Challenges for Resource Allocation, Decision Making and Consideration of Social Values for Screening, Diagnosis and Treatment of Hepatitis C in Canadian Populations

by

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Abstract

Introduction: Health care system decision makers face challenges in allocating resources for screening, diagnosis and therapies for hepatitis C, caused by the highly infectious and blood borne hepatitis C virus (HCV) (WHO, 2014). Approximately 240,000 individuals are infected with HCV in Canada (PHAC, 2013), and HCV is the leading cause of liver transplants (Canadian Liver Foundation, 2012). Populations most affected by HCV include indigenous peoples, persons who use injection drugs (PWID), the homeless, immigrants and prison inmates as well as persons born between 1946-1965 (baby boomers) (Government of Alberta, 2016). A new suite of curative but expensive drug regimens, novel direct acting antivirals (DAAs), have become available for hepatitis C.

Objectives: I analyzed approaches to screening, diagnosis and treatment of hepatitis C in a resource-constrained environment. The recent adoption of DAAs for the treatment of hepatitis C combined with the constellation of marginalized and dominant populations affected, necessitates a re-evaluation of these approaches. In addition, I explored how health system decision-makers might make resource allocation decisions, which dominantly relies on cost effectiveness analyses, might consider a systematic, transparent and reproducible set of social values in HTA beyond utility.

Methods: I conducted a scoping review of academic literature to identify and analyze the social values and evidence-based recommendations for screening, diagnosis and treatment of Hepatitis C in Canada. In parallel, I analysed 22 semi-structured interviews with policy makers, public health experts and clinicians in one Canadian province, Alberta, on barriers, challenges and resource allocation in the context of Hepatitis C.

Results and Implications: My scoping review demonstrated that the academic literature can be used to identify an expanded set of social values that might be considered by decision makers in resource-constrained environments. This literature clearly calls for greater consideration of equity and justice and the duty to provide care that accounts for consideration of individual and community interests. Further, it calls for more tailored approaches to screening, diagnosis and treatment of Hepatitis C that considers a broader range of social values, especially with respect to marginalized populations.

My analysis of expert interviews suggested there is an overall lack of access to care and no consensus on screening, diagnosis and treatment of Hepatitis C. However, approaches need to address the social determinants of health that vary between affected populations and provide considerations beyond a biomedical model of health.

Preface

This thesis is an original work by Caroline O'Keefe-Markman. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "Reality vs. Recommendations: Developing Equity-Based Canadian Policy for Screening, Diagnosis and Treatment of Hepatitis C", No. 00062490, 05/10/16.

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

My research explores some of the barriers and challenges that exist in health system decision-making about screening, diagnosis and treatment of hepatitis C for different patient populations in Canada, with a focus on the Province of Alberta. In the context of hepatitis C, decisions-makers must allocate resources within Canada's publicly funded provincial health care systems. Allocation decisions may be based on Health Technology Assessments (HTA). HTA agencies make recommendations based on cost effectiveness analyses, and, in Canada, a major consideration for HTA is efficiency, defined as the balance that maximizes population health outcomes for given resources (Culyer, 2012). In considering cost effectiveness, however, HTA may fail to adequately consider broader social values and patient preferences (Menon et al, 2009; Blomqvist et al 2013; Menzel et al, 1999;Ubel et al, 2000).

In the context of Hepatitis C, which disproportionately impact marginalized populations (Grady et al, 2013), HTAs might benefit from consideration of social values other than efficiency, such as equity, in part, defined as the absence of socially unjust or unfair health disparities (Braveman, 2003) and justice, defined as fair, equitable and appropriate treatment in light of what is owed or due to persons (Childress et al, 2013). Considerations of justice enable a more complete representation of the contextual factors and social determinants of health that affect those with Hepatitis C.

To address the challenges that Hepatitis C poses for health system decision-makers, I first analyzed the academic literature to identify the populations at risk of hepatitis C and the social values relevant to those populations that might be applicable for HTAs by provincial health agencies. The findings of this scoping review are relevant for decision makers; they provide an overview of barriers and challenges faced by marginalized populations when accessing screening, diagnosis and treatment of the Hepatitis C virus (HCV). In parallel, I consulted with policy makers, public health experts and clinicians to elicit their professional opinions on barriers, challenges and resource allocation in the context of Hepatitis C, with a focus on the Province of Alberta. My research is relevant to the design and development of programs that target populations affected by hepatitis C.

In this chapter, I first define the populations at risk of Hepatitis C in Canada and current screening, diagnosis and treatment practices and recommendations. I then describe social values inherent in health care system resource allocation decision making in the context of Hepatitis C screening, diagnosis and treatment. Finally, I provide an outline of the chapters in this paper-based thesis. Note that while prevention and harm reduction programs are important public health interventions for Hepatitis C, those topics are beyond the scope of this thesis.

Background

Disease Statistics

HCV is highly infectious and blood borne (WHO, 2014). Approximately 240,000 individuals are infected with HCV in Canada (PHAC, 2013). In Alberta, the rate of HCV is approximately 30.6 per 100,000 people (Government of Alberta, 2016). Populations most affected by HCV in Canada include indigenous peoples, persons who use injection drugs (PWID), the homeless, immigrants and prison inmates as well as persons born between 1946-1965 (baby boomers) (Government of Alberta, 2016). The majority of persons infected with HCV are unaware of their disease status, due to the asymptomatic nature of the disease until it reaches an advanced stage, when the function of the liver is affected (Canadian Liver Foundation, 2012). Once the liver is implicated, liver transplantation is often required and makes HCV the leading cause of liver transplants in Canada (Canadian Liver Foundation, 2012).

Screening Programs

The Canadian Task Force on Preventative Health Care (CTFPHC), an organization established by Public Health Agency of Canada to form recommendations and guidelines for primary care practioners, has controversially recommended against age cohort screening in Canada (CTFPHC, 2016). These recommendations form the basis of practice guidelines at a federal, provincial and clinical levels and are in opposition to recommendations made by the United States Centre for Disease Control (CDC) to screen anyone born between 1945-1965 (CDC, 2016).

In Canada and Alberta alike, screening is not routine and many people remain unaware of their disease status (Wong et al, 2015). This is especially true in marginalized populations as these individuals are less likely to seek primary and preventative medical care, and can remain HCV positive for many years. Current Alberta Health Guidelines recommend screening high-risk groups for Hepatitis C, including people who have injected drugs, regardless of frequency, people who have ever been incarcerated and persons who have received a transplant or transfusion (Alberta Health, 2015), but do not recommend screening for persons born between 1945-1965, in accordance with the recommendations put forward by CTFPHC.

Diagnostic Protocols

There are 2 types of laboratory tests for HCV, serologic and molecular. Serological tests are used to detect the presence of HCV antibodies as a first step in diagnosis (Ghany et al, 2009). Primary physicians order serology testing if a patient is suspected of having HCV (Government of Alberta, 2016). Molecular assays are used to detect the presence of active infection as opposed to spontaneous resolution. (Ghany et al, 2009), followed by genotyping assays to determine the genotype present. In combination, these tests determine the appropriate course of treatment (Ghany et al, 2009). Once HCV is confirmed, patients are referred to specialists for treatment (Government of Alberta, 2016).

Treatment

Interferon treatments have largely been phased out and replaced with a new suite of curative drug regimens, novel direct acting antivirals (DAAs) to target the enzymes involved in the replication of the HCV virus (Asselah et al, 2011).

There are four main classes of DAAs: NS3/4A protease inhibitors, nucleoside and nucleotide NS5B polymerase inhibitors, NS5A inhibitors, non-nucleoside NS5B polymerase Inhibitors (Pacific Hepatitis C Network, 2015). These novel drugs have fewer adverse effects on patients than interferon based regimens (e.g., fatigue, headaches, fever, muscle pain, insomnia, nausea, hair loss, anorexia, depression, irritability, anemia and joint pain) (Beasley et al, 2014; Fried et al, 2002). They have a cure rate of >90% with an 8 to 12 week regiment (Beasley et al, 2014).

The cost of the drugs, however, strains resource constrained health systems: Epclusa ($74,760), Sovaldi ($84,000), Harvoni ($95,000 per 12 week course), Holkira Pak ($55,860), Zepatier (60,300), Sunvepra (89,000), Daklinza ($95,550), Technivie ($58,656) and Galexos ($96,078) (CATIE, 2016;Beasley et al, 2014; Fried et al, 2002). The high cost of the drugs has lead health care decision makers to restrict who can access them. These criteria vary across Canada, with different provinces addressing access to treatment in diverse ways. As of April 2018, the government of Alberta has granted access for all infected individuals and has negotiated a price of $15,000-$20,000 for treatment (CATIE, 2018).

Populations Most Affected by HCV in Canada

Populations most affected by HCV in Canada include People Who Inject Drugs (PWID), Indigenous Peoples, Prison Populations, Blood Transfusion Recipients, Baby Boomers (those born between 1946-1965 and more recently recognized men who have sex with men and those who are HIV+. While I discuss risk factors specific to each group below, it is important to note that these groups are not mutually exclusive (CATIE, 2018).

People Who Use Injection Drugs (PWID)

PWID are the group most commonly affected by Hepatitis C (Smith et al, 2017). Approximately 68% of PWID have HCV (PHAC, 2014), with HCV prevalence ranging between 44%-71% in Canada (Fischer et al, 2005). Needle sharing is the principle route of HCV transmission in Canada (Miller et al, 2002;Smith et al, 2017). PWID are socially marginalized and lack access to treatment for Hepatitis C (Barocas et al, 2014). Healthcare practioners and institutional structures reinforce stigmatization of PWID patients resulting in their symptoms being discounted or PWID being underserviced (Paterson et al, 2013). PWID require tailored strategies to decrease the burden of HCV. A community based and multisectoral approach to treating HCV amongst PWID would, in addition to providing healthcare services positively impact the social determinants of health by connecting PWID with a broad range of social services (Newman et al, 2013).

Indigenous Peoples

Indigenous peoples in Canada (First Nations, Inuit and Métis) represent a high-risk group for HCV infection – they make up approximately 19% of HCV patients and have a seven-fold higher prevalence rate than the general population (Craib et al, 2009). Individuals infected with Hepatitis C are often street involved, faced with socioeconomic instability and homeless (Wu et al, 2007). Further, indigenous people face stigmatization within the health care system and have trouble accessing health care other than acute care (Spittal et al, 2010). Complicating matters, indigenous peoples have suffered historical trauma and systemic oppression; these have contributed to the epidemic of HCV and other blood borne diseases (Craib et al, 2009), necessitating special considerations for access screening, diagnostics and treatment for HCV. Further, the Truth and Reconciliation Commission of Canada (2012) calls for acknowledgement of the current state of indigenous health pertaining to previous governmental policies and residential schools as well as the need to implement subsequent health care for indigenous people.

Multi-level approaches and interventions must be tailored to address the specific needs of this population and need to incorporate culturally sensitive approaches (Spittal et al, 2009). Any interventions should be either indigenous-led, or developed and implemented in conjunction close collaboration with community members (Wu et al, 2007), and adopt a holistic approach that addresses historical trauma stemming from colonization, and family, community, environmental and cultural factors (Dell et al, 2005;Wu et al, 2007).

Prison Populations

Prison inmates have a disproportionately high prevalence of HCV, ranging from 23-87% (Farley et al, 2005). Screening upon entering the prison system is performed on a voluntary basis, and very few inmates are offered HCV treatment while in prison. Failure to provide screening services poses a risk to other prisoners (Chu et al, 2009). Due to the length of previous interferon-based HCV treatment options, HCV treatment was not feasible in the prison system, however the new DAAs may offer an alternative (Farley et al, 2005). The Canadian Correctional Services (CSC) stipulates that inmates are owed access to health care services and should not have different outcomes due to imprisonment (CSC, 2017; Farley et al, 2005, Chu *et al.* 2009).

Treatment within the prison system can be provided with support for completion (Farley et al, 2005), especially for a population that may have limited interactions with the healthcare system when in the community (Farley et al, 2005;Chu et al, 2009). Thus imprisonment offers a unique opportunity to address HCV infection in prison inmates while they serve their sentence in a closed system; however, prison inmates are not provided with adequate care (Chu et al, 2009) and therefore form a source of community infection/reinfection once released.

Blood Transfusion Recipients

Prior to 1990 in Canada, blood collected for transfusions were not screened at the time of donation, nor at the time of transfusion (Government of Alberta, 2016). Therefore, persons who received blood prior to 1990 are at heightened risk for HCV, with approximately 34,800 Canadians infected between 1960-1992 (Remis et al, 1998). The number of patients acquiring HCV from blood transfusion has subsequently decreased after initiating sensitive screening at time of donation (Government of Alberta, 2016); the transmission of HCV through blood has decreased to 1 in 6.7million donations (O'Brien et al, 2012). Targeted look back programs are in place to notify blood and blood product recipients of potential health issues arising from their previous transfusions. Additionally, Canada has since provided educational and financial support to HCV positive individuals and encourages other countries to follow suit (Angelotta et al, 2007; Thein et al, 2009). In contrast to vulnerable populations, Canada set aside $1.1 billion dollars to compensate individuals who received contaminated blood, because these individuals suffered a negative "no fault" health outcome (Krahn et al, 2004).

Baby Boomers

Hepatitis C prevalence is significantly higher in the baby boomer generation, those born between 1946-1965 (Schanzer, 2014), with baby boomers representing 58% of all HCV infections in Canada (Shah et al, 2013). Although this population disproportionately represents some of the highest disease burden, Canada does not screen patients based on age cohort (Schanzer, 2014) with the exception of targeted look back programs, which are aimed at discovering cases and providing compensation (Goldman et al, 1998). However, without routine screening, cases remain undetected until significant disease progression occurs. This results in more hospital admissions and cases of liver disease reported, which, in turn, result in resource expenditure on treatment and transplantation in this population (Schanzer, 2014). The provision of DAAs would reduce prevalence of HCV and associated complications (Smyth et al, 2014).

Social Values

One aim of my research was to identify a broader set of social values for consideration by HTA agencies. My starting point to identify these social values was the *Canada Health Act* (Government of Canada, 2017), which articulates the five social values for Canadian health systems, namely:

1) Portability: Insured persons must have reasonable and uniform access to insured health services, free of financial or other barriers; no-one may be discriminated against on the basis of factors such as income, age and health status;

2) Accessibility: Insured persons must have reasonable and uniform access to insured health services, free of financial or other barriers; no one may be discriminated against on the basis of factors such as income, age, and health status;

3) Public Administration: Each provincial health care insurance plan must be administered on a non-profit basis by a public authority;

4) Universality: All Canadian residents in the province must have access to public health care insurance and insured services on uniform terms and conditions; and

5) Comprehensiveness: All medically necessary services provided by hospitals and doctors must be insured.

Beyond these five values explicit in the health care system, I identified other social values from the bioethics and public health ethics literature. These include:

- Equity: The absence of socially unjust or unfair health disparities (Braveman, 2003). Note that my focus was on equity in outcomes, not equality in opportunity/access to programs;
- Utilitarianism: The best action is the one that maximizes the well being of all sentient beings; supremacy is given to the needs of the community as this benefits the most individuals (Bentham, 2011);
- Individual interests: This category includes: liberalism, which is defined as the right of an

individual to pursue his/her own conception of good (beliefs about what makes life valuable of worthwhile) (Holland, 2015))

- Community interests: This category includes communitarianism, which emphasizes the responsibility of the individual to the community (Arneson, 2013); some argue that community should be at the forefront of our moral thinking (Holland, 2015).

Research Objectives

I analyzed approaches to screening, diagnosis and treatment of hepatitis C in a resource-constrained environment. The recent adoption of DAAs for the treatment of hepatitis C combined with the constellation of marginalized and dominant populations affected, necessitates a re-evaluation of screening, diagnosis and treatment programs. While, health system decision-makers face constraints when making resource allocation decisions, hepatitis C presents an opportunity to explore the systematic, transparent and reproducible set of social values in HTA beyond utility.

Accordingly, my objectives were to:

- Analyze the academic literature on screening, diagnosis and treatment of hepatitis C in Canada to identify implied social values in this domain.
- Analyze which social values might be the most pertinent to be taken into account by Canadian HTA agencies, in consideration of Hepatitis C screening, diagnosis and treatment.
- Analyze how policy makers and clinicians in Alberta make decisions about screening guidelines and implementation; provision of diagnostics services; and the allocation of novel treatments for Hepatitis C in a resource-constrained setting.
- Examine the challenges faced by health policy makers and clinicians when approving and implementing hepatitis C screening, diagnosis, and treatment within Alberta's health care system.

Thesis Outline

My thesis is paper-based; each chapter includes an introduction, methods section, analysis of results, and interpretation of results in a discussion section, a description of study limitations and a conclusion.

Chapter 2 entitled, *Reality vs. Recommendations: Developing Equity-based Canadian Policy for Screening, Diagnosis and Treatment of Hepatitis C* is formatted for submission to the *Journal of Medical Ethics*. In it, I aim to analyze the social values that might be taken into account by Canadian HTA agencies, using Hepatitis C as a case study. HTA agencies make recommendations for resource allocation about screening programs, diagnostics and therapeutics in Canada's health care systems based on cost effectiveness analyses. As such, HTA has been criticized as being overly utilitarian because it fails to incorporate a broader set of social values. In Chapter 2, I analyzed the academic literature on screening, diagnosis and treatment of Hepatitis C in Canada to identify other social values in this domain. This case study is timely because of the introduction of novel, effective but costly DAAs for HCV. Further, the populations most at risk of HCV infection are marginalized, which may necessitate different approaches to their care.

I used a scoping review of the academic literature to identify and analyze the social values and evidence-based recommendations for screening, diagnosis and treatment of Hepatitis C in Canada. Specifically, I coded each article for social values based on biomedical and public health ethics and the *Canada Health Act* (2016). I extracted social value statements line by line and then clustered them into one of 4 categories: (1) equity and juctice, (2) duty to provide care, (3) maximization of population benefit, and (4) individual versus community interests.

My analysis demonstrated that the academic literature is a rich source to identify an expanded set of social values that might be considered by decision makers in resource-constrained environments. Accounting for these social values, particularly in the context of marginalized populations, may enable HTA to consider values that may increase the willingness to pay for treatment for specific populations. The academic literature clearly calls for greater consideration of equity and justice and the duty to provide care that accounts for consideration of individual and community interests. In making evidence-based recommendations for screening, diagnosis and treatment, provincial health systems may better address the needs of populations with Hepatitis C. Further, the academic literature calls for more tailored approaches to screening, diagnosis and treatment of Hepatitis C that considers a broader range of social values.

Chapter 3, entitled *Tribulations and Triumphs for Screening, Diagnosis and Treatment of Hepatitis C in Canadian Populations*, is formatted for the *Canadian Journal of Public Health*, is based on 22 semi-structured interviews with clinicians and key informants in the field of public health and health systems policy. I analyzed interview transcripts using qualitative content analysis and constant comparison methods. I analyzed how policy makers and clinicians in Alberta make decisions about screening guidelines and implementation, provision of diagnostics services and the allocation of novel treatments for Hepatitis C in a resource-constrained setting. Further, I examined the challenges faced by decision-makers when approving and implementing screening, diagnosis and treatment within Alberta's health care system.

My analysis identified that there is an overall lack of access to care and no consensus on how to best approach issues of screening, diagnosis and treatment of Hepatitis C. However, populations affected by HCV should be at the forefront when deciding how to screen, diagnosis and treat. Interviewees recommended a dynamic approach to meet individual needs. My research suggested that approaches for HCV need to address the social determinants of health that vary between populations and provide considerations beyond a biomedical model of health.

Chapter 4 brings together the results of chapters 2 and 3 to address the possible approaches and provide recommendations for screening, diagnosis and treatment of Hepatitis C, considering perspectives from experts in the field as well as the social values inherent in the academic literature. It discusses options for further research.

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Chapter 2: Reality vs. Recommendations: Developing Equity-based Canadian Policy for Screening, Diagnosis and Treatment of Hepatitis C

Introduction

Health Technology Assessment (HTA) agencies make recommendations for resource allocation decision making in Canada's publicly funded health care systems and tend to be based on cost effectiveness analyses. Decisions include those about screening programs, diagnostics and therapeutics. Traditionally, HTA considers efficiency, defined as the balance that maximizes population health outcomes for given resources (Culyer, 2012). As such, HTA has been criticized as being overly utilitarian in approach. Decisions premised in utilitarianism maximize wellbeing and limit the loss of wellbeing for individuals; the most successful outcomes increase wellbeing with minimal corresponding loss (Culyer et al, 2012;Hofmann et al, 2014). However, approaches based on utility have been criticized for failing to provide a more considered approach to measure an acceptable amount of loss and benefit, including consideration of a broader set of social values (Culyer et al, 2012;Hofmann et al, 2014;Assasi et al, 2016).

In most Western countries, ageing populations, combined with expensive, innovative therapies, raise health care expenditures and straining health care budgets. This confluence of factors drives the application of strict criteria on who can access treatments and when (Paulden et al, 2014). The affordability and cost effectiveness of novel treatments has called into question the feasibly of providing access to all who may need them. This in turn has led to demands formal, transparent and ethical review processes of new health care technologies (Paulden et al, 2014). Health care systems, therefore, undertake cost effectiveness analyses; yet have been criticized for failing to consider the larger social values (Menon et al, 2009; Blomqvist et al 2013; Menzel et al, 1999;Ubel et al, 2000).

Some HTA agencies are responding to the challenge of integrating social values into their analyses by consulting with Canadian publics about the social values and population characteristics that ought to be taken into account by decision makers when making resource allocation decisions. For example, the Canadian Agency for Drugs and Technologies in Health

(CADTH), when considering the cost effectiveness of screening programs, additionally takes into account patient preferences and the values of screening and harms (Menon et al, 2009). Indeed, CADTH aims to incorporate a broader set of values into its decision-making framework, including the patient perspective (CADTH, 2017). An example of one mechanism that incorporates diverse perspectives is a citizens' jury comprised of members of the public. An expert panel presents the jury with information on health technology innovations. Jurors are then asked to complete questionnaires, explicating HTA priorities (Menon et al, 2008). This process helps guide resource allocation decision-making as well as the adoption of new therapies (Menon et al, 2009). Another method is discreet choice analysis, which also places members of the public at the forefront of decision-making and enables the elucidation of values for resource allocation choices (Chen et al, 2003). Although these mechanisms try to incorporate social values into the decision making process, Wailoo et al (2009), while advocating for transparency in decision making, highlight the difficulties in this process, calling for consideration of practical challenges (what should be valued, whose values should be included, the trade offs between equity and efficiency and how equity weights should be obtained). I therefore aim to identify which value propositions have been suggested for inclusion in HTA decision making for hepatitis C screening, diagnosis and treatment.

While these efforts enhance the transparency of HTA, uncertainties remain about the social values that should be applied (Menzel et al, 1999;Menon et al, 2009). The academic literature provides another rich data source to identify ethical dimensions that ought to be accounted for by HTA agencies. In this Chapter, I aim to identify candidate social values that might be taken into account by Canadian HTA agencies, using hepatitis C as a case study. I analyze the academic literature on screening, diagnosis and treatment of hepatitis C in Canada to identify social values in this domain. This case study is timely because of the introduction of novel effective but costly direct acting antivirals (DAAs) for the hepatitis C virus (HCV) (Shah et al, 2013). Further, the populations most at risk of HCV infection are marginalized, necessitating different approaches to their care (Grady et al, 2013). While issues of prevention of HCV infection is important, a discussion of prevention programs is beyond the scope of my analysis. The exception is that treatment of an infectious disease, such as HIV and HCV, may prevent further infections, a strategy known as "treatment as prevention" (Montaner et al, 2010;Martin et al, 2013).

In the context of hepatitis C, social values that might augment technology assessments include equity in health outcomes, in this chapter, defined as the absence of socially unjust or unfair health disparities (Braveman, 2003) and justice, defined as fair, equitable and appropriate treatment in light of what is owed or due to persons (Childress et al, 2013). Considerations of justice enable a more complete representation of the contextual factors and social determinants of health that affect those with HCV. Values such as equity and justice may be particularly relevant when populations under consideration are marginalized (Grady et al, 2013). In a resource-constrained environment, consideration of such social values is paramount to ensure a just distribution of resources that considers more than cost alone.

Background on Hepatitis C Screening, Diagnosis, and Treatment in Canada

Novel but costly direct acting antivirals (DAAs), namely, Epclusa ($74,760), Sovaldi ($84,000), Harvoni ($95,000 per 12 week course), Holkira Pak ($55,860), Zepatier (60,300), Sunvepra (89,000), Daklinza ($95,550), Technivie ($58,656) and Galexos ($96,078) (CATIE, 2016) have fewer adverse effects on patients than the previous standard of care, interferon based treatments (Beasley et al, 2014; Fried et al, 2002). They have a cure rate of >90% with an 8 to 12 week regimen (Beasley et al, 2014). They require a once daily tablet instead of complex treatment regimens of older HCV drugs. Although there have been major medical advances in the treatment for HCV, these drugs remain expensive. The large budget impact stemming for the combination of expensive therapies and high disease prevalence results in limits being placed on who can receive treatment.

The high cost of DAAs has limited the populations in which they are employed. For example, in the Province of Alberta, treatment is available to those who have a fibrosis score (liver stiffness score and progression of disease) of F2 or above, signifying moderate liver fibrosis prior to being given access to curative treatment (Alberta Blue Cross, 2017). Exceptions are made for persons co-infected with HIV or hepatitis B virus (because of the greatest risk of liver disease in those patients), co-existent liver disease with evidence of fatty liver disease, post organ transplant, extra-hepatic manifestations, chronic kidney disease, diabetes, and woman of childbearing age planning pregnancy within the next 12 months (Alberta Blue Cross, 2017). This decision is based mostly on cost but fails to consider both the larger population effect of treating high-risk populations as a means of preventing transmission (Grady et al, 2013).

Treatment advances have led to revised recommendations on screening for HCV (Shah et al, 2013), for example, the Canadian Task Force on Preventive Health Care (Canadian Task Force on Preventive Health Care, 2017). The Task Force (2017) developed a Grading of Recommendations Assessment, Development and Evaluation system (GRADE), based on the effectiveness of screening in different populations and cost. Each population receives a GRADE of strong or weak. Strong suggests both a high level of evidence in support of screening in a particular population and high desirability of outcomes. Weak suggests the inverse (Canadian Task Force on Preventive Health Care, 2017). Based on GRADE, the Task Force recommended screening for current and past injection drug users, those who have been incarcerated, and individuals who received blood transfusions prior to 1992. It did not recommend screening for the general public or the baby boomer cohort (Canadian Task Force on Preventive Health Care, 2017), as the United States (US) Center for Disease Control (CDC) has done. However, it is timely to consider whether the range of social values accounted for by the Task Force was overly focused on a utilitarian calculus.

Methods

Scoping Review

I undertook a scoping review of the academic literature to identify and analyze the social values and evidence-based recommendations for screening, diagnosis and treatment of HCV in Canada. Following the methodology of Arksey and O'Malley's (2005), I collected, organized and included articles in my scoping review based on a search strategy and inclusion/exclusion criteria developed in consultation with experts. From included articles, I abstracted: type of intervention(s), population(s) affected, location of study, screening methods, diagnostics and treatment options. I then abstracted qualitative codes for ethical considerations and social values (Table 1). Specifically, I coded each article for social values (Table 1). I extracted social value statements line by line and then clustered them into one of 4 categories: (1) equity and justice, (2) duty to provide care, (3) maximization of population benefit, and (4) individual versus community interests. Specifically, I followed the following 5 steps.

Step 1: Development of Research Question

I consulted with infectious diseases, HTA and ethics experts to identify the research question in the context of resource constraints facing Canadian health systems and the market authorization for curative novel therapies for HCV in Canada (Food and Drug Act (FDA), 2016; Health Products and Food Branch (HPFB), 2016). In reviewing the academic literature, my research question is: **What social values are implied in recommendations on the populations that should receive access to screening, diagnosis and treatment for HCV?** My analysis will inform decision makers about the social values that might be taken into account when making resource allocation decisions.

Step 2: Literature Search

I consulted a health science librarian to develop a list of key words and journals of interest. Search terms included synonyms for HCV or hepatitis C, combined with synonyms for screening, diagnosis and treatment (see Appendix 1). I performed my literature search in OVID (OVID, 2016). OVID is a search engine that simultaneously searches multiple databases, covering the medical, policy, economics and HTA literature. The databases searched were: EMBASE, MEDLINE, NHS Economic Evaluation Database and Health Technology Assessment with published dates ranging from 2000- February 1st 2016. The search identified 1,609 articles (Fig. 1).

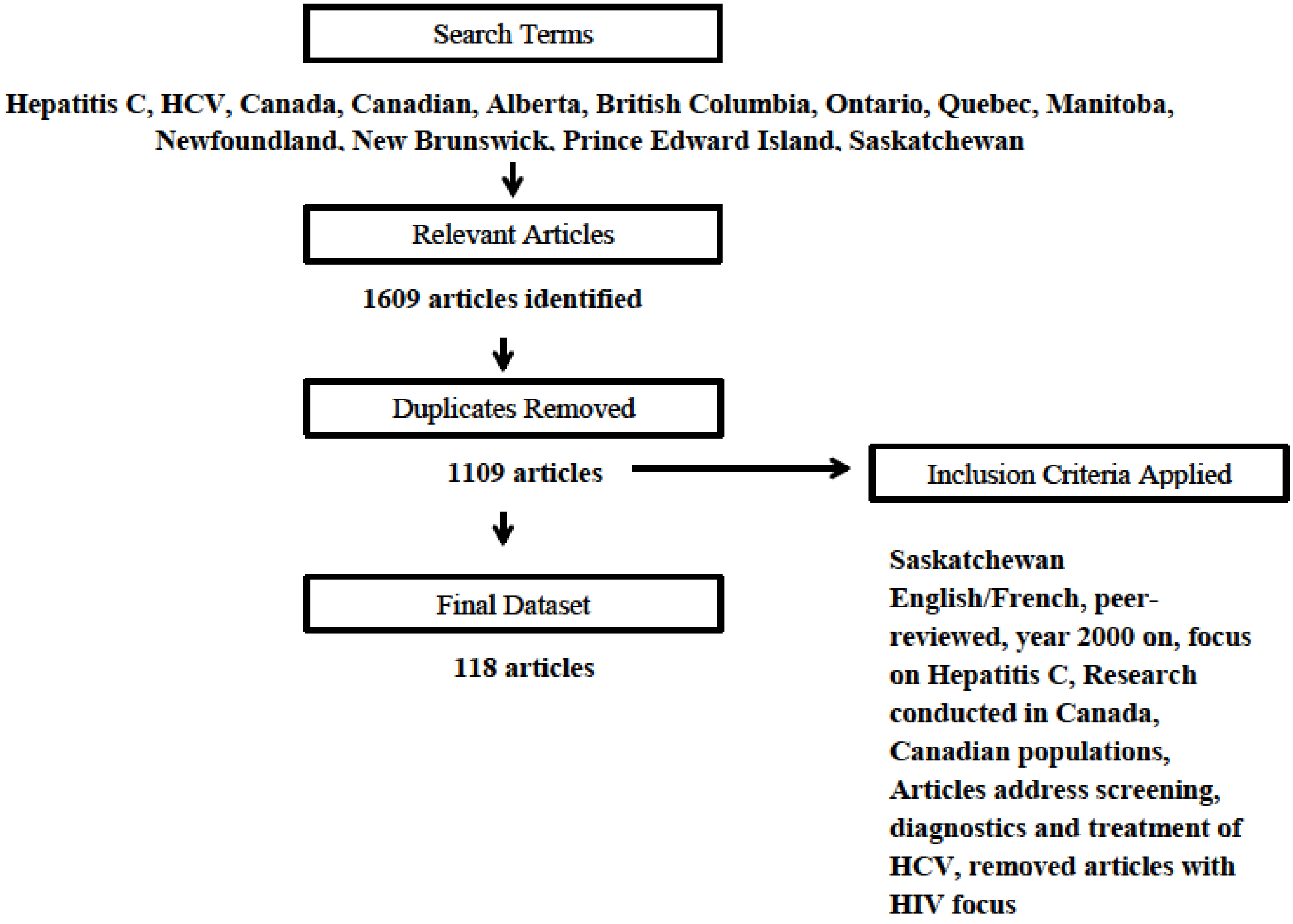
Step 3: Application of Inclusion/Exclusion Criteria

Two coders (COM and a Research Assistant (RA)) applied the inclusion/exclusion criteria and removed duplicates. We included articles that were in English or French, described research conducted in Canada or on a Canadian population and whose focus was hepatitis C. We excluded articles that described basic science experiments, described drug mechanisms of action, had a focus on HIV (Human Immunodeficiency Virus), only addressed prevention of HCV or were published before 2000. Both coders reviewed all articles and any disagreements were resolved by consensus following a discussion.

Step 4: Descriptive analysis of included articles

I developed an online form to code each article for study population characteristics: Persons who inject drugs, Baby boomers (those born between 1945 and 1965), indigenous peoples, individuals who received blood transfusions, high risk youth, prison inmates and general patient population), and location of the study (clinic, urban, prison, inner city, rural, and community health center) as well as the intervention type (screening, diagnosis, and treatment).

Figure 1: PRISMA flowchart of final study inclusion



Step 5: Qualitative analysis of social values articulated in articles

I imported all full text articles into NVIVO for analysis. My analysis used an *a priori* coding scheme (Table 1) developed based on literature on biomedical and public health ethics and social values, including Beauchamp and Childress (2013), the *Canada Health Act* (2016), Cookson and Claxton (2012), and Singer (2013). Based on these works, I defined key social values and verified these in consultation with experts in infectious diseases, HTA and ethics. I merged codes based on these discussions to more clearly represent social value statements. I then clustered social value codes into 4 major categories: (1) equity and justice; (2) duty to provide care; (3) maximization of population benefit (4) individual versus community interests (Table 1). I then coded the 118 articles in my dataset. In the early stages of my analysis, a research assistant independently coded 20% of the articles, and we discussed any discrepancies in our coding. These discussions validated my coding of the articles and enabled me to proceed with coding the remaining articles.

Table 1: Definitions of social value codes clustered by category

Category	Social Values Incorporated	Definition
Equity and Justice	Equity	Absence of socially unjust or unfair health disparities (Braveman, 2003)
	Inequity	Differences in health that are unjust, unfair, unnecessary and avoidable (Braveman, 2003)
	Justice	Fair, equitable and appropriate treatment in light of what is owed or due to persons (Childress et al, 2013)
	Distributive Justice	Persons in like need ought to be treated the same way (Culyer, 2012)
	Egalitarianism	All humans are equal and should be afforded equal rights and opportunities (Arneson, 2013)
Duty to Provide Care	Portability	Requires provinces to cover insured health services provided to their residents while they are temporarily absent from their province of residence or from Canada (Canada Health Act, 2016)
	Accessibility	Insured persons must have reasonable and uniform access to insured health services, free of financial or other barriers; No one may be discriminated against on the basis of such factors as income, age, and health status (Canada Health Act, 2016)
	Publicly Administered	Each provincial health care insurance plan must be administered on a non-profit basis by a public authority (Canada Health Act, 2016)
	Universality	Demands that all residents in the province have access to public health care insurance and insured services on uniform terms and conditions (Canada Health Act, 2016)
	Reciprocity	Society must be prepared to facilitate individuals and communities in their efforts to discharge their duties i.e public health agencies should assist individuals in complying with health measures (Childress et al, 2002).
	Duty to Provide Care	Obligation to provide safe, competent and ethical care (College of Nurses, 2016)
Maximization of Population Benefit	Efficiency	The balance that maximizes outcomes for given resources (Culyer, 2012)
	Utilitarianism	The best action is the one that maximizes the well being of all sentient beings. Supremacy to the needs of the community as it will benefit the largest number of individuals (Bentham,2011)
Individual vs. Community Interests	Liberalism	Right of an individual to pursue their own conception of good (defined as beliefs about what makes life valuable or worthwhile) (Holland, 2015)
	Libertarianism	People should have freedom and autonomy of choice so long as it does not interfere with others autonomy and freedoms. (Belsham, 2005)
	Welfarism	Individual preferences, desires and decisions are the most important factors when doing an economic analysis (Culyer, 2012)
	Autonomy	The right for an individual to make his or her own choice (Beauchamp &Childress, 2001)
	Communitarianism	Emphasizes the responsibility of the individual to the community (Arneson, 2013) Community should be at the forefront of our moral thinking (Holland, 2015)
	Consequentialism	The consequences of an action serve as the judgment of the rightness or wrongness of the action (Mill, 2008)

Results

My search resulted in 118 articles on screening, diagnosis and treatment of HCV in a Canadian context (Figure 1). Of these, 54 (45.8%) discussed screening, 4 (3.4%) discussed diagnosis and 60 (50.8%) discussed treatment options. Most articles discussed the general population and other non-vulnerable populations - baby boomers and individuals who received blood transfusions. Articles that discussed vulnerable populations focused on persons who use injection drugs (PWID), but few considered other vulnerable populations such as high-risk youth, prison inmates, and indigenous peoples (Table 2). Most articles did not specify their study location. Of those that did specify location, most were conducted in clinics, but few were conducted in other locations, such as rural locations and community health centers.

Table 2. General characteristics of populations and study locations discussed in 118 articles on screening, diagnostics, and treatment of hepatitis C in Canada.

	Population Characteristic		Number of Articles	Percentage of Articles
Type of Population	Vulnerable Populations	Persons who use injection drugs (PWID)	35	29.6
		High risk youth	8	6.7
		Prison populations	7	5.9
		Indigenous peoples	7	5.9
	Non Vulnerable Populations	Baby boomers (those born between 1945 and 1965)	11	9.3
		Blood transfusions recipients (prior to 1992)	11	9.3
		General patient population	39	33.1
Location of Study	Geographic Location	Inner City	12	10.2
		Urban	8	6.8
		Rural	4	3.4
	Specific Location of Study	Clinic	18	15.3
		Prison	10	8.5
		Community Health Centre	5	4.2
		Not specified	61	51.7

Analysis of *Social Values*

The social value categories of equity and justice, duty to provide care and maximization of population benefit occurred most frequently in the 118 articles (Table 3). In total, I coded 1243 statements, some of which were double coded within the 118 articles. Most fell within the category of the duty to provide care (Table 3) and were focused on screening and treatment. Only 4 articles discussed diagnosis.

Table 3. Social value categories in 118 articles on screening, diagnosis, and treatment of HCV in Canada. [1]

Social Value Category	Number of Articles	% Articles (n=118)	Number of Coded Statements	% Coded Statements (n=1243)
Equity and Justice	78	66.1	388	31.2
Duty to Provide Care	76	64.4	412	33.1
Maximization of Population Benefit	71	60.1	350	28.1
Individual vs Community Interests	27	23.0	93	7.5

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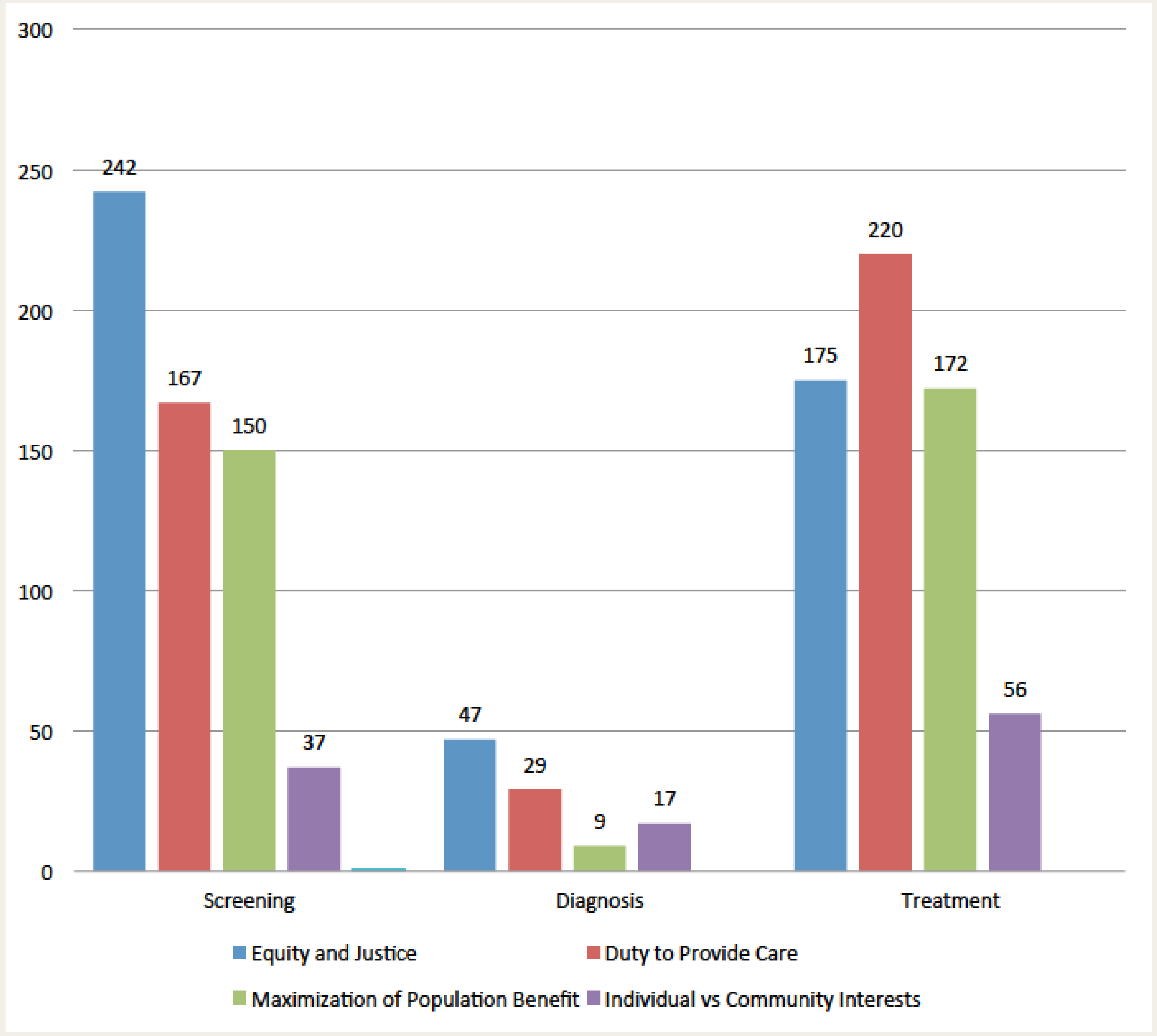
[1] Note that articles could include statements in more than 1 category.

Figure 2. Number and category of social value statements by intervention type in 118 articles on screening, diagnosis, and treatment of HCV in Canada.



Most coded statements on screening fell in the category of equity and justice (n=242) as did most coded statements that referenced treatment (n=220) (Figure 2). Articles on treatment discussed modes of provision, the populations most in need of treatment and treatment guidelines. Other coded statements on treatment fell within the categories of maximization of population benefit (n=172) and equity and justice (n=175), with reference to high risk but vulnerable populations, such as persons who use injection drugs, who have inequitable access to treatment (n=157) (Figure 3).

Figure 3. Number and category of social value statements by study population in 118 articles on screening, diagnosis, and treatment of HCV in Canada.

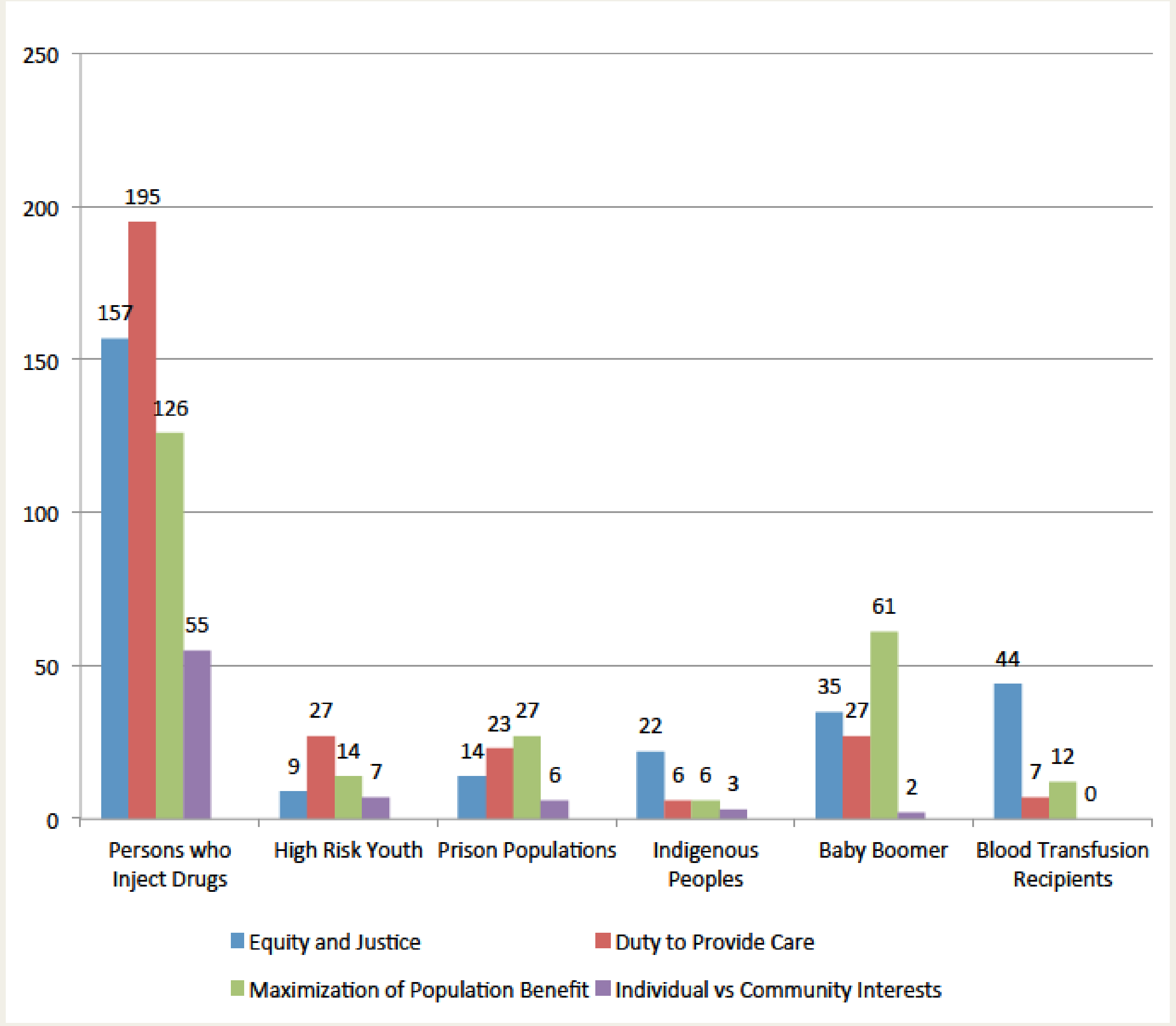
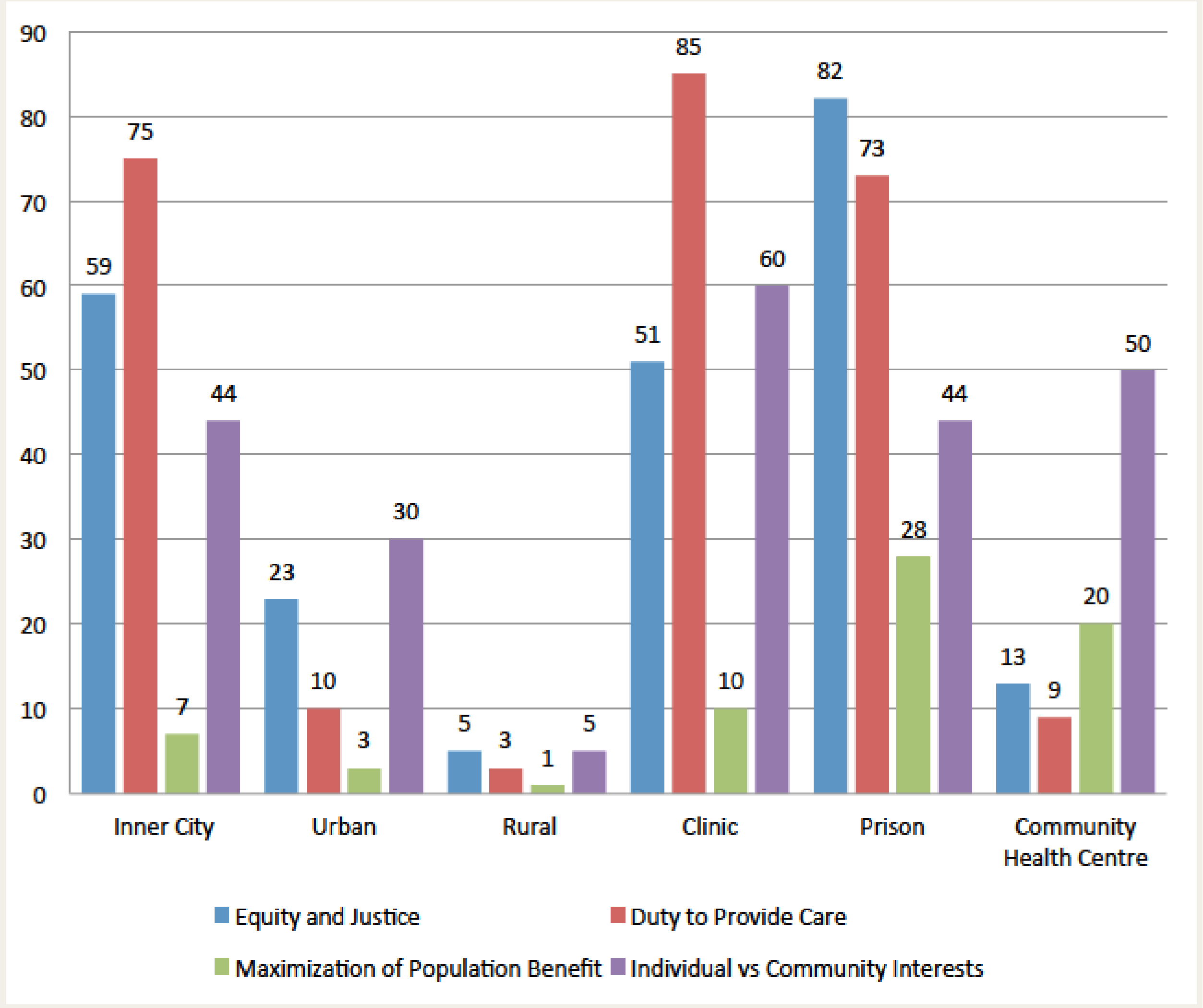


Figure 3 illustrates the categories of social value statements discussed with reference to study populations. Duty to provide care was the most common category for persons who inject drugs (n=195) and high-risk youth (n=27), while maximization of population benefit was the most common category for prison inmates (n=27) and baby boomers (n=61). However, for blood transfusion recipients (n=4) and indigenous peoples (n=22), most statements fell in the category of equity and justice.

Figure 4. Number and category of social value statements by study location in 118 articles on screening, diagnosis, and treatment of HCV in Canada.



Most of the 118 articles in the dataset did not specify study location (n=61). Of the 57 articles that did specify a study location, most took place in clinics and inner city locales (Table 2). Only 4 articles described research in a rural setting. Nevertheless, some differences were apparent in social value statements (Figure 4). Most social value statements in articles that described research conducted in clinic (n=85) and inner city settings (n=75) fell in the category of duty to provide care, while individual versus community interests was the most common category for studies in urban (n=30) and community health care settings (n=50). Studies set in prisons contained social value statements that most commonly fell in the category of equity and justice (n=82) and duty to provide care (n=73).

Examples of Social Value Codes

In this section, I provide excerpts from the literature as examples of the coded social values statements (Table 1).

1.*Equity and Justice*

The coding category of equity and justice includes codes for equity, justice, distributive justice and egalitarianism. Equity refers to an absence of socially unjust or unfair health disparities (Braveman, 2003). Inequities arise when there are differences in health that are unjust, unfair, unnecessary and/or avoidable (Braveman, 2003). For example: "Aboriginal people are not only disproportionately represented among HCV infected people in Canada but also underrepresented in community based treatment programs" (Spittal et al 2012).

Articles made justice claims in reference to (a) individuals who had been infected with HCV through no fault of their own following an unscreened blood transfusion; (b) indigenous populations due to historical injustices, including trauma as a result of the residential school system, and (c) prisoners who cannot freely access health care while incarcerated. Exemplar statements include:

> *Blood Transfusion Recipients:* The difficulties involved in all forms of HCV look back emphasize the importance of informing patients and their families that they have received transfusion therapy that carries certain risks (Goldman et al, 1998).
>
> *Aboriginal Populations:* The findings confirm the necessity of acknowledging the role of historic trauma in the health of Aboriginal peoples…. The Public Health Agency of Canada estimates that the prevalence of HCV infection is 0.8 percent in the general population in Canada and seven fold higher among Aboriginal people (Spittal et al, 2009).
>
> *Prison Populations:* Given the dire conditions in federal prisons today, our federal government should respond with a sensible approach to drug policy based on solid scientific evidence, sound public health principles and respect for human rights- both inside and outside of prison… (Correctional Service of Canada, 2010).

Distributive justice expands on justice by stating that persons in like need ought to be treated the same way (Culyer, 2012). For example, "[w]ith new medications that cure over 90% of hepatitis

C, liver disease experts are urging that screening recommendations be expanded to include all Canadians born between 1945 and 1975" (Fralick et al, 2014). Under the code for egalitarianism, all humans are considered equal and should be afforded equal rights and opportunities (Arneson, 2013). For example: "[t]he decision to treat HCV infected persons should be considered on a case by case basis and should not necessarily exclude persons based on their use of illicit drugs" (Werb et al, 2011).

2. *Duty to provide care*

Duty to provide care encompasses the values articulated in the *Canada Health Act* (CHA), namely: accessibility, publicly administered, comprehensiveness, portability and universality. Of these, articles referenced the values of accessibility, comprehensiveness, and universality but not portability (coverage rules for Canadians between provinces) and public administration (provincial insurance plans must be administered on a non-profit basis by a public authority). In addition, in putting the *CHA* into practice, provinces comply with the ethical principle of reciprocity (Childress et al, 2002). For example, "[b]ecause most new HCV infections occur as a result of IDU (injection drug use)…Clinicians may need to alter their guidelines and emphasis to reach vulnerable populations that are disproportionately affected by HCV and HIV (Hill et al, 2008).

Accessibility refers to insured persons having reasonable and uniform access to insured health services, free of financial or other barriers. Individuals may not be discriminated against on the basis of such factors as income, age and health status (Canada Health Act, 2017)

> Access to specialists in Canada via health care professional referral may be a barrier to HCV care. However, clinics that operate in conjunction with hepatitis C Program, Edmonton Alberta, allow self-referral. It is hypothesized that this improves access to care without increasing inappropriate referrals (Doucette et al, 2009).

Comprehensiveness states that provincial health care insurance plans must all include services that are medically necessary, including hospitalization and doctors, however most plans do not cover the cost of out-patient medications. "Current programs and services are marked by inconsistent implementation and accessibility, both within individual institutions and across the federal prison system as a whole" (Lines, 2003).

Universality demands that all residents in the province have access to public health care insurance and insured services on uniform terms and conditions (Canada Health Act).

> Treating HCV in the prison population is no less likely to fail than treating this disease in the community at large, and that the closer monitoring of psychiatric side effects in prison setting allows interferon to be safely administered even in inmates with a previous history of psychiatric illness (Farley et al, 2005).

3. Maximization of Population Benefit

Maximization of population benefit combines the social values of utilitarianism and efficiency. Under utilitarianism, the best action is the one that maximizes the well being of all sentient beings. Utilitarianism privileges the needs of the community, and aims to derive benefits for the greatest number of individuals (Bentham et al, 2002). For example:

> Because offenders may enter the correctional system already infected, correctional health care assumes the responsibility for caring for those infected and preventing the transmission of disease infected inmates. With most offenders eventually returning to the community, the correctional setting also represents a critical opportunity to identify infected persons and link these inmates with community resources in preparation for their release (De et al, 2004)

Treatment of the group (previously infected inmates) is highlighted as a means of benefiting the broader community and decreasing the overall burden of disease.

The related value of efficiency is the balance that maximizes outcomes for given resources (Culyer, 2012). For example, there is a need to maximize resources for the benefit of the health of the population:

> In order to effectively design treatment as prevention programs, it is necessary to understand factors associated with HCV transmission so that limited resources can be directed in such a way as to have the largest positive impact through the implementation of public health and treatment as prevention interventions at the population level (Cunningham et al, 2015).

4. *Individual vs Community Interests*

Interventions for hepatitis C may favor individual or community interests. Individual interests privilege the right of the individuals to choose how they live their lives, regardless of whether those choices affect their risk of acquiring HCV (Holland et al, 2015). Privileging community interests, on the other hand, suggests that individuals should be held accountable for the community impact of their actions (Arneson et al, 2013). In other words, decisions to allocate health care resources should account for the life choices of individuals, which may increase their risk of HCV infection (Culyer et al, 2012).

Individual interests:

Liberalism prioritizes the right of an individual to pursue his or her own conception of good, defined as beliefs about what makes life valuable or worthwhile (Holland, 2015). For example,

> [t]he illness reality that emerged in interactions with health care practioners was one that delegitimized participant's experiential knowledge, priorities and goals in living with hepatitis C as a chronic illness. It also reinforces the authoritarian structures of power that exist with hepatitis C care.

Similarly, libertarianism states that people should have freedom and autonomy of choice so long as it does not interfere with the autonomy and freedoms of others (Belsham). For example,

> Expanding diagnostic and treatment services is merely a first step in addressing infectious diseases in penitentiaries. A major challenge faced by correctional health care providers is the need to balance individual inmate rights with the health and safety of the wider inmate population (De et al, 2004).

Autonomy argues for the right for an individual to make his or her own choice (Beauchamp &Childress, 2001). For example,

> [t]he staff becomes legitimized in providing health care that is not at a similar standard to that provided in the broader community. Through this process, the incarcerated women becomes more of an object to manipulate and less of a person in a relationship (Rehman et al, 2009).

Community Interests:

Consequentialism states that the consequences of an action serve as the judgment of the rightness or wrongness of the action (Mill, 2002). For example, "[u]ntil recently, HCV treatment guidelines in North America categorically excluded illicit drug users from consideration, citing concerns about adherence, susceptibility for side effects (e.g., depression), and re-infection risks" (Grebely, 2008).

Furthermore, although welfarism is a branch of consequentialism, it maintains that individual preferences, desires and decisions are the most important factors when doing an economic analysis (Culyver, 2012). For example,

> The illness realties of participants… points to the need to reconsider the efficacy of the acute care model…this model perpetuates common assumptions about acute illness (e.g. practioners as expert, disease should be patients top priority)… decontextualized from the patients everyday life and priorities (Patterson et al, 2006).

Finally, communitarianism emphasizes the responsibility of the individual to the community (Arneson, 2013). The community should be at the forefront of our moral thinking (Holland, 2015). For example,

> Since they worry about transmitting the infection to others, they notify their injection partners that they are infected…They view HCV infection as a serious disease and make significant effort to avoid sharing equipment and thus remain healthy…HCV infection is viewed as requiring significant changes in strategies aimed at protecting themselves and others (Roy et al, 2007).

Discussion

In this scoping review, I asked: what social values are implied in recommendations on the populations that should receive access to screening, diagnosis and treatment for HCV? My aim was to provide an expanded set of social values, identified from the HTA and academic literature, to augment the utilitarian focus of HTA in Canada. In identifying social values that might be considered, I respond to the call by Menon et al (2009) for economic evaluations to be conducted from the perspective of society, thereby reducing the weight given to the perspectives of healthcare budget holders. Similarly, Blomqvist et al (2013), call for HTA processes that are more inclusive and take into consideration multiple values, ethics and perspectives. These authors suggest open dialogue between payers, patients and physicians in order to compromise and collaborate on decision-making.

My analysis has addressed CADTH's goal to incorporate a broader set of values into its decision-making framework (CADTH, 2017). However, it has identified the challenges of considering a "societal perspective", given the diversity of populations affected by HCV and the diversity of study sites. While researchers identify a range of values to be considered for decision-making on health care resource allocations, in the context of HCV, there is no consensus on the best way to approach these decisions. Nevertheless, it is clear that the simple application of a utilitarian calculus disregards important contextual factors (Blomqvist et al, 2013), including factors specific to vulnerable populations. The following discussion positions my findings on screening, diagnostics and treatment in the literature, followed by a discussion of social values relevant to each study population and location.

Screening

The literature on HTA relevant to HCV focuses on the cost effectiveness of screening; however, some studies consider patient preferences (CADTH, 2017; Muhlbacher et al, 2015; Shan et al, 2017). This body of literature advocates for an equitable approach to screening to ensure access to necessary services (Myers et al, 2012), meaning that screening programs should be made available without barriers. While the specific screening methods for HCV are still under debate, a duty to provide screening services, in part to raise awareness of HCV and to mitigate the spread of infection underpins this position (Cox et al, 2009; Artenie et al, 2015).

Consideration of screening in the HTA literature focuses on baby boomer and other high-risk groups and has been precipitated by market access to curative new therapeutics. CADTH (2017) suggests that individuals make the decision to be screened, taking into consideration their life situations and recognition of the stigma associated with screening. De-stigmatization is one argument for routine screening, which increases the acceptability and convenience of screening (CADTH, 2017). However, the Canadian Task Force on Preventive Health Care (CTFPHC) recommended no screening for the baby boomer cohort, a controversial decision that is in contradiction to other literature that suggests that birth cohort and high-risk population screening is highly cost effective (Coward et al, 2016).

In contrast to the HTA literature, my analysis suggests that authors in the academic literature use equity and justice arguments to support their claims for screening. While some articles apply these claims to the boomer cohort, members of which may have received infected blood transfusions, most articles addressed screening programs for marginalized populations. Screening in marginalized populations seeks to address the morbidity and mortality associated with HCV (Myers et al, 2012), both of which are increased because many individuals remain unaware of their HCV status and have not been reached by traditional screening procedures (Alavi et al, 2014;Bruggmann et al, 2012;Grebely et al, 2013). Moreover, marginalized populations face stigmatization within society and may not feel comfortable using the health care system, necessitating targeted and novel approaches to screening (Grebely et al, 2014). Fear of judgment when interacting with the health care system negates the positive effects of screening (Artenie et al, 2015).

Authors advocate for an equitable approach to screening amongst populations such as PWID to ensure they are additionally able to access other social and health services (Myers et al, 2012). This body of literature suggests that screening programs be made available without barriers to achieve an equitable approach. Equity arguments are also made with respect to prison populations. While HCV infected prisoner may pose a risk to other prisoners, prisoners also have a right to the same standard of healthcare services provided outside of prison (Chu et al, 2009).

While screening methods for HCV are still under debate, there is support in the academic literature for the premise that screening falls under our duty to provide healthcare services because it helps raise awareness of HCV, mitigates the spread of infection (Cox et al, 2009; Artenie et al, 2015), and provides a public health benefit (Cox et al, 2009). It is, therefore, important to address the accessibility of screening services (Buxton et al, 2010)

Diagnosis

In contrast to screening, few articles discussed diagnosis, with the exception of the HTA literature that analyzed the cost effectiveness of point of care diagnostics, which have the potential to reach populations without having to formally engage them in care (Chapko et al, 2015;Weber et al, 2016). These articles made arguments about equity in access, since point of care diagnostics may be provided outside of a clinical setting. Point-of-care diagnostics may aid in reaching vulnerable and geographically isolated populations (McPartlin et al, 2014; Weber et al, 2016). While diagnosis should lead to the appropriate standard of care, researchers argue that knowledge of disease status is valuable regardless of treatment acquisition (Henderson et al, 2017). This advocacy for enhanced access to diagnostics suggests a duty to provide care.

Treatment

New DAAs are challenging health system budgets in Canada (Government of Alberta, 2016), and, to date, there are few implementation guidelines (CADTH, 2014). DAAs promise greater sustained virological response (SVR) and fewer side effects (Artenie et al, 2015), however, access for many populations remains limited (Alavi et al, 2014;Dore et al, 2012). When considering whom to treat and how, reaching the greatest number of people with treatment is prioritized. Preventing worsening of disease and reducing the need for invasive procedures offsets the initial high cost of treatment and is considered cost effective (Smyth et al, 2015). However, this has a significant budget impact, displacing funds available for other treatments (CADTH, 2017;Smyth et al, 2015). Currently, Canada has adopted a model prioritizing those with more severe disease (Fibrosis score greater than 2 on a 4 point scale) to limit the number of people able to receive reimbursement for treatment as a means to address the budget impact, while implementing cost effective treatment (Smyth et al, 2015). This approach neglects to consider treatment as a means of preventing transmission, which may also be cost-effective however there are limited studies addressing this (Jagpreet et al, 2016).

The academic literature, with respect to high-cost therapies, was similarly focused on efficiency and population benefit. For example, Smyth, *et al.* (2014) stipulated that treatment management is necessary to ensure cost-effectiveness in combination with treatment prioritization for high-risk populations. While there is high patient demand for treatment, there is no consensus on which population should be prioritized for treatment (Conway et al, 2005).

Nevertheless, social values claims are made for the provision of treatment for specific populations. Access to medication within a publicly funded health care system especially remains problematic for marginalized populations (Sanyal et al, 2011). For example, numerous articles suggest that a targeted treatment program treatment for the infected prison population would be just and economical (Conway et al, 2005;Fischer et al, 2004) and would provide treatment to an overlooked population with a disproportionate rate of HCV infection, which might not otherwise seek treatment, thereby maximizing population benefit by decreasing transmission both within and without prisons (Farley et al, 2005). Similarly, Smyth, *et al*. (2014) advocate for treating baby boomers as a just means to ensure adequate treatment for a large population.

Population specific considerations

A range of social values was evident in the academic literature on HCV screening, diagnosis and treatment for both vulnerable and non-vulnerable populations. Here I discuss each population in turn.

Prison Populations

My analysis found that social values with respect to prison inmates primarily fell in the categories of equity and justice and the duty to provide care. Claims about the duty to provide care, were premised on the fact that inmates have a to the same standard of care as the general Canadian population. The Canadian Correctional Services (CSC) stipulates that inmates are owed access to health care services and should not have different outcomes due to imprisonment (CSC, 2017; Farley et al, 2005, Chu *et al.* 2009).

The provision of appropriate care for HCV in prisons has individual and population health benefits. Prisoners have a disproportionately high prevalence of HCV (Farley et al, 2005). Treatment within the prison system can be provided with support for completion (Farley et al, 2005), especially for a population that may have limited interactions with the healthcare system in the community (Farley et al, 2005;Chu et al, 2009) and a population that may be overlooked for treatment (Farley et al, 2005). However, the provision of health care services for this population remains largely insufficient, with the needs of individuals not being met or met with significant barriers to access (Stoller et al, 2003), contrary to the guarantees for universal, comprehensive and accessible health care in the *Canada Health Act*.

This failure to provide care causes inequities, which may place individuals at risk. For example, a failure to provide screening services poses a risk to other prisoners (Chu et al, 2009). Stoller et al (2003) suggest that there is a culture of depersonalization within the prison system, whereby prisoners are not seen as persons but more so as “permanent criminals” and are not prioritized for treatment. This in turn results depersonalized treatment and prisoners being treated as a means to an end rather than human beings (Stoller et al, 2003). Overall, prisoners have high prevalence of HCV that offers a unique opportunity to be addressed while they serve their sentence in a closed system, however they are not provided with adequate care nor are they treated equitably as they are not treated with the same standards of care (Chu et al, 2009).

PWID

In addition to population health benefits, articles on PWID addressed the duty to provide care and issues of equity and justice. Population health benefits are apparent because PWID are the population at the greatest risk for acquiring HCV (Alavi et al, 2014; Patrick et al, 2001). A targeted suite of HCV-related services for PWID would therefore meet the needs of a large and vulnerable population, thereby reducing the transmission of HCV (Leonard et al, 2008; Fischer et al, 2004; Wood et al, 2004). Fischer et al (2004) state, “the time has come for a targeted and proactive HCV treatment approach for [Injection Drug Users], and that it is feasible and desirable from a public health perspective.” Similarly, Newman et al (2013) stipulate that a community based and multisectoral approach to treating HCV amongst PWID would enable us to tackle more than just the clinical effects of the disease, but also positively impact the social determinants of health, by connecting PWID with a broader range of services. In particular, provision of screening services might enable healthcare providers to address both physical and psychological concerns and connect PWID to other services (Cox et al, 2009; Shah et al, 2013; Kapeluto et al, 2014; Smyth et al, 2014).

However, social stigma of drug use creates inequities in healthcare. PWID are faced with the bias of health care professionals in terms of willingness to provide high cost therapies (Newman et al; Myles et al, 2011; Grebely et al, 2009), though studies have found similar sustained virologic responses (Myers et al, 2015). Practioners and institutional structures reinforce stigmatization of PWID patients resulting in their symptoms being discounted or PWID being underserviced (Paterson et al, 2013). Paterson et al (2013) demonstrated that health care workers in an emergency department stigmatized HCV positive patients who were PWID. Furthermore, the stigmatization of PWID leads to the devaluation of persons and turns HCV from a health issue into a moral one (Macneil et al, 2011). There is a common belief that PWID are drug seeking and are less deserving of care than other patients because their HCV results from a self-inflicted cause (Paterson et al, 2013). The academic literature concluded that a targeted approach to screening, diagnosis and treatment of HCV would reduce inequities by providing accessible and effective care.

Indigenous Peoples

The few articles that specifically addressed the HCV in indigenous populations made statements in the category of equity and justice. This reflects equity and justice most likely due to the historical injustices they have faced by indigenous peoples in Canada. Authors therefore advocate for increased multi-level approach, interventions be tailored to address the specific needs of this population and that incorporate needs incorporating a culturally sensitive approach (Spittal et al, 2009). Any interventions should be developed and implemented in conjunction with community members (Wu et al, 2007) and address family, community, environmental and cultural factors (Dell et al, 2005;Wu et al, 2007). It is estimated that this population has a seven fold higher HCV prevalence (Craib et al, 2009). Shaw et al, point out the structural factors contributing to a seven-fold higher HCV prevalence in indigenous this populations, namely, they note that historical trauma, lack of access and systemic oppression have significantly contributed to the epidemic of HCV and other blood borne diseases. (Craib et al, 2009). Indeed, A multi-level approach addressing family, community, environment and cultural factors is therefore needed (Dell et al, 2005;Wu et al, 2007). Moreover, Rempel et al (2012) suggest that HCV infection is a product of self-inflicted behaviours resulting from trauma relating to colonization and residential schooling (Rempel et al, 2012). The authors suggest addressing these issues when advising policy. This historical and personal trauma, therefore, experienced by this population warrants special consideration for treatment. Trauma and disease should be examined together in order to determine the most appropriate course of action (Wu et al, 2007). Interventions should be developed and implemented in conjunction with community members themselves (Wu et al, 2007).

Baby Boomer Population

In contrast to vulnerable populations, academic articles on the baby boomer cohort, born between 1945 and 1975, focused on the maximization of population benefit. Baby boomers have disproportionate rates of HCV and the provision of DAAs would reduce prevalence of HCV and associated complications (Smyth et al, 2014). Complications include hepatocellular carcinoma, which requires a liver transplant and equates to high healthcare utilization. Addressing HCV in this population might therefore reduce health care expenditures and maximize population benefits (Smyth et al, 2014), because the cost of treatment is approximately $80,000 compared to $104,000 for a liver transplant, not including antirejection medication and follow up care (Smyth et al, 2014).

Furthermore, the Canadian Liver Foundation calls for age cohort screening in order to capture a large number of active HCV infections (Canadian Liver Foundation, 2013). Shah et al (2013) suggest that birth cohort screening is cost effective, despite high up-front costs. Controversially, however, the Canadian Task Force on Preventive Health Care (2017) determined that there was not enough evidence to support age cohort screening as being cost effective.

Blood Transfusion Recipients

Equity and justice claims are made with respect to the sub-population of baby boomers who were infected as the result of a contaminated blood transfusion (Bowker et al, 2004). Targeted look back programs are in place to notify blood and blood product recipients of potential health issues arising from their previous transfusions. These programs, together with compensation programs, represent justice for recipients of contaminated blood and blood products (Bowker et al, 2004). Furthering justice claims, the Krever Commission or Krever Inquiry- Inquiry on the Blood System in Canada (Mathias et al, 1998) recommended that all patients who had received a blood transfusion between 1978 and 1990 should be identified to provide them with necessary medical care (Callum et al, 2000). Additionally, Canada has since provided educational and financial support to HCV positive individuals and encourages other countries to follow suit (Angelotta et al, 2007; Thein et al, 2009). In contrast to vulnerable populations, Canada set aside $1.1 billion dollars to compensate individuals who received contaminated blood for those suffering a negative “no fault” health outcome (Krahn et al, 2004).

Location

Most of the articles analyzed took place in urban and inner city locations. These locations have the highest population density of HCV-infected persons. However, focus on these locations generates inequities in our knowledge base about rural and remote locations (Myers et al, 2015). Populations in rural and remote regions require special consideration for HCV screening, diagnosis, and treatment due to geographical isolation and inequities in healthcare services and delivery.

Brunnings et al (2013) advocate for more resources for rural populations, especially with respect to education and risk communication. They advocate for coordinated outreach teams to provide screening, counseling and treatment for people living outside of the city limits to ensure availability and accessibility of care. Additionally, they stress the importance of trusting relationships between physicians and patients to encourage people living away from medical centers to seek care. However, rural patients face long wait times to see specialists, most travel further distances to major medical facilities and take more time off work, constituting an opportunity cost (Myers et al, 2015). Moreover, indigenous populations living in rural settings have limited access to health care resources at a disproportionate rate (Spittal et al, 2012). Many go undiagnosed and have difficulty accessing screening and treatment (Dawood et al, 2006). Authors concluded that persons who are geographically isolated should be prioritized for HCV outreach programs.

Limitations

Hepatitis C literature addresses different populations, locations and, interventions, but rarely mentions people living in rural communities and fails to distinguish the special circumstances of indigenous peoples living on and/or off reserves. My search identified few articles that addressed the specific needs of these populations; therefore, there may be other social values specific to these populations that were under-represented in my analysis. Furthermore, the coding of the social values is subjective, this was mitigated by double coding and coming to consensus on any disagreements but the subjective nature of social values can be interpreted differently based on readership.

Conclusion

Hepatitis C screening, diagnosis and treatment present unique opportunities and challenges for health system decision makers, especially in light of treatment options with novel and curative, but expense DAAs. The academic literature identifies an expanded set of social values that might be considered by decision makers in resource-constrained environments. Accounting for these social values, particularly in the context of vulnerable populations, may augment the purely utilitarian calculus applied in most HTAs that primarily rely on cost effectiveness analyses. In making evidence-based recommendations for screening, diagnosis and treatment of different populations and in different settings, the academic literature clearly calls for greater consideration of equity and justice and the duty to provide care that accounts for consideration of individual and community interests.

Screening interventions must address issues concerning access and equity with attention given to marginalized populations. Although there has been much debate regarding whom to screen and how, it remains important to fulfill our duty to provide care in a just and equitable way, addressing the needs of the populations most at risk of acquiring HCV.

The HTA literature asserts that DAAs are cost effective, yet restrictions on who can access them remains based on disease severity. These limits address potential budget impacts but fail to address other populations in need who could benefit, namely the prison population and PWIDs. The academic literature calls for decision makers to account for social values such as equity and justice as well as our duty to provide care, which would lead to an increase in access to treatment contextualized by the social determinants of health that increase the probability of infection.

In conclusion, the academic literature calls for more tailored approaches to screening, diagnosis and treatment of HCV that considered the needs and life circumstances of different populations in different settings. Such resource allocation decision-making would be facilitated through the implementation of dialogic processes that are inclusive of the views of affected populations.

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Chapter 3: Tribulations and Triumphs for Screening, Diagnosis and Treatment of Hepatitis C in Canadian Populations

Introduction

Disease Statistics

Hepatitis C is a blood borne virus that is highly infectious (WHO, 2014). It is estimated that there are 240,000 infected with hepatitis C (HCV) in Canada (PHAC, 2013). In Alberta, the rate of HCV is approximately 30.6 per 100,000 people, with men being twice as likely as women to become infected (Government of Alberta, 2016). The number of people infected however is underestimated since marginalized populations are frequently missed in surveys and represent the highest rates of infection in Canada (CCDR, 2014). Constituents of this group include persons identifying as indigenous, persons who use injection drugs, the homeless, immigrants and prison inmates. Additionally, persons born between 1946-1965 have increased rates of HCV, especially in men, where as women have higher rates of new infection (Government of Alberta, 2016). Many individuals remain unaware of their HCV status (Wong et al, 2006). HCV often is asymptomatic until it reaches an advanced stage, affecting liver function (Canadian Liver Foundation, 2012). Hepatitis C remains the leading cause of liver transplant in Canada (Canadian Liver Foundation).

History of the epidemic in Canada

Prior to 1990 in Canada, blood collected for transfusions were not screened at the time of donation, nor at the time of transfusion (Government of Alberta, 2016). Therefore, persons receiving blood before this time are at heightened risk for HCV. The number of patients acquiring HCV from blood transfusion has subsequently decreased after initiating sensitive screening at time of donation (Government of Alberta, 2016). The residual risk is 1 in 2.3 million (O'Brien et al, 2007; PHAC, 2009).

Baby Boomers

Hepatitis C is significantly higher in the baby boomer generation, those born between 1946-1965 (Schanzer, 2014). Although this population disproportionately represents some of the highest disease burden, Canada does not screen patients based on age cohort (Schanzer, 2014) according to guidelines set by PHAC, with the exception of the Northwest Territories (Government of Alberta, 2016). As this disease continues to worsen, there are more hospital admissions and more cases of liver disease reported, resulting in resources being expended on treatment and transplantation in this population (Schanzer, 2014). Hepatitis C was largely transmitted to this population through recreational injection drug use as well as unscreened blood transfusions. Members of this latter population are often prioritized for HCV screening, with targeted look backs aimed at discovering cases and providing compensation (Bowker et al, 2004).

Persons Who Use Injection Drugs

One of the most commonly affected groups is people who use injection drugs (PWID). Transmission can occur through multiple pathways, including needle and syringe sharing as well as indirectly through sharing filters, cookers, and rinse water (materials used as part of the drug injection process). Needle sharing is the principle route of HCV transmission in Canada and necessitates harm reduction strategies such as sterile syringe distribution and supervised injection services (Miller et al, 2002). Although there is limited research on reducing HCV incidence in comparison to HIV, these forms of prevention may play an important role in reducing syringe sharing. PWID's represent an HCV cohort warranting attention and need specific strategies tailored to them in order to decrease the burden of HCV.

Indigenous Population

Indigenous Populations, specifically in Canada, represent a high-risk group for the contraction of hepatitis C. Within this population, individuals infected with hepatitis C are often street involved, are faced with socioeconomic instability and homelessness (Wu et al, 2007). These disparities stem from the historical trauma this population has been faced with and has contributed to the initiation of injection drug use (Spittal et al, 2010). This group warrants attention as they make up approximately 19% of HCV patients and are often under represented in the Canadian Health Measures Survey, a survey designed to collect health information in all the provinces every 2 years and is used to establish baseline measurements and determine public health approaches to disease. This survey however, does not take into account indigenous populations, resulting in a systematic exclusion (Schanzer, 2014). Indigenous people face stigmatization within the health care system and have trouble accessing health care other than acute care (Spittal et al, 2010), necessitating special considerations for this population to access screening, diagnostics and treatment for HCV.

Prison Population

Inmates in correctional facilities in Canada have an HCV prevalence ranging from 23-87% (Farley et al, 2005). Persons who inject drugs (PWID) contribute to the spread of HCV while incarcerated (Farley et al, 2005) in part, due to the prison system not providing addiction treatment and access to sterile injection supplies (Chou et al, 2009). A lack of sterile tattooing equipment increased the risk of HCV incidence amongst incarcerated populations. Furthermore, screening upon entering the prison system is performed on a voluntary basis and very few inmates are offered HCV treatment while in prison. Due to the length of previous HCV treatment options, HCV treatment was not feasible in this system, however new interferon free treatments may offer an alternative (Farley et al, 2005).

Screening Programs

Currently, there is no formalized screening program for hepatitis C in Alberta, although the Centre for Disease Control (CDC) and the World Health Organization (WHO) recommend executing a screening program (CDC, 2014). Due to the lack of organized screening, many people remain unaware of their status and are not routinely screened for HCV (Wong et al, 2015). HCV is largely asymptomatic resulting in patients uncovering their disease status after significant liver involvement (Wong et al, 2015). This is especially true in marginalized populations as they are less likely to seek primary and preventative medical care, and can remain HCV positive for many years. However, clinicians with more PWID patients and other high-risk patients are more likely to actively screen their patients.

The screening of blood and blood products is now routine practice after contaminated and unscreened blood was used in blood transfusion practices prior to 1990 (Long et al, 2002). This practice helped to decrease the incidence of infectious disease transfer in patients. Targeted look backs have helped to find cases of HCV in persons who did not know their status (Long et al, 2002), contributing to baby boomers having received screening, although baby boomers still require screening.

Current Alberta Health Guidelines recommend screening high-risk groups for hepatitis C including people who have injected drugs, regardless of frequency, people who have ever been incarcerated, and persons who have received a transplant or transfusion (Alberta Health, 2015).

Diagnostic Protocols

Diagnosis of HCV fall under two types of laboratory test, serological and molecular. Serological tests are performed using assays to detect HCV antibodies (Ghany et al, 2009). Molecular assays are used to distinguish between those who have spontaneously cleared the virus and those with ongoing, active infection (Ghany et al, 2009).

Serological testing is used to screen and diagnose HCV simultaneously and is the first step in determining presence of HCV. Enzyme immunoassays (EIA) are commonly used and are highly specific (>99%) (Ghany et al, 2009) Primary physicians most commonly order these tests when patients are suspected to have HCV (Government of Alberta, 2016). Molecular assays are done using real time polymerase chain reactions (PCR) to determine the presence of HCV RNA, which is also highly specific (98-99%) (Ghany et al, 2009). Genotyping assays are performed after disease status is confirmed in order to determine appropriate course of treatment (Ghany et al, 2009). Once HCV is confirmed, patients are referred to specialists (Government of Alberta, 2016).

In Alberta, EIA and PCR testing are done in a stepwise manner. EIA is done initially to determine HCV antibodies and PCR is done subsequently to determine the presence of active infection (Government of Alberta, 2016). PCR tests can only be ordered by specialists in order to reduce the number of test being inappropriately ordered (Alberta Provincial Laboratory, 2016). PCR testing is also used when treating the patient in order to determine if the treatment is effective and the viral load is decreasing (Alberta Provincial Laboratory, 2016).

Non-invasive liver stiffness (Fibroscan) tests are performed, where in the level of liver fibrosis is assessed. Fibroscan largely replaces the invasive procedure of liver biopsy. A scale of 0-4 is used, where in 0 signifies no fibrosis and 4 severe fibrosis (Ghany et al, 2009). At the time of my interviews with experts, a fibroscore of 2 or above established eligibility for treatment coverage (Government of Alberta, 2016). On April 1, 2018, this eligibility criterion based on fibroscore was removed (CATIE, 2018). Treatment is now available for persons with fibroscores of 0-1 if they have one of the following co-morbidities: co-infection with HIV or hepatitis B, co-existent liver disease, organ transplant, chronic kidney disease, diabetes, woman of childbearing age planning pregnancy within the year (Alberta Blue Cross, 2017).

These tests are used in conjunction in order to determine the best course of treatment and to monitor treatment success (Alberta Provincial Laboratory, 2016).

Available Treatment

Interferon treatments have largely been phased out and replaced with a new suite of curative drug regimens. These novel therapies use direct acting antivirals (DAAs) to target the enzymes involved in the replication of the HCV virus (Asselah et al, 2011). There are four main classes of DAAs: NS3/4A protease inhibitors, nucleoside and nucleotide NS5B polymerase inhibitors, NS5A inhibitors, non-nucleoside NS5B polymerase Inhibitors (Pacific Hepatitis C Network, 2015). These novel drugs have fewer adverse effects on patients than other drugs on the market (e.g. fatigue, headaches, fever, muscle pain, insomnia, nausea, hair loss, anorexia, depression, irritability, and joint pain) (Beasley et al, 2014; Fried et al, 2002). They have a cure rate ranging between 89%-95% (Su et al, 2017) and a virologically sustained response with an 8 to 12 week regiment (Beasley et al, 2014). These drugs are also user friendly, as they require a once daily tablet instead of complex treatment regimens as seen in other HCV drugs. Although there has been major medical advances in the treatment for HCV these drugs remain prohibitively expensive with the cost of treatment.

There remains inequitable distribution of screening, diagnostics and treatment resources for HCV and substantial variation in the policies addressing this in Canada. It is therefore timely to analyze how policy makers and clinicians in Alberta make decisions about screening guidelines and implementation; provision of diagnostics services; and the allocation of novel treatments for hepatitis C in a resource-constrained setting. Furthermore, it is important to consider the social values taken into account when determining policy, addressing resource allocation and in identifying the variations in policies relating to the screening, diagnosis and treatment of hepatitis C. I therefore analyze how policy makers and clinicians in Alberta make decisions about screening guidelines and implementation; provision of diagnostics services; and the allocation of novel treatments for hepatitis C in a resource-constrained setting. Further, I examine the challenges faced by health policy makers and clinicians when approving and implementing screening, diagnosis, and treatment within Alberta's health care system. Although prevention is an important factor in managing hepatitis C, it is outside the scope of this paper. Therefore, I address it only briefly.

Methods

Participant Recruitment

I conducted key informant interviews with experts in policy or practice who had experience with screening, diagnosis, resource allocation, and/or treatment of hepatitis C. Key informants included policy makers and clinicians, predominately in Edmonton, Alberta, with additional input from individuals from Vancouver, British Columbia and Yellowknife, Northwest Territories. Clinicians included hepatologists, infectious disease doctors or family practitioners all of whom screen and/or treat HCV. Participants represented different perspectives on challenges in screening, diagnosis, and treatment of hepatitis C and the interdisciplinary approach needed to address these challenges. I contacted participants by email and provided an information sheet outlining the study, the risk and benefits of participation, and confidentiality protocols. I recruited 22 participants, eight of whom were clinicians and 14 policy or public health experts.

Data Collection

In consultation with my thesis committee and based on an extensive review of the literature (see Chapter 2), I developed two semi-structured interview guides specific to (a) clinicians and (b) key informants with broader public health and health systems policy expertise. I asked clinicians about their screening and diagnostic protocols, available treatment for HCV, and the barriers for different populations in seeking health care. I asked policy experts about screening, diagnosis, and treatment protocols, and program implementation, as well as resource allocation and decision making processes.

I conducted semi-structured interviews with the 22 key informants. Semi-structured interviews allowed open dialogue about experiences of key informants with screening, diagnosis, and treatment of patients with HCV from different populations. Semi-structured interviews also enabled unanticipated findings to be further explored (Rapley et al, 2001) because the questions were open-ended and allowed for further probing on respective roles, challenges faced in daily practice, equity of access, novel therapies, and patient prioritization. Interviews took place in person at a location chosen by the participant for convenience and comfort. Interviews lasted approximately 30 minutes to an hour and took place during the months of September to November 2016.

Data Analysis

A professional from a medical transcription company, Cabbage Tree, transcribed the audio recordings. I used NVivo qualitative analysis software to organize, manage, and analyze the content of the verbatim transcripts. I used the constant comparison method (Charmaz, 2010) to analyze the transcripts. This method inductively identifies emergent codes from the transcripts, which are coded in iterative manner to ensure the congruency of codes. If I identified new codes in a transcript, I returned to previously coded transcripts to incorporate these newly emergent codes. After having the data set coded in its entirety, I created sub-codes as well as broke out the major themes to better understand their relationships to each other. The end result was major themes with subsets of codes contributing to the major themes. Thus, the constant comparison method allowed for continual checking to ensure that the meaning remains the same in different stages of the process and enables cognizance of saturation (no new themes emerging) (Charmaz, 2010). It helped to ensure meanings are not misrepresented and that important information is not left out. No new themes were found after 5 interviews in each of the two sample populations. No new themes emerged from clinicians or policy makers collectively as well as in the individual groups. The emergent themes were relatively homogenous between the two groups, allowing saturation to be met more quickly than otherwise expected (Guest et al, 2006).

A second coder read and applied the finalized codebook to one clinical transcript and one policy expert to test whether I had captured all major themes and to test the appropriateness of the coding framework. The second coder identified no new themes or codes.

Finally, I conducted member checking, by providing participants with a summary report of the major themes and findings within their individual interview so that they could check the accuracy of my representations of their interview. Member checking helps to ensure accuracy, representativeness and completeness of findings and provides participants with the opportunity to clarify their answers (Creswell et al, 2000). Furthermore, member checking is a means to incorporate additional insights. Thirty six percent of participants made amendments to summaries to better reflect their thoughts, all of which were integrated into the findings.

Results

System Level and Policy Findings

Approaches for screening, diagnosis and treatment of Hepatitis C: The research participants in this study stressed the need for integrated services where multiple services can be offered simultaneously in one location, thereby simplifying access to health care. The rationale for this type of approach for screening, diagnosis and treatment is that it is difficult to access services in general and in reducing the barriers to accessing care, such as the number of times you must connect with the health system, would benefit all patients, including those who marginalized and face challenges accessing conventional healthcare services.

> It's hard to reach that group of patients and so the hepatitis C screening would require more resourcing to do. One can envision it being integrated into other aspects of their care, so integrating it into substance use programs, integrating it into primary care, integrating it in STI clinics... (Clinician 2)

> You come to emergency and you've sprained your ankle, my training is to look at your ankle. I don't think about whether you have untreated syphilis, but you should be thinking it might be the only time he present to healthcare facility…this might be the one opportunity where I could really make a huge intervention…So we have to think differently I think. (Clinician 5)

Patients are not always able to get themselves to care centers and often require external support in navigating the system or following through with care. Participants noted that we should be supporting patients in accessing care or providing the necessary resources to stay on their medications for example.

> If you once again don't discharge people, so you get somebody incarcerated, you treat them with hepatitis C and you solve that problem. And then you discharge them to live underneath the high-level bridge. Well, their chances of success is staying off of their addictive substances are there, right. So what about health? What about housing? What about age? What about income support? So it's a larger public health perspective that needs to be addressed here. (Public Health Expert 11)

> And then they start making changes because it's that external sense of worth that they begin to internalize. And this kind of thing can be really powerful in doing that in motivating people. Because why would you change if you're kind of a loser and nobody cares about you and you're living on the street? Why would you bother making any change? So this kind of changes that as well. (Clinician 3)

Other approaches that participants expressed were similar to a one-stop shop but involved meeting people where they are at and implementing a more active approach. This takes the form of community engagement and outreach, where health care workers are actively engaging community members and providing screening at the ground level, instead of in an institution.

> They've got lots of crap to do in their life and accessing care is difficult for them. For them to really seek out hepatitis C testing or any kind of medical care I think is difficult, so it's going to take effort to reach them. It almost needs an outreach. We'll have to find them where they're at rather than expecting passively for them to come to us, and that will cost money. (Clinician 2)

Beyond advocating for the type of approach to implement, participants also noted what was not working. Currently, the treatment of hepatitis C is reliant on referrals to specialists by general practitioners. Both pose a barrier because there is a limited number of specialists and patients may not have access to a referring general practitioner. Furthermore, even referred patients who are seen by specialists may not qualify for treatment at a specific point in time and may need to re-enter the referral process when their liver damage score reaches the required level. Thus clinician interviewees expressed frustration with this process. An exacerbation to the existing issues is that each branch of health care left to their own devices to deal with issues that arise and there is little communication amongst different branches of care.

> So we have hepatologists that know everything about livers. You know how to treat, how to make people live longer, you know if they have hepatitis C. Well, that's wonderful, right, but if you don't approach it from addictions and mental health perspective, compliance with treatment, on and on and on, right. (Public Health Expert 11)

Influences on Resource Allocation: Participants were keen to point out organizations working in this field and praised them for the work they do advocating for marginalized populations.

> There are increasing, I should say, there are a couple of inner city advocacy groups that work with injection drug users. Streetworks, and the ARCH (Addiction Recovery and Community Health) program at the Royal Alex Hospital. These are groups that are starting to advocate on behalf of injection drug users. They work extremely hard, but perhaps a larger critical mass is necessary to get that political will. (Clinician 2)

They acknowledge that there are limited resources and that there is not a simple solution to screening and treating hepatitis C, especially among marginalized populations. Nevertheless, participants are hopeful that hepatitis C can be made a priority and that Alberta can dedicate resources to screening, diagnosis and treating hepatitis C.

> Now, I'd love to see all the carriers treated but realistically, is that possible? Alberta got somewhere in the region of -- must have 40,000 carriers, right? So that's four by ten to the four by ten to the five. I would say Alberta would have to find a couple of billion dollars to treat its own carriers, all of its carriers. Can they afford that? I don't know. I mean we're meant to be a rich province, right? (Public Health Expert 1)

Comparison to HIV: Participants drew comparison between two infectious diseases that are both transmitted through body fluid, HIV and HCV. Both diseases have received attention but not to the same degree. Participants note that HIV has received a lot more advocacy and the patient population as well as society at large has been a lot more vocal. HIV also was discussed in the context of HCV because participants described how stigma is implicated in the screening, diagnosis and treatment of HCV.

> HIV is another stigmatizing condition but it affects a group that is quite motivated to be politically active and put pressure on politicians and to, I guess, advocate. What I mean specifically is gay men who have HIV are quite socially and politically active and have made HIV -- I think have made great strides in de-stigmatizing HIV and encouraging political will. I think we've seen a lot of action on HIV in terms of proactive screening, dedicated publicly funded STI clinics with active screening in place. (Clinician 2)

Screening

Accessing Screening: I asked participants about barriers for screening. They notified me that access to screening remains a large barrier, especially for marginalized populations. This occurs for several reasons but all stem from difficulty accessing health care in general. Often this population does not have the required documentation, such as identification or health card, when presenting to a clinic or hospital and when they do successfully access health care it is for an acute reason. Screening opportunities are therefore missed or not a priority. Overall there is inadequate access to screening.

> So it has to be available on a very low threshold, pretty much a walk-in basis if someone chose that…. I find it hard to get to appointments and I have so many resources at my disposal right, so it has to be offered in environments where people feel comfortable accessing care. (Clinician 5)

Implementing screening: Participants were asked what their ideal screening would look like and there was no consensus amongst participants on where it should take place, who should be screened and how. There are a lot of barriers in terms of actually implementing screening programs and there are a lot of different opinions on how to approach it. Every participant talked about how it is difficult to implement a screening program and they expressed that they are unsure about the best way to do so.

> The problems are that sometimes inner cities -- I have patients that don't have phones, don't have home addresses. I have patients that live on the street. We were seeing the lady. "Where do you live?" And she said, "Well, I live under the bridge." "How will we contact you?" Not very easy. (Clinician 4)

Furthermore, participants considered HCV not to be an urgent disease or not a pressing matter due to the difficult nature of implementing a screening program in a disenfranchised group. Participants felt it would be difficult to engage this group in screening. Compounding this issue, HCV is not seen as an urgent health care matter as it can take decades for the disease to progress to a point where it affects peoples well being.

> With hepatitis C, the bulk of the population affected are disenfranchised people already and so it's difficult for them to advocate for themselves because of all the other issues they face and so it's easy to ignore them politically…but it's easy to say, well, don't inject drugs if you don't want hepatitis C and not spend money. Yeah, and there's no consequence. (Clinician 2)

Overall, participants perceived that in marginalized groups screening is not a priority as they have more pressing issues and concerns than knowing their disease status. This suggests that it is important to not only address screening but also other social determinants of health in order to effectively increase screening uptake and to increase awareness of HCV screening and its benefits.

> I think for a lot of these patients, they have priorities other than chronic hepatitis C. Hepatitis C is famously known as the silent epidemic because the symptoms take so many years to develop. (Clinician 2)

> Hepatitis C I think is perceived as an infection of substance users or injection drug users so that has led to a stigma or perhaps deprioritizing it I think after the political will is driven by the issues that are visible. So it requires people to make those issues very visible to get the political will. That's difficult. (Clinician 2)

Furthermore, stigma was also highlighted as a barrier to screening. Persons feel stigmatized when seeking HCV screening and prefer to keep their status and testing habits private.

> I think there is probably some stigma that the patients feel and they refuse to get or are not keen to be screened. I worry about prejudice or people thinking that the drugs are expensive and this person may not deserve them. (Clinician 4)

> Yeah, I think you know it is very hard for a lot of our patients to walk through the doors of the traditional medical facility because they feel judged or was people look at them differently or because their household for whatever reason. (Clinician 5)

Additionally, the sentiment that by getting tested people are admitting to having done something wrong either currently or previously prevents people from being tested.

> To a lot of people and a lot of clinicians, unfortunately, it is a matter of asking for hepatitis C screening "I have done bad things and now I need to be" …it implies that you are morally bereft in one way or another instead of people saying, "Well, I've heard about this. Should I get screened for this?" "Well, in the past did you ever?" "Well, I did that once."" Well then, yes, maybe you should be." (Clinician 3)

Participants also felt that doctors are not always willing to screen their patients for HCV due largely to their busy work schedules and often do not think their patients are at risk. This may contribute to the stigma felt or the wrongfulness of ones actions. Conversely, some doctors screening their patients without hesitation.

> “I think there's a portion of physicians who have their head in the sand and those are difficult to reach.” (Clinician 6)

Another contributing factor to persons not being screened is that screening is left to the physicians’ discretion with no clinical guidelines in effect.

> “But it really is left to the front-line discretion of the physicians. There's not a public health policy or procedure in terms of how we would access or screen high risk populations so we know we're missing groups.” (Public Health Expert 7)

Approaches to Screening: Participants were asked to describe their preferences for screening and suggest ways that current screening could be improved. The normalization of screening where in screening becomes more common was highly desired. Making screening easier by simply having to opt out of screening when attending a doctor’s appointment instead of having to actively seek screening was suggested. Furthermore, participants noted that it is important to have open dialogue between doctors and their patients so that those who would like to be screened can advocate for themselves.

> I do think that convincing people that getting screened for stuff is okay, particularly where things involve or seem to involve behaviours. We need to sort of be a little less Victorian about the whole thing. People do stuff particularly when they're younger that, in hindsight, was probably not the best idea. (Clinician 3)

> I think there’s got to be a way to normalize the testing so there’s not so much stigma attached to it because it’s so related to drug use and people don’t understand that there’re other ways. (Public Health Expert 2)

> Make it the standard and people have to have the "opt out" option but it shouldn’t be so much of everything that you’d have to go and ask and almost demand it of your doctor to get it, like I would have to convince my doctor that I needed to have a hepatitis C testing or screening. I would have to convince him. I shouldn’t have to do that. He should ask me. (Public Health Expert 2)

Secondly, participants recognized that marginalized populations who do not often have family doctors, but may present to emergency departments more frequently than members of the general population, should be given the opportunity to have HCV screening provided when contacting health care services. Participants suggested that the use of the health care system should act as a catch all and that physicians should move away from traditional training where they look at the presenting issue only to a more holistic approach where in they can address other determinants of health and underlying issues.

> So I think the ideal screening program has to make use and be very opportunistic, so if you are admitted to the hospital, we need to think about doing that. If we're doing outreach in the community and you come across somebody who hasn't been screened you have to put a mechanism in place that those patients can receive appropriate health interventions. We have to be a lot more opportunistic with it. We should be doing this at shelters. This group of patients is missed. (Clinician 5)

Similarly to the screening methods above, participants were in favour of implementing a systematic approach to screening. Examples of this could include prenatal screenings.

> So it may be more practical to go to a universal-based screening or a birth cohort-based screening approach that can be implemented that can be done as part of a routine blood work. I think it would be ideal to increase resources for injection drug users and target screening to that group. I think finding hepatitis C amongst injection drug users would be critical to actually fight the epidemic because we think the injection drug users are the main core. They account for almost all forward transmission and so identifying those patients would be very good. (Clinician 2)

Other examples of this could involve targeted approaches to screening. A highly debated form of this is targeting all persons in a specific age cohort, i.e. the baby boomers. Participants held strong opinions on whether or not we should be targeting this group in particular. Arguments for included the higher prevalence in this age group.

> But I feel very strongly that Canada, and certainly Alberta, should be screening baby boomers because as you know, it’s the age cohort that has the highest prevalence of hepatitis C. (Public Health Expert 1)

While others contemplated its usefulness and the effect it would have on resources.

> “Well, there'd be a lot of things more pointless and horrible but it would be pointless and horrible to recommend every baby boomer be screened.” (Clinician 3)

The approach to screening that the most participants agreed upon and advocated for was risk based screening. This would entail actively seeking persons at elevated risk of transmitting and contracting HCV. Persons who currently and frequently use injection drugs are at a higher risk and should be targeted for screening. Outreach programs that seek to screen users is one approach highlighted. Other approaches could involve more passive screening techniques such as offering screening services at needle exchange sites.

> I think it would be ideal to increase resources for injection drug users and target screening to that group. I think finding hepatitis C amongst injection drug users would be critical to actually fight the epidemic because we think the injection drug users are the main core. They account for almost all forward transmission and so identifying those patients would be very good. (Clinician 2)

The biggest concern that participants envisioned with implementing more screening programs is that if we suddenly screen more people and uncover more HCV cases are we going to be able to offer them treatment. It is imprudent to discover cases of HCV if we are unable to do anything about it.

> And they will be screened overwhelmingly at the level of their family doctors. And so there will be, no doubt, thousands of new diagnosis. And if the family doctors are immediately referring to hepatitis C treatment programs it would be a nightmare because people would be waiting for months and months to be told that there's nothing wrong, there's no problem and they don't have hepatitis C or they don't need this or they don't need that. So until those things are in place mandating screening without a clear follow up plan in place is harmful to people rather than beneficial. (Clinician 3)

On the other hand, participants advocate for screening everyone and also providing them with treatment.

> Now that we good therapy, you should be screening, if you have no good treatment, screening is less valuable because you're just making a diagnosis but you can't do much about it. But now that we've got excellent therapy and the diseases are progressive and you can pick up patients at an earlier time and treat them in earlier phase of their disease, I think that's worthwhile. So they should be screened. (Clinician 4)

Current Screening: It was noted that HCV is a notifiable disease so there is inherently surveillance built in. This helps to monitor disease progression, genotypes and population level data on who is being screened.

> We have the notifiable disease registry, so we have everyone that was confirmed diagnosed with hepatitis C in Alberta. We don't want to double count within the country because usually the federal public health agency comes up with an overall Canada value. So we make sure were not duplicating. (Public Health Expert 10)

Participants underscored the successes we have had by screening blood at donation and how we have been able to prevent transmission of HCV by implementing national protocols for blood products.

> Well, what's worked is now; you don't see post-transfusion hepatitis C. So the implementation of the blood test into the blood banks has eliminated post-transfusion hepatitis C. If you go back to the '70s and early '80s, before we identified hepatitis C and before we developed the test, the incidence of hepatitis C following a transfusion was as high as 10% because they're giving multiple units from multiple donors. And the risk of walking away with hepatitis C could be as high as 10%. Now, it's zero. So that's been a big success all around the world where they've implemented the diagnostics into the blood banks. Yeah. So I think that's for sure, that's been a big success. (Public Health Expert 1)

Diagnostics

Participants were asked about barriers to diagnosis. Participants emphasized that there are no barriers to diagnosis. If a test is ordered it will be performed in a timely manner. The provincial lab is in charge of fulfilling all diagnostics and they are able to do so with their current lab capacity. Participants also noted that there is no form of diagnostic prioritization nor is there a need for it.

> Okay, well, this is a pretty straightforward thing. The testing is all done in the provincial lab. It's the same in the north and south of the province. It is serologic testing…they're talking about doing PCR testing on everyone who is positive as a routine. (Clinician 1)

> "The lab puts forward no obstacles." (Clinician 1)

Of note, participants did suggest that point of care testing would be beneficial as it would allow testing to be done on location instead of having to send a specimen to a lab. This is especially useful in remote areas or with hard to reach populations.

> There are point-of-care tests for hepatitis C that use antibodies and in many centers, particularly in the States, can be used by outreach workers and peer educators. These spot tests can be done on saliva or fingerprints. The saliva ones can be done by anyone. The blood prick ones can be done by nurses or LPNs on outreach vans. Current methodology requires a phlebotomist and needs to be done at the healthcare center. It can't be done easily in someone's apartment or in their corner of the homeless shelter. I think if we were to reach these hard-to-treat populations, we would need testing that's a bit easier to do. (Clinician 2)

Treatment

Population affected: There is much debate over who should be eligible for treatment. Fourteen participants are in support of treating vulnerable populations with novel treatment, in comparison to the seven who opposed it.

Participants in favour of treating PWID make statements as such:

> I wouldn't deny treatment for an injection drug user merely because they use injection drugs especially if we can get them access to clean needles and clean paraphernalia, I think they would still be eligible for treatment. (Public Health Expert 6)

> "You shouldn't have to choose who you treat. You should be able to treat whoever you think needs it." (Clinician 6)

Where as those against treating PWID generally propose a criterion for deciding who should receive treatment. Eligibility cited varied from being a "productive member of society" to seeking addiction services. A criterion on who can access treatment is directly opposed to everyone infected and places different values on individuals based on their position in society. Public health experts mention expectations of contributing to society as a reasonable reason to limit access within a public health system.

> Should it be based on the productivity of that person for society? I would think there's a case for that, personally. I mean you would want people that are helping others to be able to continue to do that, whether they are doctors, nurses, or teachers, people that work with the elderly, disabled. There might be a case. I think you could put forward but it should be based on productivity to society. (Public Health Expert 1)

Restrictions: It follows that there is no consensus on whether people support the implementation of restrictions to treatment based on fibrosis score. There are strong opinions on both sides of the argument. Arguments opposing having disease progression restrictions include:

> I would love to have no set restriction on fibrosis. I mean, it makes sense. Those with more advanced fibrosis are more in urgent need of therapy. The problem is you can go to all this work, put someone through all the hoops to diagnose their hepatitis C and get the stage and then you tell them they're not eligible for treatment yet, come back in two or three years when you are. There's lots of room for lost-to-follow-up. Then in the interim, they may progress to more severe liver disease and potentially suffer medical consequences as a result. So I would like to treat everyone and get rid of that fibrosis barrier. (Clinician 2)

Conversely, other participants' support restrictions:

> The rationale there of course is that F2 and above, there's a greater risk of developing end-stage liver disease or liver cancer. Therefore, the argument is with a limit on health resources and health funding, you should treat the advanced fibrosis before the mildly infected cases. (Public Health Expert 1)

Other considerations for whom to treat involve taking different values into consideration. Some participants argue for equal access to treatment,

> Nothing short of unrestricted access to HCV therapy will do anything meaningful to reduce the burden of HCV in Canada and that policy will obviously be equitable. (Clinician 7)

where as others are concerned with the risk of reinfection and its deterrence for providing treatment.

> Risk of reinfection that's kind of difficult to apply in practice but, of course, treated hepatitis C does not confer any immunity against reinfection and so you'd be spending a huge bundle of money and if the patient goes out and gets reinfected, that's kind of gone down the drain. But, as I say, a challenging thing to assess and one would not want to be over-exclusive. (Clinician 1)

There are differing opinions on whether or not the risk of reinfection is a justifiable reason to withhold treatment.

> But on the other hand, it's kind of a legitimate; with the cost of this treatment it's kind of a legitimate concern if the patient has a high risk of reinfection. So legitimate principle but difficult to apply in practice. (Clinician 1)

Treatment as a low priority: Participants underscore that treatment for HCV remains a low priority since they struggle to meet their basic needs. They point out the chaotic lives that PWID and other vulnerable populations live.

> It also depends too on what the patient's priorities are. So for some getting that work up done and completed than going to see a specialist is not their top priority. So it falls off the radar because of so many other more urgent competing priorities, like housing, food, substance abuse issues. So that is another challenge. So even if the identified that they are antibody positive, it may be that they don't actually go and do anything about that at that particular time. (Clinician 1)

Participants emphasize that HCV treatment is not a pressing matter and is overlooked by the government.

> Every time I meet them, we all complain to each other that the government hasn't moved fast enough. They also believe that the drug should be more readily available than what they are in Canada. (Public Health Expert 1)

To further complicate this issue participants note that their patients remain unaware of new treatments. They note that their clients have a lot of misinformation and are only familiar with the older therapies (interferon based therapies) and are therefore less willing to undergo treatment.

> I don't think they're really aware. I think they still think it's like the old treatments, because they always talk about that, they don't really say about the new treatment. (Public Health Expert 14)

New vs. old treatment: Participants were keen to point out the advancement in therapies. When asked about if and how the new therapies would change treating HCV participants were keen to point of the advancement in the technology, namely their efficacy. Participants felt that the novel therapies offer benefits to HCV patient populations that have not previously been available. For instance, they note that the reduction of HCV transmission is now possible. Furthermore, participants noted that there is a large patient population who refused interferon-based treatment who can now make use of novel therapies.

> Oh, they're amazing. They're extremely effective, extremely well tolerated. We can cure 95% of treatment-naive patients even regardless of whether they have a very advanced, far advanced liver disease, and we can cure most patients who have already failed or developed resistance on previous regimens. So efficacy-wise and safety-wise, they're amazing. They are costly. (Clinician 2)

Cost of Treatment: The other major comment regarding treatment is the cost. The cost of treatment for HCV remains prohibitively high. Negotiation with pharmaceutical companies has been proposed as a way to decrease the cost of treatment and participants expressed similar ideas.

> Or you negotiate in a different way with the Pharma right. And that's what other jurisdictions and what other countries have done so Australia for example, decided we want to get rid of hepatitis C, right. We want to treat a population and so if you negotiate with Pharma and you say, instead of treating this small number of patients at a high cost

> were going to treat every body, right. And so they don't need to charge as much for the drugs if they know that they are going to be able to treat everybody that has hepatitis C, cost comes down. (Clinician 6)

Aside from advocating for buying in bulk to drive the cost of treatment down, participants underscore that even with private insurance and the coverage provided there are still gaps, where in the working poor are unable to access treatment.

> There's a lady that works in a bottle depot sorting bottles, minimum salary, doesn't have Blue Cross, continuing to work because she doesn't want to go on to social assistance. She has no coverage because she is the working poor. And there are a fair number of patients that are not making adequate income where they feel they can easily access Blue Cross. That's an issue. (Clinician 4)

Furthermore, the debate surrounding who should pay remains in dispute. Participants argue that the government should pay while others justify the patient paying. Overall, participants are unsure what the best cost effective course of action is and there is no consensus on the matter.

> The cost effectiveness analyses are always hard to interpret because they're often done by drug companies themselves and sometimes its medication is coded as cost-effective but that does not mean cost savings. So whether the government should pay for everyone to get treated for hepatitis C, that would be a huge burden at current prices. It would mean that people couldn't get treatment for TB or it would displace something else. So I think that's a difficult question. (Clinician 2)

Participants also noted that physicians must remain up to date on current treatments and must be willing to treat their patients with new regiments alongside prevention strategies.

> Also even readiness of doctors to do it because another one…Even up to a year ago we had infectious disease doctors here that were not behind it, even though science says that it works, it's a good thing, it's a prevention tool to add to the tool kit, there were local doctors that were out there speaking about we should not be giving medication to healthy people. That was a year or two ago and obviously, it's pretty bad when they're behind. (Public Health Expert 2)

Finally, a couple of participants mentioned the importance of clinical trials and the access to therapeutics they provide.

> I think it's worth noting in here that clinical trials have been extremely valuable to many patients and have saved the government a lot of cost because clinical trials, the drugs are provided free. And often those trials are treating, literally, hundreds of patients on the trials so that they can get treatment earlier without cost. (Clinician 4)

System level Barriers

Onus on physicians: In light of cost effectiveness analysis, currently the decision of how to treat patients remains that of the physician. When asked about how they make their decisions, physicians indicated that there was a lack of guidelines to follow.

> But basically, physicians derive the standard of care. There's no policy set for by the government. The college, the medical association and physician rule themselves. They're an autonomous professional group. (Public Health Expert 7)

Furthermore, physicians look to the US guidelines for treatment rather than Canadian guidelines, as Canada has not set out specific guidelines for treatment.

> I would reference the ASLD (American Society of Liver Disease) and IDSA (Infectious Disease Society of America) guidelines, recognizing of course what is recommended in the guidelines, we don't necessarily have access to in Canada. I follow the evidence base that I have applied in my head… I let people know in Canada what we can't actually access. (Clinician 6)

Canada vs. USA: multiple participants pointed out the differences in availability of drugs in Canada and the United States (US). Drugs become available more quickly in the US and physicians noted their frustration in not being able to offer their patients the most recent drugs.

> There are a lot of drugs that are approved in the States and they can take up to two or three years to be subsequently approved in Canada and Alberta. So if you are on social assistance and you have Blue Cross, Blue Cross takes many months if not years after a drug is first discovered and licensed in the States before they will cover the cost. (Clinician 2)

Increasing Awareness

Public Understanding of HCV: Participants highlighted issues surrounding the publics' awareness and understanding of HCV. They noted that their patients and the general public remain unaware of the signs and symptoms of HCV. They feel it is important for better communication and education about this so that people are able to advocate for themselves.

> And then at the individual level, people who are at risk needs to be informed or made aware about that they need to be screened and they need to demand screening for their hepatitis C infection to get diagnosed early. And then to get treatment then if they're eligible based on provincial guidelines…. promoting disease awareness among high-risk populations to get themselves screened. (Public Health Expert 4)

Furthermore, the messaging the public receives is not user friendly and does not convey the message appropriately.

> A lot of it is fear-based. So it's like, "Get testing or else you could be spreading all these diseases and getting very sick." And there is that stigma that's attached to getting a diagnosis of HIV or hepatitis C. (Public Health Expert 5)

They suggest taking a more open and understanding approach where by stigma is decreased and dialogue is encouraged.

> If we just accept that that's sort of a human thing to do, then yes. Well, if you're talking to a 67-year-old who said, "Yes, in the 60s I might've injected once or twice," the appropriate response would be, "Yes, you and thousands of others. So let's just check that out." (Clinician 3)

Clinician understanding of HCV: Novel treatments for HCV have been introduced and have changed the way physicians treat HCV. There has been significant change in recent years and physicians are required to stay up to date. Therefore, education of practitioners is necessary as their practice is continually changing.

> "So it's education and risk identification and education of clinicians and how to identify people at risk or what a hepatitis C diagnosis means and how to decide what the next steps are and how to pursue those steps." (Clinician 3)

Trust: Participants spoke about the importance of having a trusting relationship between practitioners and patients. They note that talking about hepatitis C can be a sensitive topic and requires openness. Patients must not feel judged in order to disclose information, it is therefore important to decrease barriers to accessing health care such as stigma, especially in hard to reach populations. They need to feel a sense of trust before being willing to enter into care.

> It can be socially awkward when someone comes to you and is looking for treatment for their sore throat and then you're interrogating them about their sexual practices or their injection drug use behaviours. It often takes a relationship to be established before you can just start blasting the risk factor screening. (Clinician 2)
>
> Populations are hard to reach so making sure that they have a good relationship that's culturally appropriate, that meets all their needs, they have a trusted healthcare professional…that's really hard to do. (Public Health Expert 7)

Other Considerations Raised by Interviewees

Harm Reduction: Participants frequently spoke about prevention although there were no questions on the topic. Public health practitioners and physicians who interact with PWID clientele highlighted the importance of incorporating harm reduction strategies when addressing HCV and the importance of addressing multiple issues simultaneously.

> It's like it's providing them with clean needles. My God, if you don't think they're going to stop using needles, we need to make sure they've always got clean needles. I don't like the whole idea of excluding people because they're not worthy. (Public Health Expert 2)

Participants recognize that harm reduction strategies are needed to mitigate risk of HCV and open dialogue between practitioners and patients is suggested to enable access to these services. People will continue to inject drugs and as long as that continues to occur it is important to provide services such as clean needles. Participants also noted that patients are proficient at using harm reduction strategies if they are made available.

> It is definitely my experience that most people -- IV drug users -- are very aware of these things and do their best to prevent transmission to others. They take that responsibility quite seriously. (Clinician 3)

Treatment as Prevention: Another form of prevention that was mentioned was by using therapies as a way to reduce transmission and therefore prevent the spread of HCV amongst PWIDs. The overall consensus was that by treating PWID with novel therapies we can effectively prevent the spread of disease, but there are a few outliers that feel that it is not beneficial to treat PWID because they may become re-infected with HCV.

> If you've treated hepatitis, if you treat enough hepatitis C and you've never seen a reinfection, then you're too conservative right. I mean, he's saying we need to push, we need to treat people who are actively using, those are the people who are transmitting,

> and once in a while you will be wrong and some of them will get reinfected right. (Clinician 6)
>
> Use the networks because they're careful how they inject and they're careful who they trust and they tend to have their own networks of uses, where they get the drugs from and share drugs and share equipment. You could go into those networks and treat them. And by treating maybe 50%, 60% of that network, you will significantly reduce the incidents of infection. (Public Health Expert 1)

Vaccination: Vaccination was infrequently talked about and there were no vaccine specific questions. When discussed, the focus mainly pertained to the hope that a vaccine becomes a viable and cost effective solution for preventing HCV but it will be a lengthy wait for clinical trials and development to occur.

Discussion

My results suggest that there are different approaches that clinicians and policy makers take to determine the most effective way to implement screening, diagnosis and treatment within the Alberta Health Care System. The majority of participants advocated the need for better access to health care, screening services and access to novel therapies. Additionally, they vouched for fewer barriers to care and a more holistic approach. Participants also highlighted the current challenges they are faced with when working in resource constrained settings and outline their views of how a more ideal approach can be taken to help meet the needs of Albertans with HCV. These views were heterogeneous across the different participant groups, indicative of the challenges of addressing screening, diagnosis and treatment of HCV in Alberta.

Structural Factors

At a system level, there have been unclear guidelines for screening and treatment of HCV. In contrast, the infrastructure for diagnostics is clear and already being implemented in Alberta at the population based lab (Provlab) (Jayaraman et al, 2007). Screening and treatment however continue to face barriers in terms of access and funding (Alavi et al, 2014). Barriers remain at the patient and provider level of engagement in care (Alavi et al, 2014). The costs of novel treatments remain prohibitive and there are supports lacking for persons to access screening, resulting in suboptimal uptake (Grebely et al, 2013). System level changes to the implementation of screening programs and accessibility of treatment needs to be addressed

(Alavi et al, 2014). Although the novel treatments are expensive, countries like Australia have moved to make them accessible for their entire patient population (Fischer et al, 2004). This requires system level planning, resources, and commitment; with a collaborative effort Alberta can make the necessary changes within its programs.

Screening

The Canadian Task Force on Preventative Health Care (CTFPHC) released the first ever-Canadian population wide screening guide for hepatitis C in April 2017. This document aims to deliver systematic research findings to clinicians to assist in making clinical decisions. Clinician interviewees highlighted the need for a consensus on screening because to date, screening has been discretionary. Experts in the literature concur that multiple barriers to screening remain. They highlight a need for a concerted effort to change the way we screen for HCV (Alavi et al, 2014).

Accessing screening remains a challenge for marginalized population (Barocas et al, 2014). Clinician interviewees noted that marginalized individuals only access health care for acute reasons and do not access the health care system with any regularity. They have difficulties making appointments with general practitioners (GP) for reasons such as not having the appropriate documentation such as identification. Their lack of access to GPs compounds their access to HCV specialists because of the need for a referral (Doucette et al, 2009). In Edmonton, some clinics allow for self-referral, which may facilitate access to all aspects of care for HCV (Doucette et al, 2009) by eliminating barriers and enabling patients to seek appropriate care. Overall, by improving access to HCV screening, care can be provided with fewer barriers and the burden of HCV can be addressed in populations that otherwise may not be able to (Doucette et al, 2009).

Policy makers and clinicians interviewed noted that hepatitis C is not seen as a "worthy disease"; it is not prioritized or seen as urgent. This lack of prioritization is partly due to political will but is also due to the patient population being largely disenfranchised and having priorities other than health (Alavi et al, 2014). Interviewees pointed out that marginalized individuals are often in search of basic necessities and do not advocate for themselves or seek medical treatment because their more pressing issues involve housing and food. Alavi et al (2014) reached a similar conclusion that poverty, insecure income, injection drug use and social marginalization all demonstrate barriers that affect access to HCV care. These authors recommended targeted strategies for HCV access to overcome disparities.

Additional barriers to health care, including screening, faced by PWID are mistrust of practitioners and fear of detection for drug possession (Fischer et al 2004). Within the PWID population, concerns arise over the stigma associated with HCV. Interviewees highlighted that some of their PWID patients felt it is better "to not know my status". However, other patients wanted to know their status so that they can protect their friends by abstaining from sharing injection equipment whenever possible.

In contrast, persons who are not marginalized or PWID access health care and screening and thereby gain access to treatment for HCV (Conway et al, 2005). Nevertheless, individuals in the general baby boomer population may still face stigma when seeking screening. While this stigma is not associated with lifestyle choices, it still occurred when asking to be screened in a doctor's office. Interviewees noted that doctors were not always willing to screen or would ask for specific reasons to screen, i.e., lifestyle factors. For this reason, some interviewees considered that screening should be automatic, with an opt-out option. Baby boomers are targeted systematically for screening in the US based on age cohort (Galbraith et al, 2015). The Canadian Liver Foundation recommends one-time cohort based screening to capture baby boomers with HCV. However, other interviewees noted that a baby boomer screening program would require substantial time and resources and that simply identifying cases of HCV is insufficient. Furthermore, there have been efforts to compensate individuals who received contaminated blood and screening programs have targeted them specifically (Krahn et al, 2004). This program highlights the preference given to HCV positive persons who contracted the disease based on circumstances outside their control, rather than through what may be perceived as lifestyle choices.

While screening could take many forms, interviewees suggested that effectiveness involves normalization of screening, opportunistic screening and systematic screening, combined with the willingness of doctors to screen. Participants defined normalization of screening as screening becoming commonplace, where doctors do not have to think about whether or not to screen. Where as they define, opportunistic screening as asking people with risk factors if they have been screened or if they want to be screened every time they contact health care. This would require physicians to be trained to look at all aspects of health and to look beyond the presenting issue. Furthermore, systematic screening is defined as becoming part of a routine primary and preventative care and not require looking for HCV risk factors. This would simplify doctors' roles and would just be another check mark instead of having to ask personal questions.

Aside from how screening should be done, another concern was if we widely screen a population, we must also be able to provide treatment in a cost-effective way. Participants noted the ethical dilemma in establishing presence of disease but not being able to actively treat it. Physicians worry they would be causing unnecessary panic amongst their patients. The opposite argument exists where in people feel they have the right to know their disease status and are able to determine how to best address it, including prevention strategies and education.

It is important to note, however, that screening programs place resource pressures on laboratory services within provincial health systems. Interviewees indicated that laboratory services in some provinces might not be able to accommodate a wider net for screening, laboratory services and a prioritization strategy would have to be put in place. However, Alberta has a relatively a large laboratory capacity in its Provincial Laboratory (ProvLab). The interviewees were in favor of expanding the information captured by Provlab to include risk exposure and ethnicity to garner a more complete picture of the HCV epidemic (Jayaraman et al, 2007).

In summary, routes of transmission for HCV include previously received unscreened blood and current or past use of injection drugs (Fischer et al, 2004). There has been greatly improved blood screening and there is almost no HCV transmission (Fischer et al, 2004). Persons who have been infected from unscreened blood have received compensation and were notified in multiple provinces across the country (Krahn et al, 2004). Many efforts have been made to detect these cases and the baby boomer age cohort have largely been targeted for HCV screening. This is not the case for other high-risk groups due to poverty, social issues and poor overall health (Fischer et al, 2004). Most interviewees advocated for high-risk screening to capture the largest number of positive cases and to target populations in which active transmission of HCV is ongoing. Targeted screening of both of these populations would enable access to appropriate health care and services, and decrease of HCV transmission.

Diagnosis

Diagnosis is a key factor in the management of HCV. A positive diagnosis enables patients to seek treatment, which has a population health benefit as successful treatment reduces the burden of HCV (Jayaraman et al, 2007). Diagnostic protocols in Alberta are well established (Alberta Provincial Laboratory, 2016). Diagnostics follow a stepwise process where by primary physicians order an EIA. Based on the result, if positive, patients are referred to specialists who then order a confirmatory PCR test (Alberta Provincial Laboratory, 2016).

There are very few barriers to diagnosis. The central laboratory based in Edmonton, has large capacity to run tests and is capable of generating results in 3-5 days at most (Alberta Provincial Laboratory, 2016). However, PCR testing may be restricted to certain physicians in order to decrease the number of tests ordered inappropriately (Alberta Provincial Laboratory, 2016). Furthermore, by having a two-step system for diagnosis may prove problematic for persons who are hard to reach as they may be lost to follow up. Contrariwise, Alberta is trying to implement more outreach diagnosis via a portable Fibroscan machine, currently Firbroscan is not available outside major cities such as Calgary and Edmonton (Government of Alberta, 2016). This would increase the availability of testing to populations living remotely or that are otherwise hard to reach.

Irrevocably, confirmed cases of HCV are captured by the public health surveillance systems and provide information about demographics of disease burden (Jayaraman et al, 2007).

Treatment

Barriers to accessing novel treatments still exist for marginalized populations such as PWIDs, prison inmates and indigenous populations (Volk et al, 2011). Irrespective of treatment advancement, access to treatment in marginalized populations remains inadequate (Alavi et al, 2014;Dore et al, 2012), and treatment uptake has not increased (Alavi et al, 2014; Hellard et al, 2009; Milne et al, 2015). Thus, barriers to HCV therapeutic access must be managed to achieve the promised population health outcomes of new drugs (Milne et al, 2015). Barriers to treatment include substance use, mental illness, poverty, homelessness, criminalization, stigma and marginalization (Milne et al. 2015).

Individuals impacted by barriers relating to the social determinants of health often face significant trouble accessing health care services (Browne et al, 2012). Treatment is not always a priority among inner city patients as they often have more pressing issues such as finding shelter and food (Fischer et al, 2014). Furthermore, because HCV often is asymptomatic, these pressing issues take precedence over seeking HCV care (Fischer et al, 2014). There is also a lot of misconception about available treatments (Milne et al 2015). Individuals have a negative impression of the old regimens, which were accompanied by severe side effects, and are unaware of the new treatments (Robaeys et al, 2013; Grebely et al, 2014). Dissemination of knowledge about the efficacy and tolerability of novel HCV drugs will advance the individual and population health benefits associated with treating HCV in marginalized populations (Milne et al, 2015). Interviewees highlighted the need for public education on screening and treatments as well as simplified messaging targeted to those populations are increased risk of HCV incidence.

Patient provider relationships and trust is vital in breaking down barriers to treatment for HCV (Alavi et al, 2014). Both the literature and interviews identified trust as a barrier to treatment. Interviewees spoke about the importance of having patient provider trust in order to effectively communicate about risk factors, lifestyle, treatment and prevention options. Access to treatment and other services is impacted if physicians are unwilling to engage with patients deemed unworthy or if patients perceive judgment or stigmatization (Milne et al, 2015; Fischer et al, 2004). Low-threshold clinics, where barriers to access are reduced and patients are able to have their needs met within their communities, are needed (Alavi et al 2013;Grebely et al 2013;Milne et al 2015). HCV services should build on established and trusted community services to foster relationships (Milne et al 2015). Ongoing relationships and open dialogue encourage individuals to seek care (Milne et al, 2015). Treatment and other social services should be provided in tandem. Such a holistic, multisectorial approach, which bundles treatment with other supports, correlates with increased completion of the treatment courses and is the most fruitful approach (Harries et al, 2013;Robaeys et al 2013;Milne et al, 2015). It enables expertise to be combined to tackle all aspects of HCV treatment (Fischer et al; Edlin et al, 2001).

While health, social, and addiction services collectively need to inform policy regarding access to treatment in PWID (Fischer et al, Edlin et al, 2001), the high-cost of HCV drugs remains a barrier to access. At the time of my interviews with experts, a fibroscore of 2 or above established eligibility for treatment coverage (Government of Alberta, 2016). On April 1, 2018, this eligibility criterion based on fibroscore was removed (CATIE, 2018). Interviewees did not reach consensus on the issue of access to high-cost drugs, with some policy makers arguing that the high cost is a reasonable reason to limit access within a public health system, and some policy makers and the majority of physicians arguing that treatment should be made available to all whom seek it because of public health benefits. These contrasting viewpoints are echoed in the literature (Fischer et al, Davis et al 2001; Edlin et al, 2001; Edlin et al, 2002).

Some interviewees also noted that the new drug regimens should be limited to persons who are not likely to be re-infected due to continued drug use, however, others argued for universal access to achieve a greater public health effect and to decrease transmission. Fischer et al (2004) and Milne et al (2015) argue for the latter position, suggesting that treatment for marginalized populations, namely, PWIDs, should be individualized, and persons should not be excluded from treatment systematically. This disagreement highlights the concept of deservedness, which serves as a barrier to treatment for PWIDs, who are often criticized for having "brought the disease on themselves". This leads to the conclusion that they should not be prioritized to receive treatment (Fischer et al; Heathcote et al, 2001;Edlin et al, 2001;Rehm et al, 2003). To compound issues of access, willingness of doctors to treat HCV amongst their PWID patient population remains problematic (Alavi et al, 2014). The debate is reflected at the structural level, persons who are economically disadvantaged are covered for treatment only in certain jurisdictions (McLaren et al, 2008). This leads to inconsistent access to treatment based on provincial coverage decisions (Milne et al, 2015). However, a strong argument may be made that the greatest public health benefit may be realized by treating the highest risk populations without discrimination and with comprehensive access to treatment (Fischer et al 2004, Rehm et al, 2003).

The risk of re-infection after treatment of HCV amongst PWID remains a practical concern with differing opinions on how to allocate treatment resources. Grady et al (2013) suggest that reinfection after treatment does occur in PWID groups but the rate of reinfection remains low. They suggest that treatment for HCV amongst this group should still be considered as it can reduce transmission of HCV. They also note that more resources are needed for education, counseling and follow up. Equally, Martin et al (2011) suggest that treating HCV within PWID groups is cost-effective but only when 60% of the user network are antibody positive, in order to establish maximal results. This would require a concerted effort in finding persons in the early stages of the disease. They also note that treatment should be prioritized within this group, but understand that policy makers may not be willing to invest in treating this group, as they must consider budgetary demands. Overall, deciding on treatment prioritization within this groups remains challenging, with no clear-cut approach.

Limitations

The present study has a few limitations. Firstly, it was difficult to contact all members in the field. Nurses were hard to reach and did not participate in interviews, which suggests that a viewpoint may be missing, as they are often the more hands on care providers. I was however, able to contact GPs and Infectious disease physicians (IDs), but similarly to the nurses, I was unable to contact hepatologists, who often see a lot of patients with HCV. GPs are aware of screening recommendations and are often the first point of contact for people and IDs see and treat a lot of hepatitis C and want to reclaim the field so they are motivated to participate and follow the literature closely. The participants represented in this study were invested and keen to participate but overall the results may biased due to the lack of all members of the field being able to participate. Furthermore, the sample size was limited due to busy schedules of professionals and there is a limited number of practitioners working on hepatitis C.

Additionally, the study was limited to one main jurisdiction. The results are therefore relevant of Alberta but cannot be applied Canada wide since health care is a provincial responsibility.

New guidelines for screening and treatment were released after the interviews were conducted; therefore, participants could not comment on the controversial recommendation not to implement universal screening as well as the exclusion of fibrosis score as a criterion for accessing treatment. Having these guidelines prior to conducting interviews could lead to different questions, however the responses given highlighted the lack of consensus amongst participants and the frustration with not having clear guidelines.

Conclusion

My research contributes to the literature by determining how policy makers and clinicians in Alberta make decisions about screening guidelines and implementation; provision of diagnostics services; and the allocation of novel treatments for hepatitis C in a resource-constrained setting. There is seemingly an overall lack of access to care and no consensus on how to best approach issues regarding screening, diagnosis and treatment of hepatitis C.

Throughout my research there were many different screening options proposed, each with their own merit. My research findings indicate that consensus needs to be reached amongst professionals in the field in order to determine which approach to screening should be undertaken. A combination of screening approaches would be reasonable to be undertaken, in a comprehensive way to address the needs of the populations effected by HCV. Populations effected by HCV must be at the forefront when deciding how to screen. A dynamic approach where in individual needs can be met remains of the utmost importance. Access to screening regardless of the population must come to fruition. Persons should be able to have their needs met where they are. Physicians must remain vigilant and aware of their patients' needs.

The fear of screening but not being able to provide treatment is a practical concern highlighted in my findings. However, even if screening is provided with no immediate follow up or treatment, patients often appreciate knowing their status and becoming more educated about lifestyle factors and preventative strategies (Mahmudal et al, 2014).

Diagnosis in Alberta is performed at a centralized provincial laboratory that has a large capacity for HCV testing. We are not currently faced with the need to prioritize testing. Provlab is able to handle requests for testing in a timely manner.

My research suggests that approaches for HCV treatment need to cast a wider net and move outside of the biomedical model of health. A holistic approach where in the individuals social determinants of health can be addressed is called for

> An effective model could be based on a multidisciplinary "one-stop shop" approach whereby the treatment of addiction, HIV, HCV, and other infectious diseases were integrated via systematic collaborations between nurses, counselors, addiction specialists, infectious disease specialists, primary care physicians, and researchers (who would be mandated to measure the effectiveness of the program in an objective way)(Conway et al, 2005).

Integrated services may be a good way to address the lack of access to health that vulnerable populations are faced with. People in these populations interact with the health care for acute medical care and have their needs met in that way but this misses the bigger picture of health (Milne et al, 2015). If we can have a catch all system where by vulnerable populations can have all their health concerns addressed at one location we can minimize the inequities they experience (Conway et al, 2005). An example of this is outreach programs to actively engage people in care by meeting them where they are, instead of having them navigate a complicated health care system.

Although screening, diagnosis and treatment for hepatitis C seemingly work in silos, there are many stakeholders involved and there are increasingly more panel discussions. Stakeholders such as CATIE, The Canadian Liver Foundation, The Hepatitis Support Program etc. all offer invaluable services and support for persons with HCV. We will need to continue to increase dialogue between different sectors to have a more coordinated approach.

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Chapter 4: Conclusion

In this thesis, I addressed the current Canadian landscape of screening, diagnosis and treatment for Hepatitis C and identified the social values that might inform health system decision-making for different populations. My research explored the barriers and challenges that exist in applying a broad range of social values in health system resource allocation decision-making, using hepatitis C as a case study. HTA agencies in Canadian provinces make such recommendations based primarily on cost effectiveness analyses. These analyses consider efficiency, defined as the balance that maximizes population health outcomes for given resources (Culyer, 2012). In focusing on cost effectiveness, however, HTA fails to adequately consider broader social values and patient preferences (Menon et al, 2009; Blomqvist et al 2013; Menzel et al, 1999;Ubel et al, 2000).

My research focused on the Province of Alberta. I had 4 aims, namely, to:

1) Analyze the academic literature on screening, diagnosis and treatment of Hepatitis C in Canada to identify inherent social values in this domain.

2) Analyze the social values that might be taken into account by Canadian HTA agencies, using Hepatitis C as a case study.

3) Analyze how policy makers and clinicians in Alberta make decisions about screening guidelines and implementation; provision of diagnostics services; and the allocation of novel treatments for Hepatitis C in a resource-constrained setting.

4) Examine the challenges faced by health policy makers and clinicians when approving and implementing screening, diagnosis, and treatment within Alberta's health care system.

In this chapter, I briefly summarize my thesis research and propose recommendations for decision makers about screening, diagnosis and treatment of Hepatitis C in at-risk Canadian populations that reflect social values identified in my scoping review. I then discuss study limitations and suggest future research.

To address aims one and two, I conducted a scoping review of the academic literature on screening, diagnosis and treatment of HCV in Canada.

I abstracted: type of intervention(s), population(s) affected, location of study, screening methods, diagnostics and treatment options. The populations were PWID, indigenous peoples, prison populations, blood transfusion recipients and baby boomers. I then abstracted qualitative codes for social values: equity and juctice, duty to provide care, maximization of population benefit and individual versus community interests. I presented the results in Chapter 2 found that academic literature calls for more tailored approaches to screening, diagnosis and treatment of Hepatitis C that consider a broader range of social values.

In my second empirical chapter, which addressed aims three and four, I presented an analysis of semi-structured interview transcripts that aimed to identify the challenges and barriers faced by policymakers and clinicians, who are deciding whether and how to implement screening, diagnosis and treatment programs for HCV. I interviewed policy makers and clinicians to gain insight into how we can better address the needs of different populations at risk of HCV infection. My interviews also addressed the considerations that ought to be taken into account by health system decision makers when making resource allocation decisions. My analysis identified that there is an overall lack of access to care and no consensus on best practices for screening, diagnosis and treatment programs. However, the experts suggested that populations affected by HCV should be specifically considered when deciding how to screen, diagnosis and treat. Interviewees recommended a dynamic approach to meet individual needs. They suggested that approaches for HCV need to address the social determinants of health that vary between populations and provide considerations beyond a biomedical model of health.

Hepatitis C in Canada represents multi-level challenges at both population and systems levels. There is a need to tailor HCV screening, diagnosis and treatment to meet the characteristics and need of specific at-risk populations. Screening measures are controversial; indeed, the Canadian Task Force on Preventive Health Care (2017) recommended against age cohort screening. In contrast, the academic literature highlighted the need for equitable approaches to screening, in part, based on a duty to provide care for specific populations. Clinicians and policy makers echoed the need for population-based screening based on risk factors. They argued for a combination of screening approaches specific to needs of the different populations affected by HCV. The academic literatures as well as experts in the field of HCV advocated for an equitable approach to screening to ensure necessary access and for screening programs to be made available without barriers (Myers et al, 2012). It remains important to screen individuals in so they can consequently receive a diagnosis.

Diagnosis of HCV is more straightforward, and the provincial laboratory in Alberta has thus far been able to accommodate the demand for diagnostic services (Government of Alberta, 2016). Further, one solution to improve diagnostics for geographically isolated populations through point of care diagnostics is advancing and may result in more equitable access to diagnostic services (McPartlin et al, 2014; Weber et al, 2016).

Access to DAAs for HCV has simplified treatment regimens because this class of drugs only requires one tablet a day and has fewer adverse effects than older treatments. However, these therapies are high-cost, meaning that provincial health systems limit access to them. Furthermore, some populations with HCV are difficult to engage in care. The academic literature as well as experts stressed the importance of engaging high-risk populations in care and the need to tailor care to meet their needs. This involves addressing more than just HCV, but also taking into account the living situation of individuals and the underlying social determinants of health. Treatment must be implemented in a just and equity-based manner. Further, the literature and experts emphasized that health systems have a duty to provide care, especially to the most vulnerable segments of society.

Recommendations

Hepatitis C screening, diagnosis and treatment in Canadian provinces are in a period of transition. While the controversial Canadian Task Force on Preventive Health Care (2017) screening guidelines recommend against population-based screening, diagnostic services and curative therapies are available. Access to the latter is limited and based on evaluation of disease severity. Accordingly, these therapies present both opportunities and challenges for addressing the needs of populations with HCV. Based on my scoping review and expert interviews, I make the following recommendations for screening, diagnosis and treatment of HCV in Canadian populations.

The Canadian Task Force on Preventive Health Care (2017) have been criticized as not being systematic and not wholly addressing the needs of affected populations. It is timely, therefore, to reconsider and develop innovative screening programs. Experts in the field described different approaches to screening, namely normalization of screening, opportunistic screening and systematic screening. These approaches seek to make screening more accessible for marginalized populations and high-risk populations alike, while also implementing an equity based approach that accounts for a broader range of social values than simple efficiency. The experts argued that HCV should be broadly available even if not all those who are then diagnosed with HCV can access new treatment regimens. Knowledge of HCV infection may reduce transmission because it enables individuals to take appropriate precautions. Furthermore, screening programs for HCV could be integrated with other screening programs, and by addressing the social determinants of health, connect vulnerable individuals to health and social services. This recommendation considers social values beyond utility, including equity and the health system's duty to provide care.

In Alberta, the provincial laboratory is able to meet the demand for diagnostic services (Government of Alberta, 2016). However, individuals living in remote areas, outside of urban centers and on reserves still face access issues. Further implementation of point of care diagnosis for HCV may address this access issue.

DAAs for the treatment of HCV are curative. However, these new drug regimens remain prohibitively expensive, especially in publicly funded Canadian health care systems (Artenie et al, 2015). Decisions to adopt are not neutral in a budget-constrained environment, and the adoption of costly new interventions will displace other services in the health care system (opportunity costs) and have a budgetary impact (Government of Alberta, 2016). Such resource limitations necessitate innovative approaches to enable equitable access to DAAs and other HCV treatments. The social values identified in the academic literature suggest that in designing treatment programs, decision-makers should account for the needs of marginalized populations, taking into account their position in society.

Health systems should simultaneously address the social determinants of health coincident with HCV infection and focus on improving access to a broad range of health and social services for marginalized populations. To increase access to services, open dialogue between patients and providers is necessary. Such dialogue will additionally address structural stigma associated with HCV. Integrated health services and outreach programs would ensure equitable approaches to health care and would increase much needed access to health services wherein treatment options can be discussed. Improving access to healthcare services is essential for marginalized populations, because the individuals who make up these populations require innovative approaches to care. Their needs are not met by traditional health care services (Barocas et al, 2014)) and require an approach that considers the contextual factors that influence their unique circumstances. Moreover, access to care needs to encompass more than health care directly, but needs to apply an approach that seeks to address the underlying social determinants of health. Marginalized populations should therefore be involved in health care decision-making.

Study Limitations

The scoping review is inherently limited to the available literature. Anything published after the literature search step of the scoping review is excluded. Further, there was limited literature on populations living in rural and remote communities as well as persons living on reserve. Considerations of these populations are therefore not as well represented as the other populations in my study. The particular social values specific to these populations are under represented in my analysis. Furthermore, the coding of the social values is subjective, this was mitigated by double coding and coming to consensus on any disagreements but the subjective nature of social values can be interpreted differently based on readership.

The qualitative content analysis sample population is limited in terms of the members that were able to participate, nurses were hard to reach and did not participate in interviews. This viewpoint is therefore not represented. Similarly, I was unable to contact hepatologists. Both of these groups represent active members in the field of HCV that are missing from the study, this is diminished by contacting other engaged clinicians and public health experts. The participants represented in this study were invested and keen to participate but overall the results may be biased due to the lack of all members of the field being able to participate. Furthermore, the sample size was limited due to busy schedules of professionals and there is a limited number of practioners working on Hepatitis C.

An overall limitation of both chapters is that they did not consider preventive of HCV, nor did they consider means of harm reduction. Prevention and harm reduction are important interventions for addressing HCV and seek to decrease the transmission of HCV. These services are an integral part of managing HCV but the vase literature on these topics may it unfeasible to include them in the present study. Lastly, the study was limited to one main jurisdiction. The results are therefore relevant to Alberta but cannot be applied Canada wide since health care is a provincial responsibility. Each province determines its own resource allocation and how they choose to address HCV. It remains unclear if the overall conclusions apply to other jurisdictions, however the scoping review considered all Canadian Hepatitis C literature.

Future Research

In conclusion, future research might better address the needs of people affected by HCV. For example, it might reevaluate the controversial Canadian Task Force on Preventive Health Care (2017) guidelines for screening of HCV in Canadian provinces, especially the exclusion of baby boomers from one-time screening. Furthermore, it might pilot and evaluate comprehensive, alternative screening programs that account for health risk behaviours and structural inequities. Such alternative programs include comprehensive, opt out, routine screening, and risk based screening. To tailor screening programs, research might better elucidate the means by which individuals in different target populations seek and process health-risk information about HCV infection. Such research might further shed light on why individuals do not access screening, for example, do individuals choose not to be screened, or do they face barriers in accessing information and screening.

The HCV landscape is rapidly changing with the approval of DAAs. However, access to these novel therapies remains difficult for marginalized populations. For example, socially disenfranchised PWID make up a large proportion of persons infected with HCV. Future research might focus on how best to engage individuals from marginalized populations. This might include an evaluation of the feasibility and impact of treating prison populations while incarcerated. Further, it remains unclear if treatment of HCV is a means of prevention against transmission, warranting further investigation.

Finally, my research identified a broad range of social values that might be taken into account by health resource allocation decision-makers. Further research should evaluate how these social values might be incorporated into decision making processes, including HTA, and their acceptability to decision makers. Such research should include a wider selection of Canadian provinces and expand the research beyond Alberta and Hepatitis C.

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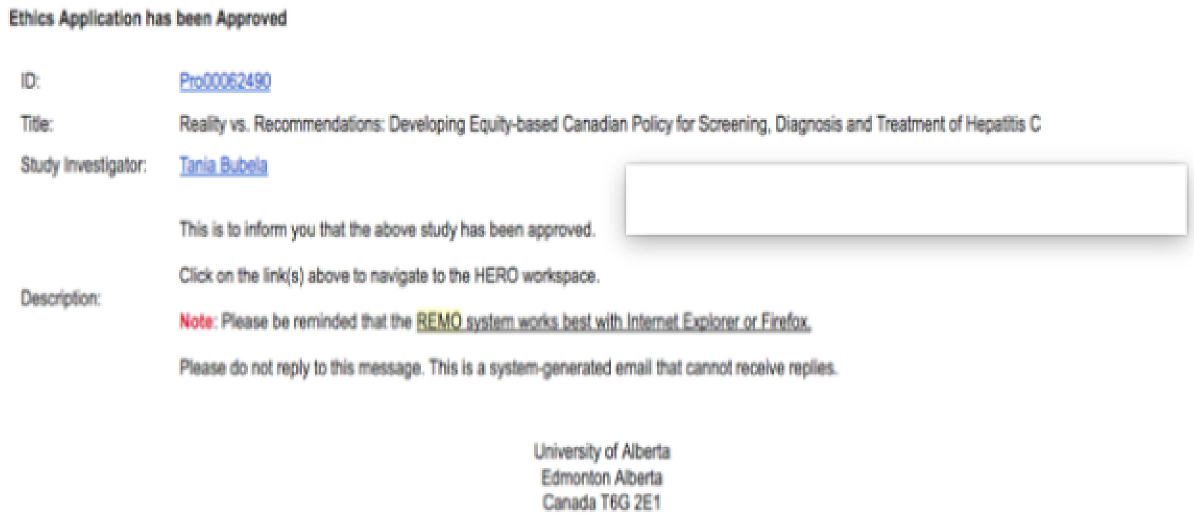
Appendices

Appendix I: University of Alberta Research Ethics Board Approval Letter



Ethics Application has been Approved

ID:	Pro00062490
Title:	Reality vs. Recommendations: Developing Equity-based Canadian Policy for Screening, Diagnosis and Treatment of Hepatitis C
Study Investigator:	Tania Bubela
Description:	This is to inform you that the above study has been approved. Click on the link(s) above to navigate to the HERO workspace. Note: Please be reminded that the REMO system works best with Internet Explorer or Firefox. Please do not reply to this message. This is a system-generated email that cannot receive replies.

University of Alberta
Edmonton Alberta
Canada T6G 2E1

Appendix II: Information Sheet

INFORMATION SHEET for the University of Alberta Research

Reality vs. Recommendations: Developing Equity-based Canadian Policy for Screening, Diagnosis and Treatment of Hepatitis C

Background:

Hepatitis C (HCV) is a blood borne virus (WHO, 2014). It has infected more than 185 million people worldwide and causes 350,000 deaths per year due to HCV-related cirrhosis and liver cancer. HCV prevalence is greatest among the "baby boomer" cohort born between 1946-1965 (Schanzer, 2014) as well as vulernable populations, including street involved individuals, persons who inject drugs (PWID), incarcerated persons, and persons of aboriginal descent. Population-level control of HCV requires coordinated programs for screening, diagnosis and treatment. In Canada, HCV is a notifiable disease; monitoring and surveillance systems identify cases at a population level. Researchers have additionally recommended systematic surveillance (Schanzer, 2014), but provincial healthcare systems have yet to implement these recommendations. Because of the lack of routine screening, most Canadians are unaware of their HCV status (Wong et al, 2015). Until recently, standard treatment has been alfa interferon or a combination of interferon and ribavirin (Manns, 2001). However, since 2013, novel, curative treatments such as Sofosbuvir have become available. These are prohibitively expensive at $80,000 for an 8 week treatment regimen. Given the high cost of thereapies, significant equity issues arise with respect to access by vulnerable populations (Volk et al, 2011).

In light of novel but expensive treatment options, it is timely to evaluate the best available evidence for policy development and resource allocation decision-making for screening, diagnosis and treatment programs for HCV in Canada. My analysis of efficient and equitable resource allocation will enable the optimization of access to expensive new treatment options. By focusing not only on epidemiological and economic considerations, but also on social values, my research will provide decision-makers with a framework to ensure equitable access to HCV interventions, especially for vulnerable populations.

Purpose:

The main objective of the proposed research is to inform the development of an evidence-based national strategy for screening, diagnosis, and treatment of HCV. While prevention is also an important HCV intervention, prevention programs are beyond the scope of this study. Specifically, I will support decision-making for HCV interventions by (1) developing an evidence-base on recommended best practices in the literature for screening, diagnosis, and treatment of HCV via a scoping review of the Canadian literature; (2) using qualitatitve methods to analyse that literature for explicit and implicit social value statements about the design and implementation of HCV interventions; and (3) conducting semi-structured interviews with experts (policy makers, HTA decision-makers, and clinicians) on the barriers and enablers to implementation of HCV interventions, current programs in 3 key jurisdictions (British Columbia, Alberta and Ontario), and social values taken into account when designing and implementing HCV programs.

What will you be asked to do?

A project researcher will interview you. This interview will take approximately three-quarters to one hour of your time. We will give you the option to review our notes on your comments, and you may request to receive the final report by providing your contact information on the last page.

What type of personal information will be collected?

Should you agree to participate in this study you will be asked to express your point of view and tell us about your experiences with screening, diagnosis and treatment of Hepatitis C and/or resource allocation and patient prioritization decision making. We will ask your permission to audio record our conversation. You may request the audio recording device to be shut off at any time.

Are there risks or benefits for participating?

We are not aware of any long-term risks posed by participating in an interview and care will be taken to de-identify participants information. There are no costs for you to participate in this study, other than the investment of your time. The benefits include the opportunity to provide feedback on your experiences to help us inform policy development.

Participation:

Participation in this research is voluntary and you may choose whether you would like to participate or withdraw without consequence.

Withdrawal from the study:

Even after you have agreed to participate in the interview you can decide at any point that you do not wish to continue. You may decide that you do not want what you said to be used up until the time the results of this study are put together for publication. The researchers then cannot use this information and it will be destroyed.

Confidentiality:

The information you provide will be de-identified by being assigned a number rather than your name. The de-identified data will be made available to the study researchers working on this project, all of whom will have signed a confidentiality agreement. The audio recording device will be used for research reference only. The data collected, including audio recordings, transcripts of recordings, and any notes, will be stored in a secure manner by the principal investigators and kept for 5 years post-publication after which the data will be destroyed.

Use of the Information:

From the results of this research, the researchers will make practical recommendations for policy makers, research institutions, funders, and industry. The results may also be used in academic presentations and be published in academic journals.

Contacts: This study is run by Dr Tania Bubela (Department of Public Health Sciences).

If you have any further questions or want to clarification regarding this research and/or your participation, please contact:

Dr. Tania Bubela

Department of Public Health Sciences

University of Alberta

(780) 492-9335

tbubela@ualberta.ca

Additional Contacts:

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

Appendix III: Consent Form for Interview Participants

CONSENT FORM To Participate in the University of Alberta Research Project:

Reality vs. Recommendations: Developing Equity-based Canadian Policy for Screening, Diagnosis and Treatment of Hepatitis C

Dr. Tania Bubela (Principal Investigator)

Department of Public Health Sciences

University of Alberta

(780) 492-9335

tbubela@ualberta.ca

Do you understand that you have been asked to be 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 research 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 in this study at any time without giving a reason?	Yes	No
Has the issue of confidentiality been explained to you?	Yes	No
Do you consent to being audio recorded?	Yes	No
Do you understand who will have access to the records from this interview?	Yes	No

Do you understand that the information you provide will be used to make policy recommendations? Yes No

Can we use this information in the future for presentations and publications? Yes No

This study was explained to me by: ______________________________

I agree to take part in this study.

____

Signature of Research Participant Date Printed Name

I would like to receive a copy of research results (check one):

☐ No ☐ Yes

If you would like to receive a copy of the research results please provide us with your address:

____

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

__________________________________ __________________

Signature of Investigator Date

Appendix IV: Interview Guide for Clinicians

SEMI-STRUCTURED INTERVIEW GUIDE: CLINICIANS

Preamble

Thank you for agreeing to an interview. My study aims to understand the evidence and the implementation barriers for the screening, diagnosis and treatment of Hepatitis C in [NAME PROVINCE] and Canada.

I will be asking you questions about decision making processes with respect to resource allocation and prioritization for Hepatitis C screening, diagnostics and treatment in [NAME PROVINCE] and Canada.

I would like to remind you that all of your answers will be kept confidential and there will be no personal identifiers attached to the data collected. You may decline to answer any questions. You may withdraw your answers for any reason up to 90 days after this interview.

Do you have any questions before we begin?

Questions

Background

1. Please tell me briefly about your clinical background.
   [PROMPT: Specialist training, length of career, number of patients with Hepatitis C seen]

2. Can you please describe your Hep C patient population
   [PROMPT: Median Age, Socio demographic, risk factors etc.]

Screening

1. Can you please describe the current screening program in [Name of Province]?
2. What is your involvement in screening for Hepatitis C?
3. Does [NAME OF PROVINCE] differentiate among populations in its screening program? If yes,
   a. What is your opinion on the screening criteria?
4. If you could the design an ideal screening program, what would it look like?
   [PROMPT: Who would you screen? How often would you screen? Where would screening take place? Would it be a Provincial or nationally coordinated effort]
5. What barriers prevent the implementation of the ideal screening program?
   [PROMPT: inter-provincial co-ordination/co-operation; health information sharing; budget; political/policy will]

Diagnosis

1. What is the diagnosis protocol for Hepatitis C in [Name of Province]?
2. Do you prioritize diagnosis in some populations?
   [PROMPT: Which groups are prioritized]
3. Is access to diagnostics in [Name of Province] adequate, and if not, how could it be improved?
   [PROMPT: budget, access to healthcare services by vulnerable populations]
4. What sort of follow up do you have with patients once they have been diagnosed?

Treatment

5. Which clinical guidelines for treating Hepatitis C patients do you follow when deciding on a treatment regimen?
6. What patient characteristics do you take into account when determining the treatment regimen?
   [PROMPT: Reinfection? Co-infection? Likeliness to adhere?]
7. What is your clinical opinion on the new HCV drugs?
   [PROMPT:In your opinion, what are the main benefits of the new treatments for Hepatitis C? Do the new treatment options, such as Sovaldi, change the way you treat and diagnose patients?]
8. Is access to therapies in [Name of Province] adequate, and if not, how could it be improved?
   [PROMPT: budget, access to healthcare services by vulnerable populations]
9. What barriers exist in matching patients with the most clinically and cost-effective treatment regimen?
   [PROMPT: budget, access to healthcare services by vulnerable populations]
10. How should hepatitis C drugs be funded?
    [PROMPT: What should the system look like? (e.g.. Tiered)]

Miscellaneous

11. Is there anything else you would like to add?
12. Are there any people that you would suggest that we also interview?

Thank you for your time! That concludes our session for today. I will be in touch to provide you with a summary of the information gathered and a chance to comment and provide feedback. This will give you a chance to clarify your answers if you desire.

Appendix V: Interview Guide for Public Health Experts

SEMI-STRUCTURED INTERVIEW GUIDE: PUBLIC HEALTH PROFESSIONALS/DECISION MAKERS

Preamble

Thank you for agreeing to an interview. My study aims to understand the evidence and the implementation barriers for the screening, diagnosis and treatment of Hepatitis C in [NAME PROVINCE] and Canada.

I will be asking you questions about decision making processes with respect to resource allocation and prioritization for Hepatitis C screening, diagnostics and treatment in [NAME PROVINCE] and Canada.

I would like to remind you that all of your answers will be kept confidential and there will be no personal identifiers attached to the data collected. You may decline to answer any questions. You may withdraw your answers for any reason up to 90 days after this interview.

Do you have any questions before we begin?

Questions

Background

1. Please briefly tell me about your background and current position
2. What is your role in the design and implementation of screening/ diagnostics and/or treatment programs for Hepatitis C?

Screening

3. Can you please describe the current screening program in [Name of Province]?
4. How are decisions in [Name of Province] made on whom to screen, frequency of screening and screening method?
   [PROMPT on Process and individuals/agencies involved? How are different populations prioritized, if all]
5. In your experience, what has worked and what needs improvement?
6. How does [Name of Province]'s screening program compare with other jurisdictions in Canada?
7. If you could the design an ideal screening program what would it look like?
   [PROMPT: Who would you screen? How often would you screen? Where would screening take place? Would it be a Provincial or nationally coordinated effort]
8. What barriers prevent the implementation of the ideal screening program?

[PROMPT: inter-provincial co-ordination/co-operation; health information sharing; budget; political/policy will]

Diagnosis

9. What is the diagnosis protocol for Hepatitis C in [Name of Province]?
10. Who decides which diagnostics methods are used and what is the decision-making process?
11. Is diagnosis prioritized in some populations?
    [PROMPT: Which groups are prioritized]
12. Is access to diagnostics in [Name of Province] adequate, and if not, how could it be improved?
    [PROMPT: budget, access to healthcare services by vulnerable populations]

Treatment

13. What is the standard of care for Hepatitis C in [Name of Province] and how was that arrived at for different populations?
    [PROMPT: new vs. old treatment regimens]
14. Can you explain the decision-making process for the adoption of new treatment regimens, such as Solvadi in [Name of Province]?
    [PROMPT: What role do practice guidelines and evidence of clinical and cost-effectiveness play? Who has input into the decision-making process? Are specific populations prioritized?]

15. What should decision-makers take into account when making decisions on the adoption of treatment regimens?
    [PROMPT: equal access; lifestyle factors, co-infection, risk of re-infection, age]
16. Is access to therapies in [Name of Province] adequate, and if not, how could it be improved?
    [PROMPT: budget, access to healthcare services by vulnerable populations]

17. What barriers exist in matching patients with the most clinically and cost-effective treatment regimen?
    [PROMPT: budget, access to healthcare services by vulnerable populations]

Miscellaneous

18. Is there anything else you would like to add?
19. Are there any people that you would suggest that we also interview?

Thank you for your time! That concludes our session for today. I will be in touch to provide you with a summary of the information gathered and a chance to comment and provide feedback. This will give you a chance to clarify your answers.

Appendix VI: Confidentiality Agreement

Confidentiality Agreement

Project title: Reality vs. Recommendations: Developing Equity-based Canadian Policy for Screening, Diagnosis and Treatment of Hepatitis C

I, [NAME OF RESEARCH STAFF], have been hired as research staff or Dr, Bubela, University of Alberta entitled.

I agree to -

1. keep all the research information shared with me confidential by not discussing or sharing the research information in any form or format (e.g., disks, tapes, transcripts) with anyone other than the members of Dr. Tania Bubela's research team.

2. keep all research information in any form or format (e.g., disks, tapes, transcripts) secure while it is in my possession.

3. return all research information in any form or format (e.g., disks, tapes, transcripts) to Dr. Bubela when I have completed the research tasks.

4. after consulting with Dr. Bubela, erase or destroy all research information in any form or format regarding this research project that is not returnable to Dr. Bubela (e.g., information stored on computer hard drive).

(Print Name)	(Signature)	(Date)

Researcher(s)

(Print Name)	(Signature)	(Date)

Appendix VII: Member Checking Example

Dear <Name>

Thank you for participating in our project titled *Reality vs. Recommendations: Developing Equity-based Canadian Policy for Screening, Diagnosis and Treatment of Hepatitis C.* I am contacting you for your feedback on our findings based on our initial interview with you and other experts and the first round of the online expert responses. As part of my research I strive to make sure that I am accurately representing your thoughts. As such I have included a summary of the emergent themes I have captured as part of your one on one interview. Please let me know if you feel I have effectively captured your sentiments or if you feel I am misrepresenting what you said or if you have any disagreements. Furthermore, please let me know if there is anything else you would like to add.

Here you will find summaries of the key themes we identified. At this stage, we would appreciate response on the strengths and weaknesses of our summaries, as well as any other comments you would like to make.

Summary:

The main themes that you expressed are as follows:

Screening:

- There should only be a screening program if we are actually able to provide treatment to those who need it without barriers.
- Fibroscan assessments are a barrier
- Onus on doctors to pick up on risk factors and thus screen based on the risk factors.

Diagnostics:

- There are very few barriers to diagnostics from a lab perspective once it is received. The worry is that we are going to overwhelm the labs if everyone starts getting screened.

Treatment:

- New treatments offer a lot of promise and should be made available.
- Infectious disease doctors need to help inform practice and guidelines.
- We are underservicing at risk populations and need to try to engage them in treatment.
- Funding is the biggest barrier and we need to bargain with pharmaceutical companies.

If you are willing to continue your participation in our research, we would appreciate your comments by [**date: week from date of e-mail**].

Your identity will remain confidential, as results will be de-identified or described in the aggregate.

Thank you for your participation in this research effort.

Sincerely,

Tania Bubela

Associate Professor, Department of Public Health Sciences