Refocusing the focus on adherence to antiretroviral therapy using a community-based participatory research approach

by

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Abstract

Adherence to antiretroviral therapy is critical to treatment success. Using an epidemiological and community-based participatory research approach, my thesis reports on two papers related to antiretroviral therapy success (and subsequent failure). My thesis also includes a third paper which discusses an effective and appropriate knowledge translation plan. In the first paper, I used logistic regression to compare initial treatment success among treatment-naïve HIV-positive individuals cared for at the Northern Alberta HIV Program. For individuals achieving initial treatment success, I used survival analysis to determine the probability of subsequent treatment failure. Results showed that compared to Canadian-born, non-Aboriginal patients, the odds of achieving initial treatment success were similar for foreign-born patients and significantly lower for Canadian-born Aboriginal patients. Of those individuals who achieved initial treatment success, compared to Canadian-born, non-Aboriginal patients, foreign-born and Canadian-born Aboriginal patients had similar rates of treatment failure. I concluded that HIV clinicians, researchers, HIV community services organizations, and HIV-positive individuals, work together to better understand adherence to antiretroviral therapy. As such, my second study used focused ethnography to understand, from the perspective of HIV-positive individuals who maintain adherence to their antiretroviral therapy, reasons for antiretroviral therapy *success*. I conducted one-on-one interviews with 14 individuals with "chaotic" lives (e.g., unstable housing, substance use, involvement in the sex trade, and incarceration) but who nonetheless had demonstrated sustained adherence to antiretroviral therapy and involved a 'grand tour question'; "what is your secret for taking your HIV medication all the time?". My data revealed "control" as the cornerstone for maintaining adherence. Participants felt that while they had little or no control over their life circumstances they recognized that, by taking their

ART, they *could* have control over their HIV treatment, which enabled them to make additional positive life changes. The third paper is a commentary describing my knowledge translation plan (a video and peer-educators) to move the knowledge generated from the previous project into action. My evaluation of this knowledge translation plan emphasized the importance of "humanizing" the experience of ART adherence; peer-educators became local HIV medication "celebrities" to their peers. Together, the findings from this thesis consider antiretroviral therapy in a new light by emphasizing success; clinicians must be aware of the extent to which individuals believe they can control their HIV treatment and incorporate support for this sense of control in efforts to improve adherence.

Preface

This thesis is an original work by Megan Lefebvre. The research project, of which this thesis is a part, received several research ethics approvals from the University of Alberta Research Ethics Board: “HIV Treatment Outcomes in Immigrant and Refugee Patients”, Pro00027949, April 2012; “Adherence amongst chaos: a qualitative study to explore adherence to antiretroviral therapy”, Pro00037033, April 2013; “"Living with HIV and it's OK" video evaluation”, Pro00037033_AME2, July 2013; and “"Living with HIV and it's OK" video evaluation”, Pro00037033_AME3, February 2014.

The research conducted for this thesis forms part of an interdisciplinary research collaboration, led by Drs. Stan Houston, Faculty of Medicine and Dentistry and School of Public Health; Duncan Saunders, School of Public Health; Christine Hughes, Faculty of Pharmacy and Pharmaceutical Sciences; Yutaka Yasui, School of Public Health; and Maria Mayan, Faculty of Extension, at the University Alberta. The video referred to in chapter 5 was created by me, with the assistance of my PhD supervisory committee. The data analysis, interpretation, and analysis in chapters 3 and 4 are my original work, as well as the literature review in chapter 1.

Chapter 4 of this thesis has been accepted for publication as Lefebvre M, Hughes CA, Yasui Y, Saunders LD, Houston S, “Antiretroviral treatment outcomes among foreign-born and Aboriginal people living with HIV/AIDS in northern Alberta,” Canadian Journal of Public Health [in press, 2014]. I was responsible for the data collection and analysis as well as the manuscript composition. C Hughes, Y Yasui, LD Saunders, S Houston assisted with the data collection and contributed to manuscript edits. Y Yasui assisted with statistical analysis. S Houston and LD Saunders were the supervisory authors and were involved with concept formation and manuscript composition.

Chapter 5 of this thesis has been submitted for publication as Lefebvre M, Mayan MJ, Hughes CA, Houston S, “Adherence among chaos: Exploring adherence to HIV Medication,” Qualitative Health Research [submitted, 2014]. I was responsible for the data gathering and analysis as well as the manuscript composition. MJ Mayan, CA Hughes, and S Houston contributed to manuscript edits. MJ Mayan assisted with data analysis. MJ Mayan was the supervisory author and was involved with concept formation and manuscript composition.

Chapter 6 of this thesis has been submitted for publication as Lefebvre M, Mayan MJ, Hughes CA, Yasui Y, Saunders LD, Houston S, “Refocusing the focus on adherence to

antiretroviral therapy," Qualitative Health Research [submitted, 2014]. I was responsible for creating the video as well as the manuscript composition. MJ Mayan, CA Hughes, Y Yasui, LD Saunders, and S Houston contributed to manuscript edits. MJ Mayan was the supervisory author and was involved with concept formation and manuscript composition.

Dedicated to

My parents, Sheila and Grant.

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I am grateful to a number of individuals and organizations who have been an instrumental and incredible part of my journey. Thank you to: all of the participants for their insight and for the opportunity to learn from them. Particularly, I am honored to have gotten to know and work with "the guys", Richard, Brian, Darren, and Dwight; the Northern Alberta HIV Program staff, for being a consistent source of support, inspiration, and encouragement; the HIV Edmonton staff, for your incredible support and for championing this research; my fellow classmates/friends in the School of Public Health, including Elaine Hyshka, Amy Colquhoun, Emily Hastings, Chris Bell, Keren Tang, Jacqueline Torti, and Stephanie Kowal, for their friendship and making Edmonton home for me; Bob Haennel, for giving me my "start" in graduate school, and believing in me; Faith Davis and Michael Lavoie, for their interest, support, and enthusiasm; Janet McDonald, for her friendship, support, and laughs; the School of Public

Health mentors and staff, including Benu Bawa, Felicity Hey, Shona Williams, and Carmen McBride, for their patience and guidance; Karen Goodman and the Canadian North *Helicobacter pylori* (CAN*Help*) Working Group, opening so many doors, including the opportunity to experience epidemiological fieldwork and community-based participatory research; and to the Edmonton Inner City Health and Wellness Network (EICHREN), Women and Children's Health and Research Initiative (WCHRI), and Community-University Partnership (CUP), including Tatjana Alvadj, for the financial support and mentorship that made my research possible.

Thank you to my parents (Sheila and Grant), brother (Mark), grandma (Pamela), and best friends (Brione, Vanessa, Bekki, Suzanne, Lea, Kathy, and Tanya), for lending me your ears (and shoulders) on numerous occasions. I could not have done this work without all of your constant support, love, and encouragement. Throughout my experience, the participants consistently reminded me of the importance and meaning of "family", and I am truly blessed to have my family and friends as my family. Lastly, thank you to my wonderful husband, Dennis. There are no words to describe how important you are to me, so I will borrow a few lines from Edward Sharp and the Magnetic Zero's "Home": "Alabama, Arkansas, I do love my Ma & Pa / Not the way that I do love you / Holy Moley, Me-oh-My, you're the apple of my eye / I've never loved one like you / Man, oh man, you're my best friend, I scream it to the nothingness / Home / Let me come Home / Home is wherever I'm with you / Home / Let me come Home / Home is wherever I'm with you". I am fortunate and grateful to have you as my partner, best friend, and husband. Your love, support, guidance, and insight have made all of this possible. Thank you.

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List of Abbreviations

AIDS – Acquired Immune Deficiency Syndrome

AR – Action Research

ART - Antiretroviral Therapy

AZT – Zidovudine

CANOC - Canadian Observational Cohort

CBA - Canadian-born Aboriginal

CBNA - Canadian-born non-Aboriginal

CBPR – Community-based Participatory Research

CBR – Community-based Research

CCR5 - Chemokine Receptor Type 5

CIC - Citizenship and Immigration Canada

d4T - Stavudine

ddC – Zalcitabine

ddI – Didanosine

FB - Foreign-born

GMHC - Gay Men's Health Clinic

GIPA - Greater Involvement of People with HIV/AIDS

HAART – Highly Active Antiretroviral Therapy

HIV – Human Immunodeficiency Virus

HIVE – HIV Edmonton

IDU – Injection Drug Use

iKT – Integrated Knowledge Translation

IME - Immigration Medical Examination

KT - Knowledge Translation

KU – Knowledge user

MSM - Men who have sex with men

NAP – Northern Alberta HIV Program

NRTI - Nucleoside Reverse Transcriptase Inhibitor

NNRTI – Non-Nucleoside Reverse Transcriptase Inhibitor

PAR – Participatory Action Research

PHAC – Public Health Agency of Canada

PWA – People with AIDS

PR – Participatory Research

PE – Peer-educator

PLWHIV/AIDS - People Living with HIV/AIDS

PI - Protease Inhibitor

RCA – Rapid community assessment

SE – Self-efficacy

UNAIDS - United Nations Programme on HIV/AIDS

VL - HIV-1 RNA Viral Load

CHAPTER 1

Introduction

1.1 Purpose

Adherence, as defined by the World Health Organization, is "the extent to which a person's behaviour – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a healthcare provider" (1, p. 3) is critical to success in antiretroviral therapy (ART). Adherence, however, is important to the outcome of most medical therapies. Clear examples are studies in hypertension (1, 2) which have consistently shown that adherence is often poor, adherence is a major determinant of treatment failure, and physicians under-recognize non-adherence. In clinical trials, observational studies, and clinical practice, adherence levels for individuals prescribed ART range from 40-95% (3-5). Compared to most medical therapies very high ART adherence levels need to be achieved and maintained over the course of life-long treatment, if treatment is to be successful and the emergence of drug resistance prevented (6, 7). For the non-adherent HIV-positive individual, drug resistance can make current ART ineffective (7). From a public health perspective, a drug-resistant strain of HIV caused by non-adherence can be transmitted to uninfected individuals, leaving newly infected and previously treatment naïve individuals with less effective HIV treatment options (7).

Despite the benefits of ART, some HIV-positive individuals in Alberta (e.g., Canadian-born Aboriginal (CBA) individuals) appear to experience less successful ART outcomes, such as higher ART failure and all-cause mortality rates, than non-Aboriginal individuals (8). Recently, clinicians at the Northern Alberta HIV Program (NAP) have noticed the proportion of foreign-born (FB) individuals they care has increased. Little is known regarding ART outcomes among this group. Accordingly, NAP clinicians wanted to gain a better understanding of ART treatment outcomes among FB individuals.

Recognizing which individuals are more likely to be successful is an essential component of HIV care. Understanding determinants of ART adherence, however, is equally important to HIV care. While ART adherence barriers have been well documented, little attention is given to facilitators of ART adherence. Clinicians at the NAP have also commented on how many HIV-positive individuals with chaotic lives (e.g., experience of unstable housing, substance use, incarceration, and / or involvement in the sex trade) have maintained consistent ART adherence over prolonged periods of time; what we can learn from these individuals may help those people living with HIV who struggle with ART adherence. It is not enough, however, to only generate

evidence; systemic change demands moving knowledge into action using context-specific knowledge translation (KT) plans (9). Consequently, the purpose of my thesis research was to describe ART outcomes (ART success and subsequent treatment failure) among FB and CBA individuals. My findings from this study then informed the next part of my thesis research which sought to understand why certain HIV-positive individuals with "chaotic" lives were able to successfully maintain ART adherence. My research also aimed to evaluate a context appropriate KT plan to effectively move this knowledge into action. Taken together, I approached this research using a "qualitative epidemiology" approach, an approach which emphasizes the strengths of the other (e.g., the epidemiological data illustrate the "what" and the qualitative data captures the "why") to generate and move knowledge into action.

My thesis covers three studies related to ART outcomes and adherence to ART. Initially, I used quantitative methods and a clinical database to compare ART outcomes among HIV-positive individuals cared for by the NAP staff. Then, I used qualitative methods to understand the reasons for maintaining ART adherence, despite living in "chaos". Lastly, drawing from the knowledge generated in the qualitative study, I created and evaluated: (1) a KT product, a video ("Living with HIV and its OK"); and (2) a KT strategy which involved peer-educators (PEs).

1.2 Setting

My research involved HIV-positive individuals attending the NAP. The NAP provides care to all HIV-positive individuals in the northern half of Alberta, with four sites of care in Edmonton: the Kaye Edmonton Clinic (University of Alberta); the Royal Alexandra Hospital; the Edmonton Sexual Transmission Infection clinic; and a private physician's office. Before starting ART, individuals and their healthcare team discuss treatment readiness on an individual basis, to address possible obstacles to adherence (e.g., active substance use, transportation barriers). After starting ART, the each individuals' viral load (VL) is measured, and approximately four weeks later, individuals attend the NAP with those results (e.g., their "baseline" VL test results). Once individuals are stabilized on ART, they are seen at the NAP with repeat virologic monitoring, every three to four months. Individuals are seen by a multiple disciplinary healthcare team (10), including infectious disease physicians, nurses, pharmacists, social workers, psychologists, and dietitians. Antiretroviral prescribing is limited to infectious

disease physicians who meet specified criteria (e.g., have specialized training or experience in HIV care). Antiretroviral therapy for adults in northern Alberta is dispensed from two locations of a chain pharmacy (Rexall pharmacy). Furthermore, ART is provided to all individuals in whom they are indicated at no cost to the individual through a provincial government program; CD4 cell counts, VL measurements, and where necessary, genotypic ART sensitivity testing, are also provided through the provincial program. VL is typically measured either prior to or at each visit as part of routine care.

The NAP currently cares for roughly 2,000 individuals with approximately 100 new patients (i.e., treatment naïve or transfers from other jurisdictions) per year. The population of HIV-positive individuals in northern Alberta is heterogeneous with about one third of individuals identifying as Metis or First Nations and 20% of individuals being immigrants and refugees. Similarly, there is a variety of HIV transmission risk groups, including heterosexual transmission, homosexual transmission (e.g., men who have sex with men (MSM)), injection drug use (IDU), and a proportionally smaller number of perinatal transmissions (who are followed by pediatric physicians in the clinic). A substantial proportion of individuals have patient- and socioeconomic-related barriers (defined in chapter 3) to adherence such as unstable housing, active substance use, chronic mental illness, language and/or cultural barriers, or residence in a remote community, comprising a broad spectrum of barriers to adherence. The NAP has a specific focus on enhancing access to care among such individuals through the activities of program staff and connections with community organizations. Partnering with the NAP clinicians offered an opportunity to address their concerns regarding ART outcomes among FB, CBA, and CBNA HIV-positive individuals, and to explore adherence to ART among HIV-positive individuals with chaotic lives. The findings from my thesis research are relevant to similar HIV-positive populations across Canada.

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CHAPTER 2

Research Approach Overview

2.1 Positioning myself

I thought it would be helpful for you, as the reader, to know a little bit about my background to understand my approach to my thesis research. I began my thesis research identifying as a "quantitative researcher" with a background in kinesiology and exercise science. I continued on as a "quantitative researcher" when I entered into the PhD program within the School of Public Health, specializing in epidemiology. Throughout my graduate studies, I had many opportunities to learn about other approaches to science. One of these opportunities was a qualitative methods course I took, *Introduction to Qualitative Inquiry*, instructed by Dr. Maria Mayan. I began reading books by Michael Agar (1, 2, 3), an ethnographer from Baltimore who studied drug use and policy, and who wrote about combining epidemiology and ethnography to better understand complex health issues. During this time, I gained epidemiological fieldwork experience working with Dr. Karen Goodman and the Canadian Northern *Helicobacter pylori* (CAN*Help*) Working Group, a team that "links University of Alberta researchers with northern community leaders and health officials in a collaborative effort to investigate *H. pylori* [*Helicobacter pylori*] infection with the goal of finding solutions to community concerns about health risks" (4). I began to appreciate how qualitative methods and epidemiology could work together to better understand complex health concerns, and in my case, adherence to antiretroviral therapy (ART). It was at this time that I began to approach my research using a different lens, that of a qualitative epidemiologist.

This background explains why I wrote my thesis from the perspective of a qualitative epidemiologist. My initial study, which used the principles of epidemiology, was necessary to quantify ART outcomes among HIV-positive individuals in northern Alberta. The results from this study then informed my subsequent research which aimed to understand why some HIV-positive individuals in northern Alberta were able to maintain adherence to their ART despite living in "chaos" (Appendix 1). This study was guided by principles of community-based participatory research (CPBR) (e.g., research was driven by community concerns and benefited all partners) and qualitative methods. From my experience of working closely with, and learning from, research participants, I developed a fascination for integrated knowledge translation (iKT). Together we created an effective strategy to integrate our research findings into the HIV community. As Michael Agar (3) commented, "*research on humans in their social world by*

other humans is not a traditional science like the one created by Galileo and Newton. It's not that the creators [Galileo, known as the "Father of Science", and Sir Isaac Newton] were wrong. Far from it. The ones who were wrong were the historical figures who tried to imitate the way the creators worked, neglecting the fact that learning how people make it through the day is different from dropping balls from the Leaning Tower of Pisa or getting hit on the head by falling apples. Galileo didn't have to communicate with balls" (p. ix, italics in original).

At the end of my journey, I appreciate why and how quantitative and qualitative methods are *both* necessary to learn "how people make it through the day" (3, p. ix). Quantitative methods can describe trends of health behaviours, while qualitative methods are powerful tools for providing the story behind the numbers. As such, I tend to identify with a constructivist theoretical perspective which presumes that "social reality is relative to the individuals involved and to the particular context in which they find themselves. Change the individuals and you change the reality. Or change the context and you change the reality. Or change both the individuals and the context and thoroughly change the reality" (5, p. 39). Throughout my experiences working with HIV-positive individuals, I paid attention to how I interacted with my participants, how I dressed, what I said (and did not say), how all of this shaped our interactions, and how I was subsequently shaped by this research. As Mayan suggests, "research is dialogic: It is about being in a relationship" (6, p. 25). I know that future (academic and non-academic) experiences will continue to shape who I am, and how I position myself in my research (and this can change). As a result of this experience and learning from my committee members, study participants, Northern Alberta HIV Program (NAP) clinicians, HIV Edmonton staff, and academic scholars, I wrote my thesis through the lens of a qualitative epidemiologist.

2.2 Qualitative epidemiology

Epidemiology is an approach used to understand the distribution and determinants of health determinants within large populations to identify risk factors and public health control strategies, whereas ethnography involves "intensive contact with a small number of people to learn their particular way of viewing and acting in their world" (7, p. 391). During Michael Agar's work with the National Institute of Drug Abuse in the mid-1990s, he became increasingly aware of the explanatory limitations of epidemiologic approaches to research and the limited

generalizability of ethnographic studies. As a result, Agar suggested a method, ethno-epidemiology, which he later would refer to as qualitative epidemiology, to minimize the limitations of epidemiology and ethnography while maximizing their potential (e.g., the use of large samples in epidemiology and ethnography's richness). Ethno-epidemiology combines ethnography's focus on local contexts with epidemiology's focus on populations, and allows for interaction between the different levels. Ethnographic research can inform the design and interpretation of epidemiologic studies and, in turn, epidemiological research guides ethnographic research and tests ethnographic findings in larger samples (7, 8).

To integrate epidemiology and ethnography, Agar initially used the traditional epidemiologic agent-host-environment triad (7). Upon reflection, however, he knew this traditional triad was too simplistic to understand health and illness from a combined epidemiological and ethnographic lens. Agar's theory, therefore, shifted towards a qualitative epidemiology approach to understand health and illness. Qualitative epidemiology considers three features: 1) "Person-in-context" (8, p. 975); 2) "Many hosts, all at once" (8, p. 981); and 3) an ecological model to suggest health illness is interconnected with many levels of environment. First, qualitative epidemiology replaces the epidemiologic "case record" with the "person-in-context" (8, p. 978). Here, one applies a qualitative approach to research and, thus, adopts an epistemology of an understanding that questioning how the human world works isn't about conducting research in controlled environments. Research is about going into the world and doing what is necessary to answer questions you were unaware of until after you started the study. The second feature, many hosts, notices that unhealthy person-in-contexts tend to group among certain kinds of individuals more than others. One must notice and explain the cluster; however, how can one describe these clusters if any person, at any time, is a combination of many hosts (or different identities)? A person-in-context is a combination of many hosts ranging from standard demographics (age, sex, ethnicity) to relationships (son/daughter, husband/wife) to the effects of culture, religion, and history. Lastly, qualitative epidemiology uses an ecological model to understand that environments are composed of many interacting components that adapt and change based on their surroundings.

I chose Michael Agar's 1996 (7) and 2003 (8) articles to illustrate qualitative epidemiology because I identified with why Agar decided to pursue new methods to advance the

fields of ethnography and epidemiology. In Agar's 2003 keynote address (8), he shared his experience working with epidemiologists on a panel at the National Institute on Drug Abuse to describe national drug use trends; the team used a qualitative approach to describe quantitatively collected drug use data. He taught epidemiologists to think qualitatively. As an epidemiology graduate student, I struggle with the limitations of approaching my research with a lens which sometimes fails to consider context; to understand the whole picture, the numbers are a start, but I would like to understand the story behind the numbers. Agar's commentaries on ethno-epidemiology and qualitative epidemiology resonated with me. I agree with Agar when he said, "it struck me then, and still does, that a link between qualitative research and epidemiology makes perfect and powerful sense" (8, p. 975). There is a need to approach research using qualitative epidemiology, an approach which emphasizes the strengths of the other (e.g., the epidemiological data illustrate the "what", and the ethnography captures the "why") to improve and / or design effective public health interventions. Epidemiology is changing and a qualitative epidemiology can provide the richness traditional epidemiology lacks.

2.3 Research Approach

My research was guided by the principles of CBPR and iKT. Accordingly, researchers from the University of Alberta partnered with the NAP clinicians and HIV-positive participants who attend the NAP. Together, we determined the relevant and pressing issue that needed to be addressed. As a result, we actively collaborated during the issue framing stage, decisions about methods, data collection stage, and at the interpretation and knowledge dissemination stage. I used an integrated approach and worked alongside researchers and study partners / knowledge users (KUs) (i.e., NAP clinicians and HIV-positive study participants) to discuss the various interpretations of findings and plan appropriate dissemination strategies before, during, and after study completion. A context-specific dissemination strategy, therefore, involved asking KUs the following questions: 1) What is the most appropriate dissemination approach (e.g., written report, oral presentation, formal, or informal)?; 2) what level of detail do KUs expect?; 3) what type of language do KUs prefer (e.g., scientific, or lay terms)?; and 4) should researchers request preliminary feedback from some KUs on the selected dissemination format? These questions provided information from KUs to ensure my study results were context-specific.

To explain findings to the NAP clinicians, I gave presentations at various NAP weekly rounds where, together, we interpreted and made sense of the findings. Similarly, I met individually with study participants and shared the research findings to ensure I correctly interpreted ART adherence experiences from the participant's point of view and to gather their feedback. As such, our knowledge translation (KT) strategy involved sharing our findings with HIV-positive community residents and HIV community organizations. To do this, we created a video, "Living with HIV and its OK", which featured original study participants so that the research findings could be available to a wide audience, mainly HIV-positive community residents. These individuals may be able to better identify with, and therefore learn from, our participants who face similar life challenges (verses a healthcare or community organization staff member). The purpose of our video, therefore, was to start a conversation about the importance of taking HIV medications consistently; the intention was to help HIV-positive community members be inspired, informed, and gain the confidence to make positive changes in their life.

I have shared this video with inner-city community organizations in Edmonton, including the Boyle McCauley Health Centre, Boyle Street Community Services Centre, StreetWorks, Hope Mission, and HIV Edmonton (Appendix 2 - 5). To reach an even broader audience, with additional informed consent from the video participants, I made the video privately available on YouTube. As such, various HIV community organizations can host our video on their website (Appendix 2). Lastly, end of study KT also included the creation publications for relevant newsletters, such as HIV Edmonton, a popular source of HIV information for HIV-positive individuals regarding the potential implications and benefits of consistent medication adherence (Appendix 5).

2.3.1 Quantitative research approach

For the quantitative component of my research I partnered with the NAP clinicians to determine ART outcomes among foreign-born (FB), Canadian-born Aboriginal (CBA), and Canadian-born non-Aboriginal (CBNA) individuals, using the NAP clinical database. Clinical databases are commonly used in epidemiology to gather large amounts of information and follow-up populations. In northern Alberta, all HIV-positive individuals are treated in conjunction with the NAP. As such, clinical (e.g., viral load (VL), CD4 cell count), personal (e.g., age, country of origin, sex, HIV risk transmission), treatment-related (e.g., ART regimen,

dose, side effects) information, in addition to other information from patient medical records (e.g., personal-, clinical-, and treatment-related information) is collected by NAP clinicians at baseline and is updated at each clinic visit (approximately every 3-6 months). Having access to this database was essential to my quantitative research which aimed to compare ART outcomes among individuals cared for by the NAP clinicians.

Quantitative research is the investigation of numerical data, quantifying the strength of the association between the exposure and outcome variable(s) (9). Quantitative research is categorized into descriptive and analytic studies. Analytic studies are further classified into experimental and observational studies. In observational studies, the investigator has no control over assigning individuals to exposure groups; populations are observed in their natural environment to determine the distribution of disease (or outcome) (9). Epidemiology is a scientific discipline of public health, and aims to determine the distribution and determinants of illness (or health) in a population (9). Given the nature of the data available for my research, a retrospective cohort study was the most appropriate study design to address my research question. Data from all treatment-naïve patients treated at the NAP from 2006-2012 were obtained from the NAP database. These data were coded, cleaned, and prepared for statistical analysis. Descriptive statistics were used to describe the cohort (e.g., age, sex, country of origin) and logistic regression analysis was used to compare probabilities of virological suppression. Lastly, among those who achieved virological suppression, Cox proportional hazard models were used to determine treatment failure rates.

2.3.2 Qualitative research approach

For the qualitative component of my research I used focused ethnography which is a "targeted form" of traditional ethnography (6, p. 39). Traditional ethnography is the more general process characterized by long-term field visits to understand the culture of another human group. Focused ethnography, however, focuses on a distinct problem (i.e., the research question or topic is selected prior to data collection) within a specific context among a small group of people (6). Since the intent of focused ethnography is to concentrate efforts on a specific question, the research can be accomplished within a shorter time than traditional ethnography. Focused ethnography, therefore, is characterised by relatively short-term field visits and by the intensity

of data-generation (10). That is, focused ethnographies produce large amounts of data in a relatively short time period, thus, demand an intensive data analysis.

2.4 Research Objectives

The objectives of my thesis research were three-fold:

1. To use the NAP clinical database to compare ART treatment outcomes among FB, CBA, and Canadian-born non-Aboriginal (CBNA) individuals.
2. To use focused ethnography to understand why HIV-positive participants attending the NAP with chaotic lives maintain consistent ART adherence.
3. To conduct a pilot evaluation of my:
    1) KT product: A video, "Living with HIV and its OK"
    2) KT strategy: Peer-educators (PEs)

2.5 Study Rationale

Although the history of ART is relatively short, this field of science has undergone rapid development. Progress in ART has resulted in dramatic improvements in prognosis as well as challenges, including difficult pill-dosing schedules, pill burden, and side effects (11). To address these therapy-related factors of nonadherence, drug development strategies simplified ART regimens to reduce therapy-related determinants of nonadherence and ultimately improve HIV treatment outcomes. On July 12, 2006, the FDA approved the first single tablet (fixed-dose) taken once a day for the treatment of HIV infection. As a result, a widely used therapy option in developed countries changed from prescribing individuals twice- or three-times daily therapy to fixed-dose combination therapy (12). Taken together, drug development has allowed greater "tolerance" of missed doses and improved tolerability of ART. As such, the field of HIV treatment is a forerunner in the emerging science of adherence and determinants of adherence.

A critical component of ART adherence research is to determine the characteristics of HIV-positive individuals who are likely to maintain ART success, and the characteristics of HIV-positive individuals who are at risk of failing ART. Consequently, the first part of my research aimed to explore ART success and subsequent failure by applying the principles of epidemiology. Although current ART adherence research has provided valuable information

identifying barriers to adherence, the most important source of information relating to consistent ART adherence, HIV-positive individuals who maintain adherence, have rarely been taken into consideration. The second part of my research, therefore, utilized qualitative methods to understand the learning process that enabled HIV-positive individuals to maintain ART adherence despite their chaotic lives.

Given the importance of ART adherence to HIV treatment success, clinicians, researchers, HIV-positive individuals, and HIV community organizations should continue to pursue rigorous knowledge for this endeavor. Currently, research questions which ask why HIV-positive individuals are able to maintain ART success (i.e., focus on facilitators to ART adherence), have received little attention. A critical step in improving HIV treatment is to understand facilitators of ART adherence. My research, therefore, aims to address ART adherence-related issues to improve the care of HIV-positive individuals residing in northern Alberta, and beyond.

2.6 Research Ethics

My thesis research obtained ethical and administrative approval from the University of Alberta Health Research Ethics Board 1 and the Northern Alberta Clinical Trials and Research Centre.

To ensure participant confidentiality, my co-investigators and I were the only researchers to have access to the raw data (from the quantitative and qualitative studies). I stored the raw, audio data, transcripts, signed informed consent forms, and any other forms that identified participants in a locked cabinet. I gave participants the right to request that I destroy text- and audio-material at any time during the research process up until the end of data collection and analysis. Unless otherwise instructed by participants, all raw data will be kept locked in my office for five years after the end of this study, then destroyed.

Research involving HIV-positive individuals presents unique challenges and risks to the participants. In this research, participant risks may have been further complicated by issues surrounding the potential emotional risks associated with disclosing personal experiences related to HIV-positive status, life, and adherence experiences. Further, participants may have revealed more than they intended to during our interview and therefore experienced feelings of loss when

the interview finished. Finally, there was a risk that participants may have felt obligated to participate so that they could have been assured of ongoing access to services and proper care at the NAP. Fortunately, to my knowledge, none of these situations presented themselves during the research.

I utilized several strategies to avoid and / or mitigate the potential emotional risks to study participants. First, I acknowledged that risk assessment was an ongoing and reflexive process. Due to the inductive nature of qualitative research, risks related to the participant, research, or research outcomes may have changed at various time points throughout the research process. Thus, I assumed the ongoing responsibility of risk assessment and response throughout my research. To minimize participant risk at the time of enrolment, NAP clinicians screened participants to ensure that they were aware of the questions I would ask during our interview and that participants were comfortable speaking about their experiences. This study required all participants to read and sign an informed consent agreement, which NAP clinicians discussed with each participant prior to the interview. Clinicians clearly described: 1) The research objectives; 2) anticipated risks or benefits of the research; 3) what would be expected of participants if they participated; 4) how participants' privacy and confidentiality would be respected, and then extended an invitation to participate. The NAP staff emphasized participation was voluntary; participation (or non-participation) would not affect participant care at the NAP. We invited 14 HIV-positive individuals to participate in our study, "Adherence among chaos: Exploring adherence to HIV medication (see Chapter 5); all 14 individuals agreed to participate and provided their informed consent to participate. If, upon completion of an interview, participants experienced abnormal negative emotions or distress, counseling services were immediately available. Participants would have been referred to the psychologist, social worker, and/or nurses at the NAP; this information was included in the information letter (Appendix 1). This scenario, however, did not occur, and as a result, none of the participants requested to meet NAP clinicians following their interview.

In addition to risks related to my participants, I thought through the possible risks related to myself (the researcher). For example, since participants were appropriately compensated for their time with a $25 honorarium, they may have asked me to assist them financially for other needs. As a result, my research team and I came up with an appropriate action plan which helped

me anticipate any risks and how to "ethically, respectfully, and sensitively respond to participants and any difficult events or reactions" (6, p. 130).

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CHAPTER 3

Literature Review

3.1 Background

The aims of my review are to outline the determinants of adherence to ART and to highlight areas of the ART adherence literature where more knowledge is needed. Successful treatment of HIV demands strict adherence to ART. While many studies have explored determinants of non-adherence, most of these studies do not provide a clear understanding of the determinants of ART adherence. Further, little research addresses facilitators to successful HIV treatment among HIV-positive individuals with "chaotic lives" in developed countries.

My thesis research specifically relates to ART adherence among HIV-positive individuals in the northern half of Alberta, Canada. As I carried out my research in Canada, my discussion is largely focused on determinants of ART adherence among HIV-positive individuals cared for in developed countries.

My literature review is organized as follows. I situate the reader by writing about the general HIV context for this research by reviewing the HIV/AIDS epidemiology (e.g., I review the history of the HIV/AIDS epidemic, ART treatment outcomes, and summarize current Canadian data). Next, I briefly discuss adherence to ART, including common terms to describe medication-taking behaviour, and a discussion of the determinants of ART adherence. I then provide an overview of my approach to research: Applying the principles of community-based participatory research (CPBR) to (qualitative) epidemiological research. Finally, I summarize the acquired immune deficiency syndrome (AIDS) treatment activist movement driven by people living with AIDS.

3.2 HIV/AIDS Epidemiology

History

Evidence suggests that HIV-1 entered the human population from chimpanzees in Africa early in the 20th century. The syndrome now known as AIDS was first reported in the United States in the June 1981 issue of *Morbidity and Mortality Weekly Report* describing *Pneumocystis carinii,* now *P. jiroveci,* pneumonia among 5 homosexual men in Los Angeles, California (1). Although the disease was first observed in homosexual men and injection drug users, the risk groups quickly identified included Haitians (2), transfusion recipients (3), infants (4), female

sexual contacts of infected men (5), prisoners (6), and Africans (7). In May 1983, Barre-Sinoussi and colleagues (8) isolated HIV from a patient at risk for AIDS; a year later Robert Gallo and his colleagues published a report confirming the identification of HIV as the cause of AIDS (9). Today, worldwide, HIV/AIDS is considered a pandemic, with an estimated HIV prevalence of 35.3 million people as of 2012 (10).

In Canada, on March 27, 1982 the *Canadian Disease Weekly Report* described the first case of AIDS in a homosexual man from Ontario who had recently returned from Haiti (11). In 1983, however, upon going back and inspecting blood samples, Rogan *et al*. (12) found one of the first Canadian patients to exhibit symptoms of AIDS was in fact a man treated in Edmonton who died in June 1980 (it was later learned that he underwent blood transfusion in Zaire in 1976).

Canadian HIV statistics

At the end of 2012, the United Nations Programme on HIV/AIDS (UNAIDS) estimated 59,000 – 85,000 people were living with HIV in Canada (10). Since reporting HIV/AIDS to the Public Health Agency of Canada (PHAC) began in 1985, 76,275 positive HIV tests have been reported up to December 31, 2012; and, since 1979, 22,702 AIDS cases have been reported (13). In Alberta, 239 HIV positive tests were reported in 2012, and interestingly, Alberta (and Ontario) had the second highest rate for positive HIV reports in Canada at 6.2 per 100,000 population (as compared to the national rate of 5.9 per 100,000 population) (13).

Exposure category

In Canada, when HIV reporting began in 1985, men who have sex with men (MSM) accounted for over 80% of all HIV positive tests with their HIV exposure categories reported. In 2012, MSM continued to be the most common risk behaviour associated with HIV infection in Canada, however, this exposure category accounted for only 50.3% of all prevalent HIV cases (with known exposure category). Heterosexual contact accounted for the was the second highest reported exposure category (32.7%): 13.2% were attributed to heterosexual contact among people born in a country where HIV is endemic; 9.9% were attributed to heterosexual contact with a person at risk; and 9.6% were attributed to having heterosexual contact with someone with no identified risk. The third most frequently reported exposure category among adults in 2012 was injection drug use (IDU) (14.0%) (13).

Age and sex distribution

Over the past decade, the proportion of female HIV cases in Canada has generally held stable at approximately 25%. The age distribution, however, of positive HIV reports for females varies from that for males, the diagnosis generally being made at a younger age in females (13).

"Race / ethnicity"[1]

Since 1998, race/ethnicity has been included in HIV reporting in Canada. By 2012, approximately two-thirds (62.2%) of positive HIV test reports included race/ethnicity information, however, a large proportion of race/ethnicity information is missing. Of the HIV case reports with race/ethnicity information, 52.7% were attributed to the "White" category, and 23.3% to the "Aboriginal" category. This was followed by the "Black" category (13.1%), "Asian" (4.3%), "Latin American" (3.1%), "South Asian/West Asian/Arab" (2.5%) categories, and 1.0% were identified as "Other" (13).

Immigration

Since January 15, 2002, the Immigration Medical Examination (IME) Citizenship includes regular HIV screening. Between January 15, 2002, and December 31, 2012, 5,777 individuals (with an IME) were found to be HIV positive. In 2012, 534 individuals (with an IME) were found to be HIV positive; 231 of these were identified through HIV testing in Canada, and 303 applicant were tested outside of Canada (13).

3.3 Antiretroviral therapy

History

Although the history of ART is relatively short, this field of medicine has undergone rapid development. On March 19, 1987, the FDA approved the first antiretroviral drug to treat AIDS, zidovudine (AZT) (14). Unfortunately AZT, used in monotherapy, did not prove to be effective. The same was observed for the nucleoside reverse transcriptase inhibitors (NRTIs) zalcitabine (ddC), didanosine (ddI), and stavudine (d4T), introduced between 1991 and 1994 (15). Subsequently, in 1995, two studies demonstrated that two NRTIs used in combination were more effective than monotherapy; initial treatments combining ddC or ddI to AZT prolonged life and delayed disease progression (16, 17).

Antiretroviral treatment progressed with the release of two new drug classes: Protease inhibitors (PIs) on December 6, 1995 and non-nucleoside reverse transcriptase inhibitors (NNRTIs) on June 21, 1996 (18). Clinical trials (16, 17, 19) demonstrated the efficacy of

combining antiretroviral therapies with the unprecedented possibility of complete suppression of plasma viremia, and with the availability of new therapies, a combination approach to HIV treatment was standard practice. As such, "highly active antiretroviral therapy" (HAART) describes treatment with the combination, usually of at least three antiretroviral drugs, and with the goal of suppressing plasma virus. Today, "antiretroviral therapy" or "ART" refers to combination therapy.

Progress in ART has resulted in dramatic improvements in prognosis, yet there are barriers, including life-long high adherence to ART (20). Antiretroviral therapies continue to advance with the approval of three new drug classes: Fusion inhibitors in 2003; chemokine receptor type 5 (CCR5) antagonists; and integrase inhibitors in 2007 (21). Moreover, in 2006, a widely used option for HIV-positive, treatment naïve individuals became three-drug fixed-dose combination tablet, taken as a single tablet once daily (e.g., Atripla®; efavirenz/emtricitabine/tenofovir) (21). Therapies advanced in 2011 and 2012 with the addition of two single tablet fixed-dose combination pills, Complera® (emtricitabine/rilpivirine/tenofovir) and Stribild® (elvitegravir/cobicistat/tenofovir/emtricitabine) (21). As of 2013 - 2014, simpler treatment options continue to be explored in randomized controlled trials. For example, findings from the NEAT 001 study (22) suggested a dual combination regimen of raltegravir plus ritonavir boosted darunavir worked as well as traditional ART containing tenofovir/emtricitabine/darunavir/ritonavir. This is an exciting advancement as HIV treatment guidelines have historically recommended combination ART consisting of two NRTIs plus a third drug from a different class, such as a PI, NNRTI, or integrase inhibitor. However, NRTIs can cause severe side effects and toxicities in some HIV-positive individuals, and the introduction of novel antiretroviral classes allows flexibility to create NRTI-sparing regimens and perhaps regimens using fewer than three drugs.

Antiretroviral treatment goals

Huffman and Mulcahy (20) elegantly summarize antiretroviral treatment goals,

> In the daily chaos of CD4 cells, viral load, routine laboratory, genotypic and phenotypic resistance testing, tropism and HLA typing, as well as drug plasma levels, the ultimate goal of antiretroviral therapy should always be borne in mind: To prolong the patient's life, while maintaining the best possible quality of health and life (p. 160).

It is important not only to prevent AIDS-defining illnesses, but to minimize the side-effects of therapy; ideally, ART should minimally influence activities of daily living. Moreover, because ART is not a cure for HIV/AIDS and treatment is indefinite, maximal adherence is critical for treatment success and requires commitment from the patient and healthcare providers.

Treatment success

Virological, immunological and clinical outcomes can evaluate antiretroviral treatment success (20). The earliest indicator of treatment success is virological treatment success, or the suppression of a patient's HIV-1 RNA viral load (VL) below detectable limits (20) (7). The VL detectable limit is based on the current available tests and clinical experience demonstrating the level of suppression which correlates with long term efficacy and prevention of resistance. As the accuracy of VL tests has improved over time, the detection limit has decreased, but <400, and more commonly, <50 copies/mL is the limit used to compare findings within the ART adherence literature. Once a patient achieves virological suppression, a "blip" can occur. A blip is thought to be an isolated low level detectable VL that is followed by a return to virologic suppression. A blip does not indicate virological failure (20). Conversely, viral rebound occurs when a patient's VL increases in a persistent or progressive manner.

Immunological treatment success is the increase in a patient's CD4 cell count which is important for monitoring disease progression and the risk of AIDS-defining illnesses. Immunological success does not directly correlate with virological success in individual patients; even partial VL suppression can cause an increase in a patient's CD4 cell count (23); decreases in AIDS-defining illnesses and mortality are indicators of clinical success (20). Finally, there is a strong association between VL and the rate of decline in CD4 cell counts and progression to AIDS and death (24, 25). CD4 cell response, however, can be somewhat delayed and highly variable following virologic suppression and is influenced by other factors. Accordingly, VL is a more sensitive and specific measure of treatment response to ART than a patient's CD4 cell count (25, 26).

3.4 Adherence to antiretroviral therapy

3.4.1 Terms used to explain medication-taking behaviour

The topic of medication-taking behaviour has generated extensive literature and has been the focus of research in medicine and social science for many years. Medication-taking

behaviour is multi-dimensional and complex. The complexity of medication-taking behaviour is demonstrated by the fact that healthcare providers and researchers commonly use four terms to explain this behaviour: Compliance; adherence; concordance; and recently, persistence. In this section of my review I aim to: 1) Briefly describe compliance, adherence, concordance, and persistence; and 2) Discuss why adherence, concordance, and persistence are appropriate terms to use to describe determinants of medication-taking behaviour among HIV-positive individuals.

Compliance

Until relatively recently the most common term used to describe an individual following medical recommendations was compliance. Haynes, Taylor, and Sackett (27) define compliance as "the extent to which the patient's behaviour matches the prescriber's recommendations." Some researchers (28) have critiqued the term compliance, suggesting that compliance is used to describe a negative relationship between the patient and provider; the provider holds the power in the relationship and, as Robert Horne and colleagues (28) state, the patient "passively follows the 'doctor's orders'". Compliance assumes that: Patients will comply with medical recommendations; patients must do as they are told; and noncompliance should never occur. Moreover, compliance assumes that healthcare providers communicate health recommendations clearly, effectively, and patients have a complete understanding of the provider's instructions. Noncompliance to medical recommendations, therefore, assumes the patient is at fault, incompetent, and unable to correctly follow instructions (28). Trostle (29) describes noncompliance as a deviant behaviour and suggests patients should carry the blame; intentional or unintentional noncompliance results from forgetfulness or ignorance.

As a result, initial views of compliance to medical therapy considered the patient as the source of the 'problem of compliance'. Later this view expanded to include not only the patient, but the healthcare providers, recognizing the importance of the patient-provider relationship. Some researchers suggest the term adherence is thought to better capture the dynamic and complex behaviour required by patients and providers to achieve optimal health (30).

Adherence

The term adherence was introduced as an alternative to compliance. Adherence attempts to equalize the relationship between patients and providers, and emphasizes the patient's right to choose whether to follow the provider's recommendations (28). A main difference between compliance and adherence, therefore, is that adherence requires the patent's agreement to the

provider's recommendations. Considering that adherence underscores the need for agreement between patients and providers, Horne *et al*. (28) suggest adherence improves the definition of compliance.

Effective patient-provider relationships and bi-directional communication allows the patient and provider to discuss and negotiate alternative treatment options and the actual treatment regimen, and discuss potential adherence issues. Adherence, therefore, implies the patient is an active participant in their own health care and that good communication between patients and providers is necessary to achieve optimal adherence. Still, some researchers are not satisfied with compliance and adherence, as these terms do not capture the complexity of medication-taking behaviour (31); concordance is now increasingly used to describe medication-taking.

Concordance

Concordance is a term used in the United Kingdom to describe medication-taking behaviour. Horne *et al*. (28) define concordance as "a new approach to the prescribing and taking of medicines. It is an agreement reached after negotiation between a patient and a healthcare professional that respects the beliefs and wishes of the patient in determining whether, when, and how medicines are to be taken. Although reciprocal, this is an alliance in which healthcare professionals recognize the primacy of the patient's decisions about taking the recommended medications" (p. 33). Concordance recognizes the need for patients and providers to work together to reach an understanding and make a joined decision, and also recognizes that patients and providers may have differing health beliefs.

Given that patients and providers may have differing health beliefs, concordance, therefore, is a term that can address the problem of nonadherence. Concordance acknowledges that for some patients, nonadherence may be an intentional, rational response based on the patients' experiences and beliefs. Some research indicates treatment nonadherence can happen when providers prescribe medication without considering patients' personal experiences and treatment preferences (32). Patient-provider dialogue, therefore, that ignore patient's beliefs would be more likely to lead to nonadherence (e.g., disconcordant). In concordant medical interactions, the patient's beliefs are discussed and deemed extremely important. Accordingly, the term concordance emphasizes the importance of the medical interaction; the patient's

experiences and opinions are valued, the patient and provider discuss the best treatment plan, and the patient makes the final decision (33).

Persistence

Since single tablet once-daily fixed-dose combination tablets are becoming the standard of HIV treatment, some clinicians and researchers suggest using the term persistence to describe HIV treatment (34, 35). Medication persistence is defined as "the duration of time from initiation to discontinuation of therapy" (36), and is articulated as the number of days (or months) on treatment. Medication persistence and adherence are similar in that they both measure the extent to which a patient's behaviour agrees with a provider's recommendations. Bae *et al*. (34), however, argue these terms differ in that "adherence measures 'how often', whereas persistence measures 'for how long'" (p. 281) and suggest these terms are "complimentary but distinct" (p. 281).

Adherence and concordance to describe medication use among HIV patients

The term adherence, although slightly less authoritarian than compliance, may imply an imbalance of power; the healthcare provider suggests certain medical recommendations to be followed, regardless of the patient's opinion. Generally, the HIV-specialized provider has extensive ART prescribing knowledge, and therefore can advise the patient on the most appropriate treatment available. The provider's decision is balanced against risks, evidence-informed, and tailored to the HIV-patient's lifestyle (20).

Specific to HIV treatment, adherence and persistence describe the patient and provider working together to achieve a treatment plan acceptable for both, and emphasize that both parties may be responsible for treatment failure. Whereas concordance implies patients should take a greater responsibility for their treatment plan. HIV treatment is complex, involving a combination of usually at least three antiretroviral drugs, has substantial challenges including difficult pill-dosing schedules (in some cases), dietary requirement, side-effects, significant drug-to-drug interactions, and antiretroviral resistance testing must be used to guide therapy choices (37). Patients and providers must work together to achieve treatment success. Persistence is an appropriate term to understand medication-taking behaviour among HIV-positive patients when wanting to accurately quantify the duration a patient remains on medication. When the goal is to understand the complexity of medication-taking behaviour and the determinants of medication-taking among HIV patients, however, adherence and concordance are more appropriate terms.

3.4.2 Adherence to antiretroviral therapy

Achieving optimal ART adherence is a critical issue in treating HIV-infected patients. Initially, researchers thought that ART would completely eradicate HIV from the patient. Eradication, however, has been hindered by HIV reservoirs, even when a patient's VL is undetectable. Resting memory T cells, which house proviral DNA, survive for longer than originally believed (20). Currently, available antiretroviral drugs are only active during various stages of viral replication, hence are not able to eliminate this reservoir.

Sustained viral suppression is also critical to prevent the development of mutations which can confer antiretroviral drug resistance. Accordingly, adherence to ART must be high and consistent to achieve sustained viral suppression. High levels of adherence to ART are associated with good virological, immunological, and clinical outcomes (e.g., virological suppression, improved CD4 cell counts, and decreased morbidity). In a seminal article, Patterson *et al*. (38) compared patients with <95% adherence to un-boosted PI-based ART to patients with ≥95% adherence; patients with ≥95% adherence were less likely to fail treatment, had a higher increase in CD4 cell count, and spent less time in hospital. Patterson *et al*.'s (38) research suggested that ART may require adherence rates of ≥95% to be effective at suppressing VL.

Patterson et *al*.'s (38) article, however, was published over ten years ago. Current antiretroviral drug regimens may be more forgiving of suboptimal adherence due to longer drug half-lives (e.g., NNRTIs or ritonavir boosted PI regimens), increased potency, and higher genetic barriers to resistance (39, 40). For example, NNRTI-based regimens have a low genetic barrier to resistance, require one mutation to develop resistance to ART. Whereas PI-based have a high genetic barrier to resistance, meaning these regimens require multiple mutations over a long time period before resistance can occur (37). Suboptimal adherence to ART, nonetheless, may allow a patient's VL to increase, which can lead to the development of antiretroviral drug resistance (41). Once resistance begins to develop, a cycle of increasing treatment failure and increasing levels of resistance can result. Consequently, controlling viral replication with currently available drugs becomes difficult.

Friedland and Williams (40) suggest a "bell-shaped" relationship between suboptimal adherence and antiretroviral drug resistance; perfect adherence and perfect non-adherence to ART are less likely be associated with developing ART resistance, whereas moderate levels of adherence increase the likelihood of developing resistance. As a result, it has been proposed that

only marginally suboptimal adherence can lead to treatment failure and antiretroviral drug resistance. Some researchers suggest, however, that each antiretroviral class has different relationships between adherence and drug resistance (39, 40). For example, NNRTI resistance is more likely to develop at lower levels of adherence, whereas resistance to boosted PI-based therapy is uncommon at any level of adherence due to the high genetic barrier of resistance. For patients who develop resistance to boosted PI-based therapy, resistance likely occurs at moderate-high levels of adherence (42). Nonetheless, a high level of adherence remains critical to ART success.

3.4.3 Determinants of adherence to antiretroviral therapy

A critical issue in treating HIV-positive individuals with ART is maintaining optimal adherence over the course of life-long treatment. Evidence indicates individuals need to achieve and maintain high adherence levels to suppress the VL, prevent the emergence of drug resistance, and prevent disease progression, including early death (38, 42, 43). Although research attempts to clarify determinants of ART adherence, findings are inconsistent and research questions focus on identifying barriers to ART adherence. According to the World Health Organization (30), determinants of adherence correspond to five dimensions: Patient-related; social/economic-related; condition-related; therapy-related; and healthcare team/system-related factors (Table 3.1).

Table 3.1 Determinants of adherence to antiretroviral therapy, classified according to the World Health Organization's five dimensions of adherence (reference 30).

Dimension	Determinant
Patient-related	Depression/anxiety, substance use, self-efficacy, treatment beliefs and attitudes, forgetfulness, hopelessness, life stresses, and age
Social / economic-related	Education, income, literacy level, social support, social exclusion, unstable housing, and employment
Condition-related	Disease severity (baseline viral low and CD4 cell count), rate of disease progression, and understanding the relationship between adherence and viral load

Therapy-related	Pill burden (# of pills), regimen complexity (dietary and dosing), ease of administration/use, understanding instructions about how to take medication, side effects, and previous treatment failures
Healthcare team/system-related	Patient-provider relationship, access to health care/treatment, and poor implementation of educational interventions and/or medication distribution systems

Literature search and selection strategy

I conducted a systematic search for English-language publications that addressed ART barriers and facilitators I searched the Medical Literature Analysis and Retrieval System (MEDLINE), PubMed, Embase, Cochrane Central, International Pharmaceutical Abstracts, Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsychINFO, and Web of Science to locate peer-reviewed published articles that contained some combination of the following terms with Medical Subject Headings (MeSH): 1) Antiretroviral therapy, HAART; 2) Adherence, compliance, barrier; 3) Facilitator; 4) Qualitative studies; 5) Systematic review; 6) Meta-analysis; and 7) Meta-synthesis (i.e., an approach to summarizing qualitative research) (see Appendix 6 for search terms and strategies). For completeness, I reviewed the bibliographies of reviews identified in the search.

Search inclusion criteria included: 1) Systematic reviews and/or meta-analysis and/or meta-synthesis of quantitative and qualitative studies published in English between 2006 and present; 2) Adult HIV-positive individuals, age 15+ years; and 3) Studies conducted in developed countries (e.g., Canada, USA, France, Spain, Italy, Ireland, Australia, Switzerland). I limited my search to systematic reviews and meta-analysis/synthesis due to the proliferation of published studies pertaining to ART adherence[2]. I excluded reviews focused on pregnant or breast-feeding HIV-positive women and institutionalized populations. If a systematic review or meta-analysis/synthesis included studies from developing and developed countries, I included the findings from studies conducted in developed countries. For example, if a meta-analysis/synthesis included studies conducted in developed and developing countries and did not report results for developed and developing countries separately, I excluded the meta-analysis/synthesis from my literature review.

Findings

My selection process resulted in 13 articles; six meta-analyses were excluded as authors did not report results for developed and developing countries separately. The seven articles included in this literature review are summarized in Tables 3.2 and 3.3.

Table 3.2 Number of barriers and/or facilitators reported by review, classified according to the World Health Organizations' dimensions of adherence to antiretroviral therapy (reference 30).

Citation (reference No.)	No. of studies in review	Patient-related factor (No.)	Social / economic-related factor (No.)	Condition-related factor (No.)	Therapy-related factor (No.)	Healthcare team/system -related factor (No.)
Atkinson *et al*. (44)	22	3	-	1	4	-
Mills *et al*., 2006a (45)	31	2	-	-	-	1
Mills *et al*., 2006b (46)	72	21	5	2	8	5
Malta *et al*., 2008 (47)	41	8	1	-	-	3
Vervoort *et al*. (48)	24	7	2	1	3	1
Falagas *et al*. (49)	17	-	3	-	-	-
Malta *et al*., 2010 (50)	38	2	2	-	-	1
***Unique No. of studies and factors**	150	22	6	2	7	7

No. = number

*: I recognized there is overlap between studies included in my literature search (references 44-50). This row indicates the number of unique studies identified in my literature search and the number of unique studies reporting different kinds of adherence-related barriers and/or facilitators.

Table 3.3 Summary of primary findings from all studies included in my literature search

Citation (reference no.)	Primary findings
Atkinson *et al*. (44)	Patient-related (-): Lower adherence self-efficacy; anxiety or depression; and active substance use Treatment-related (-): High pill burden; frequent / severe medication side effects; twice vs. once daily dosing; and use of more medication classes Condition-related (-): High baseline viral load and low CD4 cell count

Mills *et al*., 2006a (45)	Patient-related (-): Active substance use; and depression/anxiety Healthcare team/system (-): Poor patient-provider relationship
Mills *et al*., 2006b (46)	Patient-related (+): Higher self-efficacy; medication takes priority over substance use; accepted HIV status; seeing positive results; belief in efficacy of ART; and living for someone Patient-related (-): Fear of disclosure; feeling overwhelmed; active substance use; forgot to take ART; want to be free of medication; ART is a reminder of HIV status; doubts about ART efficacy; felt healthy; decreased quality of life; work/family responsibilities; feel asleep; too busy/away from home; feeling hopeless; haven't accepted HIV status/doubt HIV status; and low self-worth SES (+): High social support SES (-): Financial constraints; Homelessness; social isolation; and lack of social support Condition-related (+): Understand the need for high adherence to ART Condition-related (-): Don't understand the treatment Treatment-related (+): Simple regimen (e.g., three-drug, fixed dose, combination tablet); having a fixed daily routine; and use of reminder tools (e.g., pill box, beeper) Treatment-related (-): Negative side-effects; regimen was too complicated (e.g., disrupts daily routine, dietary requirements); frequency of dosing (e.g., twice vs. once daily dosing); drugs were too toxic; and treatment was inconvenient Healthcare team/system (+): Patient was part of decision making; and good patient-provider relationship Healthcare team/system (-): Pharmacy problems (e.g., hours of operation conflicting with schedule, access to pharmacy); lack of trust in provider; and transportation problems
Malta *et al*., 2008 (47)	Patient-related (+): Higher self-esteem; higher adherence self-efficacy; positive attitude towards ART; sense of responsibility for protecting others from HIV; and fewer depressive symptoms Patient-related (-): Negative ART outcome expectations; active substance use; and depression/anxiety SES (+): Higher education (being a high-school graduate) Healthcare team/system (+): Access to substitution therapy (e.g., methadone maintenance therapy); and access to mental health treatment (e.g., psychiatric care / receiving antidepressant medication) Healthcare team/system (-): Delayed access to care (e.g., longer delays in initiating ART)
Vervoort *et al*. (48)	Patient-related (+): Positive ART beliefs (acceptance of HIV and acknowledging ART is life-long)

	Patient-related (-): Negative ART beliefs; negative life stress (impact of being HIV-positive on daily life); active substance use; depression; forgetfulness; and low motivation to take ART as prescribed SES (+): Access to social support SES (-): No access to stable housing Condition-related (-): lack of knowledge/understanding of the relationship between adherence and viral load Treatment-related (-): Severe side effects; high pill burden; complicated ART regimen (difficult to schedule dosing an dietary concerns) Healthcare team/system (+): Supportive patient-provider relationship (Provider: caring attitude, effective, and frank communication, providing clear instructions, and being responsive and accessible)
Falagas *et al*. (49)	SES (-): Income, education, employment (SES-related factors were not consistently associated with lower adherence to ART in all studies. Nine of the 11 studies found a trend towards low SES and lower adherence)
Malta *et al*., 2010 (50)	Patient-related (-): Active substance use; and depression/anxiety SES (+): Access to stable housing; and access to social support Healthcare team/system (+): Access to substitution therapy (e.g., methadone maintenance therapy)

(-) Factors having a negative effect on adherence; (+) Factors having a positive effect on adherence; SES = Social / economic; ART = antiretroviral therapy.

These articles have attempted to clarify questions pertaining to the determinants of ART adherence, however, results are inconsistent (44 - 50) (Table 3.3). For example, Atkinson *et al*. (44) identified a number of therapy-related (e.g., pill burden, side effects), condition-related (e.g., high baseline viral load), and patient-related factors (e.g., poor adherence self-efficacy, anxiety or depression) associated with adherence from 22 studies. Using data from quantitative and qualitative studies to conduct a meta-analysis/synthesis, Mills *et al*., *2006a* (45) suggested that the region where the study was conducted, adherence cut-off values, and study quality can explain differences in determinants of adherence and adherence levels. Mills *et al., 2006b* (46) summarized quantitative and qualitative barriers and facilitators to ART adherence. Their review of qualitative studies identified some barriers to ART adherence that were not identified in quantitative studies, such as feeling hopeless, individuals had not accepted/doubting their HIV-positive status, and low self-worth. Conversely, a recent systematic review by Malta *et al*. (47) stated that active substance abuse, depression, and low ART outcome expectations were

associated with poor adherence. Lastly, in a review of qualitative studies, Vervoort *et al*. (48) identified a wide-range of factors that impact ART adherence, but concluded healthcare team/system-based factors were key to ART adherence success. For example, these authors emphasized that a trusting relationship between healthcare providers is essential to medication success. Moreover, attention should be paid to "discussing the details of the circumstances that lead to forgetting medication can reveal aspects that need attention in order to improve adherence. Attention should be given to personal skills, such as the capacity to organize one's life and one's activities and the ability to anticipate risk situations" (p. 279).

Little attention is given to facilitators of ART adherence. Although these reviews did report facilitators to ART adherence, research questions frequently asked about barriers to ART adherence. For instance, Atkinson *et al*. (44) wanted to know "What types of clinical conditions and comorbidities affect nonadherence?", and Falagas *et al*. (49) summarized social / economic-related barriers to adherence. Three reviews summarized ART adherence facilitators (Table 3.3), however, findings were, again, inconsistent. Malta *et al*. (47) and Vervoot *et al*. (48) summarized patient-related ART facilitators. Malta and colleagues (47) reported that higher self-esteem, adherence self-efficacy, and education; a positive attitude towards ART; having a sense of responsibility for protecting others from HIV; and fewer depressive symptoms promoted ART adherence, whereas Vervoot *et al*. (48) stated that acceptance of an HIV diagnosis and an understanding that ART is life-long contributed to ART success. Although both studies summarized patient-related factors, the findings varied. Three studies addressed healthcare team/system-related ART facilitators; all three authors reported various ART facilitators (Table 3.3).

Taken together, this literature review suggested that, although a lot of research has been done to clarify determinants of ART adherence, findings were mixed, and many factors are important to an individuals' ability to maintain ART adherence. This literature review also highlighted a gap in the knowledge; few authors approached their research by asking questions about adherence *success*, rather than failure. By refocusing our questions on adherence success, and working with HIV-positive individuals, clinicians, and HIV community organizations, perhaps we can better understand ART adherence.

3.5 Research using a Community-based Participatory Research Approach (CPBR)

Healthcare providers and researchers are increasingly seeking alternate approaches to the traditional research paradigm to address complex health problems. This step away from traditional ways of conducting research has come at a time that communities are demanding research that is *community-based*, rather than *community placed*. In Canada, the US, and Europe, CBPR is more frequently being used as term to encompass this alternate research paradigm. The WK Kellogg Foundation's Community Health Scholarship program (51) defines CBPR in the health field as "a collaborative approach to research that equitably involves all partners in the research process and recognizes the unique strengths that each brings. Community-based participatory research begins with a research topic of importance to the community with the aim of combining knowledge and action for social change to improve community health and eliminate health disparities" (p. 2).

Together with related action research (AR) and participatory research (PR) approaches, CBPR challenged and changed the traditional research paradigm, where the researcher usually determines the research questions, methods, outcomes, and interventions (52, 53). Although often incorrectly referred to as *research methods*, CPBR (and other participatory approaches) are not methods, but are *approaches to research*. Fundamental to CPBR (and AR and PR) is a commitment to consciously lessen the distinction between who *does* the researching and who *gets* researched. Accordingly, a trademark of CPBR is involvement of community members as co-researchers (54). As Cargo and Mercer (54) suggest, "a key strength of [CPBR] is the integration of researchers' theoretical and methodological expertise with nonacademic participants' real-world knowledge and experiences into a mutually reinforcing partnership" (p. 327).

In epidemiology and other disciplines, scholars recognize that co-production of knowledge between researchers, participants, and/or knowledge users (KUs) / stakeholders can bridge the knowledge-to-action gap (55, 56). In a self-reflection towards the end of his career, Dr. Leonard Syme, a world-renowned social epidemiologist, admitted his research could have been more meaningful to society if he engaged with community members. In his reflection, Dr. Syme challenged young researchers to collaborate with community members "to see the importance of embracing the community as an empowered partner" (56). Syme acknowledged his million-dollar National Cancer Institute-funded research failed because he failed to engage

with the community; “the challenge of involving the community is especially difficult if one has been trained, as I have been trained, to be an arrogant, elitist prima donna. I am the "expert," after all, and I help people by sharing my expertise” (56, p. 1).

Terminology and core principles

The term, *community-based participatory research*, has gained popularity, especially in the US. A number of variations of CBPR are used, however, key terms include: *Action research* (AR) (used extensively in the UK, Australia, and New Zealand); *community-based research* (CBR) (used in Canada) (57); *participatory action research* (PAR); *participatory research* (PR) (used in developing countries); and most recently, *community-partnered participatory research* (58). Proponents to these various terms continue to engage in critical discussion over which term best captures the principles driving participatory research. Many experts argue that although these various approaches have different goals, a common ground is found in a set of core principles (58, 60) summarized by Israel *et al*. (53) who suggest that CPBR:

1. “Recognizes community as a unit of identity” (p. 178)
2. “Builds on strengths and resources within the community” (p. 178)
3. “Facilitates collaborative partnerships in all phases of the research” (p. 178)
4. “Integrates knowledge and action for mutual benefit of all partners” (p.179)
5. “Promotes a co-learning and empowering process that attends to social inequalities” (p.179)
6. “Involves a cyclical and iterative process” (p. 180)
7. “Addresses health from both positive and ecological perspectives” (p. 180)
8. “Disseminates findings and knowledge gained to all partners” (p. 180)

Taken together, CPBR is used as an overarching term to describe an *approach* to research that values the aforementioned principles. Further, proponents of CPBR consider research as a process to respectfully engage with communities to combine research with knowledge and action for change.

Historical roots of community-based participatory research

Although there has been a growing agreement with respect to principles and values, the majority of participatory and action-oriented approaches to research stem from two separate

traditions that are opposite each other along a continuum. At one end of the continuum is *AR*, championed by Kurt Lewin (61) and his supporters (62, 63) who emphasized engaging people affected by a problem in practical ways through a cyclical process of research, action, and evaluation. The term AR has recently been used in the UK and Australia to describe an overarching family of "participatory inquiry and practice" approaches (64, 65). In this tradition there is some, but not necessarily extensive, involvement of interested/affected individuals, and generally little commitment to broader social change objectives (62).

At the other end of this continuum is the emancipatory focus of the *PR*, *collaborative action research*, and *PAR* traditions, which have their roots in education and the related work in the 1970s with and by marginalized peoples in Africa, Asia, and Latin America (66). Many researchers suggest that these approaches are tied to social movements such as anticolonialism. In fact, some suggest these approaches were a counter to the "colonizing" nature of the research these people were subject to (67, 68). As Budd Hall (69) suggested, "Participatory research was very largely theorized and disseminated from a social movement. Among the original premises were the importance of 'breaking' what Hall referred to as the 'monopoly over knowledge production' by universities… [with] recognition that the academic mode of production was, and remains, in some fundamental way, linked to different sets of interests and power relations than [those held by] women and men in various social movement settings or located in more autonomous community-based, nongovernmental structures" (p. 35).

Community-based participatory research for epidemiology and public health

Community-based participatory research can and does occur at many places along the continuum from Lewanian action research through emancipatory participatory (action) research. For everyone to live up to the principles of CPBR for health, the principles of forming true partnerships between researchers and communities and achieving a balance between research and action should be emphasized. Moreover, CBPR provides an important goal for public health sciences and epidemiology to ensure that research questions are focused on the community's concerns and is conducted in a scientifically rigorous manner. At the same time, CBPR can create the conditions in which the researcher becomes the co-learner (rather than outside expert), and communities better recognize and build on their strengths and become full partners in creating and moving knowledge into action.

3.6 Community-based AIDS treatment activism driven by People with AIDS: A concise history

Early in the AIDS epidemic, people with AIDS (PWA) did not participate in HIV care and treatment activist roles: Once physicians confirmed their AIDS diagnoses, they were dying. By 1983, however, many gay men living with AIDS wanted to participate and advocate for their own HIV care. Celebrated PWA activists Callan and Turner (70) wrote,

> New York People with AIDS began to express growing frustration at attending too many [Gay Men's Health Crisis] GMHC forums in which those of us with AIDS would sit silently in the audience and hear doctors, nurses, lawyers, insurance experts, and social workers tell us what it was like to have AIDS…It seemed to occur to several of us simultaneously…that there was something wrong with this picture. The "real experts," we realized, weren't up there…The idea struck us like a bolt of lightning. Until then, it simply hadn't occurred to those of us in New York who were diagnosed that we could be anything more than passive recipients of the genuine care and concern of those who hadn't (yet) been diagnosed (p. 17).

In May 1983, the first organized PWA self-empowerment movement evolved out of an unplanned meeting in a Denver hotel among PWA attending a national AIDS forum. This group talked about a vision of creating multiple PWA groups, groups situated in the major AIDS epicenters (e.g., New York, Los Angeles, San Francisco, and Denver), and linking these groups as a national association. They also generated four guiding principles to advocate for PWA self-empowerment, and as Callan and Turner (70) wrote,

> Decided to storm the closing session [of the National AIDS Forum] and present our demands. In a democratic fashion, we each declaimed one of the points until our whole list of recommendations and responsibilities had been publicly uttered for the first time (p. 17).

These four principles became known as the 'The Denver Principles' (71) and became a foundation document for PWA to empower themselves and community members. This document introduced a new attitude by stating "We condemn attempts to label us as 'victim,' which implies

defeat, and we are only occasionally 'patients,' which implies passivity, and dependence upon the care of others. We are 'people with AIDS'" (71). The first principle addresses healthcare professionals, and asks them to stop hiding from their attitudes about AIDS and to treat PWA as "whole people and address psychosocial issues as well as biophysical ones". The second principle targets "all people," urging them not to blame PWA. The third principle identifies PWA's human rights, including the right to "full and satisfying sexual and emotional lives", to access to quality medical treatment and social services without discrimination, full explanations of treatments, privacy and confidentiality, and finally "to die--and to LIVE--in dignity" (71, caps as original). This principle also encourages PWA to be safe while engaging in sexual activities and to tell their sexual partners about their HIV status. The fourth principle encourages PWA to join together and "form caucuses to choose their own representatives, to deal with the media, to choose their own agenda, and to plan their own strategies. To be involved at every level of AIDS decision-making… [and to] be included in all AIDS forums with equal credibility" (71). The ideas of the Denver Principles proved to be fundamental to later AIDS activism.

Political actions

Larry Kramer, a novelist and playwright, was one of the few voices advocating for political actions. In his New York Native newspaper article, '1,112 and Counting' (72) (the title reflected the AIDS death toll), Kramer called the gay community to action; he publicly criticized their apathy and inaction to advocate for themselves in response to the AIDS epidemic,

> Every straight person who is knowledgeable about the AIDS epidemic can't understand why gay men aren't marching on the White House. Over and over again, I hear from them, "Why aren't you guys doing anything?"…Every politician I have spoken to has said to me confidentially, "You guys aren't making enough noise. Bureaucracy only responds to pressure."

Hoping to set the wheel in motion, Kramer (72) wrote,

> I hope that we don't have to conduct sit-ins or tie up traffic or get arrested. I hope our city and our country will start to do something to help start saving us. But it is time for us to be perceived for what we truly are: an angry community and a strong community.

Kramer concludes with a call to action (72):

> It is necessary that we have a pool of at least three thousand people who are prepared to participate in demonstrations of civil disobedience…I am asking every gay person and every gay organization to canvass friends and members and make a count of the total number you can provide towards this pool of three thousand.

ACT UP

March 1987, Larry Kramer gave a pivotal speech at the Lesbian and Gay Community Services Center in Greenwich Village, New York City. Kramer caught the audience's attention by stating, what he thought was obvious, that most of this community would be dead in a matter of years, and then asked the question: "Do we want to start a new organization devoted solely to political action?" (70, p. 23). His answer was 'yes!'. Kramer ended his speech by asking, "What are we going to do?" and "suddenly, a slight woman in the back stood up and shrieked, 'Act up! Fight back! Fight AIDS!'" (73). Kramer's speech had an incredible effect; within days, 300 people joined together to participate in the initial meeting of the 'AIDS Network,' now known as the AIDS Coalition to Unleash Power, or ACT UP.

The flyer for ACT UP's first action read (74):

> NO MORE BUSINESS AS USUAL! Come to Wall Street in front of Trinity Church at 7AM Tuesday March 24 for a MASSIVE AIDS DEMONSTRATION…AIDS IS THE BIGGEST KILLER IN NEW YORK CITY OF YOUNG MEN AND WOMEN. Tell your friends. Spread the word. Come protest together...AIDS IS EVERYBODY'S BUSINESS NOW (74, emphasis as original).

This flyer outlined the goals that would become central to ACT UP and their activism efforts are summarized by the slogan "Drugs into Bodies." With the goal of finding resources for developing new and affordable HIV drugs, they demanded (74):

1. "Immediate release by the Federal Food & Drug Administration of drugs that might help save our lives.

   These drugs include: Ribavirin (ICN Pharmaceuticals); Ampligen (HMR Research Co.); Glucan (Tulane University School of Medicine); DTC (Merieux); DDC (Hoffman-LaRoche); AS 101 (National Patent Development Corp.); MTP-PE (Ciba-Geigy); AL 721 (Praxis Pharmaceuticals)
2. Immediate abolishment of cruel double-blind studies wherein some get the new drugs and some don't

3. Immediate release of these drugs to everyone with AIDS
4. Immediate availability of these drugs at affordable prices. Curb your greed!
5. Immediate massive public education to stop the spread of AIDS
6. Immediate policy to prohibit discrimination in AIDS treatment, insurance, employment, housing
7. Immediate establishment of a coordinated, comprehensive, and compassionate national policy on AIDS.

President Reagan, nobody is in charge!" (74)

This call for widely available HIV medications remains central to the ACT UP agenda. By 1988, over 100 ACT UP chapters could be found in the US (Boston, Los Angeles, Portland, Seattle, Houston, and New Orleans), Canada (Montreal), and worldwide (Sydney, London, Berlin, Amsterdam, and Paris). Following ACT UP, the Treatment Action Campaign in South Africa used a similar strategy of community mobilization and empowering people with AIDS to pressure the government to make HIV drugs available in the South African public healthcare system (75). Finally, Wright (71) elegantly reminded us,

> By organizing themselves [AIDS activists], and then organizing their communities around them, the earliest AIDS activists remained important and, ultimately, honored people within their communities. Their ideas and actions, and those of the activist movements they inspired, helped to eventually make AIDS a fact of life rather than a synonym for death (p. 1796).

3.7 Footnotes

[1]The term, "race/ethnicity" is the term PHAC uses to describe ethnicity in the HIV and AIDS in Canada Surveillance Report to December 31, 2012 (reference 13).

[2]For example, a search using MEDLINE and a combination of search terms including antiretroviral therapy, compliance, year 2006+, adults, barriers, Canada, and English (Appendix 6, search strategy using terms 1-34) lead to 549 unique studies.

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CHAPTER 4

Antiretroviral treatment outcomes among foreign-born and Canadian-born Aboriginal people living with HIV/AIDS in northern Alberta

This chapter was submitted for publication as Lefebvre M, Hughes CA, Yasui Y, Saunders LD, Houston S, "Antiretroviral treatment outcomes among foreign-born and Aboriginal peoples living with HIV/AIDS in northern Alberta," Canadian Journal of Public Health [in press, 2014].

4.1 Introduction

The HIV/AIDS epidemic in Canada disproportionately impacts vulnerable populations including immigrants/refugees. In 2012, individuals born in HIV-endemic countries comprised approximately 2.2% of the Canadian population but accounted for 13% of newly diagnosed HIV cases (1). In Alberta, from 2000-2005, next to Caucasians, Aboriginal peoples made up the second largest group of HIV cases with known ethnicity. After 2006, however, there have been more individuals from HIV-endemic countries diagnosed with HIV than Aboriginal peoples (2). Antiretroviral therapy (ART) has the potential to dramatically increase healthy life expectancy, but requires life-long treatment and a high level of adherence. Although the literature has taught us that ART can be effective (if taken as prescribed), in Canada, some vulnerable HIV-positive individuals are not able to experience the full benefits of ART. Martin *et al*. (3) reported that Canadian-born Aboriginal (CBA) individuals starting ART were less likely to attain initial treatment success compared to Canadian-born non-Aboriginal (CBNA) individuals. These authors (3) also observed that among those individuals who were successful on ART, CBA individuals had increased rates of subsequent treatment failure. Moreover, researchers have noted that CBA HIV-positive individuals have increased rates of death (pertaining to all causes) compared to CBNA HIV-positive individuals (4, 5).

Little attention has been given to ART outcomes among foreign-born (FB) HIV-positive individuals in North America. Since this is a substantial and growing population (1, 2), and ART can prolong life, we urgently need to understand ART outcomes among FB HIV-positive individuals. The stress of resettlement after migration and lack of familiarity with the Canadian medical system can impact access to and utilization of healthcare, and this may result in poorer ART outcomes (6). Cultural and language barriers, including health beliefs and expectations of a medical interaction, may impact access to and utilization of healthcare and ART outcomes. Further, stigma may be a major obstacle to accessing healthcare in close-knit ethnic communities. Findings from the USA indicated that delayed presentation for HIV-related medical care was associated with belonging to an ethnic minority and HIV transmission through heterosexual contact (7, 8). FB individuals may also experience poorer HIV treatment outcomes, including treatment failure and progression of HIV disease.

I conducted this research with the clinicians at the Northern Alberta HIV Program (NAP). The NAP is a multiple site HIV clinic based in Edmonton and cares for all HIV-positive individuals in the northern half of Alberta (from Red Deer to the Northwest Territories boarder), approximately 2000 individuals. The population of HIV-positive individuals in northern Alberta is heterogeneous with 15-20% of individuals born outside of Canada and approximately one-third of individuals self-identifying as Metis or First Nations.

The NAP team is composed of infectious disease doctors, nurses, a dietician, social workers, psychologists and pharmacists. Individuals are usually seen in follow-up approximately four weeks after starting ART, then every three to four months. ART in northern Alberta is dispensed from two outpatient pharmacies, and is provided free of charge for all individuals with provincial healthcare coverage; this program also provides CD4 cell counts, HIV-1 viral load (VL) measurements, and genotypic resistance testing. Genotypic resistance testing is performed routinely at diagnosis, and any resistance identified is taken into account in the selection of the treatment regimen. Additionally, Canada has a national program which covers ART for those refugees who qualify. The NAP clinical database contains patient related information including patient demographics, HIV transmission behaviour, ART regimen, CD4 cell counts, VL measurements, and is updated following each patient's clinic visit.

To understand how FB HIV-positive individuals served by the NAP were doing on once-daily ART regimens, I decided to undertake a retrospective cohort study to compare their ART outcomes with those of HIV-positive CBNA individuals using the NAP database. I also decided to compare ART outcomes between CBA and CBNA individuals to assess whether the results observed previously by Martin *et al*. (3) had changed. The Martin *et al*. (3) study observed individuals included in the NAP database who started ART from 1999-2005. In this paper, therefore, I compared the probability of achieving initial treatment success for: 1) FB individuals compared to CBNA individuals; and 2) CBA individuals compared to CBNA individuals prescribed once-daily ART from 2006-2012. Among those individuals who attained initial treatment success, I compared the rates of subsequent treatment failure between these three groups.

4.2 Methods

This study was approved by the University of Alberta Health Ethics Research Board.

4.2.1 Study design and study population

Since my study was an expansion of Martin *et al*.'s work (3), I derived the following methods for this study from those created by Martin *et al*. (3).

This study was a retrospective cohort design, following individuals starting ART in the period 2006-2012. To identify my study population, I used the NAP clinic database and these inclusion criteria: 1) previously have not received ART; 2)began ART anytime from January 1, 2006 and January 1, 2012 (this is hereafter referred to as "baseline"); 3) receiving once-daily ART; and 4) age 18 years old or older when starting ART.

My study population did not include individuals if they did not have: 1) country of origin recorded in the database; 2) baseline VL recoded in the database; 3) baseline VL <400 copies/mL; or 4) >6 months follow-up time. Individuals who were pregnant and prescribed ART to prevent mother-to-child transmission were also excluded. Baseline VL was defined as the measure that was taken closest to the ART start date, ≤6 months before, and not after starting ART. Individuals with baseline VLs that were missing or <400 copies/mL were not included as these individuals may have been transferred from elsewhere and were previously on treatment.

ART was defined as three or more antiretroviral drugs (excluding ritonavir), prescribed at the same time. To determine when an individual started ART, the initial date that ART was prescribed and entered into the NAP database was used, with the assumption that patients persisted on ART. January 2006 was chosen as the follow-up start because once-daily ART had become the standard of HIV care in the vast majority of cases by this time (9): therefore, this analysis focused on individuals prescribed once-daily ART. Data for the analyses outlined below were extracted from the NAP database.

4.2.2 Statistical methods

The main exposure variable was country of origin. Individuals were classified as: 1) FB if individuals reported being born outside of Canada (including being born in the USA); 2) CBA if individuals self-identified as Aboriginal, First Nations, or Metis; or 3) CBNA if individuals did not report being born outside of Canada or as Aboriginal, First Nations, or Metis. Individuals were followed-up from January 1, 2006 until July 1, 2012, allowing for a follow-up time of six months to six years.

The following potential confounders were considered: ART regimen (protease-inhibitor (PI) or non-PI based), baseline age, baseline CD4 cell count, baseline VL, year starting ART, injection drug use (IDU) as an HIV transmission risk exposure category, and sex. Baseline CD4 cell count and VL were defined as the measurements recorded in the database immediately prior to the date an individual began ART. To compare these results with Martin *et al*. (3), individuals were classified as IDU if NAP staff recorded their transmission risk exposure as IDU, or IDU plus any other transmission risk. Also for comparability with previous research (3), individuals with other transmission risk exposures (e.g., unknown/missing, heterosexual contact, men who have sex with men risk exposures) were classified as 'other exposures'. In the unadjusted analysis all potential confounders were assessed for associations with initial virological suppression and subsequent virological failure with two-tailed p-values of <0.20. In the final statistical models, p-values were two-tailed and associations with p-values of <0.05 were considered statistically significant. Stata (version 11.0; StataCorp LP, College Station, TX) was used to conduct the statistical analysis.

Chi-square tests for categorical variables and Kruskal-Wallis tests for continuous variables were used to compare FB, CBA, and CBNA individual characteristics. Next, following the statistical methods of Martin *et al*. (3), logistic regression analysis was used to determine the probability of attaining virological suppression with respect to country of origin, controlling for confounding variables. Virological suppression was defined as one VL test <400 copies/mL within six months after initiating ART. Individuals without VL tests within six months after initiating ART were classified as not attaining virological suppression to allow for comparison of these results with previous research from Martin *et al*. (3).

Last, Cox proportional hazards models were used to determine the rate of virological failure among those individuals who were initially successful on ART. Individuals were classified as failing ART if they had two consecutive VL tests >400 copies/mL as indicated in the NAP database. In the unadjusted analysis, cumulative incidence curves (10) were used to compare virological failure rates by country of origin. Also in the unadjusted analysis, the proportional hazards assumption for the country of origin status was assessed using a time-varying covariate (country of origin status by the log of time). Cox proportional hazards models were used to compare hazard ratios (HR) of treatment failure (10), controlling for confounders.

An individual contributed person-time (11) to this analysis beginning on the date of initial virological suppression and ending on: 1) the date of the first (of two sequential) VLs >400 copies/mL for individuals who failed treatment; 2) the end of study date (January 1, 2012) for censored individuals; or 3) if an individual died, the date of death.

4.3 Results

During the study period, 550 individuals were prescribed ART and 322 individuals met the eligibility criteria for the initial virological suppression analysis. This analysis did not include 228 individuals, the majority of whom did not have a baseline VL (53%) or had a baseline VL <400 copies/mL (22%) (Figure 4.1). Table 3.1 shows the characteristics of the 322 individuals in this analysis.

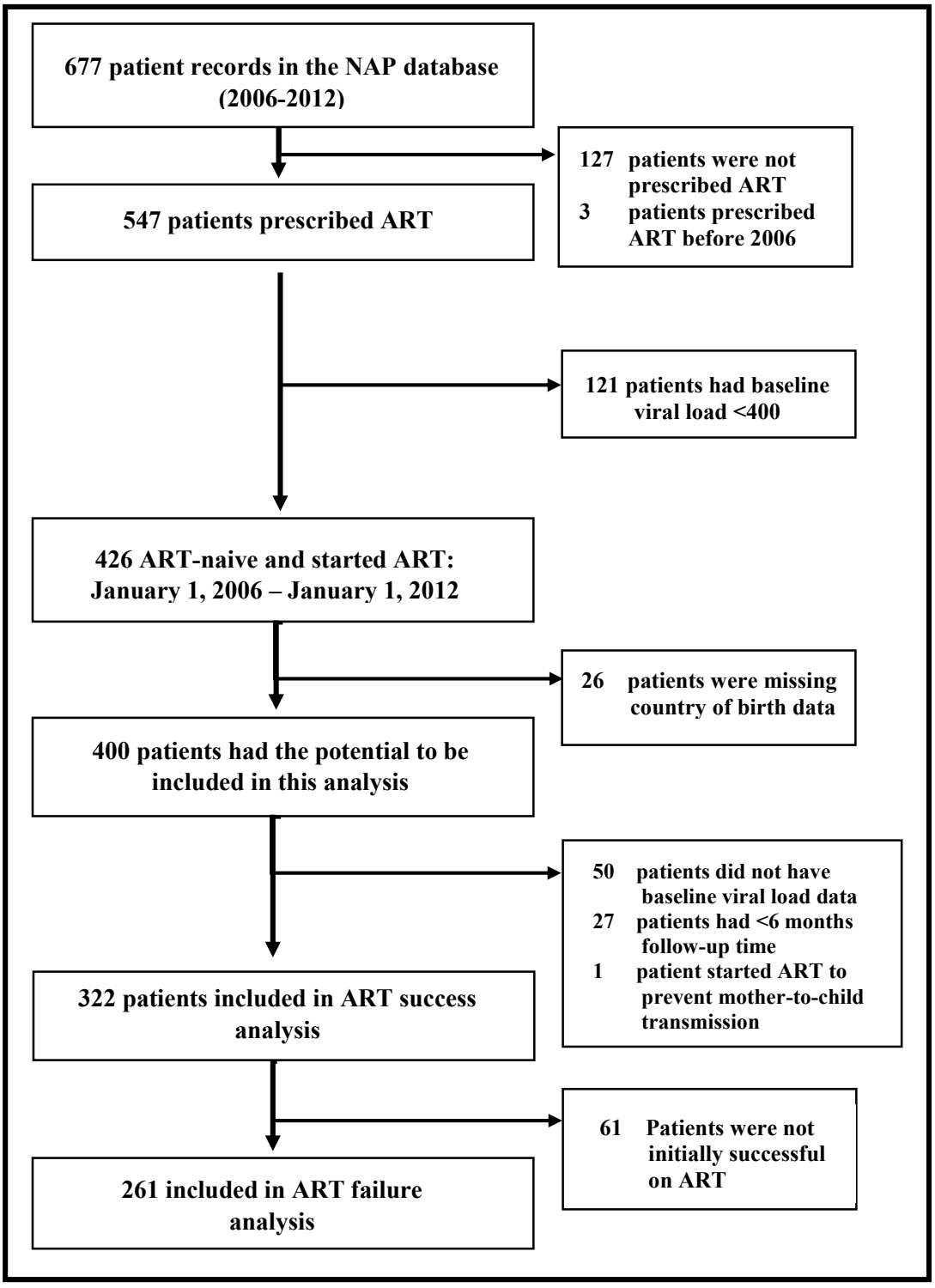

Figure 4.1 Flow chart of the study population for my analysis of antiretroviral therapy success for individuals starting antiretroviral therapy in the Northern Alberta HIV Program, 2006-2012.

Table 4.1 Antiretroviral therapy success after starting ART: Individual characteristics by country of origin (n=322) (81% attained success)

Characteristic	Foreign-born (n=128; 40%)	Canadian-born Aboriginal (n=87; 27%)	Canadian-born Non-Aboriginal (n=107; 33%)	p-value
Proportion attaining VS, no. (%)	105 (82)	63 (72)	93 (87)	0.040
Baseline Age, median (IQR)	38 (34.5-44.5)	42 (34-47)	45 (38-51)	<0.001
Baseline Age, no. (%)				0.0020
17-30	18 (14)	14 (16)	12 (11)	
31-40	58 (45)	25 (29)	23 (22)	
41-50	36 (28)	33 (38)	43 (40)	
51-77	16 (13)	15 (17)	29 (27)	
Sex, no (%)				<0.001
Female	68 (53)	41 (47)	16 (15)	
Male	60 (47)	46 (53)	91 (85)	
HIV transmission risk exposure category, no (%)				<0.001
Injection drug use	3 (2)	38 (44)	28 (26)	
Other exposure	125 (98)	49 (56)	79 (74)	
Baseline CD4 cells/µL, median (IQR)	240 (150-340) (n=122)	225 (90-360) (n=86)	211 (90-360) (n=103)	0.53
Baseline CD4 cells/µL, no. (%)				0.42
5-50	13 (10)	13 (15)	20 (19)	
51-200	35 (27)	27 (31)	30 (28)	
201-350	46 (36)	24 (28)	27 (25)	
351-1150	28 (22)	22 (25)	26 (24)	
Missing	6 (5)	1 (1)	4 (4)	
Baseline VL copies/mL (IQR)	27,000 (4,836.5-135,000)	32,000 (8,600-98,000)	73,000 (21,000-190,000)	0.38
Baseline VL copies/mL, no. (%)				0.090
0-9,999	40 (31)	26 (30)	18 (17)	
10,000-44,999	33 (26)	23 (26)	25 (23)	
45,000-139,999	23 (18)	20 (23)	33 (31)	
140,000-750,000	32 (25)	18 (21)	31 (29)	

Initial ART regimen, no. (%)				0.030
PI-based	68 (53)	46 (53)	39 (36)	
Non PI-based	60 (47)	40 (47)	68 (64)	
Year starting ART, no. (%)				0.010
2006-2008	68 (54)	30 (34)	42 (40)	
2009-2012	59 (46)	57 (66)	64 (60)	

VS=viral suppression; IQR=interquartile range; VL=viral load, PI=protease inhibitor ART=antiretroviral therapy.

4.3.1 Virological suppression

Of the 322 individuals included in this analysis, 261 (81%) attained initial virological suppression (Table 4.1) and 61 individuals did not (23 FB individuals and 24 CBA individuals). Among the 61 individuals who did not attain initial virological success, four (6.6%) died within six months after initiating ART (all CBA individuals). In the unadjusted analysis, there was no significant difference in terms of likelihood of attaining initial virological suppression between FB and CBNA individuals (Table 4.2; p= 0.31). CBA individuals, however, were significantly less likely than CBNA individuals to attain virological suppression after starting ART (Table 4.2; p=0.013). In the adjusted analysis (adjusted for age, ART regimen, IDU as an exposure to HIV, and year starting ART), comparing FB individuals to CBNA individuals, there was no statistically significant difference of attaining initial virological suppression. The odds of attaining initial virological suppression, however, were significantly lower for CBA individuals as compared to CBNA individuals (Table 4.2).

Table 4.2. Virological suppression after starting ART: Logistic regression models (n=322)

Variable	**Unadjusted Analysis**			**Adjusted Analysis**		
	Odds Ratio	**95% CI**	**p-Value**	**Odds Ratio***	**95%CI**	**p-Value**
Country of origin	p=0.040					
Canadian-born Non-Aboriginal (ref)	1.00	-	-	1.00	-	-
Foreign-born	0.69	0.33-1.41	0.31	0.73	0.33-1.73	0.51
Canadian-born Aboriginal	0.40	0.19-0.82	0.013	0.44	0.20-0.96	0.040
HIV transmission risk exposure category	0.58	0.31-1.09	0.090	0.58	0.27-1.23	0.15

(Injection drug use *vs* other exposures)						
Sex (Female *vs* male)	1.16	0.65-2.06	0.62	-	-	-
Baseline CD4 cells/μL	p=0.74					
5-50 (ref)	1.00	-	-	-	-	-
51-200	0.07	0.45-2.53	0.88	-	-	-
201-350	1.65	0.67-4.05	0.28	-	-	-
351-1130	1.04	0.43-2.54	0.93	-	-	-
Missing baseline CD4 count	1.25	0.21-6.74	0.80	-	-	-
Baseline VL copies/mL	p=0.76					
0-9,999	1.31	0.61-2.83	0.48	-	-	-
10,000-44,999	1.16	0.54-2.48	0.70	-	-	-
45,000-139,999	1.52	0.68-3.42	0.31	-	-	-
140,000-750,000 (ref)	1.00	-	-	-	-	-
Baseline age, years	p=0.070					
17-30 (ref)	1.00	-	-	1.00	-	-
31-40	2.37	1.07-5.25	0.030	2.11	0.89-5.00	0.090
41-50	2.70	1.21-6.02	0.020	2.51	1.03-6.07	0.040
51-77	2.93	1.14-7.53	0.030	2.61	0.94-7.27	0.070
Baseline ART regimen (PI *vs* non-PI based)	0.64	0.37-1.11	0.12	0.70	0.38-1.27	0.24
Year starting ART (2009-2012 *vs* 2006-2008)	1.82	1.03-3.23	0.040	2.32	1.25-4.30	0.010

95% CI=95% confidence interval, Ref=reference group, VL=viral load, PI=protease inhibitor. *Variables with p-values ≤0.20 were entered in the final adjusted logistic regression model

4.3.2 Virological failure

The 261 individuals who attained initial virological suppression were included in this analysis.

These individuals were retrospectively followed for 635.1 person-years, with a median follow-up time of 2.1 person-years. Of these 261 individuals, 21 (8.1%) met the criteria for virological failure, 234 (90%) were censored from the analysis, and six (2.3%) individuals died, indicating that no individuals left care for reasons other than death. Of the six individuals who died, 4 (1.5%) did not experience virological failure and two individuals (9.5%) did experience virological failure. The event rate for experiencing virological failure was 3.3% per person-year. There was no significant difference between the proportion of FB individuals who experienced virological failure as compared to CBNA (7.6% vs 4.3%, p=0.68), however virological failure proportions significantly differed between CBA and CBNA individuals: CBA individuals were more likely to fail treatment (14.3% vs 4.3%, p=0.01). CBA individuals were also observed to have a higher cumulative incidence of virological failure as compared to CBNA individuals (p=0.01; Figure 4.2).

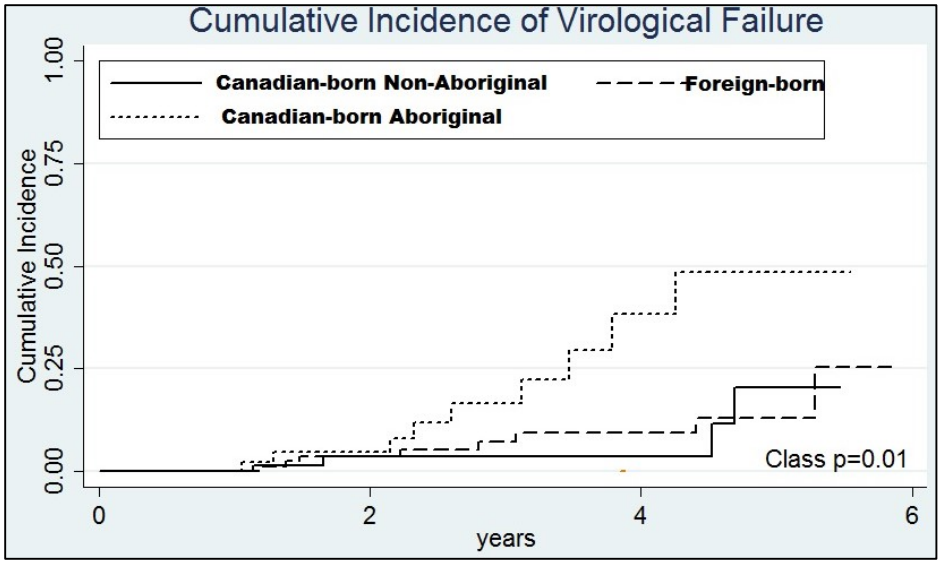

Figure 4.2 Cumulative Incidence of antiretroviral therapy failure by Foreign-born, Canadian-born Aboriginal, and Canadian-born non-Aboriginal status.

The unadjusted Cox proportional hazards analysis found that there was no statistically significant difference in the rates of virological failure for FB individuals compared to CBNA individuals (Table 4.3). CBA individuals, however, experienced significantly higher virological failure rates compared to CBNA individuals (Table 4.3)[1]. The adjusted analysis (adjusted for

baseline age, sex, baseline CD4 cell count, and ART regimen) indicated that FB nor CBA individuals had a statistically significant different rate of virological failure compared to CBNA individuals (Table 4.3).

Table 4.3 Subsequent virological failure: Cox Proportional Hazard models (n=261)

Variable	Unadjusted Analysis			Adjusted Analysis		
	Hazard Ratio	**95% CI**	**p-Value**	**Hazard Ratio***	**95%CI**	**p-Value**
Country of Origin	p=0.030					
Canadian-born Non-Aboriginal (ref)	1.00	-	-	1.00	-	-
Foreign-born	1.29	0.39-4.30	0.68	0.49	0.11-2.20	0.35
Canadian-born Aboriginal	4.16	1.27-13.58	0.020	1.54	0.38-6.18	0.54
Sex (Female *vs* male)	4.97	1.82-13.57	0.0020	2.96	0.77-11.40	0.12
HIV transmission risk exposure category (Injection drug use *vs* other exposures)	1.34	0.45-4.02	0.60	-	-	-
Baseline CD4 cells/μL	p=0.13					
5-50 (ref)	1.00	-	-	1.00	-	-
51-200	0.67	0.11-4.04	0.67	0.39	0.06-2.61	0.33
201-350	1.71	0.36-8.06	0.50	0.69	0.11-4.23	0.69
351-1130	2.89	0.61-13.67	0.18	0.49	0.07-3.38	0.47
Baseline VL copies/mL	p=0.75					
0-9,999	1.51	0.50-4.54	0.46	-	-	-
10,000-44,999	0.87	0.24-3.10	0.83	-	-	-
45,000-139,999	0.84	0.24-3.00	0.70	-	-	-
140,000-750,000 (ref)	1.00	-	-	-	-	-
Baseline age, years	p=<0.001					
17-30 (ref)	1.00	-	-	1.00	-	-

31-40	0.24	0.09-0.68	0.010	0.32	0.09-1.10	0.070
41-50	0.11	0.03-0.35	<0.001	0.24	0.06-0.90	0.040
51-77	0.04	0.01-0.32	0.0030	0.10	0.01-0.96	0.050
Baseline ART regimen (PI *vs* non-PI based)	4.07	1.49-11.13	0.0060	3.12	0.97-10.10	0.060
Year starting ART (2009-2012 *vs* 2006-2008)	1.25	0.77-2.06	0.39	-	-	-

95% CI= 95% Confidence interval, Ref=reference group, VL=viral load, PI=protease inhibitor. * Variables with p-values ≤0.20 were entered into the final adjusted model.

Proportion of patients who experienced antiretroviral therapy failure: Canadian-born Non-Aboriginal: 4/93; Foreign-born: 8/105; Canadian-born Aboriginal: 9/63

4.4 Discussion

The results from this study suggest that among HIV-positive individuals starting ART, FB and CBNA individuals had similar ART outcomes. CBA individuals, however, were less likely to attain initial virological suppression compared to CBNA individuals. Finally, among individuals who did attain initial virological suppression, rates of virological failure did not differ significantly for FB or CBA individuals, compared with CBNA individuals.

In 2010, Martin *et al*. (3) reported that compared to CBNA individuals, CBA individuals were statistically significantly less likely to attain initial virological suppression. Martin *et al*. (3) observed that compared to CBNA individuals, both CBA individuals who reported IDU (Odds Ratio (OR)=0.33, 95% CI=0.19-0.60) and CBA individuals who did not report IDU (OR=0.38, 95% CI=0.21-0.67) were less likely to attain initial virological suppression. Similarly, this study also observed that CBA individuals were less likely to attain initial virological suppression as compared to CBNA individuals (OR=0.44, 95% CI=0.20-0.96). The Martin *et al*. (3) paper also reported that CBA individuals were more likely to subsequently fail treatment one or more years after attaining virological suppression (HR=3.35, 95% CI=1.68-6.65), whereas the findings from this study indicated that once CBA individuals attained virological suppression, there was no statistical difference among virological failure rates compared to CBNA individuals (HR=1.54, 95% CI=0.38-6.18).This suggests that virological failure rates for CBA individuals have improved over time.

One explanation for this improvement could be the advancements made by pharmaceutical companies to address therapy-related barriers to ART adherence. For example, in 2006, a single tablet, fixed-dose combination pill became standard of care (for those who could tolerate this treatment) (9). Since individuals in this study were prescribed once-daily therapy, and individuals followed by Martin *et al*. (3) were not limited to once-daily therapy, perhaps CBA individuals who were recently prescribed ART and attained initial virological suppression were better able to persist on their once-daily ART (at the time of these studies, the NAP database did not contain complete ART adherence data). Since this study followed individuals recently prescribed ART (as compared to Martin *et al*. (3) who followed individuals from 1999-2005), the recent findings could also be attributed to a combination of modern ART and the comprehensive, interdisciplinary care provided by the NAP. NAP clinicians approach caring for their patients with a patient-centred and participatory approach. For example, NAP clinicians' tailor each individual's treatment plan to his/her life, while working closely with community-based organizations to ensure these individuals can be successful on treatment and experience the benefits of modern ART.

We know that HIV care, however, involves several stages, including identifying HIV-positive individuals, linking these individuals into HIV care, long-term retention in care, ART adherence, and ultimately sustained virological suppression – the "cascade of care" (12). Appropriately, the cascade of care has become of concern for areas in public health concerned with maximizing the benefits of ART. For HIV-positive individuals and communities to benefit from ART (reduction in HIV incidence and transmission), ART programs have to provide the complete quality of all HIV-related services, including testing, treatment referral, to ensuring persistent adherence to ART (13). In many settings, gaps remain in the cascade of care, where few HIV-positive individuals actually attain ART success, the ultimate goal of HIV treatment and care (12). These gaps include late HIV diagnosis, linking newly diagnosed HIV-positive individuals into care, poor retention in care, and poor ART adherence (12). Recently, Nosyk *et al*. (14) from the STOP HIV/AIDS Study Group were the first group to track the longitudinal changes in the cascade of care in British Columbia, Canada, from 1996 to 2011. This group assessed the number of individuals at each stage along the cascade of care. Although their findings suggested overall engagement in care improved from 1996 to 2011, substantial numbers of HIV-positive individuals were lost at each stage, most notably the retention in care stage.

Understanding limiting factors in each step of the cascade is important, while recognizing that what causes individuals to be lost from the cascade likely varies within the individuals and their social, political, and economic conditions.

This study's findings are also in accordance with a recent Canadian study, whose authors compared initial virological suppression among Canadian-born, Sub-Saharan African-born, and FB other than Sub-Saharan African individuals. The authors defined virological suppression as achieving a VL <40 copies/mL for two consecutive measurements. Although Sub-Saharan African-born individuals initially presented into care with a lower CD4 cell count than Canadian-born individuals, these authors observed the responses to ART were similar in Sub-Saharan African born and Canadian individuals (15). Two studies in Europe compared virological failure rates by FB status and observed results comparable to our study (16, 17). After adjusting for confounding variables both European studies reported no differences between the time to virological failure among FB and non-FB individuals. Similar to our study's analysis, these researchers considered age, sex, ART regimen, baseline CD4 cell count, baseline VL, and risk behaviour for HIV infection as confounding variables. However, residual confounding may a concern; additional factors, such as the stress associated with relocation, which may have an effect on ART outcomes among FB individuals (18).

Gardezi *et al*. (19) conducted a qualitative study to understand HIV-related treatment concerns. Among HIV-positive Caribbean and East African individuals living in Toronto, Canada, these authors suggested that: Support services need to be culturally specific; need for community development and increased community awareness; there needs to be expanded effort geared towards settlement issues; and HIV providers need to have increased sensitivity. Recently, the Canadian Observational Cohort collaboration suggested that female and non-White HIV individuals reported higher HIV-related stigma (20). The Canadian Observational Cohort concluded that future research should understand "contextual factors, such as culture, country, and rural/urban differences" (p. e48168) when addressing HIV-related issues.

Individual behaviour in relation to HIV treatment occurs within an economic, social, and cultural context. Accordingly, research needs to consider factors affecting HIV treatment response in a broader social, economic, and political context. For example, limited access to HIV information and HIV-related stigma among CBA individuals may delay access to healthcare and thus compromise effective medical care (21). The results from this study indicated CBA

individuals had poorer initial treatment outcomes compared to CBNA individuals. Initial treatment outcomes among CBA individuals in northern Alberta may be related to underlying living conditions, collectively known as the social determinants of health, including: Education, employment, working conditions, unemployment, job security, food insecurity, housing, income, income distribution, and social exclusion (22).

This study has numerous limitations, including missing data (i.e., the 26 individuals excluded for missing country of origin data), combining immigrants and refugees into a single category to describe FB individuals, small sample size, the inherent difficulties of using a clinical database for research purposes, and the retrospective nature of my design. I acknowledge that while I classified immigrant and refugee individuals into one category, this group is heterogeneous, and encompass a broad range of characteristics. The use of any classification method, however, would have been a simplification of reality. Had I classified individuals by country of origin, the limitation would have been ignoring of cultural differences within a country and the length of time an individual resides in their birth country or Canada. For example, in a small number of cases, an individual may have self-reported their country of origin as being outside of Canada, but migrated to Canada as an infant, this individual was classified as FB even though this individual may identify as Canadian. These findings, therefore, may have overlooked important differences between ethnic groups. However, the NAP clinical database defined immigrant and refugees as those individuals born outside of Canada, and therefore I did not have access to specific country of origin information.

This study used a retrospective design and relied on a clinical data source for individual data. Further, the strict exclusion criteria reduced the sample size. As a result, the small sample size contributed to this study having low power for a statistical test to detect an effect (as significant at $p<0.05$), assuming an effect actually exists. To address this issue, I considered following ART naïve individuals until July 1, 2013, which would allow for a follow-up time of six months to seven years. With an additional year of follow-up time, 24 eligible individuals could have entered this cohort, and increased the power by 5%. Although the sample size would increase slightly, it would not be enough to increase the power to the conventional value of 80%. In a paper discussing sample size and power calculations in randomized controlled trials, Schulz and Grimes (23) state, “Some shift on emphasis from a fixation on a sample size to a focus on methodological quality would yield more trials with less bias. Unbiased trials with imprecise

results trump no results at all" (p. 1352). Although Schulz and Grimes speak to experimental studies, their message can be applied to observational studies; conducting rigorous research (even studies with small sample sizes) is better than no research, or poorly conducted research. Despite these limitations, the cohort provided a representative sample of individuals who recently started ART in northern Alberta using the NAP database. Previous research has validated this database (24, 25, 26), including Martin *et al*.'s (24) investigation of health-related quality of life among CBA and CBNA individuals prescribed ART.

Although FB individuals may have potential obstacles to adherence and ART success, this analysis found that ART outcomes among FB individuals were similar to HIV individuals born in Canada. These findings also indicated that CBA individuals experienced less successful initial ART outcomes compared to CBNA individuals. Compared with previous research (3), however, the treatment experience of CBA individuals has improved over time.

4.5 Footnotes

[1]In 2012, when I conducted this analysis, virological failure was commonly defined in the literature as two consecutive VL measurements >400 copies/mL. As the accuracy of VL tests advanced, today (2014), virological failure is commonly defined as two consecutive VL measurements >40 copies/mL. When I defined virological failure using a definition of >40 copies/mL, three additional patients experienced virological failure (one FB and two CBA patients), indicating no large differences in the proportion of patients who experienced virological failure.

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CHAPTER 5

Adherence among chaos: Exploring adherence to antiretroviral therapy

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5.1 Introduction

HIV/AIDS impacts millions of people worldwide. At the end of 2012, an estimated 35.3 million people were living with HIV/AIDS (1). Successful treatment of HIV/AIDS, however, demands very high adherence to antiretroviral therapy (ART) over the course of life-long treatment (2). Individuals need to achieve and maintain high adherence levels to suppress HIV-1 viral load (VL), prevent the emergence of drug resistance and disease progression including early death, and minimize the risk of ongoing transmission (2, 3). For non-adherent individuals, drug resistance can make current treatment ineffective (4). From a public health perspective, a drug-resistant strain of HIV caused by non-adherence can be transmitted to uninfected persons, leaving newly infected and previously treatment naïve individuals with reduced treatment options (5).

It is not clear from the literature what individual, social, and system-level factors are associated with not achieving and maintaining good adherence. Although some reviews on ART adherence have attempted to clarify questions pertaining to ART adherence barriers, results have been inconsistent (6-8). Atkinson *et al*. (6) identified an extensive number of barriers, including therapy-related (e.g., type of regimen prescribed), condition-related (e.g., number of adverse events) and patient-related factors (e.g., hopelessness, depression) associated with poor adherence from 22 studies worldwide. Using data from quantitative and qualitative studies, Mills *et al.* (7), however, suggested that the region where the study was conducted, adherence cut-off points, and study quality can explain differences in barriers to achieving good adherence. Conversely, a systematic review by Malta *et al.* (8) stated that active substance abuse, depression, and low social support are also barriers to adherence.

While ART adherence barriers have been well documented, little attention has been given to facilitators of ART adherence, investigating *success* as opposed to failure. In a review of qualitative adherence literature, Vervoota *et al.* (9) attempted to clarify the processes that are impact adherence to ART and identified a therapy-based factor as the most important strategy for ART adherence. As such, these authors suggested individuals should adapt their ART regimen to their lifestyle rather than their lifestyle to their ART regimen. A multi-centre US study conducted from 2000-2005 identified baseline factors which differentiated injection drug users' (IDU) ART treatment success versus treatment failure. Findings indicated that those having informal care,

such as peer support (e.g., peers accompany HIV-positive individuals to receive their ART prescription, or peers help to facilitate engagement in the healthcare system) or emotional support were more likely to maintain treatment success. These authors suggested their findings underscore the importance of social factors (e.g., social network support, social isolation, and social stigma) for successful ART outcomes among IDUs (10).

Although some research has attempted to clarify determinants of ART adherence, findings are inconsistent, focus primarily on therapy-related barriers, and are confined within a ten-year time period (1996-2006). Staff at the Northern Alberta HIV Program (NAP), have commented on how some HIV-positive individuals with chaotic lives (e.g., experience unstable housing, substance use, involvement in the sex trade, and/or incarceration) have maintained consistent ART adherence over prolonged periods of time. Because understanding consistent adherence to ART is such a practice priority, our objective in this research was to describe why some HIV-positive individuals with chaotic lives attending the NAP were able to consistently adhere to their ART. The way to do this was to ask the most knowledgeable source of this information, HIV-positive individuals.

5.2 Methods

This study was guided by principles of community-based participatory research (CPBR) (e.g., research was driven by community and mutually beneficial among all partners) and focused ethnography (11). Focused ethnography focuses on a distinct problem (i.e., the research question or topic is selected prior to data collection) within a specific context among a small group of people (11). Rigor was ensured according to Morse *et al.* (12).

Setting

Our study involved HIV-positive individuals attending the NAP. The NAP provides care to all HIV-positive individuals in the northern half of Alberta, with two primary hospital-based outpatient clinics in Edmonton. HIV-positive individuals are seen by an interdisciplinary healthcare team (i.e., infectious disease physicians, nurses, pharmacists, social workers, psychologists, dietitians) four weeks after initiating ART and then every three to four months, depending on the patient's progress and needs. Further, HIV-positive individuals may receive support between physician visits from one or more members of the team. Antiretroviral

prescribing is limited to infectious diseases physicians and ART is dispensed from the outpatient pharmacies at the two hospital sites. ART and associated testing (i.e., CD4 cell counts, VL measurements, genotypic ART sensitivity testing) is provided at no cost to the individual through a provincial government program. Viral load is typically monitored either prior to, or at each visit as part of routine care.

The NAP currently cares for roughly 2,000 individuals with approximately 100 new HIV-positive individuals per year. The population of HIV-positive individuals in northern Alberta is heterogeneous; 50% of individuals are Canadian-born, non-Aboriginal; one third of individuals identify as Canadian-born Aboriginal or Metis; and 20% are foreign-born. Similarly, there is a variety of HIV transmission risk groups, including heterosexual transmission, men who have sex with men (MSM), and IDU. A substantial proportion of individuals have mental health and socio-economic obstacles to adherence such as unstable housing, substance use, mental illness, involvement in the sex trade, and / or incarceration, comprising a broad spectrum of threats to adherence. The program has a specific focus on enhancing access to care among such individuals through the activities of program staff and connections with community organizations (e.g., collaborating with inner-city community-based organizations to address underlying obstacles to adherence).

Sample

Study participants included 14 HIV-positive individuals who experienced chaotic lives, but were able to maintain consistent ART adherence ≥1 year.

Our inclusion criteria were individuals who: 1) Experienced chaotic lives **(**e.g., unstable housing, substance use, involvement in the sex trade, and/or incarceration); 2) were prescribed ART for ≥12 months; 3) maintained consistent ART adherence (i.e., HIV treatment success) for ≥12 consecutive months; and 4) were ≥15 years of age when starting ART. We defined ART as a combination of at least three antiretrovirals, other than ritonavir, recorded as prescribed on the same date. We defined the start of ART as the first date that an ART prescription was recorded in the NAP database, and we assumed participants remained on ART. We defined consistent ART adherence as those individuals who maintained virologic suppression (VL ≤50 copies/mL) for the previous ≥12 consecutive months. Virologic suppression is objective and the biologically/clinically relevant indicator of treatment success (14). Therefore, since NAP staff collect HIV-related information (including VL data) at each individual's clinic visit, clinicians

could determine if an individual had maintained consistent ART adherence. We excluded participants if they were: 1) Missing VL data for ≥6 consecutive months; 2) prescribed directly observed ART; or 3) started ART ≤26 weeks before delivering a baby.

From this potential pool of participants, purposeful sampling was used whereby key informants from the NAP identified HIV-positive individuals who were thought to be able to articulate their experience and approached them following their routine clinic visits. Staff described our research and if the participant agreed to participate, staff reviewed the information letter with the participant, obtained written informed consent, and scheduled an interview (Appendix 1). We offered participants a $25 honorarium to acknowledge their time and to cover possible expenses such as transportation or child care. The ages of the 14 participants (11 men and three women), varied from 37-57 years. The participants had been aware of their HIV status for between 2 and 26 years, and the duration of ART treatment varied between 2 and 16 years.

5.2.1 Data collection and analysis

I collected data using unstructured one-on-one interviews. The 'grand tour question' I asked participants was "what is your secret for taking your HIV medication all the time?" Additional questions included experiences of taking ART (e.g., how are you doing on your HIV medication?), general ART adherence questions (e.g., why do you think people take their HIV medication?) and questions about daily life. I conducted all interviews in a clinical examination room at one of the hospital sites; interviews were audio-recorded and lasted approximately one hour.

Using qualitative content analysis, my goal was to describe facilitators of adherence by systematically identifying, coding, and categorizing patterns in the data (11, 15). Data collection and analysis were iterative wherein evolving categories were alternately compared to new data and modified when necessary. The evolving analysis was brought to the co-investigators, the NAP staff, and the participants themselves for further analysis and interpretation. The final analysis and interpretation was confirmed independently by these three groups.

5.3 Findings

All participants spoke about their HIV medication regimen, their daily adherence to HIV medication, and their daily life in substantial detail. The following categories and overall theme capture why participants consistently adhere to their ART.

5.3.1 Fear of being sick and dying

Every participant conveyed fearing for their lives prior to discovering they were HIV-positive. Participants did not realize they were sick until they experienced rapid weight loss, were hospitalized for pneumonia, or were so weak daily activities became overwhelming. A participant offered the following,

> I said "my God I'm gonna die!"…, I didn't know I had it [HIV]. I was about 80lbs then I knew I had it….the first sign I got shingles …and I knew I had pneumonia but just as a joke I say, check me out for HIV and he did and he came back and said yeah, you're positive….cause I'd gone from 170lbs down to 80lbs…

Once participants learned they had HIV, many became terrified and as a participant explained she "started freaking out, I started crying, I'm gonna die, I'm gonna die". Others reported they "broke down in the doctor's office". Suddenly, participants were faced with the thought of their death.

From their past experience of extreme illness, and thinking they "were gonna die", a motivating force behind ART adherence was their internal desire to live. Participants often commented that they "know that taking the pills will keep me healthy and…um…that's where I want to be, is healthy". These participants understood the importance of taking their ART every day for the rest of their lives, and the resultant positive consequences (e.g., the amount of HIV in their body remains "undetectable" or very low such that they can successfully perform their activities of daily living). As a participant explained, "I find that like to be undetectable you have to stay on the medication, but without the medication you can feel other symptoms, like I get pains in my back and its just stuff that I want to avoid."

If these individuals missed a dose of their medications, they felt upset. A participant described how he became fraught with worry when he missed four consecutive days of medication,

> There's one time, I missed 4 days in a row of my medication and I thought fuck, I was scared. I didn't even want to talk to [participant's doctor] about it. And I figured well, cause it kept bothering me. I had to tell [participant's doctor] the next day and … if you usually miss that many times...you might become resistant to your medications…they did the test on me right away and it was good.

5.3.2 To be with my family

Every participant spoke about how their family connection, support, love, and involvement motivated them to continually take their ART despite their chaotic lives. Family was broadly defined: Immediate family; step-family; friends; and the NAP staff encompassed family. Although participants were not thinking of family at the moment they took their pills, they understood that taking their ART afforded them the ability to be part of their family. A woman described her initial reluctance to take her medication, and on account of her family, she changed,

> I didn't want to be here anymore, the depression caught up with me, I started drinking…and it took me two years to realize that my kids love me…and my boyfriend telling me that you need to take your medication, …I didn't take it right way but eventually when I did decided to take it, that's what kept me taking it. So my motivation for my kids and my boyfriend…They gave me back that hope that I lost two years ago.

The effect that family had on these participants was underscored when a participant explained how he took his medication to be able to see his son, yet when asked if he saw his son regularly, the participant did not know of his son's whereabouts. When asked what advice this participant would offer to an HIV-positive individual struggling with consistent adherence, he said, "You want to live don't you? And I'd tell them, don't you have kids? You want to see them grow up." These participants clearly illustrated that 'family' provided meaning to their lives and was a powerful motivator for life-long adherence.

5.3.3 Because I am Grateful

Participants appreciated what and who they have in their lives. Although they faced extremely tough situations, they focused on the positive and were grateful for the ability to "participate" in life.

> I owe a lot to a couple of family members who stood by me, and I don't know if you can apply this to anyone else and use it as a trick, but it's my story. My mom took care of me for a lot of years and watched me decline and enabled my drug use to a large extent…um I'm honored to start looking after my mom. You know, her and I are friends today. Our relationship was pretty toxic, as you can imagine. Today we laugh and we enjoy each other's company, to an extent! <laughter>

One man talked about being grateful for having a home and being fortunate enough to have his family in his home,

> They [participant's children] were on the street, in foster care, my wife was in jail and we all finally, we're all living together….and my kids are safe, one's working, one's just at home, my wife's at home, we got a dog. And we have a home. But you know, something as simple as that, everybody could be all broken up or in jail or on the street.

Another participant reflected on how he "lived in oblivion for a long time and wasn't able to mark the passage of time" and had little confidence in himself to take his medication properly. He "got on board", however, because he recognized that, at that point, he "was being given an opportunity to sort of re-do my life". He realized he had "been given another chance, I won't say second chance, because I've been given a lot of second chances!" and later stated "it's an honor for me to be able to participate [in life]."

Other participants spoke about how far they had come from a life on the street, "I was on the street with no teeth, no glasses, I had no wallet, I didn't have nothin' a couple a years ago". Participants often used the word "grateful" for not only what, who, and where they were, but for their ART being covered by the provincial government, "I don't feel sorry for myself, you know, I guess I'm just a pretty grateful guy. Shit, the pills are covered [by provincial government], you know." One participant illustrated how he reminded himself of the life he used to live,

> If I ever do get a craving, and this is going to sound really weird, but I go to the bad area of town and I actually see somebody pushing a shopping cart, collecting bottles, and I think, well I was you, I was down and out and I just don't want to be there and it does help me.

5.3.4 Because I am important

Many participants described how today, amongst their chaotic lives, they took responsibility for their actions and had confidence in themselves to cope with challenging circumstances including taking their medications consistently. Participants were able to face life's adversities, to understand and solve problems, acknowledge their right to achieve happiness and be given respect. One participant, because of the encouragement he received from a health care professionals, had a "big epiphany",

> I've probably went to 15-18 treatment centres over a 26-year cocaine addiction. Yeah, most people don't live that long, you know and my psychologist looked at me once, five

> years ago, probably the most meaningful thing she ever said, was "you are incredibly intact for what you've been through". You know, I was all beat up at the time, I don't mean physically beaten by someone, but beaten by myself and I hung on to that [what she said], and, I am *not* a complete waste of skin.

This sense of self-worth was shared by other participants when they spoke about having satisfaction from taking care of themselves, "not just thinking good things about themselves, but actually taking action". Another participant remarked,

> You find out what you want from yourself…cause if you want to die, it's easy to die...but if you want to live, just that one pill...and watch your life start to become better. It can't get any worse, because that's where you are right now. You're dead zone. But if you start to take that moves you were scared to take when you were sick… now you're beaming with all these things to do, to keep you wanting to live, to progress, to go on, and to care, to love, to share, to be part of the world.

A woman spoke that she "wouldn't wish it [HIV] upon anyone, so that's why I do it [take HIV medication] I guess just to keep myself self-confident and happy."

5.3.5 Clinic staff and community support workers care about me

According to participants, the NAP staff and community workers regardless of a participant's struggles, treated them with respect and sincerely cared for their well-being. These participants trusted the staff; as one participated commented, "they are all to help me…, so I just know that they want the best for me and they would never steer me wrong."

To most participants, the NAP staff were like "the family we never had because they [NAP staff] focus on the positive, whereas our family focuses on the negative". As a result, patients were motivated, confident, and determined to be as healthy as they could by consistently taking their ART. A participant explained how seeing his doctor smile, because of something *he* did, motivated him to stay on his HIV medication,

> He goes "check this; this is what I want to show you." He showed me my blood, my counts, and my CD counts and everything, and he says "right here". You know it's going to be up and down cause of the medication. But as of now, you can't detect any HIV in my body. AND THE FACE, AND THE SMILE ON HIM, it was just elating me. It was like, wow, look at this guy, he was just happy, you know, over me.

Participants spoke about the care at the NAP was not only from their physician, but from the *team*, including nurses, psychologists, pharmacists, dietitians, social workers, and administrative assistants. A participant said "I met all these magnificent people up here, you know, and they've just been wonderful."

Another woman remarked,

> [Participant's doctor] is one of the best to talk to… I like coming here, since I've known him he's been great to me so...keeps you more confident because he has a whole team of people that help you out, it's not just one person, you have a dietician you have a social worker you have these ladies if you need them.

Participants spoke how NAP staff helped them address factors that may have negatively impacted ART adherence. For example, the staff work with each patient on an individual basis and provides assistance either through clinic services (e.g., psychological counselling) or community services (e.g., social housing, or working with community pharmacies to set up directly observed therapy). A participant who was unstably housed described his struggles with keeping a month's supply of medication "safe" and the solutions offered by the NAP staff,

> Keeping my medication was BAD when I was in the shelter. You know, but I found a cure for that! I usually wear jeans, and my [medication] usually goes in my pocket. But there are so many times back at the hospital, you know I'd walk in with my head hung down, they [NAP staff] knew my name cause I'm here again, I know it happened again [HIV medication was stolen]…they're totally cool. That's why I love this hospital. They're awesome. And they said well, "we don't want to tell you what to do, but how bout we give you pills for two weeks, instead of a month." And they said, "well, have you thought about [community organization]?" And I said yeah, and they said 'well do you want your meds there?' And I said "YEAH!" And boom! All problems solved.

A lot of participants described how community support workers understood their "chaos" and worked closely with other local organizations to arrange daily ART dispensing programs. For instance, a participant explained "the [community organization] handles my medication, they're right down the street. They feed me. Monday through Friday, they feed me, I can watch TV, I can relax there, and that's how I try to spend my days." Another participant described how each morning he woke up and went to an inner city community organization to take his ART,

I'm living on the street so...when I wake up in the morning...I'll go to the [community organization] and have something to eat...then I'll go downtown and...I call it shaking my money maker, panhandling <laughing>, but first when I'm at the [community organization] I'll open my backpack and take my HIV medication.

Many participants spoke about clinic and community supports as being their "support team"; the organizations provided structure to the participants' lives and tailored solutions making it possible for participants to take their ART.

5.3.6 Theme

Why do participants adhere to their HIV medication? The theme of control, that weaves throughout the categories ("to be with my family", "because I am grateful", "because I am important", **"**health care professionals and community support workers care about me", and "fear of being sick and dying") answers this question. The nature of participants' "chaotic" lives did not allow for a lot of control over them (e.g. "a slave to drugs" "not raised right as a baby"). But participants saw their "chaos" and their HIV separately; they compartmentalized the two. Participants recognized that by taking their ART they could have control over their HIV which enabled them to become stronger. As such, participants understood that they *were* in control of doing something positive for themselves and had the ability to express gratitude for and appreciate meaning in their life, largely involving family. Further, participant constructive behaviour was positively reinforced by workers within the community and the NAP.

5.4 Discussion

Our findings raise important considerations for healthcare professionals about participants' reasoning behind ART adherence; consistent ART adherence provided these participants with the ability to have "control" over one important part of their lives, despite living in "chaos" (e.g., unstable housing, substance use, involvement in the sex trade, or being jailed). According to conventional ART adherence literature, determinants of adherence correspond to five factors defined by the World Health Organization: Therapy-related (e.g., regimen complexity, side-effect severity, and previous treatment failures), condition-related (e.g., rate of disease progression, and disease severity), patient-related (e.g., substance abuse, depression, age, and attitude and beliefs towards treatment), health system (e.g., the patient-provider relationship, lack of health services, and poor medication distribution systems), and social/economic factors

(e.g., poverty, low education, unemployment, lack of social support, and unstable living conditions) (16). Our research, however, provides insight beyond the traditional view of adherence and explains adherence from the psychological perspective of internal locus of control; the extent to which individuals believe they have control over their daily life. An individual with an internal locus of control believes that he/she is in control of the daily choices he/she makes. Whereas an individual with an external locus of control believes that he/she is not in control of his/her behavioural choices; personal behaviour and decisions are controlled by fate or other external circumstances (e.g., God, powerful others) (17). In other words, locus of control aims to answer: Do you believe you are in control of your life, or that your life is controlled by powers beyond your control? (17)

Few studies have investigated the concept of control and ART *adherence*, and the findings are mixed. Lynam *et al*. (18) suggested there was no relationship between internal locus of control and ART adherence. However, when the authors considered adherence self-efficacy (SE) and locus of control together, locus of control and SE were significantly associated with ART adherence. Accordingly, research suggests locus of control and SE are related concepts (19). Noting that the construct of locus of control includes multiple dimensions (i.e., the self, powerful others, and chance), Evans and colleagues (20) explored these dimensions to determine which dimension was the strongest predictor of ART success. They found a significant relationship between believing in powerful others, such as physicians and other healthcare professionals, and ART adherence.

More broadly, the concept of personal control in HIV *illness* has been studied in a variety of contexts, with most studies finding a sense of personal control to be adaptive in that it helps people adjust and cope with illness (21, 22). Perceptions of control over the course of HIV illness have also been associated with fewer depressive symptoms and less anxiety about death (23). While these studies suggest that personal control can be helpful, Jenkins and Patterson (24), in a study of newly diagnosed HIV-positive individuals, reported high levels of depression among participants who self-reported a high degree of personal control. These authors found that external attributions of control (e.g., chance, fate, or God) generally appeared more adaptive to adverse circumstances, such as learning of their positive HIV diagnosis.

Our findings also suggested participants' sense of control provided them with the self-worth they needed to maintain daily ART adherence despite ongoing challenges. Although we describe self-worth as the sense of pride an individual has in his/her ability to follow HIV treatment recommendations (25), the term commonly used in the ART adherence literature to describe this phenomenon is self-esteem (26). A systematic review by Wasti *et al*. (27), found that among other factors, self-esteem, was associated with HIV medication adherence. SE, family support, and desire to live longer also facilitated adherence (27). Several other studies have also shown that self-esteem is a key attribute in maintaining optimal medication adherence (28-31). For example, among HIV-positive individuals in China, Huang *et al*. (28) found that high perceived self-esteem was associated with optimal (>90%) ART adherence. In a large, multicenter survey of HIV-positive treatment naive individuals, Reynolds *et al*. (31) reported determinants of self-esteem included personal and situational factors (e.g., depression, stress, and lower education); HIV-positive individuals with lower self-esteem had less certainty in their perceived ability to adhere to their ART.

Our data also suggest a large motivation for participant medication success was their meaning in life, largely involving family (including immediate family, friends, and NAP staff). Interestingly, when we worked alongside the NAP staff to analyze and interpret the data, some clinicians were unaware of the importance "family" had on ART adherence; these clinicians routinely did not ask participants about their family within the context of ART adherence. This finding underscores the value of adopting a broad view of health and ART adherence, and including this in clinical practice with this population.

There are limitations to our findings. Canadian society is highly heterogeneous, and although we gathered data in an urban setting in Alberta, Canada, we did not interview HIV-positive immigrants or refugees. Reasons for ART adherence should be explored in other vulnerable populations, such as "chaotic" HIV-positive recent African refugee individuals. Future qualitative inquiry is also needed to understand the perspectives of those who care for and influence HIV-positive individuals, including HIV-related healthcare professionals and community service workers within local HIV community organizations.

5.5 Conclusion

We worked with local HIV clinicians and asked the most valuable source of ART-related experience information, the HIV-positive individuals, why they were able to maintain ART adherence over prolonged periods of time. Our data revealed "control" was cornerstone for these individuals to maintain adherence; a determinant not usually considered within traditional views of ART adherence. Meaning to one's life, relating to "family" (broadly defined to encompass immediate family, friends, and HIV clinicians), positive interactions with and support from community organizations, and local HIV programs may provide the necessary self-worth to overcome life- and illness-related difficulties. Lastly, the impact of a person's worldview cannot be ignored; clinicians must be aware of the extent to which a person believes he/she can control their HIV, which subsequently may impact his/her ability to appropriately adhere to ART. Clinicians should be mindful of the influence psychosociological factors, such as "control", have on consistent ART adherence and adopt a broad perspective of determinants of adherence when addressing adherence-related concerns.

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CHAPTER 6

Commentary: Refocusing the focus on adherence to antiretroviral therapy: Our experience learning from HIV-positive individuals

This chapter has been submitted for publication as Lefebvre M, Mayan MJ, Hughes CA, Yasui Y, Saunders LD, Houston S, "Refocusing the focus on adherence to antiretroviral therapy", Qualitative Health Research [submitted, 2014].

6.1 Introduction

Studies have shown impressive reductions in mortality and morbidity in HIV-positive individuals as a result of ART (1-11). This decrease in mortality is particularly apparent in high-income countries where access to healthcare and ART is more readily available. Over the past decade, ART has become more potent, better tolerated, and less burdensome, with an increasing number of three-drug fixed-dose combination tablets (12). These significant achievements have paradoxically fostered the sentiment of "we have the pill, we've solved the problem". It turns out, however, this is only the beginning; HIV-positive individuals face challenges of consistently taking their ART for the rest of their lives (13).

To solve the "Achilles heel" [1] problem of adherence, much of the ART-related research has focused on barriers. Studies have taught us that HIV-positive individuals have trouble taking their ART because of lack of knowledge of the treatment plan and regimen, ART side-effects, active substance use, depression, cultural and health beliefs towards HIV and treatment, and the absence of a social support system (13-22). While ART adherence barriers have been well documented, little attention has been given to facilitators of ART adherence, investigating *success* as opposed to failure. As such, I decided that understanding why HIV-positive individuals were able to maintain consistent adherence to their ART, from their perspective, was paramount to appropriately managing and caring for these individuals.

6.1.1 Refocusing the focus: Shifting from failure to success by learning from the experts

Northern Alberta HIV Program (NAP) clinicians have commented on how little is known regarding ART treatment outcomes among foreign-born (FB) HIV-positive individuals residing in northern Alberta. Together, we compared ART outcomes among FB, Canadian-born Aboriginal (CBA), and Canadian-born non-Aboriginal (CBNA) HIV-positive individuals. Our study findings suggested FB individuals had similar ART outcomes as compared to CBNA individuals. CBA individuals, however, experienced less successful initial outcomes as compared to CBNA individuals. This study led me to consider the 'story behind the numbers'; why are some HIV-positive individuals able to be successful on ART despite challenging circumstances, and others are less successful?

My data revealed "control" was the cornerstone for maintaining adherence, a determinant which is less well described as part of traditional views of ART adherence (23). The ART

adherence literature currently describes "control" in terms of internal locus of control (extent that an individual believes that he/she controls their daily life choices) combined with self-efficacy (the confidence an individual has in his/herself to perform a task) (24). Control is also described as being external to the individual, as in external locus of control, meaning an individual believes that his/her daily life choice are controlled by factors which he/she cannot control (e.g., chance or fate, powerful others, or God) (25). The impact of a person's worldview cannot be ignored; clinicians must be aware of the extent to which a person believes he/she can control their HIV, which subsequently may impact his/her ability to take their ART as prescribed. As a result, clinicians should be mindful of the influence psychological factors, such as "control", have on consistent HIV medication adherence and adopt a broad perspective of determinants of adherence when addressing adherence-related concerns (23).

We know, however, that it is not enough to generate evidence; systemic change *demands* moving knowledge into action, a key principle of Graham *et al*.'s "Knowledge to Action" integrated Knowledge Translation (iKT) theory (26). Consequently, I, together with original study participants, NAP clinicians and University of Alberta researchers decided an effective way to share our knowledge with the HIV community was through visual media. I created a knowledge translation (KT) product, a video, "Living with HIV and it's OK" (Appendix 2). This video captures six original study participants sharing their reasons for and stories about ART adherence, and three HIV clinicians emphasizing importance of consistent ART adherence. The purpose of this video was to start a conversation about the importance of consistently taking ART; the intention was to help HIV-positive individuals be inspired, informed, and gain the confidence to make positive changes in their life. As HIV-positive individuals continue to struggle with ART adherence, they may be able to better identify with, and therefore learn from, original study participants who faced similar life challenges (27).

We used a peer-educator (PE) KT strategy to share the video with HIV-positive individuals in the community. PEs are members of a research project's target community who share common characteristics with the target community that enable them to offer social support, encouragement, hope, and mentorship to community members (28). I chose to use a PE-based KT strategy based on the following evidence-informed premises: 1) Heath messages may have greater credibility when these messages come from individuals who are perceived as similar to the 'receiver' of the message (29); 2) PEs can provide critical information about ART adherence

without the time constraints faced by many HIV clinicians (30); and 3) PEs may help bridge cultural gaps between HIV-positive individuals and HIV clinicians and HIV community service workers (31).

The PE-based KT strategy included 3 steps: 1) I invited original study participants who were involved in the "Living with HIV and its OK" video to be PEs; 2) I worked with the staff members from a local HIV inner-city organization, HIV Edmonton, to train interested original study participants on how to be PEs; and 3) PEs hosted two "video/pizza party", an hour long events at HIV Edmonton, where the PEs showed the video to HIV Edmonton cliental. After the pizza lunch was served, three PEs spoke about their experience and reasons for participating in the video (Appendix 3). HIV Edmonton clients, Edmonton inner-city community service workers, and the PEs then watched the video (Figure 6.1). Following the video, the PEs answered questions and HIV Edmonton clients shared their thoughts about the video and personal experiences taking ART. This question session lead to an informal discussion among the audience and PEs, largely regarding HIV infection and ART adherence-related concerns.

Figure 6.1. Knowledge translation product: A video featuring HIV-positive individuals and clinicians sharing their reasons for ART success. Photo: Michael Lavoie: http://mlphotography.ca/

6.2 Knowledge Translation Evaluation

The literature lacks information on the best products (e.g., video, fact sheets, and handbooks) and strategies (e.g., meetings, working groups, and simulations) for incorporating evidence into systems. While much of research being proposed today includes KT plans, the actual KT products and strategies that were developed and implemented are rarely evaluated. To inform decisions concerning future KT, evaluations must provide credible information about what was done, why it was done, why a particular strategy produced the results that it did, and must identify what factors contributed to the results. The final part of my research, therefore, was to conduct a pilot evaluation of our KT product and strategy using a two-part plan.

6.2.1 Part 1: Pilot evaluation of the knowledge translation product "Living with HIV and its OK" video

To evaluate the KT product (video) I used a qualitative method, qualitative description, which is "offer[s] a comprehensive summary of an event in the everyday terms of those events" (32, p. 336). In a seminal paper, Sandelowski (32) presents qualitative description as a valuable

method by itself and describes qualitative description "as a method that researchers can claim unashamedly without resorting to methodological acrobatics" (p. 335). When describing the theoretical orientation of qualitative description studies, she states "there is no pre-selection of variables to study, no manipulation of variables, and no a priori commitment to any one theoretical view of a target phenomenon. Accordingly, the naturalist inquirer will use techniques that allow the target phenomenon to present itself as it would if it were not under study" (p. 337).

To gather data, I conducted unstructured one-on-one interviews with the video participants to gain a rich understanding of the participants' life since and experience in the video. Interviews involved one 'grand tour question'; "what has your life been like since participating in the video?" I used qualitative content analysis to analyze the data, and stayed "close to [my] data and to the surface of words and events" (32, p. 336).

I learned the video had a positive impact on these participant's lives. Data revealed that the video has helped them to "maintain" their success. In the six months since participating in the video, these participants have watched and re-watched the video. As a result, the video motivated them to continue to be healthy, "rise to the challenges," and take care of themselves despite their chaotic lives. Maintenance, to these participants, is about keeping life "simple" and making small, but important changes. For example, one participant commented that although he still uses illegal substances, he has "slowed down" his use: "So, you know, I'm still usin today, but I am not doin as much, I'm kinda slowin down." To another participant, the video is a reminder of his success, and as such, the video experience has contributed to an increase in his self-esteem, allowing him to feel better about himself, "I don't know if it's right for me to say, but I feel a bit better about myself! You know if you say it, maybe it's not true! [laughing] you know it's probably added in small ways to my self-esteem."

Participants also commented on their potential contribution to society, not immediately, but "down the road." A participant shared, "being able to contribute something, you know, that might have a positive effect somewhere down the road on someone else. And being able to participate and maybe have a positive impact." Participants described how, at one point in their life, they felt "marginalized," but participating in the video enabled them to not only help themselves, but help others. One participant used the word, "empowered" to describe how he felt about being involved in the video.

6.2.2 Part 2: Pilot evaluation of the knowledge translation strategy of using peer-educators to integrate evidence into the community

Greenhalgh *et al*. (33) define a KT strategy as a "novel set of ways of working that are directed at improving health outcomes that are implemented by planned and coordinated events" (p. 582). Accordingly, our KT strategy aimed to implement evidence in the HIV community and was premised on having informed HIV-positive individuals, such as PEs, promote health behaviours (34, 35); PEs can actively engage with HIV Edmonton clients to enhance their knowledge, experience, service use, health behaviour, and health outcomes (36).

Ideally, the selection of a KT strategy is informed by evidence. This evidence, however, cannot explicitly guide our decisions in all situations and circumstances and so choosing and designing an effective KT strategy becomes a balance between science and art. Moreover, evidence indicates that KT strategies are not consistently effective, partly because tailoring the method and study context varies widely between studies (37). Although many KT strategies have been evaluated, the rigor and quality of studies is mixed and therefore generalizability of findings becomes an issue.

This evaluation involved HIV-positive individuals who attend HIV Edmonton. HIV Edmonton is an HIV community service organization which serves a large proportion of Edmonton's HIV community, and is located in Edmonton's inner city. This organization aims to provide the best education and prevention methods to a wide variety of audiences. HIV Edmonton supports people living with and/or affected by HIV by designing and offering education, support, and health promotion programs. Our inclusion criteria for this evaluation included HIV Edmonton clients who attended a video/pizza party. These HIV Edmonton clients: 1) Resided in Edmonton; 2) were currently prescribed ART; 3) were > 15 years old; and 4) had challenging lives (e.g. unstably housed and/or had substance use).

As the pizza/video parties were of short duration (two parties, each 1 hour long), and I needed to gather and generate a comprehensive understanding of the context (video/pizza parties) and community (HIV Edmonton clients), our evaluation demanded a rapid community assessment (RCA). RCA is an approach to qualitative inquiry which is based on very short periods of field research (38, 39). Briefly, RCA is used to understand complicated situations where problems are unknown and there is insufficient time or resources for prolonged, traditional qualitative research (e.g., opportunities to remain in and/or return to the field). RCA uses a

participatory approach to gather and interpret data (instead of prolonged engagement in the field and iterative data gathering and analysis) to quickly develop an understanding of a situation from the participant's point of view by paying close attention to the context (38, 39). Furthermore, RCA is guided by participatory approaches to research, meaning RCA is action-oriented, participative, flexible, and recognizes that local individuals are the experts regarding the local context and knowledge (39). Therefore, *rapid,* but not *rushed,* qualitative research is suitable for evaluation.

In combination with RCA, to evaluate my KT strategy I used qualitative description (32). Following the "video/pizza party", I gathered data using brief unstructured individual interviews with approximately 15 HIV Edmonton clients, participant observation, and hand-written field notes. When I conducted the individual interviews, I asked HIV Edmonton clients "What did you think of the video?", "What did you think about having your peers show you the video?", and "How do you think this video could help other people living with HIV?" I used participant observation to "access everyday life that is otherwise unavailable through other data sources, including interviews" (40, p. 76). The crucial component of participant observation is the researcher is present the study participant's setting, as opposed to bringing the participants into the researcher's setting. For example, I was interested in how HIV Edmonton clients reacted to the video, and my ability to capture this experience was enhanced by watching how their behaviour unfolded in "real time" while being present in their world. I recorded my observations as detailed field notes to describe my reflections, feelings, ideas, questions, and interpretations of the video/pizza parties (Appendix 7).

These data were analyzed using qualitative content analysis, and while I coded the data, I remained close to the data to "get [to] the facts, and the meanings participants give to those facts, right and then convey them in a coherent and useful manner" (32, p.336). When I asked HIV-positive community members: "What did you think about the video?" individuals described the video as "personal" and "raw"; a way to identify with and connect to other HIV-positive individuals in their community. For example, one individual commented that because of his HIV-positive status, he feels "isolated", however, seeing the video made him realize he is "not alone". Another individual commented that during the video he reflected on his reasons for taking his HIV medication, and he identified with participants in the video, in that he too "wants to stay healthy".

My participant observation suggested other individuals identified with participants in the video from their reactions during the video. For instance, throughout the video, all eyes were glued to the video, and a collected "woo-hoo", "take a bow!" and applause was observed when the video ended. In fact, a HIV Edmonton staff member commented "this was the first time I have seen this group sit still and be quiet for this long". The video featured six original study participants, and each participant shared a different personal message about their ART success. I noticed different video participants and their messages resonated with different HIV Edmonton clients. For example, when the only Aboriginal participant in the video shared his reasons for ART success, many of the Aboriginal HIV Edmonton clients immediately recognized him, called out his name, and leaned closer to the TV to hear his message. Towards the end of the video, the only female participant shared her reasons for consistent adherence, "it [ART] reminds me that I am healthy." At this point, the video had captured the attention from all female HIV Edmonton clients, and by the time her video segment ended, she had captured the attention of the entire audience.

Not only did the video participants capture the attention of HIV Edmonton clients, but so did the three featured HIV clinicians. For instance, during some parts of the video, the room felt restless. However, as soon as the sound of the featured physician's voice filled the room, all heads turned towards the TV. One Aboriginal man closest to the TV stood up, snapped his fingers, and pointed at the TV, and said "Dr. [HIV physician's name]!" I noted this common response to the HIV clinicians at both video/pizza parties, and commented to myself that the clinicians appeared to have street credit with these HIV Edmonton clients. Also, from my perspective, it seemed like the physician was a champion among this group, as everyone knew his name, even if he did not directly care for them at the NAP. After the pizza party, I followed up this thought with an HIV Edmonton staff member. This staff member commented that, from his perspective, HIV Edmonton clients value their NAP staff and he got the sense that NAP clinicians honestly care about the wellbeing of their patients. This HIV Edmonton staff member used the term "loved authorities" to describe the relationship between HIV Edmonton clients and the NAP clinicians.

"Hope" was the message the video gave to HIV-positive individuals in the community. For these individuals, the video allowed them to realize that just because they have been diagnosed as HIV-positive, "all hope is not lost" as illustrated by one HIV-positive community

member, “I thought it [the video] was really awesome because being newly diagnosed, it’s good to see a video of people that have been living it for a while and all hope is not lost.”

Moreover, individuals commented on the life challenges video participants shared, and the fact that participants overcame their struggles sent an optimistic message that there is a “still a lot of life left to live”. I noticed individuals saw the video as a message of hope when the entire room nodded in agreement when a HIV pharmacist interviewed in the video commented that with today’s HIV medications “we have hope.”

6.2.3 What did we learn about the knowledge translation strategy from HIV-positive community members?

Since the KT strategy evaluation was time-sensitive and demanded a rapid approach to data gathering, I used RCA combined with qualitative description (38, 39). Using brief interviews, participant observation, and content analysis, we learned that HIV-positive individuals in the community thought that having their peers show them the video “added the human feeling” to the experience, as one man stated the PEs were, “awesome…it was like hearing it from the celebrities themselves.” When I observed individuals watching the video and interacting with the PEs, I saw how PEs added an additional layer to the video experience. For example, at one point during the video, a PE shared an extremely moving story about being grateful to participate in life. During this time, many individuals physically turned to look and smile at the PE. Having the PEs present and part of the viewing experience, appeared to make the video and ‘medication success’ real for HIV-positive community members (Figures 6.2, 6.3).

Figure 6.2. Knowledge translation strategy: Involving original study participants as peer-educators to share new knowledge with the HIV community. Photo: Michael Lavoie: http://mlphotography.ca/

Figure 6.3. Knowledge translation strategy: Involving original study participants as peer-educators to share new knowledge with the HIV community. Photo: Michael Lavoie: http://mlphotography.ca/

HIV-positive individuals in the community thought this KT strategy of using PEs and a video/pizza party created a safe place and space for them to talk openly about HIV. Before talking with HIV-positive individuals in the community, I assumed individuals who attend HIV Edmonton spoke freely about their HIV-related experiences. As one individual shared, this is not the case, "we don't talk about taking our meds but we all know we have it [HIV], so it was good to have this so we can talk about it."

Our KT strategy using PEs to effectively integrate knowledge into the HIV community is consistent with the literature which suggests PEs are an effective strategy to promote healthy behaviour in many areas of public health, including physical activity promotion (41), smoking cessation (42), and sexual health (43). The assumption underlying PE-based strategies is that PEs will automatically have more credibility with their peers. Turner and Shepherd (44) draw on social learning theory (45) assertions to account for the effectiveness of PEs, notably the credibility of PEs and the opportunities for on-going reinforcement of messages through social contact. Larkey *et al*. (46) suggest that theories supporting the use of PEs focus on communication within social groups. Diffusion of innovations theory (47), for example, suggests that the sharing of information in social groups and adoption of behaviour by some members leads to an exponential increase in adoption. The process is set in motion by "early adopters" who are typically well integrated into social networks and who act as "opinion leaders". These early adopters, therefore, act as "a bridge" between information sources outside of the social network and sources within the network. Their familiarity with the social context enables them to "tailor" messages effectively and further, by adopting the behaviour themselves, they act as role models.

The field of HIV prevention and care has a rich history of using PEs. In particular, PEs have provided a wide variety of HIV/AIDS prevention and treatment services. For example, PEs have been shown to provide HIV/AIDS education, encourage counseling and testing, help others identify risk behaviors, help people living with HIV understand specific aspects of their disease, identify and help solve barriers to healthcare, act as patient advocates, facilitate access to referrals, provide social support, and foster trust in the healthcare system (48). Research also suggests that PEs can effectively deliver HIV prevention messages; PEs have successfully

communicated safer sex and safe injection messages to a wide range of populations, and in individual, group, and community level programs (49-52).

Despite the popularity of peer-based strategies, few studies document and publish the process of working with PEs, including potential problems at the operational and supervisory levels. A recent meta-analysis of the impact that peer-based strategies had on changing health-related behaviours in adults concluded that results have been mixed (53). As a result, findings of peer-based strategies are challenging to interpret, partly because most published studies do not include a full description of PE selection, activities, and time (dose and duration) spent educating PEs (54). In a study that did describe lessons learned, Dutcher and colleagues (30) suggest that researchers should recognize that PE-based programs require flexibility to allow PEs to connect with and respond to client needs. As a result, peer-based programs should account for time spent to develop and maintain relationships between PEs and clients.

Lastly, HIV-positive community members felt that continuing to have PEs host regular video/pizza parties "couldn't hurt" and would provide an opportunity to talk about HIV medication without feeling stigmatized. Other community members also commented on the stigma of being HIV-positive, however, expressed that our peer-based KT video/pizza parties were something that they felt comfortable attending. Individuals expressed that they liked the opportunity to attend an event like this even if they "don't talk at it [the video/pizza party event]", and that the event provided them with a place to hear and learn from others. In fact, one HIV-positive community member remarked,

> Not a whole lot of people [come forward and say they are HIV+], and we're in the same boat. It's nice to be out and around people in the same boat. There's still a stigma. It couldn't hurt to have these meetings. It's a place where we can come and talk about it without having people do a 360 on you.

As a result of the positive experience and findings from this evaluation, the PEs expressed interested to keep the "conversation going" and have partnered with HIV Edmonton to host the pizza/video parties every 3-4 months at HIV Edmonton. In the literature, this action is referred to as "sustainability". Initial definitions of sustainability were based only on behavioral observations and described how the change becomes routine or "how things are done around here" (47). With the proliferation of sustainability research, a common understanding of sustainability pertains to the amount of time the knowledge/intervention has been used in the

system. Molfenter *et al*. (55) described sustainability as knowledge (or interventions) that are used for at least two years after implementation, Fixsen *et al*. (56), four years, and in a recent systematic review, follow-up varied from three weeks to 14 months (57).

Nonetheless, sustaining knowledge use is an essential component of the knowledge to action process because the implementation of new knowledge does not always result in continued use (55, 58). Researchers have reported that positive outcomes can be achieved with the help of special resources, such as the use of outside experts and having clinicians participate in creating and implementing knowledge. Yet, a return to pre-existing practices can occur shortly after removing the special resources (59). The non-use of knowledge can result in ineffective use of valuable resources (personnel, time) and can be frustrating for clinicians and community service workers who thought they had a problem resolved, only to see it return.

Despite the common occurrence of the lack of sustained knowledge (55, 58) and its potential effect on individual and community health, sustainability evidence has been "very sparse" (33). Buchanan *et al*. (60) suggest that the multitude of factors that are associated with sustainability vary so widely, and the contexts of sustainability application so diverse, that anticipating the significance of sustainability factors cannot be determined *a priori*. This presents a difficult situation for clinicians and community services workers who want to know how they can increase their ability to sustain a change in their clinical or organizational practice.

To develop sustainability-oriented KT strategies, Davis and Edwards (61) recommend considering the following factors: 1) Health needs: Is there a clear need for the knowledge (or innovation) that is being implemented and sustained? Does everyone agree on what knowledge needs to be sustained?; 2) Benefits: What are the anticipated outcomes of the knowledge implementation from all perspectives (e.g., biological, social, economic, and political)? How meaningful are the benefits to the knowledge users (KUs)?; 3) Attitudes: How do the participants, patients, KUs, interested and/or affected individuals, clinicians, community service workers, and decision makers feel about the knowledge (or innovation)?; 4) Networks: What teams can an individual's engage with to facilitate the knowledge uptake and sustainability?; 5) Leadership: What actions are necessary for leaders to take to support sustainability? Are there "champions" to support the sustainability of the knowledge in clinical or community practice? Who is responsible for continued implementation of the knowledge and making modifications as new knowledge is created?; 6) Policy concerns and integration: How will organizations assess

and manage the fit between new knowledge and existing procedures?; 7) Financial: What financial requirements are needed to implement and sustain knowledge?; and 8) Political: Who are the KUs and can their "power" be used to an advantage?

Taken together, sustaining knowledge use is a critical component of the knowledge to action process. Sustainability needs to be considered from all relevant perspectives, including those of the participants, clinicians, and community organizations. Although there are an increasing number of models focused on KT sustainability (62-64), there is a lack of rigorous evaluation assessing sustainability of outcomes; an area of research which is becoming increasingly important.

6.3 Refocusing the focus: Shifting the focus to humanizing adherence to ART

This evaluation suggested the importance of "humanizing" the experience of ART adherence; PEs became local HIV medication "celebrities" to their peers. These PEs humanized health care, and as a result, made adherence "real", and adherence success a possibility. Health care research has made significant gains in knowledge and care, due to the attention to interventions, treatment, and cure. This advancement, paradoxically, has led to a "depersonalized" health care context where, as Morse (65) suggests "patients and people are treated as objects; they do not comply with "orders" [clinician's treatment-related orders]….In general, people are trapped in a peculiar downward spiral in which the goal is longevity at any cost. Patients are willing to trade illness for pain, to be separated from their families for sake of treatment, to accept a deteriorating quality of life for longevity, and to accept treatment of their bodies while disregarding their emotional health" (p. 53).

For the past 15 years greater attention has been paid to humanizing health care. In 2009, Todres, Galvin, and Holloway (66) defined humanizing health care as the "consideration of the human dimensions in illness and caring" (p. 69). Previous to 2009, Todres and his colleagues used a qualitative method (phenomenology) to understand the lived experience of individuals, and their relatives, who were ill and suffering. As a result of this research, they developed a framework for humanizing health care, which includes eight dimensions of humanization/dehumanization of health care; 1) Insiderness/Objectification; 2) Agency/Passivity; 3) Uniqueness/Homogenization; 4) Togetherness/Isolation; 5) Sense-making/Loss of meaning; 6) Personal journey/Loss of personal journey; 7) Sense of

place/Dislocation; and 8) Embodiment/Reductionist body (66). Although these dimensions have helped to clarify what it means to humanize health care, Todres *et al*. (66) emphasized that these dimensions exist along a continuum and explain the process of dehumanization occurs "when any one or more of the humanizing dimensions are obscured to a significant degree" (p. 69).

Janice Morse (65) argues that humanizing health care "encompasses a perspective on attitudes, beliefs, expectations, practices, and behaviors that influence the quality of care, administration of that care, conditions judged to warrant (or not warrant) empathetic care, responses to care and therapeutics, and anticipated and actual outcomes of patient or community care" (p. 54). Further, she argues that "humanizing health care is not new. What is new is its articulation". The articulation of humanizing health care in the HIV literature is most often described as the 'humanization of HIV'. The growing humanization of HIV is linked to new understandings and optimistic representations of HIV/AIDS. Within such a move, efforts worldwide are being made to "empower" HIV-positive individuals to be actively involved in their health care and advocate for the HIV community by speaking openly about themselves and their experience (67, 68).

People living with and affected by HIV/AIDS have a long history with self-empowerment. In 1983, an AIDS conference was held in Denver, USA where HIV-positive individuals created a call to action, known as the "Denver Principles". These principles were a call to all HIV-positive individuals to: Choose to be an active participant in their health care; participate fully in all AIDS conferences, meeting, and discussions; practice safe sexual health; and inform all their partners of their positive status (69). In 1994 at the Paris AIDS Summit 42 nations signed and committed themselves to the Greater Involvement of People living with HIV/AIDS (GIPA) Principle (68). This principle called for the greater involvement of HIV-positive individuals in HIV prevention, treatment, and care. The GIPA principle was a way to humanize health care, address HIV-related stigma, and to educate HIV-positive individuals on their rights and responsibilities. Accordingly, the 'humanization' of HIV began when HIV-positive individuals started publically telling their personal stories.

In terms of medication adherence, using PEs to humanize medication-taking behaviour does more than just portray a face and real stories; the emotional information about medication success keeps the agenda for humanizing health care at the forefront. When providing optimal care for an individual, for example within the patient-provider relationship or community

organization staff member-client relationship, human emotion is essential. This research added the human emotional element to the traditionally dehumanized phenomenon of adherence. Finally, my experience working with HIV-positive participants, HIV clinic staff, and a local HIV community organization generated not only meaningful knowledge, but an effective KT plan to integrate this knowledge in the HIV community. Most importantly, this experience reminded me that having the "pill" is not enough; we need the human element, interpersonal connection, and emotion.

6.4 Footnotes

[1] I used the term "Achilles heel" in a colloquial sense to underscore the importance that adherence has to the success of ART; consistent adherence is the weak point in ART, a therapy that may be otherwise excellent.

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CHAPTER 7

General discussion and conclusions

7.1 Overview of findings

My multi-method thesis was composed of three studies aimed to address the following objectives.

1. To use the Northern Alberta HIV Program (NAP) clinical database to compare antiretroviral therapy (ART) treatment outcomes among foreign-born (FB), Canadian-born Aboriginal (CBA), and Canadian-born non-Aboriginal (CBNA) individuals.
2. To use focused ethnography to understand why HIV-positive participants with chaotic lives attending the NAP maintain consistent ART adherence.
3. To conduct a pilot evaluation of my:
    1) Knowledge translation (KT) product, a video, "Living with HIV and its OK"
    2) KT strategy, peer-educators (PEs)

From the retrospective cohort study using the NAP database, the following major findings were observed. Compared to CBNA individuals, the odds of achieving initial HIV treatment success were similar for FB individuals and significantly lower for CBA individuals. Of those patients who achieved initial treatment success, compared to CBNA patients, FB and CBA patients had similar rates of treatment failure. These results suggested that there was no large difference in treatment outcomes among FB patients compared with CBNA patients, however, CBA patients had poorer treatment outcomes compared to CBNA patients. Although in my analysis I controlled for confounding variables, I did not, however, directly measure (and control for) adherence to ART. Previous research has demonstrated adherence to ART is a primary driver of treatment success (1, 2), and that HIV-positive individuals must maintain optimal adherence to achieve and maintain treatment success (1-3). My findings suggested that ART outcomes among CBA patients in northern Alberta remains an issue, which could be explained partly by poor adherence.

To understand why some HIV-positive individuals who have "chaotic" lives are able to consistently take their ART, I used a qualitative method, focused ethnography. The focused ethnography data revealed "control" (identified through the categories of: "Fear of being sick and dying'; "To be with my family"; "Because I am grateful"; "Because I am important"; and "Healthcare professionals and community support workers care about me") as the cornerstone for maintaining adherence to ART. Participants felt that while they had little or no control over

their life circumstances they recognized that, by taking their ART, they *could* have control over their HIV infection, which enabled them to make additional positive life changes.

Lastly, I developed a meaningful KT product, a video, and integrated my KT product into the HIV community using a KT strategy involving PEs. My pilot evaluation of this KT product and strategy emphasized the importance of "humanizing" the experience of ART adherence; PEs became local HIV medication "celebrities" to their peers.

7.2 Impact on clinical practice and the community

Clinicians must be aware of the extent to which HIV-positive individuals believe they can control their HIV infection and adopt a broad perspective of adherence determinants when addressing adherence-related concerns. My thesis findings had an immediate impact on clinical practice and, as such, clinicians at the NAP changed the way they perceived adherence. For example, when I worked alongside the NAP clinicians to analyze and interpret the data, a social worker commented on the findings, wrote a note in her journal, and remarked, "Well, if these categories [fear of dying, family, gratitude, self-worth, and support from the NAP and community organizations] are helping patients to adhere to their HIV medication, I am going to start asking my patients different questions." A similar situation occurred when a nurse commented, "I didn't even know some of these patients had families! I never ask about their family. Knowing now that family is so important to HIV medication success, I am going to start asking my patients about their family. And if they don't have a family, we [the NAP] can be their family". As a result, clinicians collaborated with HIV-positive individuals to elicit and reinforce personal motivation for adherence behaviour, including having control over their HIV.

Today, it is not enough to generate evidence; systemic change *demands* moving knowledge into action. Context specific and appropriate KT plans are needed to effectively integrate knowledge into the community. Such plans could involve using a community-based participatory research (CBPR) approach to create innovative and meaningful KT products and strategies to gain insight from the perspective of the knowledge users (KUs). My KT plan of creating an emotionally powerful video and peer-based KT strategy generated a large amount of excitement within the HIV community and city of Edmonton. In fact, the University of Alberta, School of Public Health, and HIV Edmonton featured this research in newsletters (4-7) (Appendix 5).

7.3 Significance and impact of findings

My thesis research provides evidence of ART outcomes among FB, CBA, and CBNA HIV-positive individuals cared for at the NAP. With these results, NAP clinicians can translate this knowledge into action, plan, and implement adherence interventions targeting high-risk populations (e.g., CBA patients), and evaluate these interventions. As maintaining viral suppression continues to remain troublesome for CBA patients (8), working alongside CBA patients to co-create solutions to ensure ART success remains a health care priority. It is important to be mindful of the fact that CBA patients may be considered high-risk for failing treatment due underlying living conditions, the social determinants of health, which contribute to poor health outcomes (e.g., education, employment, working conditions, unemployment, job security, food insecurity, housing, income, income distribution, and social exclusion).

My thesis research also offers clinicians a new way to conceptualize ART adherence by considering reasons for ART *success* as opposed to failure, and to consider the positive attributes and strengths of their patients rather than focusing on the negatives. What is more, this research provides insight regarding ART success from the perspective of the experts themselves, HIV-positive individuals who maintain consistent ART adherence among living in "chaos". It is hoped that clinicians, researchers, and HIV community organizations will continue to work together with the most valuable source of information relating to what it is like to live with HIV, the HIV-positive individuals themselves, and use my findings to help those HIV-positive individuals who struggle with ART adherence.

My thesis is innovative because it addresses and helps address a knowledge gap of an essential aspect of HIV care, adherence to HIV medication. Moreover, my thesis research generated meaningful findings, I created a powerful KT product, a video, and used PEs and "video/pizza" parties as a KT strategy to integrate these findings into the HIV community. Since the video/pizza parties, the video participants have partnered with HIV Edmonton to continue to host the video/pizza parties every 3-4 months (personal communication with Dylan Richards, HIV Edmonton, Support & Education Facilitator; and participants RM, DD, DB, and BC; June 2014).

My thesis research also generated a lot of excitement with the media. For example, local news stories attracted so much local support (Appendix 4) and attention on the social media

platform, Twitter (Appendix 5), that I was contacted by a reporter from the CBC. Three original study / video participants, an HIV Edmonton staff member, and I were featured talking about our video on the CBC evening news (9) and I was interviewed on the CBC live radio show, "Radio Active" (10). The immediate change observed in clinical practice, activity on social media, and the interest from the community suggested that my research did have an impact on the HIV community and continues to resonate with a broader audience.

7.4 Future research

My findings pertaining to the care of CBA patients are consistent with previous findings which also used the NAP clinical database to explore ART outcomes comparing CBA with CBNA patients (8); findings suggest that CBA patients are less likely to achieve treatment success as compared CBNA patients. This is concerning. HIV care and treatment, however, involves several stages, including identifying HIV-positive individuals, linking these individuals into HIV care, keeping these individuals engaged in care, and persisting on ART, the "cascade of care" (11). Appropriately, the cascade of care has become topic of concern for areas in public health concerned with maximizing the benefits of ART for individuals and populations. Taken together, these results provide evidence that HIV care and adherence-related interventions targeting CBA patients are needed. Future efforts, then, can shift the focus to evaluating these interventions.

My qualitative study, focused on treatment success, did not include any FB HIV-positive individuals who have "chaotic" lives. Recently, in Alberta, more individuals from HIV-endemic countries have presented for HIV care than Aboriginal peoples (12). Since little is known regarding the culture-specific influences, medication beliefs, access, stigma, reasons for adherence, and patterns of medication taking among FB patients cared for at the NAP, this area is a good fit for qualitative inquiry. Moreover, NAP clinicians expressed interest in learning more from FB patients regarding their reasons for ART success to develop culturally-appropriate care strategies and adherence interventions.

Finally, as our KT strategy, which involved PEs, and the PEs themselves were described as "celebrities" by local HIV-positive community residents, future research could involve developing, implementing, and evaluating a peer-mentor program in Edmonton. Peer-mentor programs are based on the rationale that peers have a strong influence on individual behaviour

with the aim of modifying a person's knowledge, attitudes, beliefs, and/or behaviours. Peer-mentors may also impact change at the community level by modifying norms, contributing to changes in community-based programs and policies (13).

In Canada, HIV peer-based programs exist, and three well-established programs are: 1) Positive Living BC in Vancouver, BC (14); 2) Acute Peer-to-Peer Program in Regina, Saskatchewan (15); and 3) ASK Wellness Centre in Kamloops, BC (16). The rationale for these programs is that HIV-positive individuals are experts in *living* with HIV, and therefore, can relate with other HIV-positive individuals (versus a clinician or community service worker). Peers (also called mentors) use their lived experience to support and counsel other HIV-positive individuals and support is specific to each individual (or mentee). For example, some individuals need someone to talk to, others need a peer-mentor to help them find health care services, accompany them to their medical appointments, and act as advocates. The work of a peer-mentor, however, is to enhance and complement, not supplant, the activities of other members of the health care team.

In light of recent personal communication with video participants (i.e., the PEs who hosted the video/pizza parties) and HIV Edmonton staff (email and personal correspondence with PEs: RM, DD, DB, and BC; and HIV Edmonton staff DR and PH; June 2014), I have an exciting opportunity to partner with interested video participants, NAP clinicians, HIV Edmonton staff, and University of Alberta (UA) researchers to design, implement, and evaluate a peer-mentor program in Edmonton. My initial thoughts of our peer-mentor program involve more than "health talks" by the peer-mentors, but rather include a variety of approaches to engage HIV-positive individuals (mentees) in reflection and discussion, such as theater, group problem solving, and creating short videos.

Following the principles of CBPR and drawing from the Partner Model (17) of peer research (i.e., peers are partners in all parts of the research process, from the design, program implementation, program evaluation, and co-write and co-disseminate findings), my peer-mentor program would involve a team of peer-mentors, NAP clinicians, HIV Edmonton staff, and UA researchers. At the outset of our project, we would consider the following questions: 1) What are the goals of our peer-mentor project?; 2) What are the expectations of each team member?; 3) How will we define "peer-mentor" in this project? (I recognize that our definition and role of a peer-mentor may change over time, depending on the context, community, and direction of the

project); 4) If, and how will a peer-mentor's role change over time?; 5) How are the team members situated in relation to each other? (e.g., is there a hierarchy? What is our decision making process?); 6) What are the roles and responsibilities of each team member? (We can formalize the roles and responsibilities by creating a memorandum of agreement); 7) How will peer-mentors be supported and protected (i.e., emotionally, financially, and training-related)? 8) How will HIV-positive mentees be referred into our program?; and 9) What modality will we use to pair peer-mentors with mentees? (e.g., 1:1 face-to-face, group face-to-face, 1:1 telephone, 1:1 internet, group Internet, or a combination approach?).

Peer-based programs for HIV prevention and care are widespread and well supported, however, little is done to evaluate these programs. Recent systematic reviews (18, 19) suggest peer programs are effective in impacting HIV knowledge, promoting health and wellness of HIV-positive individuals, decreasing equipment sharing among injection drug users, and condom use, but questions remain regarding *how* and *why* these programs are effective. In fact, Simioni *et al*. (18) suggest future research should focus on how and why peer-based programs are effective. Drawing from the Partner Model (17) of peer research, my team and I could address this knowledge gap by studying the nuances of a peer-mentor program and why (or why not) a peer-program can contribute to successful HIV care/treatment (I recognize that peer-based programs have been used in HIV prevention and HIV care/treatment, and while HIV prevention and HIV care/treatment are, and should be linked, our peer-mentor program could focus on HIV care/treatment). We could do this with the following objectives:

1. Design, implement, and evaluate a HIV peer-mentor program targeting newly diagnosed HIV-positive adults (age 18+) residing in Edmonton's inner city
2. Understand *how* and *why* our peer-mentor program was (or was not) effective

The following are possible HIV care/treatment-related outcomes that our peer-mentor program may evaluate:

HIV care outcomes

- Access to HIV care (including clinical care and other support services)
- Retention in care

HIV treatment outcomes

- ART adherence
- ART outcomes (i.e., HIV viral load suppression, improved CD4 cell count)

Mentor/mentee outcomes

- Mentee's satisfaction with care (e.g., satisfaction with peer-mentor program, and with HIV clinical care)
- Mental health outcomes among HIV-positive mentors and mentees (e.g., stress, anxiety, depression)
- Mentee and mentor's ability to self-manage (e.g., the ability to make informed choices about care and treatment options by oneself)

To evaluate care-, treatment-, and mentor/mentee-outcomes, we could approach this research using a multiphase mixed methods study design (20), meaning we will sequentially collect and analyze data using quantitative and qualitative methods over time (Figure 7.1). Then, we could integrate the findings from the quantitative and qualitative data sets to better inform the next phase of our peer-mentor program evaluation.

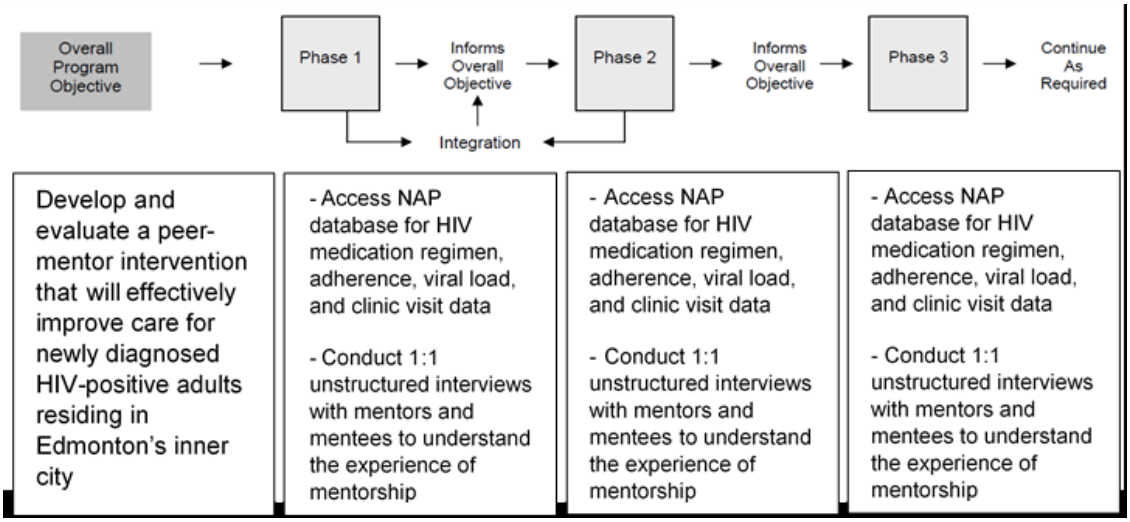

Figure 7.1. Organization of the multiphase mixed methods design. Figure adapted from Creswell *et al*. (20).

For example, our evaluation could be divided into 8 phases (Figure 7.1). We could use quantitative methods and the NAP clinical database to follow HIV-positive mentees (e.g., study participants) over time, and collect and record HIV treatment regimen, self-reported adherence, HIV viral load, CD4 cell counts, and clinic visit attendance data. We could collect these data at

baseline (Phase 1) and then every three months over two years (Phases 2-8). During this time we can calculate and track: Adherence (using self-reported adherence for each three month period of time); retention in care (using clinic visit as an indicator); and HIV treatment outcomes (viral load and CD4 cell count). We could use statistical analysis to determine if having a peer-mentor predicts adherence to HIV medication, retention in care, and HIV treatment outcomes.

Concurrently in Phases 1-8, to evaluate mentor/mentees-related outcomes we could use a qualitative method, such as focused ethnography, to understand the experience of being a peer-mentor, a mentee, and how mentorship impacts adherence to ART, mental health (i.e., anxiety, stress, depression), and the ability to self-manage from the perspective of the mentor/mentee.

Within each phase, when the collection and analysis of the quantitative and qualitative data sets is complete, we could integrate the data by merging the data (e.g., combining the quantitative data (numeric information) with the qualitative data (texts or images)) (20). We could merge our data sets either by: Reporting results together in the discussion section of an article, such as first reporting the quantitative numerical results followed by qualitative themes that support or contest the quantitative results; transforming one set of data (e.g., counting the number of times a theme is identified in a qualitative dataset) so that the qualitative findings are comparable with the quantitative data (21); and/or by creating tables or figures to show the quantitative and qualitative results (i.e., data displays). By intentionally 'mixing' the quantitative and qualitative data sets, we will be maximizing the strengths and minimizing the weaknesses of each type of data. Furthermore, the 'mixing' of these two methods will address many layers within our evaluation, thereby making the evaluation results rich and comprehensive.

To evaluate and understand why and how our peer-mentor program was (or was not) effective, we could use a participatory evaluation approach. Participatory evaluation approaches aim to involve all stakeholders (in this case, study participants, NAP clinicians, HIV community organization staff, researchers, and funders) who are invested in the evaluation to be heard and considered when making decisions about the evaluation design, implementation, and outcomes (22, 23). Participatory approaches to evaluation, therefore, ensures that outcomes are meaningful to all those who are invested in the evaluation. Moreover, involving a many different voices in the evaluation process can lead to innovative ways of assessing impact and outcomes (e.g., photovoice, collage, storytelling, and oral history) (24).

As such, our team could discuss how and when we will evaluate our peer-mentor program during the initial program planning stage. Following Fuerstein's *Training for Participatory Evaluation* (23), we could consider the following steps: 1) We will decide on our evaluation objectives; 2) next, we will select "evaluation coordinators" to plan and organize the evaluation; 3) then, we will choose our evaluation methods; 4) this will be followed by formally writing the evaluation plan (i.e., explain why, how, when, and where the evaluation will take place and who will be involved); 5) subsequently, we will prepare and test the evaluation methods by selecting participants to be trained (e.g., on interviewing); all participants will be reminded of the evaluation objectives and methods; 6 and 7) now we can begin to gather data using our pre-tested methods, and co-analyze the data; 8) we will next interpret our findings and prepare written, oral, or visual reports; and 9) lastly we will decide how to share our findings with the appropriate knowledge users.

Our previous research generated a great deal of excitement within the Canadian national media (CBC), local HIV community organizations, within the NAP, a biopharmaceutical company that develops HIV medication (Gilead Sciences Inc.), and a Canadian national public health government organization (Public Health Agency of Canada) (Appendix 4, 5, 8, 9), suggesting that our work impacted the HIV community and a broader audience. As a result, the Public Health Agency of Canada has invited our team to present our past and future research on November 6, 2014 at the Alberta Community HIV Policy & Funding Consortium (Appendix 9). This Consortium provides our team with the opportunity to inform the Alberta government about our past and future research including a peer-mentor program. Altogether, our peer-mentor program has the potential to benefit HIV-positive individuals, healthcare teams, and community organization staff, not only in Alberta, but across Canada; HIV clinical programs and HIV community organizations can have an opportunity to learn from our work and improve the care they provide to their patients / clients.

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APPENDICES

Appendix 1: Qualitative study - Information letter and Informed Consent form

INFORMATION SHEET

Taking Antiretroviral Therapy

Principal Investigator:
Megan Lefebvre, Student at the University of Alberta

Student's Supervisor:
Dr. Maria Mayan, Professor at the University of Alberta

Co-Investigators:
Dr. Stan Houston, Doctor at the Northern Alberta HIV clinic
Dr. Duncan Saunders, Professor at the University of Alberta
Dr. Christine Hughes, Pharmacist at the Northern Alberta HIV clinic and professor at the University of Alberta

BACKGROUND
People with HIV need to take medication correctly to control HIV and prevent death. Some people with HIV are very good at taking their medication every day and we want to learn from these people how and why they do this.

PURPOSE
You are being asked to participate in a study that will ask you about your HIV medication and how and why you are able to take your HIV pills.

DESCRIPTION OF THE STUDY
If you decide to participate in this study, Megan Lefebvre will interview you and ask you about your HIV medication and how you are able to take your pills. The interview will be in an office at the Northern Alberta HIV clinic (at the Edmonton Clinic or Royal Alexandria Hospital site) and will last about one hour. Megan will ask you if it is okay to tape-record your conversation so she can make sure she understands exactly what you are telling her. Megan will also take notes during the conversation. She and her supervisor, Maria Mayan, are the only people that will see Megan's notes and be able to listen to the conversation. The staff at the Northern Alberta HIV clinic (including your doctor and nurse) will never see Megan's notes or hear the conversation that she tapes. During the interview Megan will ask you questions like:

- What is your secret to taking your HIV pills every day?
- Describe a day in your life for me
- Has your typical daily routine changed recently?
- How are you doing on your HIV pills?

At any time during the conversation you can tell Megan to skip the question, or you can stop the conversation all together. If you decide to join her study, the conversations you and her will have will help doctors, nurses, pharmacists, and researchers to know why and how some people are able to always take their HIV medication. Some of the questions might be hard to

answer and you may feel overwhelmed. If this happens you can take a break from the interview, or stop the conversation all together. You can also talk with the nurse, psychologist, or social worker at the Northern Alberta HIV clinic. Participation in Megan's study is completely voluntary and will not affect your care at the Northern Alberta HIV clinic or at the hospital. The doctors and nurses will never know if you decided to participate or not. If you decide to participate, you will be given a $25 reimbursement for your time.

BENEFITS
This study may or may not have any direct benefits for you.

RISKS
It is not expected that being in this study will harm you. But, some people may feel uncomfortable, scared, or worried about talking about their personal experiences related to their HIV, lifestyle, and experiences. If you would like to speak to someone after the interview, you may contact either Megan or the other contact people identified below.

CONFIDENTIALITY
Megan Lefebvre and Maria Mayan are the only people that will ever hear the conversations and be able to access the notes Megan makes during the interview. Megan will keep all of her notes and the tape from the interview in a locked drawer in her home office where she works. Megan is the only person who has a key to the drawer. The University of Alberta requires Megan to keep all of your information for five years after the end of the study, and after that your information will be destroyed.

WITHDRAW
If you decide you do not want to participate in this study, you can tell Megan at any time up until 1 week after your interview and she will destroy your information (audio tape, transcripts).

Thank you very much for taking part in this study.

The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

ADDITIONAL CONTACT NAMES AND TELEPHONE NUMBERS
If you have problems with any part of this study, you can contact:

Megan Lefebvre	Email: mejohnst@ualberta.ca
Dr. Maria Mayan	Phone number: (780) 492-9209
Dr. Stan Houston	Phone number: (780) 407-8035
Dr. Duncan Saunders	Phone number: (780) 492-6814
Dr. Christine Hughes	Phone number: (780) 492-5903

CONSENT FORM

Taking Antiretroviral Therapy

Principal Investigator:
Megan Lefebvre (student) Email: mejohnst@ualberta.ca

Student's Supervisor:
Dr. Maria Mayan Phone Number: (780) 492-9209

Co-Investigators:
Dr. Stan Houston Phone Number: (780) 407-8035
Dr. Duncan Saunders Phone Number: (780) 492-6814
Dr. Christine Hughes Phone Number: (780) 492-5903

Please circle your answers:

Do you understand that you have been asked to participate in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you can quit taking part at any point during the interview?	Yes	No
Has confidentiality been explained to you?	Yes	No
Do you understand who will have access to the data collected?	Yes	No
Do you understand that the interviews will be audio-recorded and transcribed?	Yes	No
Do you understand that you have up until 1 week after your interview to withdraw what you have shared in the interview?	Yes	No

If you have further questions regarding the research, please contact Megan Lefebvre.

This study was explained to me by: _____

I agree to take part in this study.

_____ _____
Signature of Research Participant Date (dd/mm/yyyy)

_____
Printed name

Appendix 2: Video project - Information letters and Informed Consent form

INFORMATION SHEET

Living with HIV and it's OK video experience

Principal Investigator:
Megan Lefebvre, Student at the University of Alberta

Student's Supervisor:
Dr. Maria Mayan, Professor at the University of Alberta

Co-Investigators:
Dr. Stan Houston, Doctor at the Northern Alberta HIV clinic
Dr. Duncan Saunders, Professor at the University of Alberta
Dr. Christine Hughes, Pharmacist at the Northern Alberta HIV clinic and professor at the University of Alberta
Dr. Yutaka Yasui, Professor at the University of Alberta

BACKGROUND
People with HIV need to take medication correctly to control HIV and prevent death. We worked with you and other HIV-positive individuals who are very good at taking their medication to create a video, "Living with HIV and it's OK". We learned about your medication success and, working with you, we would like to share your information with other people, especially other community members like you.

PURPOSE
You are being asked to participate in an evaluation that will ask you about your experience in the video, "Living with HIV and it's OK". Also, with your help as peer-researchers, we would like to evaluate what other people in the community think about our video.

DESCRIPTION OF THE STUDY
If you decide to participate in this evaluation, Megan Lefebvre will interview you and ask you about your experience in the video and what your life has been like since the video. The interview will be in an office at the Northern Alberta HIV clinic (at the Edmonton Clinic or Royal Alexandria Hospital site) and will last about one hour. Megan will ask you if it is okay to tape-record your conversation so she can make sure she understands exactly what you are telling her. Megan will also take notes during the conversation. She and her supervisor, Maria Mayan, are the only people that will see Megan's notes and be able to listen to the conversation. The staff at the Northern Alberta HIV clinic (including your doctor and nurse) will never see Megan's notes or hear the conversation that she tapes. During the interview Megan will ask you questions like:

- Please tell me about your life since the video
- How did being part of the video make you feel?
- What have you done with the video?
- How are you doing on your HIV pills?

At any time during the conversation you can tell Megan to skip the question, or you can stop the conversation all together. If you decide to participate in her evaluation, the conversations you and her will have will help doctors, nurses, pharmacists, and researchers to learn about what is it like to be part of a research video and how you, as a peer-researcher, can help other people to always take their HIV medication. Some of the questions might be hard to answer and you may feel overwhelmed. If this happens you can take a break from the interview, or stop the conversation all together. You can also talk with the nurse, psychologist, or social worker at the Northern Alberta HIV clinic.

We also want to invite you to be a "peer-researcher" and share our video with people who hang out at HIV Edmonton. If you agree to participate, Megan will arrange with HIV Edmonton to have a pizza party / video afternoon. During this time, you will show the video to your peers and eat pizza with them. If you decide to participate as a "peer-researcher" and share the video at HIV Edmonton, this will help researchers, community organizations, doctors, nurses, pharmacists about what community members think about the video, and if the video will help others to take their HIV medications. Participation in Megan's study is completely voluntary and will not affect your care at the Northern Alberta HIV clinic or at the hospital. The doctors and nurses will never know if you decided to participate or not.

BENEFITS

This study may or may not have any direct benefits for you.

RISKS

It is not expected that being in this study will harm you. But, some people may feel uncomfortable, scared, or worried about talking about their personal experiences related to their HIV, lifestyle, and experiences. If you would like to speak to someone after the interview, you may contact either Megan or the other contact people identified below.

CONFIDENTIALITY

Megan Lefebvre and Maria Mayan are the only people that will ever hear the conversations and be able to access the notes Megan makes during the interview. Megan will keep all of her notes and the tape from the interview in a locked drawer in her home office where she works. Megan is the only person who has a key to the drawer. The University of Alberta requires Megan to keep all of your information for five years after the end of the study, and after that your information will be destroyed.

WITHDRAW

If you decide you do not want to participate in this study, you can tell Megan at any time up until 1 week after your interview and she will destroy your information (audio tape, transcripts).

Thank you very much for taking part in this study.

The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

ADDITIONAL CONTACT NAMES AND TELEPHONE NUMBERS

If you have problems with any part of this study, you can contact:

Megan Lefebvre	Email: mejohnst@ualberta.ca
Dr. Maria Mayan	Phone number: (780) 492-9209
Dr. Stan Houston	Phone number: (780) 407-8035
Dr. Duncan Saunders	Phone number: (780) 492-6814
Dr. Christine Hughes	Phone number: (780) 492-5903
Dr. Yutaka Yasui	Phone number: (780) 492-4220

CONSENT FORM

Living with HIV and it's OK video experience

Principal Investigator:
Megan Lefebvre (student) Email: mejohnst@ualberta.ca

Student's Supervisor:
Dr. Maria Mayan Phone Number: (780) 492-9209

Co-Investigators:
Dr. Stan Houston Phone Number: (780) 407-8035
Dr. Duncan Saunders Phone Number: (780) 492-6814
Dr. Christine Hughes Phone Number: (780) 492-5903
Dr. Yutaka Yasui Phone Number: (780) 492-4220

Please circle your answers:

Do you understand that you have been asked to participate in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you can quit taking part at any point during the interview?	Yes	No
Has confidentiality been explained to you?	Yes	No
Do you understand who will have access to the data collected?	Yes	No
Do you understand that the interviews will be audio-recorded and transcribed?	Yes	No
Do you understand that you have up until 1 week after your interview to withdraw what you have shared in the interview?	Yes	No

If you have further questions regarding the research, please contact Megan Lefebvre.

This study was explained to me by: _____

I agree to take part in this study.

_____ _____
Signature of Research Participant Date (dd/mm/yyyy)

_____
Printed name

Consent for Disclosure of Personal Information (Photographs, Videotapes and Audiotapes)

I authorize the	Office / Program / Individual
to use the designated photographs, videotapes or audiotapes	Listing of photographs, videotapes or audiotapes to be disclosed
taken on	Date photograph taken or videotapes or audiotapes recorded
for the purpose of	State specific purpose of information release
in the period	State date range for which permission will exist

Full Name:	
Date:	

Signature: _____

Protection of Privacy - The personal information requested on this form is collected under the authority of Section 33 (c) of the *Alberta Freedom of Information and Protection of Privacy Act* and will be protected under Part 2 of that *Act*. It will be used for the purpose of managing the consent for disclosure of personal information process. Direct any questions about this collection to: [contact position, full address, and business telephone number].

This information will be retained and disposed in accordance with approved records retention and disposal schedules of the University.

Information and Privacy Office, January 2006

Consent for Disclosure of the video, "Living with HIV and it's OK" on YouTube

The video, "Living with HIV and it's OK" was made based on research that we did together in the summer 2013 to ask you why you take your HIV medications every day. We wanted to learn from you and share your information with other people, especially other patients like you.

We would like to have your permission to share the video on YouTube. This could make it possible for many more people to learn from it. Your consent for sharing this video on YouTube is completely voluntary. You can refuse to have your part of the video shared on YouTube up to 1 year from today. The video will be listed on YouTube as "private". This means no one would be able to find it just by searching Google or YouTube. They could only see it if they got the link from someone else, most often an HIV agency, either directly or from their website.

The video may be shown to people living in Edmonton who attend Edmonton's community organizations (e.g., Boyle McCauley Health Centre, the Bissell Centre, Hope Mission/Herb Jamieson Centre, HIV Edmonton, Boyle Street/ Streetworks, Woman's Emergency Accommodation Centre, Mustard Seed, and the George Spady Centre). These organizations may share the video with their clients using YouTube or their website. Also healthcare workers may share the YouTube link to the video with community organizations outside of Edmonton. For example, some people who live in Calgary, Vancouver, the USA, Europe, and other countries may see this video. Lastly, the video may be shared by a Canadian HIV and Hepatitis C organization called CATIE on their website, so any person who accesses CATIE's website may view the video.

I authorize Megan Lefebvre to share the video, "Living with HIV and it's OK" on YouTube as a "private" video.

Full name: _____

Date: _____

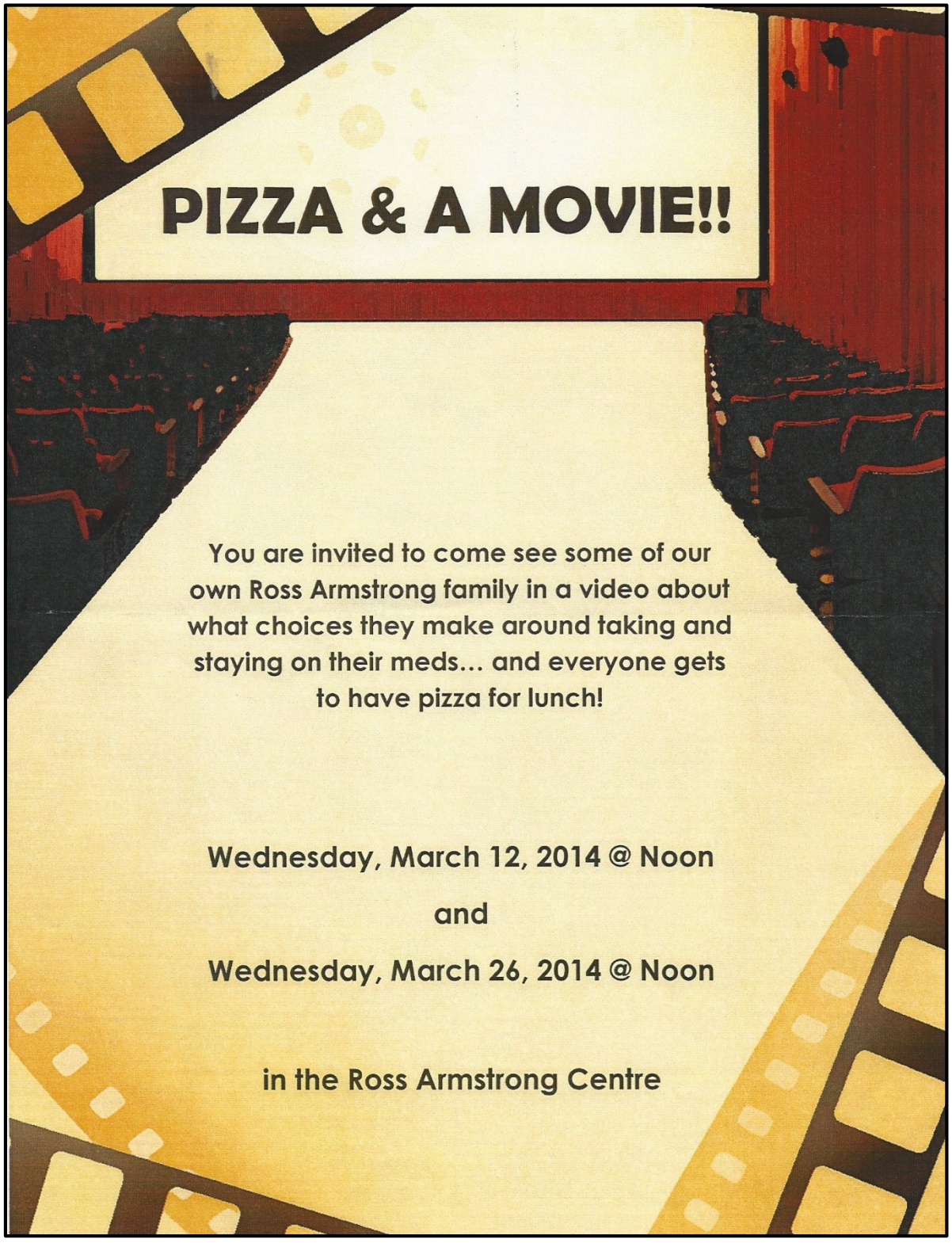
Signature: _____

Witness full name: _____

Date: _____

Witness signature: _____

Appendix 3: Knowledge Translation: Video / pizza party event documents



Video Viewing Party

Dates:

March 10th @10am – Planning Meeting

Schedule

Dates:

Wednesday March 12th & Wednesday March 26th

- Noon – Pizza eating
- 12:15 – Introductions by Brian, Darren, & Richard
- 12:30 – Begin Video
- 12:45 – Questions from the crowd (for Brian, Darren, & Richard)
- 1:00 – Megan comes in and asks questions

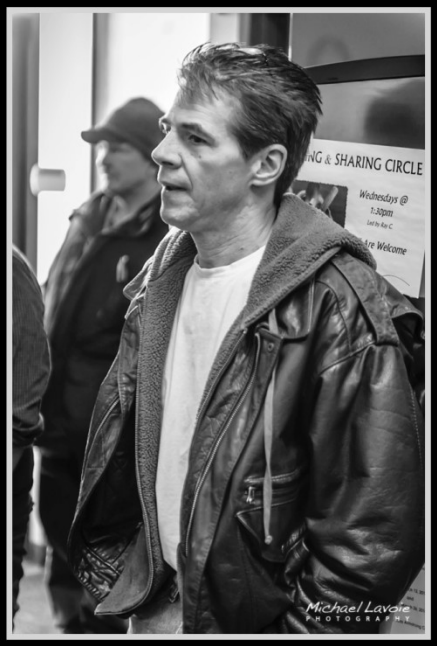

Michael Lavoie
PHOTOGRAPHY


Michael Lavoie


Michael Lavoie
PHOTOGRAPHY


Michael Lavoie
PHOTOGRAPHY


Michael Lavoie
PHOTOGRAPHY


NG & SHARING CIRCLE
Wednesdays @
1:30pm
re Welcome
Michael Lavoie
PHOTOGRAPHY


Michael Lavoie
PHOTOGRAPHY


Michael Lavoie
PHOTOGRAPHY


Michael Lavoie
PHOTOGRAPHY


Michael Lavoie
PHOTOGRAPHY


QUEBEC
Michael Lavoie
PHOTOGRAPHY


Michael Lavoie
PHOTOGRAPHY

Photos by Michael Lavoie: http://mlphotography.ca/

Appendix 4: Support from the community

UNIVERSITY OF ALBERTA

Department of Medicine - Division of Infectious Diseases
Stan Houston, MD

2D3.19 Walter C. Mackenzie Health Sciences Centre
8440 112 Street
Edmonton AB T6G 2B7

http:www.medicine.med.ualberta.ca/Divisions/INFD
shouston@ualberta.ca

Tel: 780.407.8035
Fax: 780.407.7137

February 11, 2014

Awards Committee
Canadian Public Health Association
404 1525 Carling Avenue
Ottawa ON K1Z 8R9

Dear Sir or Madam:

RE: Megan Lefebvre

I am very pleased to write this letter on behalf of the application by Megan Lefebvre for funding support in order to present her work at the annual meeting of the Canadian Public Health Association.

Ms. Lefebvre's work addresses a core problem in the successful care and treatment of patients with HIV infection, a large proportion of who face one or more psychosocial obstacles to maintaining high levels of medication adherence.

She adopted a highly innovative approach: instead of exploring the determinants of non-adherence as in most previous studies, she focused on patients who, based on personal characteristics and life circumstances were identified as being at very high risk of treatment failure, but who had demonstrated sustained adherence to antiretroviral therapy in spite of these obstacles. She attempted to determine the reasons for their somewhat unexpected success.

She then went on to capture this experience in a video which has subsequently been reviewed and shared with local medical and community agencies for use in supporting adherence for patients with multiple treatment challenges.

She has carried her work a step further to engage several of the subjects of her video as peer educators, with the video itself has a tool, evaluating the response of HIV-infected individuals to this approach.

I think Ms. Lefebvre's innovative approach provides a unique opportunity to share the knowledge of patients who have been successful in adhering to antiretroviral treatment, with both caregivers and other patients who face similar challenges. I believe this intervention has the potential to improve the outcome of the "cascade of care" in some of our highest risk patients.

Based on the enthusiastic support of the HIV program team and involved community agencies, I believe there will be a high level of uptake locally, and potentially for a much wider audience as the video is made available electronically to other professional and community HIV care providers.

Yours sincerely,

Stan Houston, MD
shouston@ualberta.ca

From: Janelle MacDonald
Sent: Friday, July 12, 2013 2:17 PM
To: 'mejohnst@ualberta.ca'

Hello Megan,

The videographer that I know is David Puff. His email address is puffstudiosinc@gmail.com

He does a lot of video work for the performance group that my husband works with, and everything I have seen has been excellent!

Good luck putting it all together, and please let us know when you are going to present it. Your study was my favourite research study (since I started this job). Thank you for providing a meaningful experience for our patients while you collected your findings. That's something that we don't often see, but it matters a lot. So thanks!

Janelle MacDonald, RN, BScN | Northern Alberta Program |
Royal Alexandra Hospital | CSC 239, 10240 Kingsway | Edmonton, AB T5H 3V9

SC Houston
to megan lefebvre
9/26/2013 9:27 AM

No subject

a little feedback on a spectacularly chaotic patient of mine that you interviewed, JT--the team said that they had never seen him so cleaned up and dressed up and sober as for your interview and when I saw him yesterday, he asked if he would be seeing you again! So you have a more positive effect on his behavior than we have managed to have over several years

Stan Houston MD DTM&H FRCPC
Professor of Medicine & Public Health
Director, Northern Alberta HIV Program
2D3.19 WC Mackenzie Health Sciences Centre
8440 112 Edmonton AB T6G 2B7
Secretary Janet McDonald 780 407-8035, janet.mcdonald@ualberta.ca

Maria Stadnyk
to megan lefebvre

2014-04-17 8:18 PM

Re: CBC: last update

Way to go Megan!!!! I am so thrilled for you & all the participants who risked their identity to make this happen - an Andy Warhol moment!

Sent from my iPhone

On Apr 17, 2014, at 4:38 PM, "megan.lefebvre2@gmail.com" <megan.lefebvre2@gmail.com> wrote:

> Hello...again!
>
> I've just talked with the CBC reporter and he said the TV story will air at about 5:10 or 5:15 (Edmonton time) tonight on CBC Edmonton. The story is longer than they usually produce as (and I quote) "our research was so compelling". He also asked me to keep in touch with him as he would like to do a follow up interview with the participants, HIV Edmonton, and myself to find out what is going on with the video at HIV Edmonton!
>
> On the website there will be a link to the piece along with a short write up about our work.
>
> Megan
>
> Sent from Windows Mail

Richard Monette
to megan lefebvre

2014-04-19 2:03 PM

Re: CBC!

Hi Megs
I thought the clip was great,hope the radio part went well.
you have done a fantastic job with this whole thing Megs and truth is you deserve more credit than anyone,I hope you enjoy your time off and we will talk soon

all the best
Richard

On Sat, Apr 19, 2014 at 10:55 AM, <megan.lefebvre2@gmail.com> wrote:

> Hi Richard,
>
> What did you think of the CBC TV news story?
> Richard, you were AMAZING! WOW! Everyone I talked to (my parents, brother, grandma, Dennis, friends, NAP clinicians) all comment on how moving your story is! Everyone commented on how well spoken you are and natural on camera!
> I thought James did an excellent job on the story and I can't wait to show the story to Brian!
>
> Megan

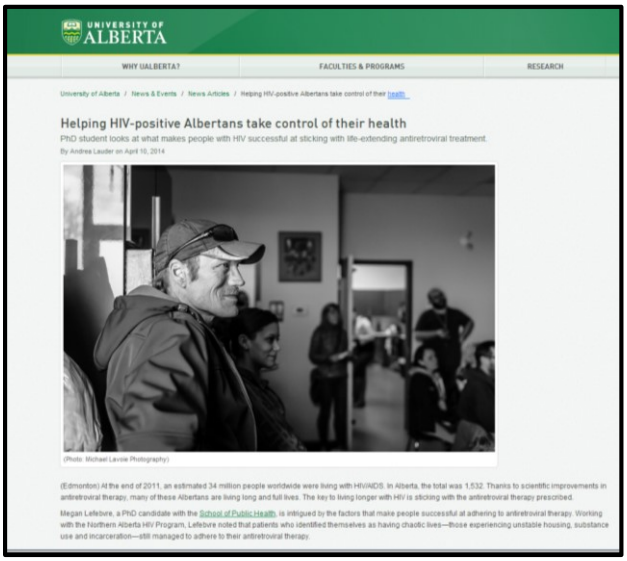
Appendix 5: Media attention generated by our project

Television

CBC News Edmonton. 'Do you want to live?' Video encourages HIV patients to stay on their medication. April 17, 2014. Available at: http://www.cbc.ca/player/News/Canada/Edmonton/ID/2450187394/

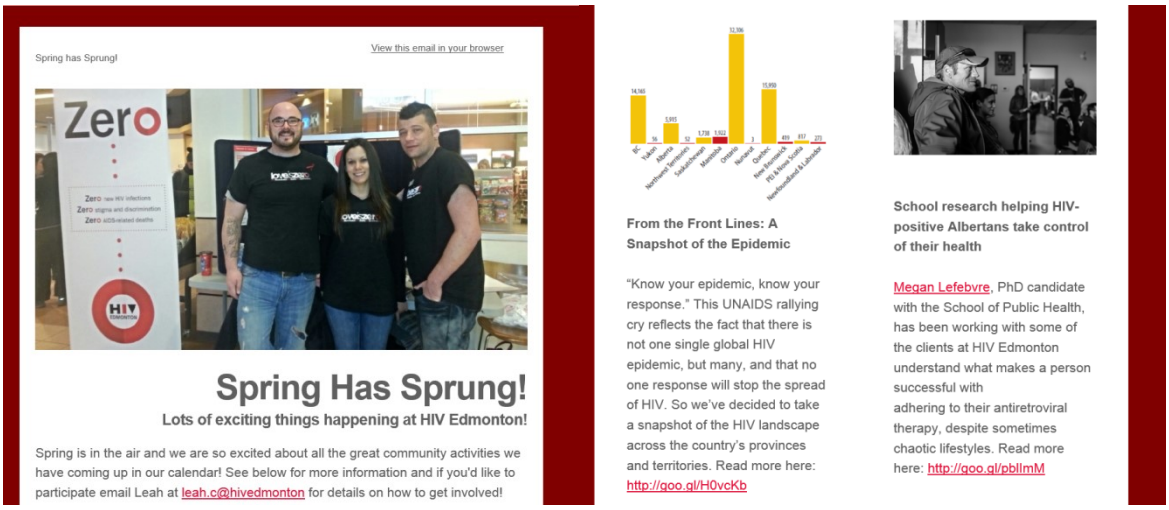
Newsletters

University of Alberta Daily News. Helping HIV-positive Albertans take control of their health: PhD student looks at what makes people with HIV successful at sticking with life-extending antiretroviral treatment. April 10, 2014. Available at: http://news.ualberta.ca/newsarticles/2014/april/helping-hiv-positive-albertans-take-control-of-their-health?utm_source=Daily%20News%20Email&utm_medium=email&utm_campaign=Daily%20News:%20April%2011,%202014&utm_content=927676



School of Public Health News. Helping HIV-positive Albertans take control of their health. April 5, 2014. Available at: http://www.publichealth.ualberta.ca/School%20of%20Public%20Health%20News/2014/April/school-research-helping-hiv-positive-albertans-take-control-of-their-health.aspx?utm_campaign=2014-04&utm_source=newsletter&utm_medium=email&utm_content=lnk-hiv-ab

HIV Edmonton. "Spring has Sprung" quarterly newsletter. School research helping HIV-positive Albertans take control of their health. Spring, 2014.



Spring has Sprung!

View this email in your browser

Spring Has Sprung!

Lots of exciting things happening at HIV Edmonton!

Spring is in the air and we are so excited about all the great community activities we have coming up in our calendar! See below for more information and if you'd like to participate email Leah at leah.c@hivedmonton for details on how to get involved!

From the Front Lines: A Snapshot of the Epidemic

"Know your epidemic, know your response." This UNAIDS rallying cry reflects the fact that there is not one single global HIV epidemic, but many, and that no one response will stop the spread of HIV. So we've decided to take a snapshot of the HIV landscape across the country's provinces and territories. Read more here: http://goo.gl/H0vcKb

School research helping HIV-positive Albertans take control of their health

Megan Lefebvre, PhD candidate with the School of Public Health, has been working with some of the clients at HIV Edmonton understand what makes a person successful with adhering to their antiretroviral therapy, despite sometimes chaotic lifestyles. Read more here: http://goo.gl/pbIlmM

HIV Edmonton. "Keeping the Light on HIV" newsletter. Have you met Megan? May 1 2014.

Have you met Megan?

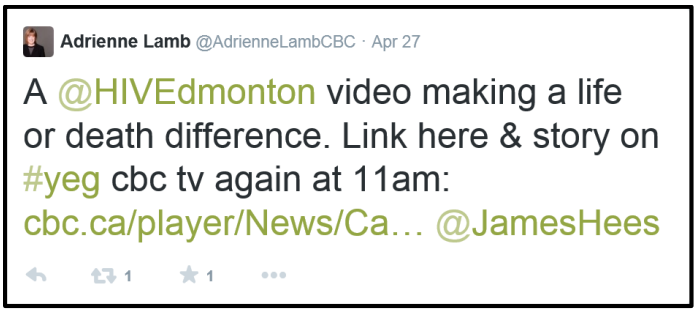
Megan is a phD candidate at the University of Alberta. She has been working closely with some of our clients over the last few months to help other HIV positive people adhere more closely to their medications.

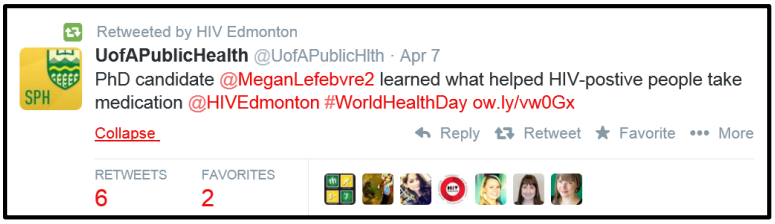
What drew you to study HIV?
"I wanted to study the health of a population [and] the social determinants of health...HIV is a disease of inequality, and most often, disproportionally affects vulnerable groups. I wanted to work with the Northern Alberta Program to explore the social determinants of health within the context of HIV."

Have you ever felt marginalized because of the work you do or the people you work with?
"I have never felt marginalized because of the work I do or the people I work with...We highlight participant's success stories, which is not often done in this field, and as a result, our work has been very well received. The HIV and academic community has been very interested to learn from our participants about why they are healthy."

If there was one thing you'd like people to know about HIV or the people you've worked with, what would it be?
"For me, the most rewarding part of my work has been working so closely with the participants and forming meaningful relationships. I have learned an incredible amount about myself and HIV from our participants. So, when you are learning about HIV, the one thing I want people to know is how critical it is to ask the most knowledgeable and valuable source of information, the HIV-positive individual."

Social media





Appendix 6: Determinants of adherence to antiretroviral therapy: Literature review search terms and strategy

Number	Search term
1	exp Anti-Retroviral Agents/
2	Antiretroviral Therapy, Highly Active/
3	(antiretroviral adj (therapy or drug* or treatment* or agent*)).mp
4	haart.mp.
5	1 or 2 or 3 or 4
6	patient compliance/ or medication adherence/ or treatment refusal/
7	(complian* or adheren* or noncomplian* or nonadheren* or non-complian* or non-adheren* or acceptance).mp.
8	6 or 7
9	5 and 8
10	limit 9 to yr="2006-Current"
11	((barrier* or hindran* or obstacle* or challenge* or difficulty or difficulties or factor* or determinant*) adj4 (adheren* or complian* or noncomplian* or nonadheren* or non-complian* or non-adheren* or acceptance)).mp.
12	exp Socioeconomic Factors/
13	exp health care costs/ or exp health services accessibility/ or healthcare disparities/
14	minority groups/ or exp social environment/ or poverty/
15	(homeless* or stigma* or discriminat* or stereotyp*).mp.
16	(marginal* adj2 (population* or group* or hous*)).mp.
17	exp Substance-Related Disorders/
18	(alcohol adj (abuse or drinking)).mp.
19	exp Mental Disorders/
20	(depression or depressive or PTSD).mp.
21	forgetfulness.mp.
22	((treatment or dosing or drug or medication) adj (regimen or frequency or complexity)).mp.
23	regimen complexity.mp.
24	self efficacy/
25	insurance, health/ or exp insurance, pharmaceutical services/

26	Medically Uninsured/
27	or/11-26
28	10 and 27
29	exp canada/ or exp united states/ or exp japan/ or exp australia/ or exp europe/
30	(canad* or united states or USA or american or japan* or australia* or great britain or england or france or french or spain or germany or sweden or norway or finland or switzerland or netherlands or belgium or italy or united kingdom or ireland or scotland or denmark or austria).af,mp,in,jw.
31	29 or 30
32	28 and 31
33	32 not (africa* or uganda* or congo or kenya* or india* or sahara* or ethiopia* or tanzania* or sudan* or malawi or malaysia* or mongolia* or mali or hondura* or mozambique or peru or cameroon or rwanda* or china or chinese or vietnam* or dominican* or developing countr* or low income countr*).mp.
34	limit 33 to english language
35	systematic review.mp.
36	34 and 35
37	exp Meta Analysis/
38	34 and 37
39	facilitators.mp.
40	34 and 39
41	exp Qualitative Research/
42	34 and 41
43	Meta Synthesis.mp.
44	34 and 43

Appendix 7: Participant observation: My video/pizza party field notes

HIV Edmonton pizza party / video event #1

March 12 2014

HIV Edmonton, Ross Armstrong centre

Event details:

People

- ~25 HIV Edmonton clients
    - ~20 men, 5 females
    - 60% Aboriginal
- 3 outreach nurses from Streetworks
- 1 Boyle McCauley outreach worker
- HIV Staff
    - Dylan, Support and Education facilitator and pizza party co-facilitator
    - Shelly Williams, Executive director
    - Sandy Johnson, Support and outreach worker
    - Corey Wyness, Community Education facilitator
    - Dalton Evans, Executive assistant

Location

HIV Edmonton, in the Ross Armstrong (RA) centre

- RA centre is a small room in the back of HIVE off of the kitchen
- TV, 1 couch, round table with 4 chairs
- Fridge, sink, bathroom, counter
- Used for drop-in space, breakfasts, lunches
- Door to the back of HIVE so clients can come and go as they please and access the smoking area
- Maximum capacity ~ 20 people
- It was Ross Armstrong week at HIVE this week.
    - HIVE stays open all day Monday – Friday with events, food, and care packages for clients. A week to celebrate Ross Armstrong, the first man in Edmonton to disclose his status

Pizza party details

12:00 noon – ate pizza

- Pizza placed outside of RA centre in the HIVE kitchen, along with drinks, cookies, chips, coffee
- People ate as a group in RA centre and in kitchen

- Enough pizza for some people to have 3 helpings!
- During this time, I met Michael, the photographer, said hello to Shelley, Darren, Brian, Richard, met a few of the HIV Edmonton clients

12:15 – Brian, Darren, and Richard introduced the video and said why they did the video

- Dylan facilitated the event and asked Darren to tell everyone "why he thought it was important to do the video"
    - Darren: (shouting) "I am told to take my HIV medications"…."megan!"
- Dylan asked Brian the same question
    - Brian: nervous, stumbling over words, twisting hands, Dylan encouraged him to tell us about his experience in the video
    - Brian spoke about his medication reminder system and how his family was important to him
    - Was very nervous, commented out loud that he was nervous, and said "ahh, I forgot my train of thought"
- Dylan asked Richard the same question
    - Richard: appeared nervous in front of a crowd (mentioned to me prior to the event he does not like to be in the "limelight")
    - People were talking, hard to hear Richard
    - As soon as Richard starting talking about his experience in the video, people stopped talking and listened
        - "Empowering to be asked to be a part of the video"
        - "lost years, couldn't participate in life"
        - Talked about how Stan and his encouragement, told us he was prepared to die, but then got stronger, "today I am more than happy to participate in life"
    - The room was silent and everyone's eyes were on Richard
        - People stopped eating, fell quiet, no chatter, room fell silent except for Richard
        - Richard now appeared calm and confident (was standing in a 'confidence' stance, with arms crossed and legs spread apart)
        - Richard's talk was heart-felt and he was well spoken

12:30 – watched the video

- Room was pretty full, people were standing in the doorway to watch
- During the video, people came and went
- Throughout the video, the room stayed pretty quiet, and no one fidgeted
    - Dylan commented to me after, "this was the first time I have seen this group sit still and be quiet for this long"
- As soon as the video started and Brian started talking he asked me, "I've already seen the video, can I go outside and have a smoke" (I said of course) [I think Brian was nervous to have people watch him on the video]
- People commented that Dwight looked nervous as he kept twisting his hands
    - Laughed when Dwight said his "doctor calls me her star patient"
- Michelle Foisey:

    - people nodded in agreement when she talked about HIV and today “we have hope”
- Christine Hughes:
    - people whispered to each other who their HCW were at the Northern Alberta Program
- Stan Houston:
    - the room started nodding in recognition to Stan
    - most people appeared to know who he was and listened very closely to his message
- When Richard came on in the video, he had moved from standing beside the fridge (sort of centre to the room) to a back corner (out of the “limelight”)
- Some people started to get restless by this point in the video (~12 min in), but as soon as RM started talking about Stan suggesting he get a job, this captured people’s attention and they started laughing
- At this point, ALL EYES were glued to the video
    - When RM talked about losing track of time, and reconnecting with his family, especially his mom, “she is 70 years old, but in my mind she was still 45” – heard an audible and collective “wow” from the audience
    - People were smiling and turned to look at Richard at this point
- When video ended and credits came on, someone yelled “take a bow!”, and “whoooo” and everyone gave a round of applause

12:45 – Questions for the participants

- At first no one had specific questions for participants, but started making comments about their meds and the side-effects, and asked “how much research is being done on HIV meds?” “are they still funding to look into meds?”
- Dylan tried to re-direct conversations and asked if anyone had questions for the participants, but room sort of broke into chaos and everyone started talking about their medications side effects
- One man stood up and told the group he just read about a clinical trial were 23 people were successfully treated by stem cells (??)
- Another man started asking questions about naturopathic medication
- Room still in chaos, BUT then Richard stood up and said “I just wanted to comment, we all have struggles, but that’s all life stuff, but we need to rise to those challenges”
- Then Darren spoke about being homeless and how he had “NO HOME”, was “walkin’ the streets BUT STILL TOOK MY MEDS”

1:00pm – Dylan explained that I had some questions for the audience about the video. He gave the floor over to me and I invited anyone who would like to, to comment on the video, and with their permission, I would audio-record our conversation. Dylan suggested I use Chris’s office and asked anyone who would like to comment on the video to follow me to Chris’ office (Chris’ office was attached to the RA centre, you had to walk down a very short hallway, but was a bit removed from the video viewing area). I went to Chris’ office and waited for anyone to come in. waited for a few minutes, but no one came. I could hear people informally talking amongst themselves in the room where we watched the video, and noticed some people were leaving to have a smoke. At this point I knew no one was going to voluntarily separate themselves and come for a “group interview” so I went back into the main room and decided to go up to people

individually and ask them “what did you think about the video” and “what did you think about having BC, DD, and RM show the video?”. I wrote what they said down in my notebook.

Mike

“What did you think about the video?”

- “I thought it [the video] was really awesome because being newly diagnosed, it’s good to see a video of people that have been living it for a while and all hope is not lost”

“What did you think about having BC, DD, and RM show the video?”

- “awesome..kinda like a Q and A session..it was like hearing it from the celebrities themselves”

I met Mike on Monday March 10 when Darren, Brian, Richard, Dylan, and I met at HIVE for our “trial run”. Darren introduced us because he said “I really want you to meet my friend Mike”. Mike said, “I heard about this video and I wanted to be in it”. Darren then shouted, “You can’t be in it! You don’t take your meds all the time!”. Mike commented he can’t swallow pills and has to take the liquid form, but “am working on it with my doctor”

Richard (not RM, this Richard was wearing a “Quebec” ball hat)

“What did you think about the video?”

- “it was good’

Another HIVE client, male, looked about 30-35 years

“What did you think about the video?”

- “insightful, gave a perspective on HIV and treatment that people don’t get, an insider perspective”
- “it [the video] was touching and shows the struggles, the person’s life is on the line, but you see people talk about having a life to live”

“What did you think about having BC, DD, and RM show the video?”

- “we don’t talk about taking our meds but we all know we have it [HIV], so it was good to have this so we can talk about it”

4th year nursing students & Streetworks outreach nurses

“What did you think about the video?”

- “raw”
- “personal”
- “lets you see personal thought and where they [participants] are right now”

“What did you think about having BC, DD, and RM show the video?”

- “added the extra human feeling to the experience”

1:30 – people started wondering off

- I stayed around to chat with the HIVE clients and ask them about their life and HIV. One man (David, Stan’s patient), told me his entire life story about being diagnosed (in Yellowknife), mis-treated in Regina, and moving to Edmonton. He told me he “takes his

meds to keep his viral load down and keep the public safe…and longevity…I've been HIV+ for 17 years, on meds for 17 years"

- Talked to Brian to ask him how it thought the event went.
    - Brian, "I was really nervous. You know I was practicing what I was going to say last night in my apartment and it's easy when I am all by myself, but today when all eyes were on me…it's not the same..i got really nervous"

2:00pm – The event was winding down, most people had other things to get to (other activities were going on for Ross Armstrong week). I asked Dylan to share any comments:

- "went really well. This was the quietest I have ever seen this group for that long"
- "Board member of HIVE came…no one told me! I didn't expect that, board member NEVER come to these kinds of functions, that never happens"

Notes from the trial run meeting on Monday March 10 2014

Dylan asked if anyone had any questions. Brian asked 'what if someone asks a really long question and I don't remember the question and can't answer'

Dylan: "good question, you can just say "fuck it, talk to my agent""

Brian: "good idea! Yeah and megan, you're our agent so they can talk to you!"

HIV Edmonton pizza party / video event #2

March 26 2014

HIV Edmonton, Ross Armstrong centre

Event details:

People

- ~15 HIV Edmonton clients (10 new clients, 5 return clients from pizza party #1)
    - ~12 men, 3 females
    - 40% Aboriginal
- 1 social worker from Boyle McCauley (invited by Darren)
- 2 OT students from U of A
- HIV Staff
    - Dylan, Support and Education facilitator and pizza party co-facilitator
    - Sandy Johnson, Support and outreach worker
    - Daltyn Evans, Executive assistant
    - Peggy Hodge, Director of Programs and Services (in and out of room)

Location

HIV Edmonton, in the Ross Armstrong (RA) centre

- **Today was the day after Mardi Gras!
    - Mardi Gras is the night of “cheque day” (cheque day is the last Tuesday of every month. At midnight everyone who receives social assistance gets their funds directly deposited into their account.)
    - The participants, HIVE clients, and HIVE service workers call the last Tuesday of each month “Mardi Gras” as most people go bananas, spend a large portion of their monthly income, and indulge in party favours (of their choice)
    - The fact that our pizza party was the day after Mardi Gras was significant for 2 reasons:
        - 2 peer-educators (PE) did not show up! (Richard and Darren)
            - I met with the PEs two days prior at HIVE to do a “trial run” of the video, practice their part about why they were involved in the video, share feedback from last pizza party (comments from my field notes), and give them the photos Michael took of them
            - All PEs commented that the pizza party would be taking place the day after Mardi Gras, but said they would be there no matter what!
            - At this meeting the PEs (again) expressed interest in presenting the video at the university. I told them about coming to a methods discussion group after Brian is out of treatment (he will be gone from March 30 – April 21 ish). They are keen to do this.
            - The PEs (again) discussed the idea of continuing the pizza parties at HIVE every 3 months. Dylan confirmed HIVE has money in their budget to support this. The PEs would facilitate these sessions on their own!
            - I commented to Dylan that I was hopefully all PEs would show up and was especially surprised Richard did not show up as in Richard’s initial interview for our study he told me he is “living the clean life” (which I took to meaning no drugs, except marijuana)
                - Dylan told me he thinks Richard is “off drugs, until he is on them” and perhaps does not use the kinds of drugs he used to.
        - Dylan purposefully scheduled the pizza party on the day after Mardi Gras as he knew a different crowd would come. HIVE usually serves a hot lunch on Wednesdays, and typically HIVE sees a different crowd the day after Wednesday. Dylan thought we would be able to capture a different perspective on the video with this crowd.
            - Peggy commented she was surprised well attended the pizza party was given the fact it was the day after Mardi Gras

Pizza party details

12:00 noon – ate pizza

- Pizza placed outside of RA centre in the HIVE kitchen, along with drinks, cookies, chips, coffee
- People ate as a group in RA centre and in kitchen
- Some pizza leftover, but I brought Ziploc bags so HIVE clients could take pizza home with them

- During this time, I mingled with HIVE clients I recognized from the first pizza party, shared photos from last time with them, and talked to Brian about our kittens and him going to treatment this Sunday.
    - Brian is nervous about going to treatment (he referred to treatment as "jail"). Since I met Brian last summer, he has arranged 3 times to go to treatment and has not gone for various reasons. Dylan told me he thinks Brian might actually go to treatment this time as being part of the video as inspired him to take better care of himself.

12:15 – Brian introduced the video and said why they did the video

- Dylan facilitated the event and asked Brian to tell everyone "why he thought it was important to do the video"
    - Brian: nervous, stumbling over words, twisting hands (same behaviour as last pizza party)
    - Unlike last time when Brian spoke about his medication reminder system and how his family was important to him, this time he told his story about when he found out he was HIV+ (he was in "the joint in Drum [Drumheller])
    - He described how the doctor, "Dr. Gill, another Stan Houston doctor" helped him get on HIV meds.
    - Brian said he hated taking the meds and as a result did not take them
    - He failed treatment multiple times, and today is on his 3rd regimen
    - He said today, he takes his meds all the time because they are keeping him "healthy and keeping me alive"
    - Like last time, Brian comment out loud that he was nervous, and said "ahh, I forgot my train of thought" and Dylan helped him stay focused

12:30 – watched the video

- Room was not as full as last time
- During the video, people came and went
- Throughout the video, the audience seemed distracted. There was a lot of chatter and fidgeting
- As soon as Michelle Foisy came on:
    - people (like last time) nodded in agreement and made comments among themselves (about hope) when she talked about HIV and today "we have hope"
- Darren:
    - Everyone recognized him and said so out loud. Seems interested to hear what he had to say (appears that HIVE clients listen to Darren and care about what he has to say)
    - Darren commented that he "didn't want to die" and 1 man shouted out "of course! Who wants to die?" others told this man to be quiet as they wanted to hear why Darren didn't want to die
- Christine Hughes:
    - Audience recognized Christine right away and asked me if she worked at the UAH
- Third participant:

    - Most of the audience recognized this participant by saying, “oh! It’s [name]!” (this did not happen last time)
    - There were 3 Aboriginal men sitting on the couch and immediately started paying closer attention to the video when this participant started talking.
- Lana Joe:
    - People were getting more restless by the time Lana came on (~10 min mark). But when Lana spoke about taking her meds “wanting to be healthy, it reminds me that I am healthy” people stopped and listened to her message.
    - The audience also recognized Lana by saying her name and that they have seen her around at HIVE.
- Stan Houston:
    - Again, the room felt restless and I wanted to tell everyone to stop what they were doing and pay attention! Of course I did not do this. BUT as soon as Stan’s voice was heard, people stopped talking and turned towards Stan to hear his message. One Aboriginal man closest to the TV, stood up, snapped his fingers, pointed at the TV, and said “Dr. Houston!”
    - It seems like all the clinicians have “street credit” with their clients, but from my perspective, it appears that Stan is a “champion”. Everyone knows who Stan is, regardless if Stan is their doctor
        - I commented to Dylan after the pizza party that most audience stopped talking as soon as the NAP clinicians appeared in the video. Dylan commented, from his perspective, HIVE clients’ value their NAP staff, and Dylan gets the sense that the NAP honestly care about their patients. Dylan used the term “loved authorities” to describe the relationship between HIVE clients and NAP staff
- Richard:
    - At this point in the video, about a third of the audience were talking amongst themselves about what HIV meds they are on
    - Like last time, some people started to get restless by this point in the video (~12 min in), but as soon as RM started talking about people taking an interest in their own life, (like last time) ALL EYES were glued to the video
        - It is my own thinking that people would have appreciated Richard’s message if Richard were there. Last time the audience physically turned to look at Richard when he was talking about being grateful to participate in life. This time, by the end of the video, the audience was restless

12:45 – Questions for Brian

- I was unsure about how the question / discussion period would go as people appeared very restless and tuned out during the video
- However, this pizza party’s discussion lasted 7 min which was significantly longer than last time! (last time had about 3 min of discussion)
    - The first person to talk was an Aboriginal man who asked “how did everyone catch HIV?” then did not wait for anyone to respond and said “I’ll tell you how I caught it, I put it in myself”
- Dylan tried to re-direct the conversation and asked if anyone had questions for Brian
- John (HIVE client who attended 1st pizza party) talked about how he fears doctors will not perform surgery on him (if necessary) as he thinks doctors / dentists “fear” him

because he has HIV. He went on to say he feels like there is a lack of services in Alberta for people with HIV and does not trust his doctors
        - (side note: last time when I was talking 1-1 with John, he was very skeptical about any HIV research. He was certain the HIV drugs don't work and the money is being spent elsewhere)
    - This was an interesting point in the discussion as other HIVE clients stood up and said they disagree with John. Many HIVE clients said "no, that's not true" and commented on the supportive nature of the NAP staff, the fact that they can see a dietician, a social worker, pharmacist, not just a doctor. Also, many audience members said they were "lucky" because their pills are free [of charge] in Alberta and this is not the case for all provinces.
- Mike (HIVE client who attended 1st pizza party) stood up and said "HIV+ people are a marginalized group, and especially if you are native" (he is Aboriginal)
- Richard (HIVE client who attended 1st pizza party) then stood up and told everyone that he brought his bubble pack and this is how he remembers to take his medication everyday
    - Other nodded in agreement that they have a bubble pack
        - I found it interesting that Richard thought about this beforehand and physically brought his bubble pack with him to share with the group
- Aboriginal man shared his story about how he became HIV+, got on meds, and has been taking his meds all the time. He said "I am undetectable and still drink, take my meds, eat good, sleep good, am over 50 years old, and I am doing good" He told everyone he has been HIV+ for over 27 years then commented, "people are dealt different hands. Some people catch AIDS virus right away".
    - Another man in audience asked "is it hard to take your meds everyday?"
    - He answered "I had quite a few circumstances and I take my legal drugs, but I still take my meds all the time".

1:00pm – Dylan explained that I had some questions for the audience about the video. He gave the floor over to me and I invited anyone who would like to, to comment on the video. I did not attempt to audio-record conversations or gather people for a group interview as the room was already starting to scatter (Ray was hosting a sharing circle in another room). A few people stayed behind, so I went up to them individually and asked them "what did you think about the video", "what did you think about having BC show the video?", "what message did you get from the video?", and "what are your thoughts about having these pizza parties every 3 months?". I wrote what they said down in my notebook.

Conversation with Kevin and Adam (HIVE clients)

Kevin

"What did you think about the video?"

- "alright"
- "glad to see it, it's interesting to hear why people continue to take their meds, it's the same reason for me. When I was watching the video, I was thinking about why I take my meds. I want to stay healthy."

"What did you think about having BC show the video?"

- "not a whole lot of people [who come forward and say they are HIV+], and we're in the same boat. It's nice to be out and around people in the same boat. There's still a stigma. Instead of telling people I have it, [if he does tell someone he has HIV], there's gonna be a 360 degree turn, so instead I can come to things like this".

Adam R.

"What did you think about the video?"

- "it was good, made me realize I am not alone"
- "You can tell someone [you are HIV+] and they make assumptions about you. So it's just something you can't talk about. You feel isolated.

"What do you think about having the pizza parties every 3 months?"

- "It couldn't hurt to have these meetings. It's a place where we can come and talk about it without having people do a 360 on you"

1:30 – the only people left in the room where Adam, Kevin, and the 2 OT students

- I stayed around to chat with Kevin and Adam. Adam told us about how he found out his was HIV+. He was in the Edmonton Remand Centre and wanted to leave unit 2C so had to have a blood test. The doctor then sat with him in an isolated room, told him he was HIV+, and asked him if he was going to commit suicide. Adam thinks the doctors at the Remand didn't care about him, and only asked about suicide because they didn't want to do extra paper work. Adam was left "alone for 1 month without meds until Dr. Ahmed came along". Adam then got on meds and linked into care at NAP.
- Adam and Kevin both commented on how it is very hard to "pick up" at the bar. Even though they are undetectable, if they pick up someone up, they have to tell that person they are HIV+. Kevin (I got the feeling he was newly diagnosed) told us he works up north and tried a few times to pick up at the bar, but as soon as he tells the girl he has HIV+, she "bolts". Kevin agreed and said he doesn't even bother anymore. It seemed like Adam is really struggling to accept (??) his HIV status, but did reiterate his takes his meds all the time. Kevin and Adam both commented they see Les, the psychologist and feel like Les is helping them.

2:00pm – The event was winding down, most people had other things to get to (Ray's sharing circle, and smoking). I was wrapping up with Dylan when Peggy came up to us and asked how things went:

- Dylan "went really well."
- Peggy "I popped my head in a few times and I was surprised about how [good] turnout for being the day after Mardi Gras"

Peggy thanked me for my work and made a comment about what good work I was doing.

Appendix 8: Support from the community for our peer-mentor program

HIV EDMONTON

HIV NETWORK OF EDMONTON SOCIETY

July 10, 2014

Dear Sir or Madam:

Re: Megan Lefebvre – Research Associate

I am pleased to provide a letter of support for Megan Lefebvre's ***Refocusing the focus on HIV medication*** project.

Megan's work with HIV Edmonton's clients has been impressive. Several of our clients are featured in the "Living with HIV and its OK" video and three have played a very active "peer educator" role. Megan has developed warm, respectful and trusting relationships with the peer educators. They are very enthusiastic about working with Megan on this project, have already embraced their role as peer educators, and are looking forward to gaining additional skills that will facilitate mentoring of other people living with HIV.

HIV Edmonton, along with Megan, co-hosted two video-viewing pizza parties in our drop in centre. Client attendance was great, feedback on the video was very positive and the peer educators were well received. Megan also provided a presentation at HIV Edmonton's monthly staff meeting. Staff members are very excited about the project and have commented on the increased confidence of the peer educators and the supportive reactions they have received from other HIV Edmonton clients.

Megan's continued focus on peer education strongly aligns with one of HIV Edmonton's priorities – *To increase the capacity of individuals and communities affected by HIV/AIDS and related communicable diseases to access care and support.* The emphasis on adherence to antiretroviral therapy is a major component in the Cascade of Care and is essential in improving health outcomes for people living with HIV, particularly those individuals who are experiencing multiple barriers (stigma, discrimination, unstable housing, mental health issues, etc.).

HIV Edmonton is committed to support and assist with the development, implementation and evaluation of this peer educator program.

Sincerely,

Shelley Williams
Executive Director

Peggy Hodge
Director of Programs and Services

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Go to www.hivedmonton.com for information or to sign up for our e-newsletter

Appendix 9: Interest from the Canadian government and industry in research

Public Health Agency of Canada: Alberta Community HIV Policy & Funding Consortium

From: Pamela Amulaku
Sent: Wednesday, July 16, 2014 12:19 PM
To: mejohnst@ualberta.ca

Hi again Megan, sorry for the long delay...

We have now set a date for the next Consortium meeting so wanted to check in with you to see if you're still interested/available to present some of your work to this group on Thursday, November 6th? Right now the schedule is pretty wide open, so if the date works for you please send me your preference as to time of day and approximately how long you think you would need on the agenda.

Thanks very much and hope you're enjoying the summer so far,
Pam :)

Pam Amulaku

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From: Pamela Amulaku
Sent: Wednesday, August 06, 2014 11:00 AM
To: mejohnst@ualberta.ca

Hi again Megan, how about from 11:15am up to 12 or 12:15ish on Nov 6th for your video presentation and discussion with the Consortium? And then you and your team would be welcome to join us for lunch afterwards if people want to keep chatting with you :) Is it possible to get a copy of the video beforehand so we can test it on the technology in that boardroom and have it all ready to go when you get there? Thanks so much and hope you're enjoying the summer, Pam :)

Pam Amulaku

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Gilead Sciences Canada: Gilead Alberta

Kristina Marvin
Wed, 16 Jul 8:38 AM
to mejohnst@ualberta.ca
cc Laura.k@hivedmonton.com

Presentation at Gilead

Megan,

Thank you so much for taking the time to present your work at Gilead yesterday. The video, Darren, Richard and yourself had a big impact on those who attended; it is meaningful for us to see the human connection to the "white powders" that we work on. You mentioned that the video was available privately on YouTube. Could you please send me a link to the video so that we might share it with other Gilead employees?

Thank you
Kristina