own service planning in order to obtain a better set of links between services.		3 = Cooperation: You and the other service should each use your knowledge of the other's service to guide and modify your own service planning in order to obtain a better set of links between services.
4 = Collaboration: You and the other service jointly plan the offering of service and actively modify service activity based on advice and input from mutual discussions.		4 = Collaboration: You and the other service should jointly plan the offering of service and actively modify service activity based on advice and input from mutual discussions.
N/A = Not applicable: Service is not applicable to your service.		N/A = Not applicable: Service is not applicable to your service.
Please answer the questions below and note; there is no right or wrong answer, just tell us what you think.		
What helps you when collaborating with other agencies? Why?		
What hinders you from collaborating with other agencies? Why?		

For Office Use Only		
Geographical Area:		
Contact:	Received by phone/email/fax:	Date rec'd/completed:

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Appendix 6

ID# _____

PARTNERSHIP SELF-ASSESSMENT TOOL

Project Title: A Description of the Relationship between Service Integration and Need, Capacity, and Access in Four Nurse-Led Clinical Service Networks

Date: _____

Position: _____ Agency Name: _____

Synergy

Please think about the people and organizations that are participants in your partnership/network. By working together, how well are these partners able to:

	Extremely Well	Very Well	Somewhat Well	Not So Well	Not Well at All	Don't Know
1 Identify new and creative ways to solve problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Include the views and priorities of the people affected by the partnership's work.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Develop goals that are widely understood and supported among partners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Identify how different services and programs in the community relate to the problems the partnership is trying to address.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Respond to the needs and problems of the community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Implement strategies that are most likely to work in the community.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Obtain support from individuals and organizations in the community that can either block the partnership's plans or help move them forward.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Carry out comprehensive activities that connect multiple services, programs, or systems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Clearly communicate to people in the community how the partnership's actions will address problems that are important to them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The Partnership Self-Assessment Tool, Oct. 5, 2006 used with permission from Center for the Advancement of Collaborative Strategies in Health, www.cacsh.org

Leadership

Please think about all of the people who provide either formal or informal leadership in this partnership. Please rate the total effectiveness of your partnership's leadership in each of the following areas:

	Excellent	Very Good	Good	Fair	Poor	Don't Know
10 Taking responsibility for the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Inspiring or motivating people involved in the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Empowering people involved in the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 Communicating the vision of the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Working to develop a common language within the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Fostering respect, trust, inclusiveness and openness in the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Creating an environment where differences of opinion can be voiced.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Resolving conflict among partners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 Combining the perspectives, resources and skills of partners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19 Helping the partnership be creative and look at things differently.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20 Recruiting diverse people and organizations into the partnership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Efficiency

Please choose the column that best describes:

	Excellent	Very Good	Good	Fair	Poor
21 How well your partnership makes use of the partners' financial resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22 How well your partnership makes use of the partners' in-kind resources (e.g., skills, expertise, information, data, connections, influence, space, equipment, goods).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23 How well your partnership makes use of the partners' time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Administration and Management

We would like you to think about the administrative and management activities in your partnership. Please rate the effectiveness of your partnership in carrying out each of the following activities:

	Excellent	Very Good	Good	Fair	Poor	Don't Know
24 Coordinating communication among partners.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25 Coordinating communication with people and organizations outside the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26 Organizing partnership activities, including meetings and projects.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27 Applying for and managing grants and funds.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28 Preparing materials that inform partners and help them make timely decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29 Performing secretarial duties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30 Providing orientation to new partners as they join the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31 Evaluating the progress and impact of the partnership.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32 Minimizing the barriers to participation in the partnership's meetings and activities (e.g., by holding them at convenient places and times, and by providing transportation and childcare).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Non-financial Resources

A partnership needs non-financial resources in order to work effectively and achieve its goals. For each of the following types of resources, to what extent does your partnership have what it needs to work effectively?

	All of what it needs	Most of what it needs	Some of what it needs	Almost none of what it needs	None of what it needs	Don't Know
33 Skills and expertise (e.g., leadership, administration, evaluation, law, public policy, cultural competency, training, community organizing).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34 Data and information (e.g., statistical data, information about community perceptions, values, resources, and politics).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35 Connections to target populations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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	All of what it needs	Most of what it needs	Some of what it needs	Almost none of what it needs	None of what it needs	Don't Know
36 Connections to political decisionmakers, government agencies, other organizations/groups.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37 Legitimacy and credibility.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38 Influence and ability to bring people together for meetings and activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Financial and Other Capital Resources

A partnership needs financial and other capital resources in order to work effectively and achieve its goals. For each of the following types of resources, to what extent does your partnership have what it needs to work effectively?

	All of what it needs	Most of what it needs	Some of what it needs	Almost none of what it needs	None of what it needs	Don't Know
39 Money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40 Space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41 Equipment and goods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Decision Making

42 How comfortable are you with the way decisions are made in the partnership?

	Extremely comfortable	Very comfortable	Somewhat comfortable	A little comfortable	Not at all comfortable	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	All of the time	Most of the time	Some of the time	Almost none of the time	None of the time	Don't Know
43 How often do you support the decisions made by the partnership?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44 How often do you feel that you have been left out of the decision making process?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Benefits of Participation

For each of the following benefits, please indicate whether you have or have not received the benefit as a result of participating in the partnership.

	Received	
45 Enhanced ability to address an important issue.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
46 Development of new skills.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
47 Heightened public profile.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
48 Increased utilization of my expertise or services.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
49 Acquisition of useful knowledge about services, programs, or people in the community.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
50 Enhanced ability to affect public policy.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
51 Development of valuable relationships.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
52 Enhanced ability to meet the needs of my constituency or clients.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
53 Ability to have a greater impact than I could have on my own.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
54 Ability to make a contribution to the community.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
55 Acquisition of additional financial support.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Drawbacks of Participation

For each of the following drawbacks, please indicate whether you have or have not experienced the drawback as a result of participating in the partnership.

	Already Experienced	
56 Diversion of time and resources away from other priorities or obligations.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
57 Insufficient influence in partnership activities.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
58 Viewed negatively due to association with other partners and partnership.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
59 Frustration or aggravation.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
60 Insufficient credit given to me for contributing to the accomplishments of the partnership.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
61 Conflict between my job and the partnership's work.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

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Comparing Benefits and Drawbacks

62 So far, how have the benefits of participating in this partnership compared to the drawbacks?

Benefits greatly exceed the drawbacks	Benefits exceed the drawbacks	Benefits and drawbacks are about equal	Drawbacks exceed the benefits	Drawbacks greatly exceed the benefits
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Satisfaction with Participation

	Completely Satisfied	Mostly Satisfied	Somewhat Satisfied	A Little Satisfied	Not at All Satisfied
63 How satisfied are you with the way the people and organizations in the partnership work together?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64 How satisfied are you with your influence in the partnership?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65 How satisfied are you with your role in the partnership?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66 How satisfied are you with the partnership's plans for achieving its goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
67 How satisfied are you with the way the partnership is implementing its plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

For Office Use Only

Geographical Area:		
Contact:	Received by phone/email/fax:	Date rec'd/completed:

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