

**Resources to Support Indigenous Reproductive Health and  
Justice in Toronto:  
A Respondent-Driven Sampling Study**

by  
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or

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## Abstract

In Canada, the reproductive health and rights of Indigenous women, two-spirit, trans, and gender diverse people are threatened by the complex nature of historic and ongoing colonialism. In the face of widespread oppression, however, Indigenous women, two-spirit, trans, and gender diverse people find ways to achieve wellness. To provide novel statistical information about Indigenous reproductive health, this Master's thesis takes a strengths-based approach to understanding causes of wellness in a cohort of urban Indigenous women, two-spirit, trans, and gender diverse people of reproductive age (n=323). Through a community-based research partnership with the Seventh Generation Midwives of Toronto and the Well Living House, this study uses secondary data collected with respondent-driven sampling (RDS) methods for the community-driven health survey *Our Health Counts Toronto*. By drawing on community perspectives and Indigenous reproductive justice theories, we hypothesized that four different resources enhance wellness: (1) relationship to land; (2) traditional foods; (3) cultural connectedness; and, (4) Indigenous programs and services. Logistic regression modelling revealed that relationships to land, traditional foods, and Indigenous programs and services were statistically significant to wellness. This study may aid policy makers and service providers in promoting equitable reproductive health care for Indigenous peoples in Toronto and other Canadian cities. Furthermore, this study demonstrates the applicability of critical Indigenous theories and activism to the fields of population health and epidemiology.

**Keywords:** Indigenous; reproductive health; maternal health; sexual health; reproductive justice

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# Table of Contents

Approval .....	ii
Ethics Statement.....	iii
Abstract .....	iv
Acknowledgements.....	v
Table of Contents .....	vi
List of Tables .....	vii
List of Figures .....	viii
List of Abbreviations .....	ix
A Note on Terminology .....	x
<b>1. Introduction.....</b>	<b>1</b>
<b>2. Background .....</b>	<b>7</b>
2.1. Indigenous Reproductive Health in the Context of Ongoing Colonialism .....	7
2.2. Envisioning Reproductive Justice from an Indigenous Perspective .....	13
2.3. Indigenous Reproductive Justice and the Health Care System.....	19
2.4. Connecting Indigenous Reproductive Health to Place in One Dish One Spoon Territories.....	23
<b>3. Methodology .....</b>	<b>28</b>
3.1. Our Health Counts Toronto: A Community-Based Research Methodology .....	28
3.2. Critically Engaging Quantitative Methods through an Indigenous Reproductive Justice Lens .....	30
<b>4. Methods.....</b>	<b>35</b>
4.1. Respondent Driven Sampling .....	37
4.2. Target Population.....	37
4.3. Recruitment Methods.....	39
4.4. Analysis .....	41
4.5. Results.....	55
<b>5. Discussion .....</b>	<b>59</b>
5.1. Limitations .....	63
<b>6. Conclusion .....</b>	<b>66</b>
<b>References .....</b>	<b>71</b>
<b>Appendix A. Crude Association Tables .....</b>	<b>78</b>
<b>Appendix B. Response Distribution by Category .....</b>	<b>79</b>

## List of Tables

Table 1.	Explanatory variables from the Our Health Counts Toronto study survey .....	45
Table 2.	Variables Constructed to Control for Confounding .....	52
Table 3.	Adjusted relative odds of wellness by relationship to land among women, two-spirit, trans, and gender diverse people of reproductive age in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016 .....	57
Table 4	Adjusted relative odds of wellness by traditional foods among women, two-spirit, trans, and gender diverse people of reproductive age in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016 .....	57
Table 5	Adjusted relative odds of wellness by cultural connectedness among women, Two-spirit, trans, and gender diverse people of reproductive age in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016 .....	57
Table 6	Adjusted relative odds of wellness by Indigenous programs and services among women, Two-spirit, trans, and gender diverse people of reproductive age in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016 .....	58

## List of Figures

Figure 1.	Our Health Counts Toronto Respondent-Driven Sampling Network Diagram.....	40
Figure 2.	Directed Acyclic Graph: Relationship to Land Model .....	48
Figure 3.	Directed Acyclic Graph: Traditional Foods Model .....	49
Figure 4.	Directed Acyclic Graph: Cultural Connectedness Model.....	50
Figure 5.	Directed Acyclic Graph: Indigenous Programs and Services Model .....	51



## List of Abbreviations

DAG	Directed Acyclic Graph
LGBTQ2	Lesbian, gay, bisexual, transgender, queer, and two-spirit
MEIM-R	Multi-Ethnic Identity Measure (Revised)
NYSHN	Native Youth Sexual Health Network
OHC	Our Health Counts
RDS	Respondent-Driven Sampling
SGMT	Seventh Generation Midwives Toronto
SOGC	Society of Obstetricians and Gynaecologists of Canada
UN	United Nations
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
WHO	World Health Organization
WLH	Well Living House

## **A Note on Terminology**

In this study, the blanket term *Indigenous* refers to First Nations, Inuit, and Metis peoples, who are culturally and linguistically diverse, and who have constitutionally protected rights stemming from prior and enduring occupation of the lands now called Canada. The term *cis* references people who identify with the gender they were assigned at birth, while *two-spirit* is a fluid term some Indigenous people use to describe their gender and/or sexual orientation outside of western cis- and heterosexual norms.

# **1. Introduction**

In 2017, the Government of Canada announced a \$650M investment into sexual and reproductive health services. This investment included a commitment to addressing the systemic barriers to sexual and reproductive health services facing Indigenous peoples, women, and girls, amongst other marginalized populations (Government of Canada, 2017). Many have argued that the systemic violence and structural inequities faced by Indigenous women, two-spirit, trans, and gender diverse people in Canada constitute a human rights crisis (Amnesty International, 2014; Native Women's Association of Canada, 2002). Globally, research has found that women facing human rights crises are more likely to receive inadequate or interrupted reproductive health services, increasing the risk of mortality, perinatal morbidity, unintended or unwanted pregnancies, unsafe abortions, sexual and gender-based violence, and sexually transmitted diseases including HIV (Singh et al, 2018). Although Indigenous reproductive health in Canada is not very well understood, available information regarding reproductive health and health services for Indigenous women, two-spirit, trans, and gender diverse people in Canada indicate a state of crisis (Nelson, 2017; Yee, Apale, & Deleary, 2011).

Increasingly, researchers are utilizing reproductive justice frameworks to advance the field of Indigenous reproductive health research and advocate for policies, programs, and services to enhance Indigenous reproductive health (Danforth, 2010; Gurr, 2015; Wiebe & Konsmo, 2014; Wiebe, 2016; Yee et al, 2011; Stote, 2017). Reproductive justice perspectives conceptualize Indigenous reproductive health as not only concerning matters of sexual health, childbearing, and parenting, but also concerning the reproduction of

Indigeneity (Danforth, 2010; Gurr, 2015; Stote, 2015; Wiebe & Konsmo, 2014). The historical and ongoing nature of settler-colonialism has produced many violations to Indigenous peoples' reproductive health (Gurr, 2015; Hunt, 2015; Stote, 2015; Million, 2014; Simpson, 2017; Smylie, 2014); these violations largely involve Indigenous peoples' sexual autonomy, gender freedom, right to parent (or not) safely and with dignity, and access to health care and other social services. While these issues are at the heart of most reproductive justice movements (Ross & Solinger, 2017), Indigenous reproductive justice movements are specifically organized around Indigenous self-determination and relational models of health (Danforth, 2010; Gurr, 2015).

Indigenous reproductive justice frameworks consider the intersectional connections between determinants of Indigenous peoples' health and Indigenous reproductive health outcomes and experiences. These frameworks have revealed compelling connections between Indigenous reproductive health disparities, environmental conditions, and sociohistorical contexts (Hoover et al, 2012; Gurr, 2015; Wiebe & Konsmo, 2014; Wiebe, 2016). However, there is a need for this research to extend to urban areas (Hoover et al, 2012). It is estimated that more than half of the Indigenous population in Canada resides in urban centres, yet there are large gaps in what is known about urban Indigenous reproductive health. Given that Indigenous fertility rates exceed the general population (Smylie, 2014; Seventh Generation Midwives Toronto [SGMT], 2018a), and that there are numerous indications that Indigenous peoples have unmet reproductive health needs (Hunt, 2016; Laing, 2016; SGMT, 2018a), this is an unacceptable information gap.

While Canada's commitment to Indigenous reproductive health is important, Indigenous people argue that for investments into Indigenous reproductive health to be

transformative, they must be in service of Indigenous reproductive justice agendas (Yee et al, 2011). Indigenous reproductive justice agendas demand change to systemic factors that give rise to reproductive harms, while building up Indigenous systems for supporting wellness. These models are rooted in ancestral knowledge, relationships to land, land-based lifeways, kinship, communities of care, and individual and collective autonomy (Williams & Kongsom, 2017). While evidence-based approaches to public health often prioritize statistical information when it comes to investments and decision making, most quantitative research examining Indigenous reproductive health has focused on understanding disparities. Furthermore, there is a lack of reproductive health research related to urban Indigenous populations, even though the majority of Indigenous peoples in Canada now live in cities (Statistics Canada, 2017). To support investments into strengths-based reproductive justice approaches, this quantitative study tries to understand resources that support urban Indigenous reproductive health and wellness in Toronto, Canada's largest city.

The City of Toronto is located in the homelands of the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples. Today, there are roughly 55,000 Indigenous peoples living in Toronto who belong to these nations as well as others (Rotondi et al, 2018). Between 2015 and 2016, Indigenous community partners in Toronto conducted the largest-ever health survey of an urban Indigenous population in Canada, Our Health Counts (OHC) Toronto. Using respondent-driven sampling methods, OHC Toronto collected baseline data on demographics, health measures, and culturally relevant health determinants for Indigenous adults and children living in metropolitan Toronto. Included within the OHC Toronto survey were a number of measures relevant to

reproductive health, a priority area of research for Toronto's urban Indigenous community.

Through a community-based graduate student research partnership with the OHC Toronto study leaders the Seventh Generations Midwives Toronto (SGMT) and the Well Living House Action Research Centre for Indigenous Infant, Child and Family Health and Wellbeing (Well Living House) at St. Michael's Hospital, this research tests the hypotheses that for urban Indigenous women, two-spirit, trans, and gender diverse people of reproductive age, wellness is enhanced by: (1) relationships to land; (2) traditional foods; (3) cultural connectedness; and, (4) Indigenous programs and services. To test our hypotheses using data collected for OHC Toronto with respondent-driven sampling methods, we bridged an Indigenous reproductive justice theoretical framework with the counterfactual framework for causal inference and logistic regression methods.

This research seeks to highlight the resiliency of Indigenous women, two-spirit, trans, and gender diverse people in the context of reproductive health. Researchers agree that there is a need for a critical shift towards strengths- or desire-based research that can reveal both the complexities and resiliencies in Indigenous peoples' lives (Richmond, 2007; Tuck, 2009). Researching from a place of strength resists pathologizing and paternalistic narratives about Indigenous peoples' health; narratives which have been mobilized to further violate the rights and dignities of Indigenous women, two-spirit, trans, and gender diverse peoples, especially those who are mothers (Gurr, 2015). This research is a categorical refusal of such narratives, and seeks to also make space for the inclusion of two-spirit, trans, and gender diverse identities within the cis- and heteronormative field of reproductive health research.

Statistics have played a large role in the marginalization and oppression of Indigenous communities; but at the same time, it is impossible to ignore their esteemed status within public health (Walter & Andersen, 2013). This research aims to promote equitable reproductive health care and services for Indigenous peoples by providing empirical evidence to support the design of policies and interventions rooted in the desires of Indigenous women, two-spirit, trans, and gender diverse peoples. This research also explores the applicability of critical Indigenous perspectives on reproductive justice for Indigenous reproductive health assessment in Canada, by bridging epidemiological methods with Indigenous reproductive justice theoretical frameworks.

This paper is influenced by my own location as an urban Nehiyaw-Nahkawekwe, mother and doula residing in Coast Salish Territories. As a doula, or traditional birth keeper, it is fitting that I would be assisting the midwives who led this research, which I am intimately connected to as a receiver and provider of reproductive health services. The seeds of this research were planted when I became pregnant with my daughter, Keestin. Through my pregnancy I gained firsthand insights into the limitations of the Canadian health care system from an Indigenous mother's perspective; at the same time, I was privileged to experience a revolutionary sense of safety that came from the care of two Indigenous doulas, who my daughter now calls Aunties.

During my pregnancy, I realized that my path lies in birth work and reproductive health. In walking this path, I feel close to the spirit of my great-great grandmother Isabel Bear, a midwife who delivered my grandmother and other babies in Pasqua and the surrounding reserves until the Qu'Appelle Indian Hospital opened in 1938. With this research I hope to do right by my grandmothers, my clients, and my colleagues; at the

same time, my work is by no means perfect, and I welcome feedback especially with regards to how my research can better create a more inclusive space for two-spirit, LGBTQ2, and other gender diverse community members.

This research was conducted in fulfilment of my Master's thesis in the Faculty of Health Sciences at Simon Fraser University, located in the shared territories of the Musqueam, Squamish, and Tsleil-Waututh peoples. Financially, this research was supported by WLH, the Canadian Institute of Health Research, Simon Fraser University, SFU Faculty of Health Sciences, the Irving K. Barber Scholarship Society, Indspire, and the Indigenous Mentorship Network. There are no known conflicts of interest associated with this research.



## **2. Background**

### **2.1. Indigenous Reproductive Health in the Context of Ongoing Colonialism**

The Royal Commission on Aboriginal Peoples (RCAP, 1996) was the first and largest nationwide undertaking to document Indigenous peoples' perspectives on Indigenous wellbeing. The final RCAP report made it clear that disparities in Indigenous health are the result of colonial policies and processes that dispossessed Indigenous people of their inherent rights to exercise political, economic, and social autonomy in their own homelands. The RCAP resulted in a paradigm shift, which saw the language of recognition, reconciliation, and healing come to the forefront of Indigenous-government relations.

While government approaches to recognition, reconciliation, and healing have been criticized for being co-opted into contemporary forms of colonialism (Coulthard 2007; 2014; Million, 2014), RCAP represented a turning point in the way Indigenous population health was discussed. Today, researchers agree that Indigenous health, including reproductive health, must be understood in the context of interrelated distal, intermediate, and proximal determinants that go beyond the social and recognize Indigenous-specific and environmental determinants of health (see Greenwood, de Leeuw, Lindsay, & Reading, 2015).

Colonialism is considered a distal determinant, or root cause, of outcomes related to Indigenous reproductive health (King, Smith & Gracey, 2009; Czyzewski, 2011; Greenwood & de Leeuw, 2012; Reading & Wien, 2009). Coulthard (2007; 2014) argues

that colonial relations produce both structural and subjective forms of violence in Indigenous peoples' lives. Statistics indicate that Indigenous women in Canada experience disproportionately high levels of violence (Amnesty International, 2014), second only to Indigenous two-spirit, trans, and gender diverse people (Wilson, 2018). These forms of violence are not only racialized, they are also gendered and sexualized (Smith, 2005; Simpson, 2017; Million, 2014). The disproportionate burden of gender violence faced by Indigenous people is nowhere more apparent than in the issue of missing and murdered Indigenous women, girls, two-spirit, trans, and gender diverse people that is currently the focus of a national inquiry.

In Canada and the US, settler state policies and processes produced and reified negative representations of Indigenous women as dirty, drunken, promiscuous, exotic, and unfit mothers (Anderson, 2004; Million, 2014; Simpson, 2017). At the same time, colonial processes violently erased the presence of Indigenous two-spirit, trans, and gender diverse peoples within Indigenous nations, recasting Indigenous systems of gender and sexuality as profane and perverse (Smith, 2005; Simpson, 2017; Wilson, 2018). Negative images of Indigenous women, two-spirit, trans, and gender diverse people permeate mainstream Canadian discourses and form the basis of Indigenous and non-Indigenous relations (Anderson, 2004; Simpson, 2017).

Million (2014) contends that negative representations of Indigenous people do not stem from ignorance, but rather “felt common knowledge” that is produced by colonial governance policies and relations. Colonial policies such as the Indian Act and residential schools removed Indigenous peoples from the Canadian body politic and placed them at the margins of Canadian social, economic, and political systems. These policies, which

were (and in many cases, still are) racist, sexist, cis-, and heteronormative, made it permissible for Indigenous women, two-spirit, trans, and gender diverse people to have their dignities systematically violated by all levels of society. Smith (2005) argues that the systematic mistreatment of Indigenous women constitutes a form of structural rape, where Indigenous bodies are rendered “inherently violable” through colonial processes that make violence against Indigenous women acceptable. Such processes also allow for violations of Indigenous lands (Smith, 2005). Gendered sexual violence is therefore a primary tool of colonial conquest (Smith, 2005; Deer; Million, 2014; Simpson, 2017).

The representational significance of Indigenous women as mothers, capable of reproducing Indigenous nations, is crucial to understanding why Indigenous women and childbearing people have been targeted through processes of colonialism (Anderson, 2004; Million, 2014; Smith, 2005; Stote, 2015). By merely existing, Indigenous women, two-spirit, trans, and gender diverse people embody and may reproduce Indigenous political, social, and economic orders, which threaten colonial power (Simpson, 2017). Indigenous body sovereignty and sexuality sovereignty, therefore, have been key sites of colonial oppression (Simpson, 2017). This is evidenced by the history of the residential school system, which removed thousands of Indigenous children from their parents and forcibly imposed Victorian gender and sexuality norms onto Indigenous children, who also widely reported being physically, sexually, mentally, and spiritually abused by residential staff (Hunt, 2015; Simpson, 2017; Truth and Reconciliation Canada, 2015). As the residential school system became phased out starting in the 1960s, Indigenous children were removed from the care of their parents (sometimes at birth) and placed into the care of non-Indigenous families by social workers acting on behalf of Canadian child

welfare ministries. Indigenous peoples have made numerous allegations of maltreatment in foster homes and while in government care, even to the point of causing death (Bennett & Auger, 2009). These practices continue; even though Indigenous children make up 7% of all children in Canada, nearly 50% of children in care are Indigenous (Turner, 2016), and there are now more children in care than ever attended residential school (Blackstock, 2007). Indigenous women, girls, two-spirit, trans, and gender diverse people are also disproportionately targets of physical and sexual violence, which is made permissible by policing and judicial systems that systematically fail to hold perpetrators to account (Amnesty International, 2014). Million (2014) argues that widespread violence against Indigenous women, girls, two-spirit, trans, and gender diverse people is not a phenomenon; rather, it is the expected outcome of regular colonial relations. These are just some of the ways that Indigenous people's reproductive lives have been violated and made violable by the settler state— and these realities have significant repercussions for Indigenous reproductive health.

Since the mid 1990s, the paradigm of reproductive health has been invoked in international contexts to discuss population health issues related to maternal-infant health, family planning and contraception, and health-care services to support individual reproductive choices (United Nations, 1994). The adoption of reproductive health agendas in international and national policy settings is attributed to the organizing efforts of feminist health organizations, researchers, and service providers across the globe, which began at least in the early 80s (Hempel, 1996). At present, the World Health Organization (WHO) defines reproductive health within a liberal human rights and conditions to health framework, which positions reproductive health as a crucial piece of

overall health and wellness (Gurr, 2015; WHO, 2018). While all people have reproductive health needs, the global dominance of settler-colonial and capitalist power relations impact the reproductive lives of women and gender diverse people in different ways than men (Nelson, 2017). International bodies such as the United Nations (UN) and the WHO recognize that barriers to reproductive health care services increase the risk of maternal mortality, poor health, and social exclusion for women and fertile persons worldwide. These issues are exacerbated in humanitarian crisis situations (Singh et al, 2018).

Canada, like many other nation states, has made national and international commitments to enhancing reproductive health and rights domestically and abroad. More recently, in 2017 Canada announced a \$650M investment into reproductive health services and initiatives, “to improve sexual and reproductive health and rights for all” (Government of Canada, 2017). In this commitment, Canada notes that part of its investment will go to addressing systemic barriers and supporting reproductive health programming for Indigenous peoples, alongside other marginalized groups (Government of Canada, 2017). The Government of Canada (2017) notes that these commitments contribute to sustainable development goals set out by the UN to ensure universal access to sexual and reproductive health services.

Although Canada does not fully acknowledge its colonial past, the reproductive health status of Indigenous peoples in Canada reflects the ongoing nature of settler-colonialism. Government and community statistics demonstrate that Indigenous peoples are more likely to face undesirable reproductive health outcomes than non-Indigenous peoples (Public Health Agency of Canada, 2010; SGMT, 2018a; Smylie, 2014; Wiebe,

2016). Indigenous peoples contend with the same reproductive oppressions that non-Indigenous people face, such as barriers to accessing abortions, contraception, fertility support, perinatal care, and high Caesarean-section rates, but Indigenous peoples face these oppressions alongside disproportionately high rates of sexual violence, structural impoverishment, racism, and other acts of genocide and persecution (Nelson, 2017; Ross & Solinger, 2017; Yee et al, 2011).

While reproductive health discourses dominated by the white middle class in Canada and the US have centred around the concept of “choice,” the experiences of Indigenous people, people of colour, and other marginalized communities illuminate the narrowness of this framework for conceptualizing reproductive health (Gurr, 2015; Smith, 2005; Ross & Solinger, 2017). Communities of colour and Indigenous communities understand that alarming disparities in maternal, reproductive, and sexual health cannot solely be attributed to individual behaviours and characteristics, as risk-factor epidemiology often suggests, but are the outcome of power relations that discriminate against and systematically disadvantage certain peoples. To fight paternalistic and pathologizing discourses that further impede reproductive health, in 1994, twelve Black feminists in the US merged the concepts of reproductive health and social justice to create *reproductive justice*. Reproductive justice is a framework for demanding health care reform to meet the needs of all women through the use of intersectional analyses and by centering the experiences and perspectives of groups who hold the least institutional power (Ross & Solinger, 2017). The primary values of reproductive justice, according to the theory’s co-creator Loretta Ross, are: “(1) the right not to have a child; (2) the right to have a child; and (3) the right to parent children in safe and healthy environments. In addition,

reproductive justice demands sexual autonomy and gender freedom for every human being” (Ross & Solinger, 2017, pp. 65). Reproductive justice is both a theoretical framework and an activist paradigm for achieving one form of social justice that is necessary, amongst others (Gurr, 2015; Ross & Solinger, 2017).

## **2.2. Envisioning Reproductive Justice from an Indigenous Perspective**

Being intersectional by nature, the reproductive justice movement that was created by Ross and others has been allied with Indigenous gender and sexual justice movements from the start (Ross & Solinger, 2017). Indigenous peoples in Canada and the US have adapted reproductive justice frameworks to call attention to their own reproductive justice histories and demands, while also making clear that although the language may be relatively new, the roots of organizing around reproductive health run deep in Indigenous communities (Danforth, 2010). For Indigenous peoples, the concept of reproductive justice largely centers around Indigenous sovereignties. Indigenous sovereignties are closely tied to matters that involve: land stewardship and ecological health; autonomy over gender, sexuality, and parenting; access to traditional food sources; self-governance; cultural and spiritual freedoms; safety from violence; and equitable access to resources in the settler state. In Canada, Indigenous sovereignties stem from prior and enduring occupation of the land as well as historical treaty relationships and are recognized through the Canadian Constitution and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). However, unaddressed historical and ongoing violations

to Indigenous sovereignties require Indigenous peoples to mobilize against settler state power. Reproductive justice is just one avenue Indigenous peoples are pursuing to advance their rights to sovereignty, inclusion, and well-being.

Indigenous reproductive justice histories contextualize Indigenous reproductive health within both Indigenous thought systems and settler state abuses to Indigenous peoples' reproductive lives. While Indigenous peoples are not homogenous and traditional societies should not be romanticized as free from violence or other social ills, the relational nature of Indigenous thought, deeply rooted connections to the land, and parallel histories of colonialism make it possible for researchers to make some generalizations. There exists plenty of evidence that prior to the arrival of European settlers, traditional societies from across the North American continent often practiced non-patriarchal systems of governance, which held places of honour and respect for people of diverse gender identities and sexual orientations (Anderson, 2004; Hunt, 2016; Stote, 2015; Simpson, 2017). Because of the deeply relational nature of Indigenous thought, traditional societies made space for more fluid ways of existing in the world (Anderson, 2004; Simpson, 2017). For example, Simpson (2017) argues that Anishinaabe thought systems give rise to "queer normativity," where diverse expressions of gender and sexuality, beyond what is cis- or heteronormative, are regarded as a social norm. The inclusiveness of Indigenous thought and pre-colonial social organization provides Indigenous peoples with visions for what reproductive justice could look like, and guideposts for making sense of settler state harms.

Researchers working with reproductive justice frameworks in Indigenous contexts have largely focused on colonialism, the land, and Indigenous self-determination as key



determinants of Indigenous reproductive health. Smith's *Conquest: Sexual Violence and American Indian Genocide* (2005) revealed the intersections between American Indian policy, environmental racism, eugenics and population control movements, and different forms of gendered sexual violence perpetuated against Indigenous women in the United States. In *Conquest*, Smith draws on the activism of Akwesasne Midwife Katsi Cook to consider how environmental harms are both racialized and sexualized, and produce different forms of violence in the lives of Indigenous women, especially to their reproductive lives, given the linkages between environmental contaminants, fertility, and other perinatal health outcomes. Smith also considers the US history of coercive sterilization of American Indian women and distribution of unsafe birth control in Indigenous communities, practices that lead to what some people estimate as up to a 50% sterilization rate of Indigenous women in the U.S. In her follow up text, *Native Americans and the Christian Right: The Gendered Politics of Unlikely Alliances* (2008), Smith considers more deeply how the politics of "choice" that dominate the pro-life/pro-choice debates at the top of reproductive health agendas in the U.S. miss the point, given that the way that reproductive choices must be exercised within systems that routinely discriminate against Indigenous and other marginalized peoples.

Following Smith's work, more writing and research in Canada began to focus on matters related to Indigenous reproductive justice. Danforth (2010), the Executive Director of the Native Youth Sexual Network (NYSHN), an Ottawa-based youth-led organization that spearheads work related to Indigenous reproductive health, rights, and justice in Canada and the US, wrote a piece called "Reproductive Justice – for real, for me, for you, for now." Danforth (2010) writes, "[reproductive justice] saved me from a

relentless, life-long battle of trying to articulate in English what it means, as an Indigenous person, to never singularly look at one issue with our bodies or spaces being disconnected from each other – or all others for that matter” (pp. 1). Danforth (2010) builds on definitions of reproductive justice presented by Ross and others by presenting perspectives on reproductive justice from her colleagues at NYSHN, which center ancestral knowledge, the land, family/community, and Indigenous self-determination. At the same time, Danforth (2010) is quick to point out that Indigenous reproductive justice organizing predates the conception of reproductive justice as a unifying framework for intersectional feminist activism related to matters of reproductive and sexual health. Danforth (2010) also notes the tensions between the activism of Indigenous feminists and other feminist communities that often overlook the history of colonialism and the ongoing dispossession of Indigenous peoples, which may be perpetuated by their work.

The archival research of Lawford & Giles (2012a; 2012b) makes important contributions to Indigenous reproductive justice histories by revealing that Canada’s longstanding policy to evacuate pregnant Indigenous women from rural and remote communities to birth in hospitals was not created out of concern for Indigenous maternal-infant mortality rates, as it is typically framed by the medical system, but out of an explicit agenda to diminish Indigenous midwifery and traditional health care systems and assimilate Indigenous peoples. Indigenous midwifery was a major source of strength and autonomy, and was therefore recognized as a threat by colonizers. Stote’s doctoral research published in 2015 also contributes to Indigenous reproductive justice histories by showing that eugenics policies in Canada, which gained favour in the early 20<sup>th</sup> century, were asymmetrically imposed upon Indigenous peoples, especially Indigenous

women. Stote (2015) takes archival evidence of coercive sterilization, abusive abortions, and targeted distribution of birth control to Indigenous peoples and argues that these acts were genocidal, as they were performed by state actors in service of colonial agendas to assimilate and eliminate Indigenous peoples.

Indigenous reproductive justice frameworks also consider the disproportionate burden that industry, development, and resource extraction activities have placed on the health of Indigenous peoples, especially fertile persons. Extractive and chemical industry often takes place near Indigenous communities, who then become exposed to contaminants through the air, water, and land-based food sources (Women's Earth Alliance & NYSHN, 2016). These risks, which asymmetrically impact Indigenous peoples in Canada, constitute environmental racism (Hoover et al, 2012; Women's Earth Alliance & NYSHN, 2016). A group of researchers including midwife Katsi Cook (Hoover et al, 2012) looked at reproductive health outcomes in five Indigenous communities in Canada and the US from an environmental health and reproductive justice perspective. Hoover et al (2012) found that reproductive health disparities in those communities could be attributed to intersecting social, economic, and environmental factors, and that federal legal mechanisms for protecting environmental and Indigenous health were insufficient. Wiebe's (2017) research with the Aamjiwnaang First Nation, whose community is located near Ontario's Chemical Valley, shows that Aamjiwnaang residents face a declining male birth rate and higher levels of miscarriage, alongside abnormal rates of cancer, respiratory illnesses, asthma, and cardiovascular disease. Wiebe's (2016) research also demonstrates how jurisdictional conflicts, systemic power, and settler state legal

mechanisms fail to adequately address the burden of harms faced by Indigenous communities, creating and maintaining reproductive injustice.

Studies such as Hoover et al (2012), Lawford & Giles (2012a; 2012b), Stote (2015), and Wiebe (2016), have made novel contributions to understanding the current status of Indigenous reproductive health, and towards articulating Indigenous and community-based perspectives on what reproductive justice entails. These studies reveal the historical and ongoing abuses levied upon Indigenous peoples by the settler state, which manifest through various social, political, and economic mechanisms which contribute to the state of Indigenous reproductive health. These studies also reveal the need for more reproductive justice-oriented perspectives on Indigenous reproductive health, especially in urban areas. Given the significance of gender and sexual autonomy to reproductive justice, there continues to be a notable absence of research that considers two-spirit, trans, and/or gender diverse reproductive health. Data derived from national statistics is not responsive to Indigenous understandings of gender and sexual diversity, which contributes to the erasure of these populations from the already-marginalized field of Indigenous reproductive health research. To address the large gaps in what is known about Indigenous reproductive health, there is a need to bring reproductive justice theories into mainstream reproductive health research; Hoover et al (2012) argue that this should happen through collaborative partnerships between academics, Indigenous communities, and health care providers.

### **2.3. Indigenous Reproductive Justice and the Health Care System**

Access to reproductive health care services is a crucial aspect of reproductive justice for Indigenous people and all people (Gurr, 2015; Nelson, 2017; Ross & Solinger, 2017). Research has shown that access barriers to reproductive health care may directly inhibit well-being (Gurr, 2015; Nelson, 2017). While this is true for all people, the well-being of women, fertile persons, and gender diverse people is inhibited by access barriers to reproductive health care in ways that are different from men (Nelson, 2017).

Reproductive health care includes services related to contraception, pregnancy, abortion, perinatal loss, child birth, postpartum, breastfeeding/chestfeeding, sexually transmitted infections, menopause, reproductive cancers, and sexual abuse (Gurr, 2015). The reproductive health experiences of women in Canada are not very well researched, and limitations with the data collection of vital statistics mean that Indigenous women's experiences are even less understood (Nelson, 2017). The absence of statistics for two-spirit, trans, and gender diverse peoples' health means that their perspectives on reproductive health care in Canada are largely missing (Hunt, 2016), but some findings suggest that two-spirit and Indigenous LGBTQ2 people experience disproportionate rates of HIV/AIDS, alongside elevated levels of discrimination and other health disparities (Laing, 2016). Both research and policy efforts are needed to address known barriers to accessing reproductive health care to enhance the autonomy, equality, and well-being of women, two-spirit, trans, and gender diverse people (Hunt, 2016; Nelson, 2017).

Efforts to advocate for Indigenous-specific reproductive health policies have been underway for at least a decade. In 2011, Yee (Danforth), Apale, & Deleary authored a joint-policy statement for the Society of Obstetricians and Gynaecologists of Canada

(SOGC) with the approval of several national Indigenous and medical associations. The SOGC joint-policy statement takes a critical gender and human rights approach to Indigenous reproductive health, and locates Canada's responsibility to providing reproductive justice for Indigenous peoples within Canada's legal and moral obligations to Indigenous peoples, codified in the Canadian Constitution and the UNDRIP (Yee et al, 2011). Within the policy statement, Yee et al (2011) make a number of action-oriented recommendations to enhance the reproductive health of Indigenous women in Canada. These recommendations include: advocacy and commitments to Indigenous reproductive health and rights; the implementation of UNDRIP; culturally safe health care; addressing barriers to federal Indigenous health programs and services; changes to federal Indigenous health policies to increase access to reproductive health services; the development of a national and provincial Indigenous birth strategy; and, to encourage the revitalization of midwifery and traditional birthing in Indigenous communities (Ye et al, 2011).

Indigenous peoples across Canada have been spearheading initiatives that act on the SOGC policy recommendations. Indigenous cultural safety training and Indigenous directed health care services have been identified as an emerging promising practice in Indigenous health (Allan & Smylie, 2015), while the revitalization of Indigenous doula and midwifery care have been identified as promising practices in Indigenous maternal health more specifically (Smylie, 2014). These initiatives have often been led by Indigenous peoples in urban centres, which is not altogether surprising, given that more than half of Indigenous peoples in Canada reside in cities (Statistics Canada, 2017), and even more travel to cities for reproductive health care (through the evacuation policy or

otherwise) and other health care services. However, urban Indigenous health has been overlooked by federal Indigenous health policies and by national, provincial, and municipal research programs, creating further inequities in Indigenous peoples' lives. The lack of attention to urban Indigenous health is starting to be addressed by Indigenous-led research programs, such as the *Urban Aboriginal Peoples Survey* and the *Our Health Counts* initiative.

Research with urban Indigenous populations can reveal novel information about Indigenous reproductive health. The complex realities of Indigenous peoples in cities challenge stereotypical, deficit-based views that permeate the media and dominant discourses, and paint a more humanizing picture of Indigenous life. Urban Indigenous realities negate dichotomous views about Indigenous peoples' experiences, such as urban/rural and traditional/modern, and complicate ideas about the land, community, governance, identity, and culture. Scarpino's (2004) research with urban Indigenous women in Vancouver challenged the linear risk/protective factor model that is predominant in resilience research, by showing that urban Indigenous women's resilience is better imagined as the ability to overcome adversity by drawing on relationships with the natural and spiritual worlds, self, and others throughout the life course. Allan's (2013) doctoral research with urban Indigenous women in Toronto reveals many ways in which Indigenous women demonstrate resilience in the face of adversity, and identifies the need for more opportunities for Indigenous women to gather and discuss matters related to sexuality, reproductive health, and well-being to counteract the shame and negativity that has been inflicted upon Indigenous sexuality, gender, and motherhood. The strengths-based, qualitative methodologies employed by both Scarpino (2004) and Allan (2013)

yielded useful information for designing and implementing interventions related to the SOGC policy recommendations, and demonstrates the need for more of this kind of research.

Urban centres are also a hub for LGBTQ2S communities, and the activism, perspectives, and experiences of two-spirit, trans, and gender diverse peoples in cities offer necessary information for addressing disparities in two-spirit, trans, and gender diverse health, and for countering heteronormative health care and research norms (Hunt, 2016). Research has shown that Indigenous two-spirit and gender diverse peoples have felt marginalized by Indigenous-specific and mainstream health care programs and services, where health care professionals were insensitive to their gender, sexuality, and/or Indigenous identity (Laing, 2016). Experiences of discrimination and fears about privacy and confidentiality have prevented two-spirit and gender diverse Indigenous people from seeking care, and impacted health care-related behaviours (Laing, 2016). These issues may be more acutely suffered by trans and gender nonconforming Indigenous peoples (Laing, 2016). Researchers agree that there is need for more health-related data that takes into account the unique needs and experiences of two-spirit peoples in the context of Canadian colonialism and through Indigenous paradigms (Hunt, 2016; Laing, 2016). Studies have shown that Indigenous two-spirit and LGBTQ2 people utilize numerous survival and coping strategies and are extremely resilient (Laing, 2016); understanding two-spirit and Indigenous LGBTQ2 resilience is important to enhancing Indigenous reproductive health.



## **2.4. Connecting Indigenous Reproductive Health to Place in One Dish One Spoon Territories**

Toronto is Canada's largest city and a generative site for understanding urban Indigenous reproductive and sexual health. Toronto is located in the homelands of the Haudenosaunee and Anishinabeg peoples, including the Mississaugas of the Credit and the Wendat people, who can trace their occupation and stewardship of Toronto and the surrounding areas for millennia. Haudenosaunee and Anishinabeg peoples in this area traditionally related to one another through a diplomatic treaty relationship known as One Dish One Spoon, or *Gdoo naaganinaa* ("Our Dish" in Anishinabemowin) (Simpson, 2008), and Toronto is also covered by Treaty 13 signed between the British Crown and the Mississaugas of the Credit, and the Williams Treaty signed between the British Crown and multiple Mississauga and Chippewa bands (City of Toronto, 2018). Today, Indigenous peoples from many nations reside in One Dish One Spoon territories, including approximately 55,000 Haudenosaunee, Anishinabeg, and diverse First Nations, Métis, and Inuit peoples (Rotondi et al, 2018). Increasingly, Indigenous and non-Indigenous peoples in Toronto are recognizing the prior and enduring relationship that Haudenosaunee and Anishinabeg peoples have to the land through land acknowledgements, historical tours, signage, artistic productions, and other initiatives aimed at sparking dialogue (City of Toronto, 2018). Some of these initiatives seek to reclaim the politics contained within One Dish One Spoon, which are rooted in relationships and responsibility, and which refuse homogenizing models of inclusion in favour of Indigenous self-determination, as an alternative to colonial hegemony.

Indigenous reproductive health in Toronto is supported by the only Indigenous-led birth centre and midwifery practice in a major Canadian city. Since 2006, the Seventh Generation Midwives Toronto have been delivering midwifery care to Indigenous and non-Indigenous families. SGMT is part of the resurgence of Indigenous birth work that is currently taking place across Canada, driven by new generations of Indigenous peoples seeking reconnection with their cultural traditions (Tabobondung, 2016). In 2012, when the Ontario government announced it would fund one birth centre in Toronto, SGMT mobilized to gain support from the non-Indigenous midwifery community to back their application for the birth centre to be Indigenous-led (Tabobondung, 2016). SGMT's application was successful and the Toronto Birth Centre opened in 2013 (Tabobondung, 2016). SGMT works with the Ryerson Midwifery Program to promote Indigenous cultural safety within Canadian midwifery education and to increase the number of Indigenous Registered Midwives. SGMT also works closely with Ottawa-based NYSHN to deliver health programming and services to Indigenous peoples in Toronto. A partnership between SGMT and the Well Living House (WLH), an Indigenous action-oriented research centre based out of St. Michael's Hospital, has led to the creation of culturally-specific resources and research projects to serve Indigenous reproductive health.

Between 2015 and 2016, SGMT and WLH delivered the Our Health Counts (OHC) Toronto study, a community-based partnership project between SGMT, WLH, over 20 other Indigenous and allied health and social service organizations, and a Counsel of Indigenous grandparents. OHC Toronto aimed to address critical gaps in baseline health data for urban Indigenous peoples in Canada, by gathering information on the holistic

health, health determinants and health needs of Indigenous peoples living in Toronto. OHC Toronto findings demonstrate that Indigenous peoples in Toronto face major social inequities; for example, 87% of Toronto's Indigenous population lives below the before tax low-income cut-off (SGMT, 2018). At the same time, OHC Toronto also demonstrates Indigenous peoples' agency in articulating their own desires and claiming their roles as experts in their own health.

OHC Toronto found that the fertility rate for Indigenous people of reproductive age is 2.12 children, compared to 1.51 per woman living in Ontario (SGMT, 2018a). Based on OHC Toronto's population size estimate, approximately 1,036 to 1,408 children are expected to be born to Indigenous women, two-spirit, trans, and gender diverse people per year in the City of Toronto (SGMT, 2018a). While there is a demonstrated need for reproductive health services, 27% of Indigenous adults in Toronto believe reproductive health services are inadequate, while 32% believed that services for Indigenous mothers are inadequate (SGMT, 2018a). Perceptions about inadequacy of reproductive health services impact health-accessing behaviours; SGMT (2018a) notes that Indigenous mothers in Toronto who experienced discrimination from a health professional were 2.5 times more likely to not receive prenatal care or receive prenatal care in the 3<sup>rd</sup> trimester of pregnancy.

The reproductive health findings of OHC Toronto also demonstrate the benefits of Indigenous self-determination over reproductive health and health care. The importance of SGMT's efforts to promote midwifery care are illustrated within OHC Toronto: 32% of Indigenous people who gave birth in the past five years used a midwife as their prenatal care provider, compared to 8% of women in the Toronto Central Local Health

Integration Network (SGMT, 2018a). All OHC Toronto participants who had a midwife indicated it was their preferred care provider (SGMT, 2018a). At the same time, OHC Toronto participants reported having unmet community resource needs for families, youth, fathers, LGBTQ2, sexual health and wellbeing, fertility services, abortion services, children, and reproductive health/pregnancy, among others (SGMT, 2018b).

A key finding of OHC Toronto was that there are approximately 55,000 (95% CI 45,000 to 75,000) Indigenous adults living in Toronto, based on conservative estimates (Rotondi et al, 2017). This estimate was calculated by cross-referencing OHC Toronto data with the 2011 National Household Survey, and suggests that the 2011 Canadian census undercounted the urban Indigenous population of Toronto by approximately 2 to 4 times (for a complete discussion of methods and findings, see Rotondi et al, 2017). This drastic undercount of the urban Indigenous population by the National Household Survey offers a partial explanation for the inadequacy of programs and services to meet the reproductive needs of Indigenous peoples in Toronto.

OHC Toronto findings indicate that matters of reproductive justice are important to the urban Indigenous community of Toronto. The Indigenous reproductive health, research, and other health care infrastructure that exists in Toronto makes the city an ideal place to conduct community-based research for advancing Indigenous reproductive health. This review makes it clear that contemporary urban Indigenous reproductive health is shaped by a number of overlapping and intersecting matters, including colonial power relations, social and healthcare inequities, acts of genocide, Indigenous ways of knowing and being, the land, Indigenous self-determination, and research deficiencies. This review also makes it clear that the actions of Indigenous women, two-spirit, trans,

and gender diverse people to meet their own reproductive health needs inherently become acts of resistance, given the sinister histories and systemic barriers that stand in the way of Indigenous reproductive autonomy and well-being.

While reproductive justice research and other reproductive-health related research has shown that Indigenous women, two-spirit, trans, and gender diverse people are resilient, much of this research comes from historical, theoretical, and qualitative analyses that have small sample sizes. There is a need for quantitative research that is attentive to reproductive justice theories and that examines Indigenous reproductive health from a strengths-based perspective. Understanding the strengths and desires of Indigenous peoples in historical and contemporary contexts is important because it restores humanity and self-determination to Indigenous peoples (Tuck, 2009). To contribute to what is known about urban Indigenous reproductive health in the service of the policy objectives identified in the SOGC policy statement and the reproductive health care needs identified by the OHC Toronto participants, this research looks at the causes of *wellness* in a cohort of Indigenous women, two-spirit, trans, and gender diverse people of reproductive age who participated in the OHC Toronto study. Through a community-based, graduate student research partnership with SGMT and the WLH, we identified four explanatory variables that we viewed as reproductive health-promoting: (1) relationships to land, (2) traditional foods, (3) cultural connectedness; and (4) Indigenous programs and services. Using quantitative methods, we examined the causal effect of these variables on self-reported wellness for Indigenous women, two-spirit, trans, and gender diverse people of reproductive age in Toronto.

### **3. Methodology**

Because of the long history of research abuse towards Indigenous communities, reproductive health research must be undertaken critically. This research uses a community-based research methodology and bridges quantitative methods with an Indigenous reproductive justice theoretical framework to serve the Indigenous research governance principles of Ownership, Access, Control, and Possession.

#### **3.1. Our Health Counts Toronto: A Community-Based Research Methodology**

The absence of baseline health data for urban Indigenous populations in Canada impacts the quality and availability of health care services for Indigenous peoples, and ultimately impacts Indigenous health status. Indigenous peoples agree that for research to be relevant and useful, Indigenous peoples must play a lead role in the design, delivery, and evaluation of research activities (Smith, 1999; Smylie & Anderson, 2006). Since the 1990s, Indigenous peoples have been working to gain control over information about their own communities (First Nation Information Governance Centre, 2018). The First Nations Regional Health Survey was designed by Indigenous peoples to collect culturally relevant health assessment data for First Nations people living on reserve and in Northern communities ((First Nation Information Governance Centre, 2018). However, the lack of health assessment data for Indigenous peoples living in urban centres continues to represent a critical information gap.

Our Health Counts is an urban Indigenous health database research project created to address this gap by Indigenous peoples, for Indigenous peoples. OHC is an initiative of the Well Living House (WLH), an Indigenous-led research centre for innovation and best practices in the field of Indigenous health. OHC is a part of the Indigenous Health Information, Knowledge, and Evaluation Network, which aims to produce Ontario's first urban Indigenous health dataset. The Toronto chapter of OHC was conducted in partnership with community-based health providers the Seventh Generation Midwives Toronto (SGMT).

To develop a comprehensive health database for Indigenous peoples living in the City of Toronto, OHC Toronto followed Indigenous data use practices aligned with the Indigenous research governance principles of OCAP. As the community-based research partner, SGMT retains full ownership over OHC Toronto data. SGMT and WLH have a data sharing agreement to ensure relevance and rigour of all research using OHC Toronto data. SGMT and WLH are further accountable to the OHC Toronto governing structure, which included representatives from over 20 Indigenous and allied service providers as well as a Counsel of Indigenous Grandparents. These governing bodies were consulted on all aspects of OHC Toronto, and helped set the priorities for research.

OHC Toronto was given ethics approval by the St. Michael's Hospital Research Ethics Board. As part of the community-based study design, OHC Toronto offers mentorship opportunities for graduate students in the field of public health. SGMT and WLH supported this study through a competitive award for a Master's student to nest their thesis within OHC Toronto. As secondary analysis, this offshoot study adheres to the OHC Toronto Data Use Protocol Agreement, which ensures project relevance and

adherence to Research Ethics determined by the OHC Toronto Governing Structure and St. Michael's Hospital. This research was also given ethical approval by the Office of Research Ethics at Simon Fraser University.

To ensure adherence to the Data Use Protocol Agreement, representatives of SGMT (Sara Wolfe, RM, MPH) and WLH (Dr. Janet Smylie) served on my supervisory committee and provided guidance on every aspect of this research. As a resident of Vancouver, British Columbia, I agreed to make a minimum of two field visits to Toronto through the course of this research. At the time of writing, I had made three visits, with at least one more planned for dissemination.

### **3.2. Critically Engaging Quantitative Methods through an Indigenous Reproductive Justice Lens**

OHC Toronto was developed using a Two-Eyed Seeing approach, meaning that contributions from both Indigenous and western thought systems were valued and bridged based on their relevance and helpfulness to OHC Toronto's overarching goal to understand the health and health services of Indigenous peoples living in Toronto (Bartlett, Marshall, Marshall, & Iwama, 2015; SGMT & WLH, 2016). To fill large gaps in relevant and reliable urban Indigenous population health statistics, OHC Toronto primarily engaged quantitative research methods. As this study is secondary data analysis, we engaged the quantitative methods critically through an Indigenous reproductive justice lens, to ensure that the contexts, experiences, and desires of the women, two-spirit, trans, and gender diverse people of reproductive age who participated



in OHC Toronto would be centred throughout the research process. An reproductive justice lens “brings together in cogent ways theories of human rights and inequality with intersectional examinations of women’s embodied experiences, and locates these in local social contexts” (Gurr, 2015, p. 33). A primary goal of reproductive justice is to demonstrate that “women’s reproductive rights are meaningless without addressing the social contexts in which these rights are exercised, including historically oppressive structures of racial, economic, and sexual inequality” (Gurr, 2015, p. 33). Through intersectional contextualization and through collaboration with the communities in question, reproductive justice paradigms seek to reveal the agency of individuals and communities in seeking reproductive wellness (Ross & Solinger, 2017). In this way, reproductive justice perspectives refute pathologizing and paternalistic narratives of Indigenous health. Because Indigenous reproductive justice perspectives center Indigenous sovereignties, they provide a salient counterpoint to the emphasis on liberal human rights-based discourses that reproductive justice frameworks also invoke (Gurr, 2015).

Quantitative methods tend to be negatively associated with positivist paradigms in Indigenous research settings, causing quantitative methods to sometimes be conflated with colonial forms of knowledge production (Walter & Andersen, 2013). As a result, quantitative methods have been marginalized within the field of Indigenous research and methodologies (Walter & Andersen, 2013). However, Walter & Andersen (2013) see “the absence of quantitative methods from the research armory of Indigenous scholars” as perilous: “Restrictions on how we engage in research as *Indigenous* scholars disarms us in the very terrain where we need to be most active, the relations of power that allow

current statistical analysis *of us* to be accepted as exhaustive descriptions and definitions of who we are” (p. 66). Statistics yield immense power over the structural and affective realities of Indigenous peoples, and Walter & Andersen (2013) argue that it is not the methods themselves, but the ways in which quantitative methods are employed, that has historically been problematic. While quantitative methods have been developed through western thought systems and to suit western agendas, counting is not an inherently western endeavour (Walter & Andersen, 2013). Traditional Indigenous societies relied on measurement, observation, and analysis to survive (Cajete, 1999; Walter & Andersen, 2013). To engage quantitative methods in ways that serve Indigenous peoples and agendas, this research follows Walter & Andersen’s (2013) recommendation to bridge quantitative methods with Indigenous methodologies to return the power associated with information and representation to Indigenous communities.

While reproductive justice perspectives can be useful for critically engaging quantitative methods, they also come with some inherent limitations (Gurr, 2015). The concept of reproduction, as it is imagined in the mainstream, prioritizes the health of individuals over the health of communities, normalizes Western ideals around sexuality, gender, and the family unit, and may justify the pathologizing and control the bodies of certain population groups through data surveillance and research (Gurr, 2015).

Furthermore, as Gurr (2015) notes:

The linkage of women’s health and well-being to their presumed reproduction and the potential use of this presumed reproduction as a bargaining chip for improved public

health reflects in complicated ways both the work of the State as it relies on women's reproductive bodies to produce structures of oppression, and reproductive justice efforts as they rely on women's reproductive bodies to argue for community well-being (p. 47).

This research mobilizes the concept of reproduction with the understanding that not all participants included in our sample will or want to have children, or identify with their reproductive capacities. We attempted to employ the paradigm of reproductive health as inclusively and respectfully as possible, with the knowledge that Indigenous women, two-spirit, trans, and gender diverse people have unique and specific reproductive health needs, and that these groups are disproportionately negatively impacted when these needs go unmet.

As Indigenous researchers, we believe that our ancestral knowledge systems and lifeway practices provide us with information that may enhance the sexual and reproductive health of Indigenous people. In this study, we examine the causal effects of four resources Indigenous peoples consider health promoting, because "achieving [reproductive justice] depends on access to specific, community-based resources" (Ross & Solinger, 2017; p. 9), and the knowledge produced by this study may promote increased access to the resources identified here. Resources such as adequate housing, a living wage, and education are also crucial matters of reproductive justice, but we decided to look at four culturally-specific resources to contribute new information for

designing reproductive health policies, programs and services that build on the existing strengths of Indigenous women, two-spirit, trans, and gender diverse peoples.

## 4. Methods

Epidemiological methods make up “the core science of public health” (Rothman, 2012, p. 1), but data for Indigenous populations in Canada are severely limited by both coverage and quality of national statistics, which include census data, vital registration data, data from national health surveys, health services utilization data, and data from surveillance systems (Smylie & Anderson, 2006). Shortcomings in coverage of Indigenous population health data can be largely attributed to “a lack of accurate identification that respectfully, systematically, comprehensively and consistently recognizes self-identified First Nations, Métis or Inuit ethnicity” (Smylie & Anderson, 2006). Furthermore, Indigenous peoples must be counted in multiple geographies (urban, remote, rural, on-reserve), and through multiple jurisdictions (federal, provincial, municipal, Indigenous governments). Governments have not effectively addressed these complexities in health-assessment data collection, resulting in systematic undercounts of Indigenous peoples (Smylie & Anderson, 2006). Ultimately, these compromised data sources impact the quality of health services (Firestone, Smylie, Maracle, Spiller & O’Campo, 2014).

The 2011 Census, which used random sampling methods, only captured 14% of Indigenous households in Toronto, even though 70% were needed to obtain a representative sample (Rotondi et al, 2017). Given that in Canada there exists “no comprehensive registry of Indigenous peoples living in cities” (Rotondi et al, 2017, p. 2), appropriate sampling methods for achieving unbiased population statistics must be sought. Respondent-Driven Sampling (RDS) is one such method that has been shown to

be effective for sampling urban Indigenous populations, as well as other marginalized populations (Beckett et al., 2018; Firestone et al, 2014; Kitching, 2017). In their paper evaluating RDS methods for generating baseline health data in OHC Hamilton, Firestone et al (2014) write that RDS also appealed to urban Indigenous community stakeholders due to its compatibility with Indigenous thought systems:

Indigenous knowledge is wholistic, relational and embraces a fluidity that allows for constant growth and change.<sup>26, 27</sup> Aboriginal identities tend to value the group over the individual, thereby establishing models of kinship where everyone has the right to give and receive according to their own choices.<sup>26</sup> Therefore, we hypothesised that RDS would be an appropriate and effective sampling methodology as it builds on social networks and would draw on existing kinship systems known to be present in Indigenous communities<sup>28</sup> (p. 2).

One major limitation of data derived from RDS methods has been that until recently, multivariable regression methods that could account for the non-randomness of RDS were not developed (Firestone et al, 2014). Dr. Michael Rotondi, Associate Professor at York University Faculty of Health Sciences has been working with the Our Health Counts team of researchers to extend multivariable regression methods to be used with RDS-derived data (see Beckett et al, 2018). This study was conducted with Dr. Rotondi's guidance.

## **4.1. Respondent Driven Sampling**

RDS methods rely on relationships that people have to social networks. Similar to chain-referral methods, the success of the RDS methods is dependent on referrals that study participants make to recruit their peers to participate in the study (Heckathorn, 1997; Heckathorn, 2002). RDS methods are unique in that there is a restricted number of referrals that participants can make, and that both recruiters and recruited are incentivized for their participation and recruitment activities (Heckathorn, 2007). Recruitment chains, which begin with an initial sample of “seeds” who must represent a diverse cross-section of the population, are tracked and recruitment waves are mapped; these maps later assist in the mathematical calculations needed to account for unequal sampling probability amongst participants (Rotondi et al, 2017).

## **4.2. Target Population**

Our Health Counts Toronto was designed to provide a representative sample of the Indigenous community residing in Metropolitan Toronto. Given the shortcomings of the census for counting Indigenous peoples, a primary objective of OHC Toronto was to provide a more accurate population size estimate (Rotondi et al, 2017). Based on findings from a previous urban Indigenous cohort study, OHC Hamilton, RDS methods were chosen. OHC Toronto sought to achieve a sample size of 1000 urban Indigenous adults in order for descriptive and comparative measures to be appropriately powered based on design effects observed in the pilot study OHC Hamilton (Rotondi et al, 2017). Between April 1, 2015 and March 31, 2016, OHC Toronto collected data from 908 adults over the

age of 15 who identified as Indigenous (First Nations, Métis, or Inuit) and resided in the City of Toronto.

The background review for this study made clear that Indigenous women, two-spirit, trans, and gender diverse peoples face some of the most intense oppressions resulting from our settler colonial present, including inequities in reproductive health services and rights. This quantitative analysis was focused on the ways this group in particular achieves thriving health in the face of adversity. Therefore, the selection criteria for this analysis included: (1) participated in the OHC Toronto Adult Survey (therefore self-identified as Indigenous and lived, worked, or accessed health care services in the City of Toronto); (2) identified as a woman, trans, or gender diverse person (this included people who further identified as two-spirit, which was asked as a separate question), and; (3) was aged between 15 and 44 inclusive at the time of the survey. All OHC Toronto Adult Survey participants who identified as men were excluded. Of the 908 Indigenous adults who participated in OHC Toronto, 323 women, trans, and gender diverse people met the selection criteria.

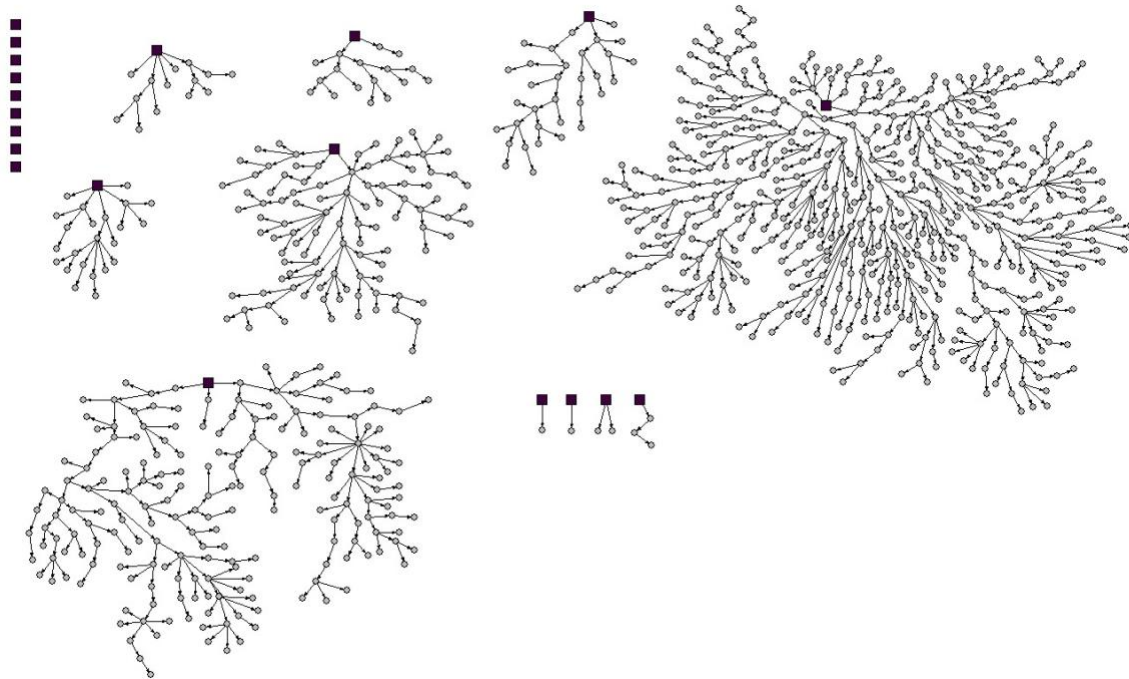
The literature review for this study revealed population-level health differences between cisgender women, two-spirit, trans, and gender diverse Indigenous people (Hunt, 2016; Laing, 2016); these differences are attributed to the intersections of white supremacy, cispatriarchy, and heterosexism in Canadian society (Hunt, 2015; Million, 2014; Simpson, 2017). While there may be effect modification of the associations under investigation by gender identity, our sample of trans and gender diverse people was too small to allow us to investigate. In spite of this limitation, we made the ethical decision to include trans and gender diverse people in our sample and make their participation



visible, because the other option – to remove them – was incongruent with a reproductive justice approach. However, given the low participation, the results of this research should be cautiously applied to trans and gender diverse Indigenous people in Toronto.

### **4.3. Recruitment Methods**

This study is a secondary analysis of OHC Toronto’s cross-sectional baseline health data, collected between April 13, 2015 and March 31, 2016. As part of the RDS design, an initial sample of 10 seeds was selected by the community partners to represent a diverse segment of the urban Indigenous population. These seeds were given between 3-5 referral coupons to hand out to people within their social networks to complete the survey. Part way through the study, an additional 10 seeds were added to speed up recruitment. Every person who completed the survey was paid a CAD\$20 incentive, and was eligible to receive an additional \$10 for each person who completed the survey using their referral coupon (up to a total of \$50 per person). Adults who lived with children under the age of 14 were also given the option to fill out a child-specific survey, and received an additional \$10 honorarium per child survey. In this way, the recruitment chain continued to grow, with each recruit representing a new wave. The recruitment chain is represented by the OHC Toronto Respondent-Driven Sampling Network Diagram in Figure 1. In the diagram, seeds are represented by the black squares.



**Figure 1. Our Health Counts Toronto Respondent-Driven Sampling Network Diagram**

While the dual incentive system aimed to reduce the possibility of participants enrolling more than once, the risk of duplication was also mitigated through the collection of provincial health insurance numbers (voluntarily provided by 97% of respondents), the use of a preliminary eligibility screener, and through the examination of surveys for duplicates. Thus, the risk of duplication was considered low (Rotondi et al, 2017). Recruiter-recruit relationships were tracked using coupon numbers that were maintained through a database.

Interviews were conducted at three locations: The Native Canadian Centre of Toronto, SGMT, and the Queen West Central Community Health Centre. Surveys could also be completed at a participant's location of choice via a mobile survey service. Interviewers who had prior experience working with Indigenous populations received cultural safety training; participants spent an average of 90 minutes with community

interviewers to complete the survey. Interview data was obtained through informed consent, and interviewers were given sensitivity training to watch for signs of distress; in the event these signs were observed, interviewers reminded participants that they had the right to skip any questions they were not comfortable answering without penalty (i.e., they would still receive their honorarium). Interview data was input by interviewers directly into an electronic database for data security purposes. For a detailed explanation of OHC TO recruitment procedures, see Rotondi et al, 2017.

#### **4.4. Analysis**

The OHC Toronto community partners were interested in better understanding the reproductive health promoting practices that cause wellness in women, two-spirit, trans, and gender diverse people of reproductive age. Specifically, we were interested how wellness is caused by: (1) relationships to the land, (2) traditional foods, (3) cultural connectedness; and (4) Indigenous programs and services.

##### *Outcome Variable: Wellness*

Indigenous peoples have widely defined the concept of individual wellness as a sense of balance in four aspects of health: mental, emotional, physical, and spiritual. To respect the agency of Indigenous peoples in determining their own wellness, our outcome variable relied on self-reported answers to OHC Toronto survey question 4.2, “How often do you feel that you are in balance in the four aspects (e.g. physical, emotional, mental,

spiritual) of your life?” For analysis purposes, the outcome variable (wellness) was recoded into a binary variable, with one category representing those who reported feeling balanced in the four aspects of their life (e.g., physical, emotional, mental, spiritual) all or most of the time, and one category representing those who reported feeling balanced in the four aspects of their life some of the time, a little of the time, or none of the time.

#### *Explanatory Variable: Relationship to the Land*

The four exposure variables were recoded as binary variables (see Table 1). Richmond (2015) notes: “The relationship between First Nations peoples and the land is a multifaceted one, and formative for countless social determinants of health, including social relationships, spirituality, and access to foods and medicines” (p. 58). Land plays a central role in Indigenous articulations of reproductive health, and health in general. OHC Toronto participants were asked, “How often do you feel strong in your relationship to the land/ Mother Earth?” Responses were recoded into a dichotomous variable: those who reported feeling strong in their relationship to the land all or most of the time, and those who reported feeling strong in their relationship to the land some of the time, a little of the time, or none of the time.

#### *Explanatory Variable: Traditional Foods*

Consumption of traditional foods is important to Indigenous economics, self-determination, diplomacy, community building, physical health, and nutrition (Million,

2014; Simpson, 2017). Indigenous food practices constitute sovereignties that are important to decolonization and Indigenous nationhood movements (Daigle, 2017). Traditional foods are nutrient dense and the adage, “our food is our medicine” conveys the importance of Indigenous foods and food sovereignty to individual and collective well-being. OHC Toronto participants were asked, “In the past 12 months, how often have you eaten traditionally hunted/gathered/grown and/or country foods?” Responses were recoded into a dichotomous variable: those who reported eating traditional foods often in the last 12 months, and those who reported eating traditional foods a few times or not at all in the last 12 months.

### *Explanatory Variable: Cultural Connectedness*

Indigenous peoples have identified matters of identity and belonging, sometimes expressed as cultural continuity or cultural connectedness, as important determinants of Indigenous peoples' health (Auger, 2016; Greenwood & de Leeuw, 2012). More broadly, ethnic identity has been conceptualized as a multidimensional concept that includes processes of identity exploration and commitments to belonging (Brown et al, 2014). In Indigenous and non-Indigenous contexts, identity is increasingly of interest for the role it plays in enhancing individual and collective health and wellness (Auger, 2016; Brown et al, 2014).

To measure the subjective concept of ethnic identity in quantitative research, the Multi-Ethnic Identity Measure (MEIM) scale was created (Phinney, 1992) and then revised (MEIM-R) (Phinney & Ong, 2007). The MEIM-R is a correlated two-factor model that measures a sense of identity based on “two distinct but related factors,” identity exploration and identity affirmation/sense of belonging (Brown et al, 2014). MEIM-R uses a 6-item scale, with each item rated from 1 (strongly disagree) to 5 (strongly agree). A higher score indicates a stronger sense of identity/belonging. Research has found that the MEIM-R is potentially a useful tool for understanding the importance of ethnicity to health outcomes, although more research is still needed to fully understand the applicability of MEIM-R across different ethnic groups and in different social contexts (Brown et al, 2014).

OHC Toronto used an adapted version of the MEIM-R scale to suit an Indigenous community context. Section 21 of the OHC Toronto survey included 12 questions that

yielded a MEIM Affirmation score (based on a sense of belonging and feelings towards the group), MEIM Identity score (based on an understanding of identity and practice of culture), and a total MEIM score. The cultural connectedness variable was constructed as a binary variable based on the total MEIM score, with strong scores (2.9 – 4.0) in one category, and other scores (1.0 - 2.9) in another category.

*Explanatory Variable: Indigenous Programs and Services*

SGMT (2018b) notes: “Indigenous-led and -centered health and social services are key for addressing the health and social needs of Indigenous people living in urban areas” (p.1) This statement is supported by the findings of Truth and Reconciliation Canada (2015), as well as the United Nations Declaration on the Rights of Indigenous Peoples (SGMT, 2018b). Indigenous community organizations offer a broad range of programming and services to Indigenous peoples living in Toronto related to cultural revitalization and the social determinants of health. OHC participants reported how many Indigenous programs and services that they accessed within the past 12 months. This dichotomous variable was split into two groups: (1) accessed 1 or more services and (2) did not access any services.

**Table 1. Explanatory variables from the Our Health Counts Toronto study survey**

Variable	Question	Response Option	Survey Question
Wellness (outcome)	How often do you feel that you are in balance in the four aspects (e.g. physical, emotional, mental, spiritual) of your life?	All of the time Most of the time Some of the time A little of the time None of the time	Section 4.2

Variable	Question	Response Option	Survey Question
Relationship to the land	How often do you feel strong in your relationship to the land/ Mother Earth?	All of the time Most of the time Some of the time A little of the time None of the time	Section 4.3
Traditional foods	In the past 12 months, how often have you eaten traditionally hunted/gathered/grown and/or country foods?	Often A few times Not at all	Section 3.7
Cultural connectedness	Total MEIM score (a higher score indicates a stronger sense of identity/belonging)	1.0 – 2.1 2. 1 – 2.5 2.5 – 2.9 2.9 – 3.2 3.3 – 3.6 3.6 – 4.0	Section 20.1
Indigenous Programs and Services	In the past 12 months have you participated in any programs or services at the following organizations: (Please check all that apply)	Number of organizations	Section 22.1

### *Confounding Variables*

Models were adjusted for confounding with the help of a Directed Acyclic Graph (DAG) (Figure 2). DAGs are used increasingly in epidemiology because they can map assumptions about complex causal relationships between variables, so long as those relationships are assumed to be unidirectional and not cyclic (Suttorp et al, 2014). Suttorp et al (2014) explain: “DAGs provide a structured way to present an overview of the causal research question and its context. They serve as a visual representation of causal assumptions by making underlying relations explicit.” DAGs are useful for identifying confounding in complex contexts (Suttorp et al, 2014), which makes this method suitable for examining questions related to Indigenous reproductive health.

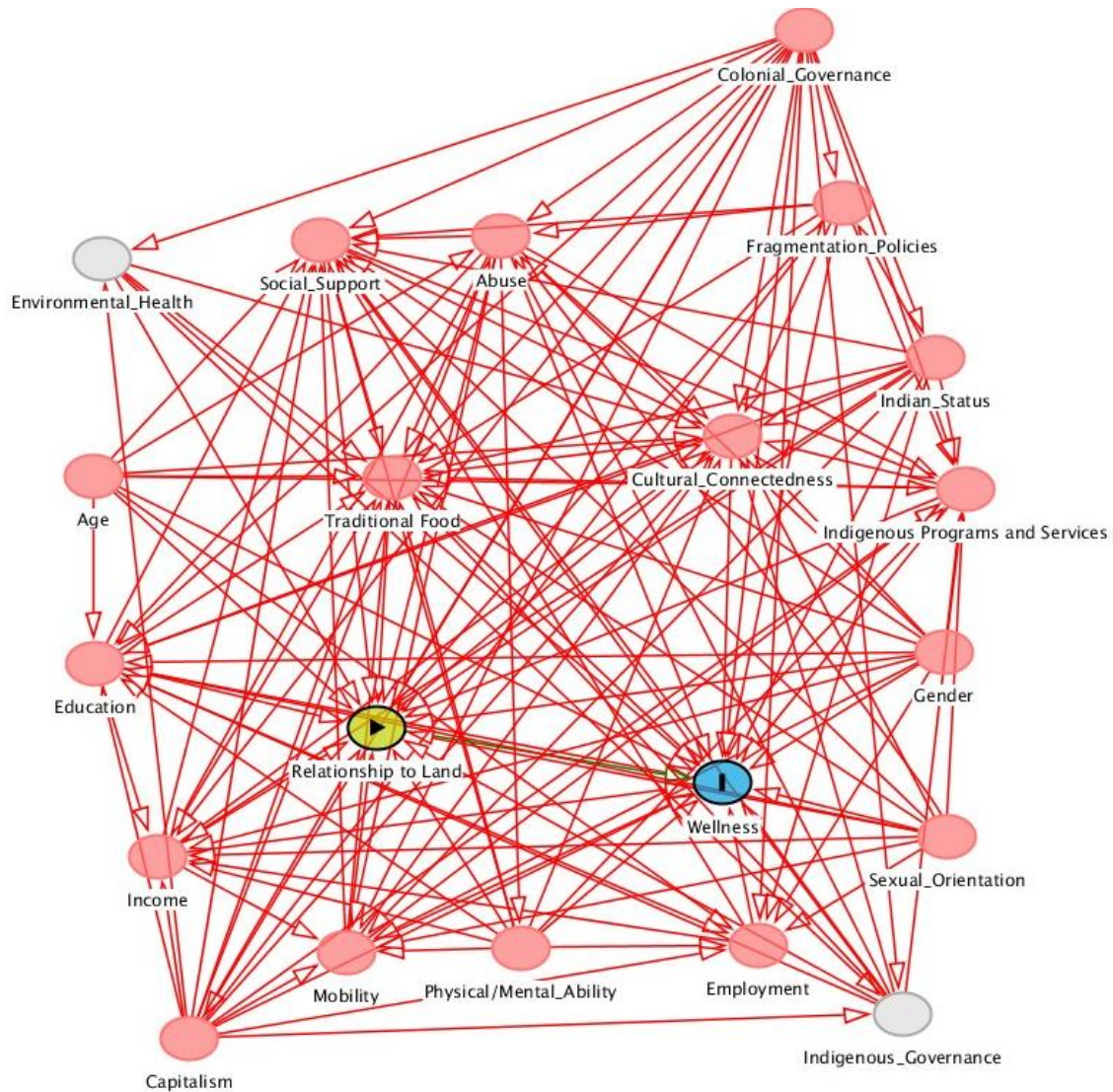


In a DAG, confounding is present when there is a common cause of both the exposure and the outcome, thereby obscuring the effect of the exposure on the outcome (Suttorp et al, 2014). In a DAG, common causes are mapped as “nodes” connected by pathways of arrows leading to both the exposure and the outcome. These nodes are conceptualized as “ancestors” of the exposure and the outcome. If there is a common cause of any two nodes, it must also be mapped, and arrows are drawn from this “parent” to its “children.” A DAG is considered complete when there are no more parents of any two nodes left unmapped on the DAG.

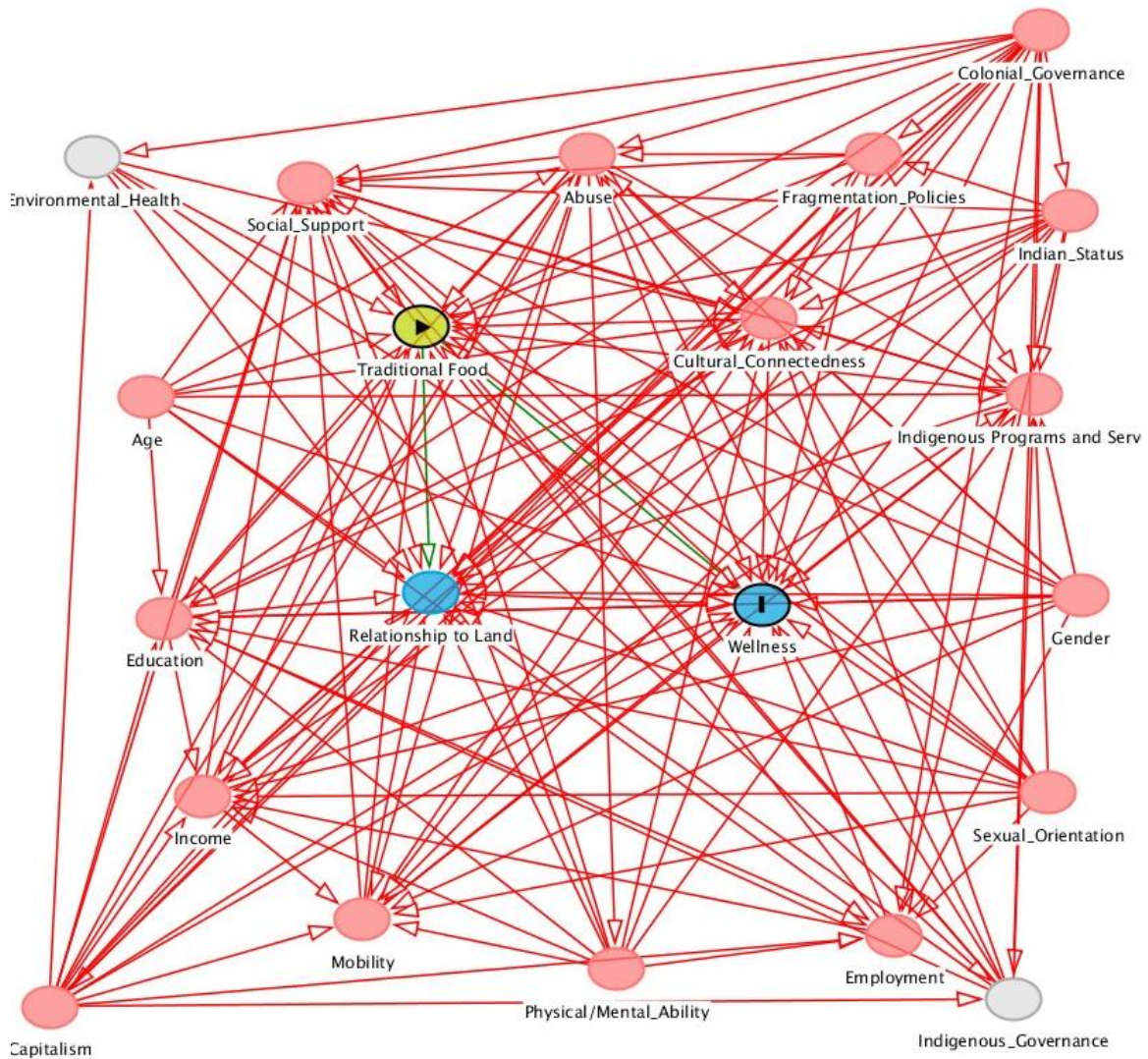
In our DAGs, each of the four explanatory variables are causes of wellness. These causal relationships are linked to several other potential common causes. These parent and ancestor causes were determined based on information derived from Indigenous reproductive justice research and Indigenous feminist theoretical perspectives, as well as community perspectives. Because of the presence of pathways between the outcome and exposure variables in each of the DAGs, in order to measure the effect of each exposure on the outcome, it was necessary to first block these pathways by controlling for confounding.

In a DAG, it is not necessary to condition every node to control for confounding; it is only necessary to condition the nodes that will ensure all backdoor paths between the outcome and exposure variables are blocked. To determine which nodes required conditioning in our complex models, we used open-source DAGitty software. The DAGitty-generated models are shown in Figures 2 to 4; blue nodes with a black outline and rectangle in the middle indicate the outcome, yellow nodes indicate the exposure, red

nodes indicate the need for conditioning, grey nodes are unmeasured, and blue nodes indicate an ancestor of the outcome.

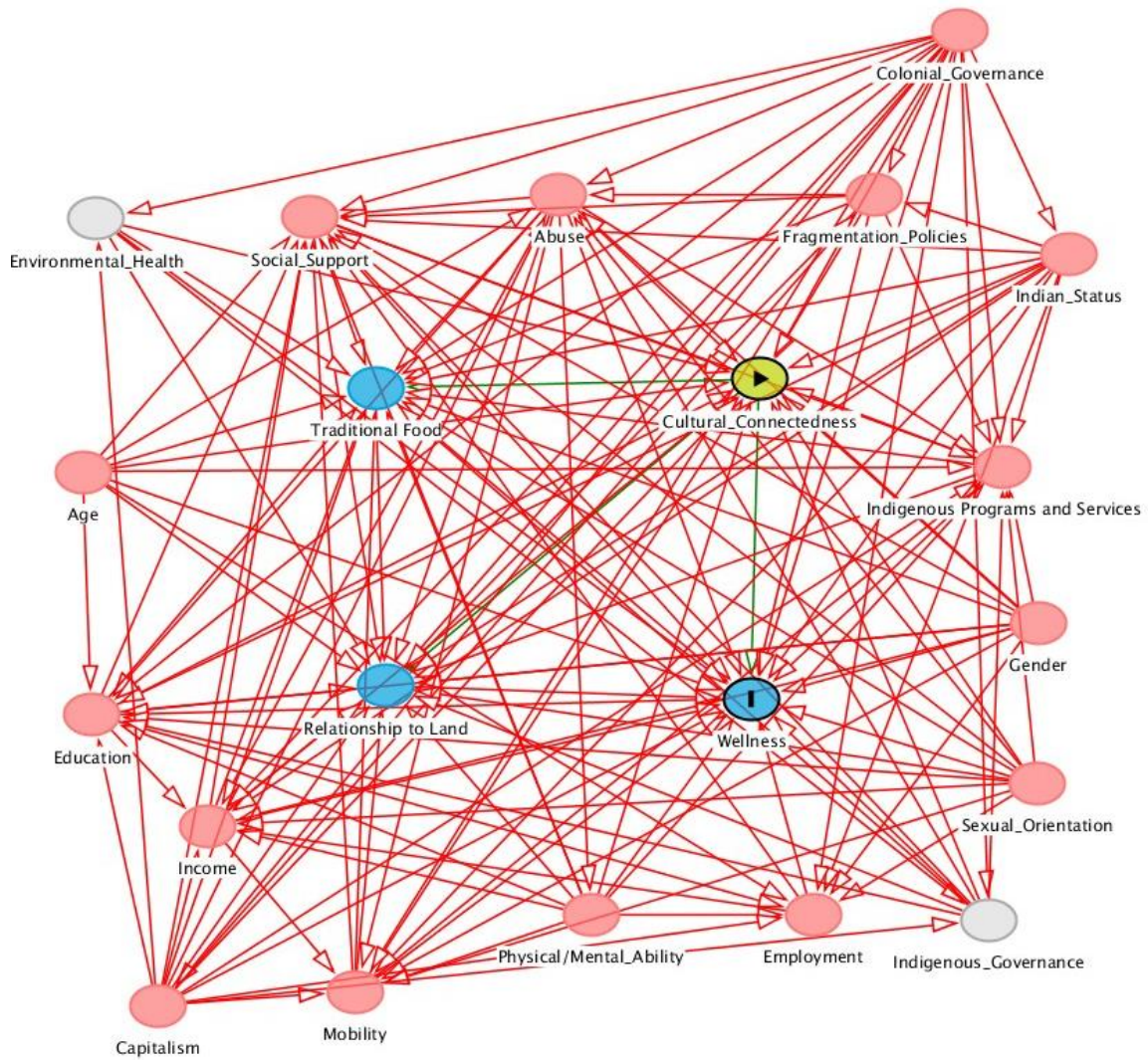


**Figure 2. Directed Acyclic Graph: Relationship to Land Model**

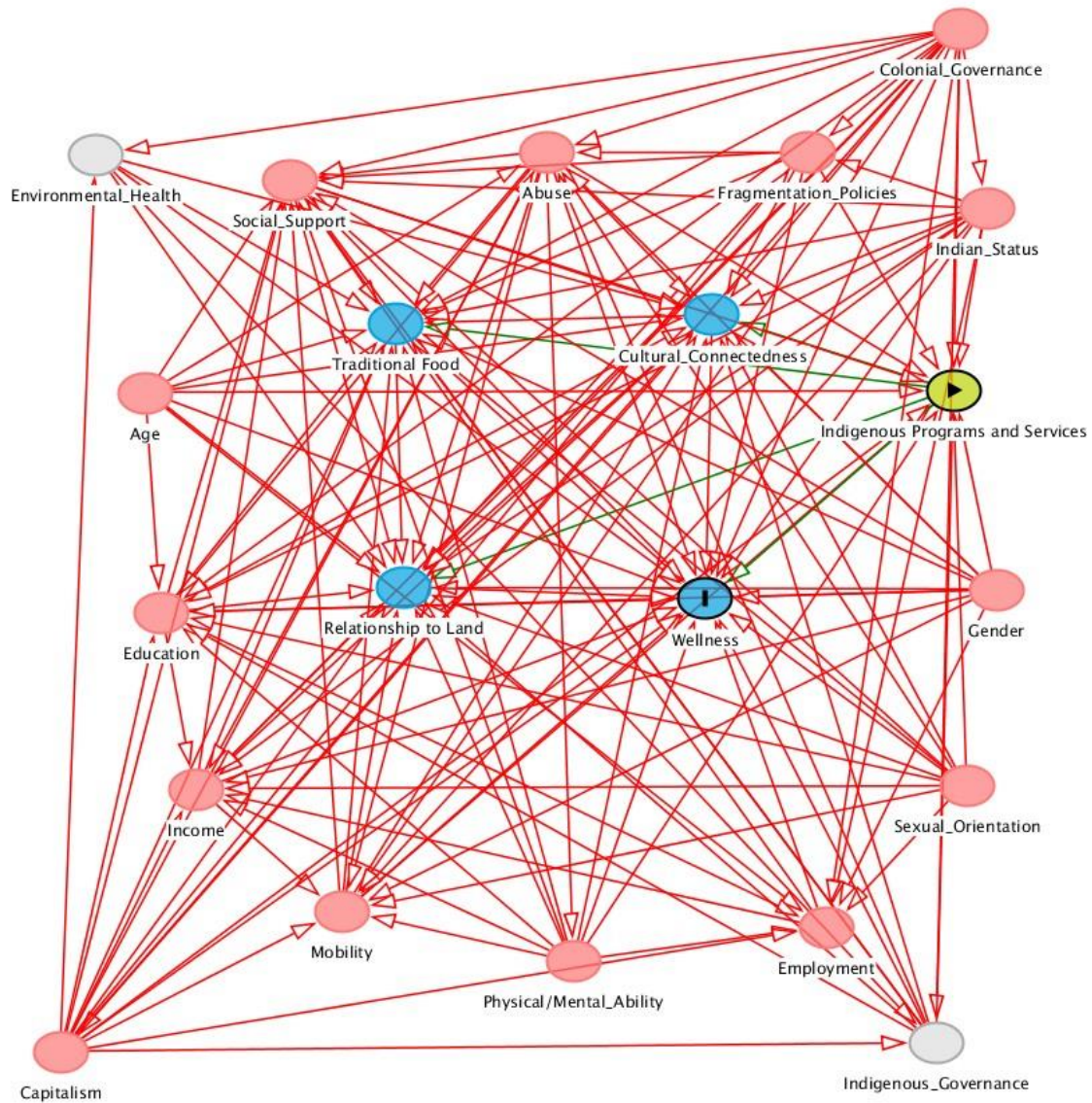


**Figure 3. Directed Acyclic Graph: Traditional Foods Model**





**Figure 4. Directed Acyclic Graph: Cultural Connectedness Model**



**Figure 5. Directed Acyclic Graph: Indigenous Programs and Services Model**

To control for confounding, it was necessary to create variables to match the concept represented by each node that required conditioning. Most variables were created from the OHC dataset, some were considered conditioned based on the fact that the entire sample population had been exposed, and some were not measurable. The confounding variables are described further in Table 2.

**Table 2. Variables Constructed to Control for Confounding**

Node	Concept	How Variable was Constructed	Data Source
Ability	Possessing the physical or mental ability to achieve one's desired health needs	A dichotomous variable, with those who reported having a physical or mental disability impacting health for 6 months or longer in one group (0), and those who did not in another (1)	OHC Toronto
Abuse	Having experienced household violence	A dichotomous variable, with those who reported having been physical hurt, insulted or talked down to, threatened with harm, screamed or cursed at, had their actions restrictions, or non-consensual sex in one group (0), and those did not report having any of those experiences in another (1)	OHC Toronto
Age	Numeric age	A continuous variable representing numeric age	OHC Toronto
Capitalism	Living within the economic system of capitalism	This variable was considered conditioned as capitalism is the dominant economic system in Toronto	n/a
Colonial Governance	Living within the governance system of colonialism	This variable was considered conditioned as colonialism is the dominant system of governance in Toronto and Canada, from an Indigenous reproductive justice theoretical lens	n/a
Education	Level of education achieved	A dichotomous variable, with those who did not complete high school in one group (0), and those who completed high school or more in another (1)	OHC Toronto
Environmental Health	The overall health of the land, including the soil, air, water, animal, and plant life	This variable was unmeasured	n/a



Node	Concept	How Variable was Constructed	Data Source
Fragmentation Policies	Firsthand or intergenerational experiences with settler state policies explicitly aimed at the assimilation and elimination of Indigenous peoples, including residential schools and child apprehension	A dichotomous variable, with those who reported feeling that their health had been negatively impacted by the residential school and child welfare policies in one group (0), and those who did not report feeling that way in another (1)	OHC Toronto
Gender	Gender identity	A dichotomous variable, with two-spirit women, trans, and gender diverse people in one category (0), and cisgendered women in another (1)	OHC Toronto
Income	Income	A dichotomous variable, with those living below the low-income cut-off in one group (0), and those living above the LICO in another (1)	OHC Toronto
Indian Status	Indian Status	A dichotomous variable, with those who had Indian status in one group (0), and those who did not in another (1)	OHC Toronto
Indigenous Governance	Living within systems of Indigenous governance, which are rooted in Indigenous knowledge and kinship systems	This variable was unmeasured	n/a
Mobility	Recently moving residence	A dichotomous variable, with those who moved 1 or more times in the last 12 months in one group (0), and those who moved 0 times in the last 12 months in another (1)	OHC Toronto

Node	Concept	How Variable was Constructed	Data Source
Social Support	Feeling connected and supported by a network of people	A dichotomous variable, with those who reported having warm and trusting relationships with others almost every day, about 2 or 3 times a week, about once a week, once or twice, or never in one group (0) and those who reported having warm and trusting relationships with others every day in another (1)	OHC Toronto
Sexual Orientation	Sexual Orientation	A dichotomous variable, with people who did not identify as heterosexual in one group (0), and heterosexual identifying people in another (1)	OHC Toronto

### *Statistical Procedures*

To estimate the total causal effect of each potential cause on wellness, we used logistic regression modelling within the potential outcomes framework of causal modeling. The GLIMMIX procedure in SAS V.9.4. was used to estimate weighted and adjusted associations between measurements, following the results of previous OHC studies that tested various modelling approaches (see Beckett et al, 2018; Kitching, 2017). Because RDS is not a random sampling method, to account for unequal probability of sampling and achieve unbiased parameter estimates, the sample participant data must be weighted to adjust for the RDS recruitment chains, in which individuals with larger social networks are more likely to be sampled than others. To calculate weights, participants were asked in the survey to estimate their personal network size with the question ‘Approximately how many Aboriginal people do you know (i.e., by name and that know you by name) who currently live, work or use health and social services in Toronto?’ (Rotondi et al, 2017). The GLIMMIX function utilizes a weighted generalised linear mixed model,



which is able to account for the non-independence of participant selection through RDS through a covariance structure that accounts for the level of correlation between data points. Participants were weighted using RDS-II weights for the outcome, and seeds were excluded from the analysis. As discussed in Beckett et al (2018), the GLIMMIX procedure was chosen based on simulation and analytic studies overseen by Dr. Rotondi that found it to be capable of reasonably maintaining the type 1 error rate.

Odds Ratios (ORs) and 95% Confidence Intervals (CIs) for the total effect of each variable on wellness were generated from each of the four models. Statistical significance was judged at  $\alpha=0.05$ . Appendix 2 shows the unweighted and unadjusted associations between wellness and each of the four community-identified resources of interest. Fully adjusted and weighted models are shown in Tables 3 to 6. In the land model, data were missing from 8 variables; these 15 missing cases were handled by case deletion ( $n=308$ ). In the traditional foods model, data were missing from 8 variables; these 15 missing cases were handled by case deletion ( $n=308$ ). In the cultural connectedness model, data were missing from 7 variables; these 14 missing cases were handled by case deletion ( $n=309$ ). In the Indigenous programs and services model, data were missing from 6 variables; these 10 missing cases were handled by case deletion ( $n=313$ ).

## **4.5. Results**

Table 3 shows that after adjusting for abuse, age, capitalism, colonial governance, cultural connectedness, education, fragmentation policies, gender, income, Indian status, Indigenous programs and services, mobility, ability, sexual orientation, social support,

and traditional foods there was a statistically significant positive association between wellness and relationship to the land that was estimated with good precision (OR 3.7, 95% CI 2.8 to 4.8). Table 4 shows that after adjusting abuse, age, capitalism, colonial governance, cultural connectedness, education, fragmentation policies, gender, income, Indian status, Indigenous programs and services, mobility, ability, sexual orientation, and social support there was a statistically significant positive association between wellness and traditional foods (OR 10.7) but it was estimated with very low precision (1.1 to 108.0, 19 times out of 20). Table 5 shows that after adjusting for abuse, age, capitalism, colonial governance, education, fragmentation policies, gender, income, Indian status, Indigenous programs and services, mobility, ability, sexual orientation, and social support the association between wellness and cultural connectedness was not statistically significant (OR 1.7) but was also estimated with moderate precision (0.7 to 4.4, 19 times out of 20). Table 6 shows an association between Indigenous programs and services and wellness that was statistically significant (OR 16.4) but was estimated with very low precision (5.0 to 53.6, 19 times out of 20) after adjusting for abuse, age, capitalism, colonial governance, fragmentation policies, gender, Indian Status, mobility, ability, sexual orientation, and social support.

**Table 3. Adjusted\* relative odds of wellness by relationship to land among women, two-spirit, trans, and gender diverse people of reproductive age (n = 308) in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016**

Variable	OR	95% CI	2-sided P value
Relationship to land	3.7	2.8 to 4.8	<.0001
* Adjusted for abuse, age, capitalism, colonial governance, cultural connectedness, education, fragmentation policies, gender, income, Indian status, Indigenous programs and services, mobility, ability, sexual orientation, social support, and traditional foods.			

**Table 4 Adjusted\* relative odds of wellness by traditional foods among women, two-spirit, trans, and gender diverse people of reproductive age (n = 308) in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016**

Variable	OR	95% CI	2-sided P value
Traditional foods	10.7	1.1 to 108.0	0.0445
* Adjusted for abuse, age, capitalism, colonial governance, cultural connectedness, education, fragmentation policies, gender, income, Indian status, Indigenous programs and services, mobility, ability, sexual orientation, and social support.			

**Table 5 Adjusted\* relative odds of wellness by cultural connectedness among women, two-spirit, trans, and gender diverse people of reproductive age (n = 309) in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016**

Variable	OR	95% CI	2-sided P value
Cultural connectedness	1.7	0.7 to 4.4	0.2624
* Adjusted for abuse, age, capitalism, colonial governance, education, fragmentation policies, gender, income, Indian status, Indigenous programs and services, mobility, ability, sexual orientation, and social support.			

**Table 6      Adjusted\* relative odds of wellness by Indigenous programs and services among women, two-spirit, trans, and gender diverse people of reproductive age (n = 313) in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016**

Variable	OR	95% CI	2-sided P value
Indigenous programs and services	16.4	5.0 to 53.6	<.0001
* Adjusted for abuse, age, capitalism, colonial governance, fragmentation policies, gender, Indian Status, mobility, ability, sexual orientation, and social support.			

## 5. Discussion

This research examined factors that may lead to wellness for Indigenous women, two-spirit, trans, and gender diverse people of reproductive age in Toronto, including relationships to land, traditional foods, cultural connectedness, and Indigenous programs and services. Although these factors have been identified as health protective in theoretical and qualitative research, less is known about the relationship between these factors and wellness from a quantitative perspective. This study involved a population whose reproductive health was not well known prior to the OHC Toronto initiative: Indigenous women, two-spirit, trans, and gender diverse people living in the city of Toronto.

We hypothesized that relationships to land would have a positive relationship to wellness. This model emerged as statistically significant at  $\alpha=0.05$  with reasonable precision (3.7, 95% CI 2.8 to 4.8). Given the abundance of literature, including from the field of Indigenous reproductive health and justice, that land is a key mediator of wellness, this finding is not surprising. These findings are salient to the field of research related to Indigenous resurgence, which often positions relationships to land and the practice of land-based lifeways as central to Indigeneity (for example, see Alfred, 2010; Simpson, 2011; Coulthard, 2014). While resurgence theories have made important contributions to Indigenous decolonization and nationhood movements, they are sometimes criticized for excluding the realities of Indigenous people who have been removed from their traditional lands and dispossessed of land-based lifeways as a result

of colonial governance and capitalist economics (see Million, 2014). These results clearly demonstrate that Indigenous women, two-spirit, trans, and gender diverse peoples living in cities are finding ways to meaningfully engage resurgent practices, adding credence to Million's (2014) argument that Indigenous resurgence theorists must find ways to "engage the actual multiplicity that is" (pp. 165).

Our second hypothesis that traditional foods may lead to wellness emerged as statistically significant but with very low precision (10.7, 95% CI 1.7 to 108.0). Precision in this model was likely impacted due to low cell sizes. Traditional foods, which can require labour intensive and time sensitive processes of harvesting and processing, and which are increasingly threatened by environmental destruction, or by private property restrictions to harvesting areas, can be difficult to obtain. This is true irrespective of geography, but traditional foods are probably especially difficult to obtain in the city, where many Indigenous people live away from their traditional land bases. This is a possible explanation for the low counts of people who reported eating traditional foods often. Despite the wide confidence interval, taken alongside growing movements for Indigenous food sovereignty (Daigle, 2017; Perry, 2013), this result is compelling. However, due to low precision, this result should be interpreted with caution. To improve precision in the estimate of the effect of consuming traditional foods on wellness, future studies would need to increase the size of the sample.

Cultural connectedness did not emerge as statistically significant at  $\alpha=0.05$ , but whether or not this variable had a positive association to wellness was ambiguous (1.7, 95% CI 0.7 to 4.4). The low precision here makes it impossible to conclude that there is no meaningfully positive association between these variables and wellness. Although the

lower bound signified a potentially inverse relationship to wellness, the upper bound of the confidence interval indicates a meaningfully large positive relationship to wellness. Therefore, further studies are needed to better assess the magnitude of the effect of cultural connectedness on wellness amongst urban Indigenous people of reproductive age.

The possibility that identity and belonging did not have a statistically significant effect on wellness parallels findings from a study that used MEIM-R to assess the influence of ethnic identity as a potential protective-predictive indicator of resilience in a cohort of predominantly Black women in the United States who had experienced intimate partner violence (Howell, Thurston, Schwartz, Jamison, & Hasselle, 2018). In this study, Howell et al (2018) draw on Ungar's (2013) socio-ecological conceptualization of resilience, which they describe as "the capacity of individuals facing adverse circumstances to navigate their way to the psychological, social, cultural, and physical resources that sustain their well-being" (p. 438). In their regression model, the outcome variable resilience was constructed using the Connor-Davidson Resilience Scale, which contains 25 self-reported measures for assessing how participants respond to stress and adversity (Howell et al, 2018). Howell et al (2018) found that ethnic identity was not a statistically significant predictor of resilience in their study, and speculated this may be because ethnic identity represents a distal determinant of health. This conclusion was supported by their finding that social support, a proximal determinant of health, was a statistically significant protective-predictor of resilience.

Our fourth hypothesis that Indigenous programs and services may lead to wellness emerged as statistically significant but with very low precision (16.4, 95% CI 5.0 to

53.6.0). Precision in this model was again likely impacted due to low cell sizes. The importance of Indigenous-specific programs and services, and the need for more Indigenous health professionals has been articulated widely in Indigenous authored reports and policy recommendations, including the SOGC joint policy statement on Indigenous reproductive health (Yee et al, 2011). Despite the wide confidence interval, this result is compelling. However, due to low precision, this result should be interpreted with caution.

The Indigenous programs and services variable was created based on the number of Indigenous programs and services participants reported attending in the last twelve months (see Table 1). The vast majority of participants attended at least one program or service (289/308, 94%)<sup>1</sup>, so the asymmetrical distribution of this variable may have contributed to low precision. At the same time, the odds of wellness amongst the participants that did not report attending at least one Indigenous program or service in the last 12 months was very low (4/19, 21%). This finding is worthy of further exploration but beyond the scope of this study.

Upon reflection, we found that attendance in at least one Indigenous programs or service was not the most accurate way to measure this variable, because the effect of Indigenous programs and services on wellness is likely mediated through matters pertaining to the accessibility and quality of those programs and services. Therefore future studies could consider examining the causal effects of participation in a specific program or services on wellness; this type of design would also allow investigation of

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<sup>1</sup> For the distribution of each variable, see Appendix 1



whether more participation in a particular program had more of a causal effect on wellness than less participation.

## **5.1. Limitations**

This study was limited by the cross-sectional nature of the data; given that the data were taken at one point in time, the possibility of reverse causality cannot be eliminated. In the first model, it is possible that feeling well could lead to spending more time on the land, which in turn may create more wellness. In the second model, it is possible that feeling well could produce the energy needed to procure traditional foods, which in turn may create more wellness. In the third model, it is possible that feeling well could produce the energy needed to participate in cultural activities, in turn creating more wellness. In the fourth model, it is possible that feeling well could motivate one to get out and participate in programs and services, which may in turn create more wellness. The need to construct relationships in an acyclic fashion is a limitation of regression methods; in Indigenous thought systems, these relationships may be more likely conceptualized as positive feedback cycles. However, despite tensions in how reality may be conceptualized by western versus Indigenous thought systems, the information measured here is still meaningful to public health. This exploratory study demonstrates the need for longitudinal research, which could better track dynamic constructs such as wellness and relationships to land, and make more sophisticated observations about causal pathways.

The explanatory and outcome variables in this study (relationships to land, traditional foods, cultural connectedness, Indigenous programs and services, and wellness), relied on

self-reports. While self-reported measures are an important way of recognizing the autonomy of individuals to determine their own health status, the data may be subject to recall error. Attempts to reduce recall error were made through community-based survey development and a pilot study, OHC Hamilton. As community interviewers were responsible for recording participants' survey responses, it is possible that participants may have inaccurately recalled information because of perceived social expectations related to the exposure and outcome. The risk of this kind of non-differential misclassification of exposure and outcome was mitigated through the appointment of Indigenous community interviewers with cultural safety and sensitivity training, but the possibility still exists nonetheless.

A strength of OHC Toronto was the use of RDS methods, which were effective for a second time in collecting health data from an urban Indigenous population in Canada (the first being OHC Hamilton). The community-based research methodology and the RDS methods used by OHC Toronto yielded novel information about Indigenous two-spirit, trans, and gender diverse experiences, given that this group has been historically erased by official statistics. However, the low participation rate of trans and gender diverse people made it not possible to disaggregate results about these groups without compromising their safety and confidentiality. The experiences and perspectives of Indigenous trans and gender diverse people are extremely important to achieving Indigenous reproductive justice, and future research is needed to support the critical shift away from the erasure of trans and gender diverse people in reproductive health research. Future studies could consider strategies to oversample these populations.

Kitching (2017) notes that the RDS design of OHC Toronto may have also under sampled Métis community members. Given the discrepancy between Toronto Métis participation in the National Household Survey and Métis participation in OHC Toronto, there is evidence that the reliance of RDS on social networks may have excluded members of the Métis community who were not linked to the wider Indigenous community (Kitching, 2017). Therefore, more research is needed to better understand the factors that contribute to reproductive health and wellness for urban Métis people, who are marginalized from accessing Indigenous-specific supports and health care benefits, which tend to be geared towards First Nations people with Indian Status (Kitching, 2017).

Because this study relied on secondary data, there were limitations associated with matching the concepts in the DAGs to the available data, in order to construct variables for conditioning. Due to the mismatch of certain concepts, there may be some residual confounding in the models. Many Indigenous people have argued that environmental health and the exercise of Indigenous governance have a causal effect on wellness, and because these concepts were unmeasured, the results of all four models may be biased away from the null. This possible bias away from the null would lead to an overestimation of the effect of the explanatory variables on wellness. Finally, understanding urban Indigenous peoples' relationships to land could be aided by more specific information about where people forge these relationships. Do they create strong relationships from their urban neighbourhoods? Or do they leave the city to work on these relationships? If so, where to? This information could aid the development of strengths-based Indigenous reproductive health programs and services.

## 6. Conclusion

This paper began by noting that recently, Canada has made political commitments to advancing equity for marginalized populations through investments into reproductive health care and services. Indigenous peoples are identified as a priority population in this commitment (Government of Canada, 2017). Inequities in Indigenous reproductive health are linked to historic and ongoing forms of colonialism, which produce political, social, and economic environments that enable disproportionately high levels of violence towards Indigenous women, two-spirit, trans, and gender diverse people, as well as the lands which are crucial to their wellbeing. For this reason, Indigenous people have been organizing, advocating, and researching for reproductive justice for at least a decade, and without the language of “reproductive justice” for much longer.

Using a reproductive justice theoretical framework, this paper explored some of the historic and ongoing processes, policies, and practices that shape contemporary Indigenous reproductive inequities. By doing so, this paper revealed that Canada’s commitment to ameliorating reproductive health disparities for Indigenous women, two-spirit, trans, and gender diverse peoples, comes from a compromised place. Beyond benevolent rhetoric and one-time investments, an equity approach to ameliorating Indigenous reproductive health disparities will require long-term commitments to structural change. Indigenous reproductive justice frameworks make it clear that these changes must address the ongoing violations to Indigenous peoples’ reproductive lives,

while creating systems for supporting wellness that are rooted in land, Indigenous knowledge, and autonomy.

Over the last twenty years, community-based and participatory approaches to research with Indigenous peoples have emerged as a best practice. Indigenous peoples are the experts in their own lives, but there continues to be a lack of community-based quantitative research regarding the health of urban Indigenous populations, even though they represent more than half of the total Indigenous population in Canada. Epidemiological data plays a key role in public health policy making and resource allocation, but there are major gaps in statistics concerning urban Indigenous reproductive health, and the research that does exist is often deficit-based. To address this gap, this study examined data collected for Our Health Counts Toronto, an inclusive community-driven health survey led by the Seventh Generation Midwives Toronto and the Well Living House Action Research Centre for Indigenous Infant, Child and Family Health and Well-Being. Through a community-based graduate research partnership with SGMT and WLH, this research tested hypotheses that for the urban Indigenous women, two-spirit, trans, and gender diverse people of reproductive age who participated in OHC Toronto, four factors enhanced wellness: (1) relationships to land; (2) traditional foods; (3) cultural connectedness; and, (4) Indigenous programs and services.

Logistic regression models informed by Indigenous reproductive justice theories revealed that relationships to land, traditional foods, and Indigenous programs and services were statistically significant to wellness. Though the results for cultural connectedness were ambiguous, it was potentially also meaningful to wellness from a public health perspective. Further research is needed to clarify the relationships between

wellness and the factors that were identified here; a longitudinal study which measures indicators multiple times over a long term may be better suited to observing dynamic concepts such as relationships to land and wellness. This study adds further evidence that respondent-driven sampling methods are suited to urban Indigenous population health research in Canada, though future studies that use an RDS design should note the requirement of large sample sizes to obtain precision with regression analyses.

This study provides policy makers and service providers with evidence of the positive impact of practices and services that are rooted in culture on Indigenous well-being. Indigenous reproductive theorists agree that reproductive health must be thought of in the holistic, relational ways that Indigenous thought supports. Protecting and enhancing Indigenous reproductive health requires a life-course approach (Reading & Wien, 2009; Hinchey, 2018), and this research provides evidence for at least three resources to support Indigenous reproductive health across the life cycle. The findings of this research are potentially unsurprising to Indigenous peoples, who have been utilizing these strategies to support health and well-being for a long time. However, my hope is that this research will provide Indigenous peoples and our allies with empirical evidence to support land-based culturally-rooted approaches to promoting health equity and reproductive justice.

The results of this research call for municipal, provincial, and national investments into Indigenous reproductive justice advocacy and self-determined models of Indigenous reproductive health care. Largely, this work is being led by Indigenous birth workers and youth-led organizations, such as the Native Youth Sexual Health Network, who centre principles of Indigenous self-determination, resurgence, decolonization, kinship, and cultural safety in their practice. Through this important work, Indigenous peoples are

creating “communities of care” necessary to advancing reproductive justice (Ross & Solinger, 2017). The growing demand for Indigenous midwives, doulas, health care and other care providers is testament to the importance of their work for reproductive justice.

By bridging critical Indigenous scholarship and reproductive justice theories with population health approaches and epidemiological methods, this research was able to glean fresh insights into Indigenous reproductive health. The use of Directed Acyclic Graphs was crucial to bringing these fields together. Quantitative studies concerning Indigenous reproductive health should continue to take critical and community-based approaches, and may consider the use of DAGs. Future research in this field should seek the participation of communities implicated by the research, especially communities who have been historically erased by reproductive health research, such as two-spirit, trans, two-spirit, gender diverse, and Métis peoples. Reciprocal research partnerships with these communities are recommended, and governments and research institutions must commit resources to supporting the participation and leadership of Indigenous peoples in research, in the spirit of fulfilling the Truth and Reconciliation Commission’s calls to action and the UNDRIP.

The process of conducting this research was simultaneously an act of grief, and one of celebration. As someone who is intimately connected to this research through my own story, and the stories of my grandmothers, aunties, friends, and clients, it was at times extremely painful to uncover the histories of genocide that have been levied against our reproductive lives. Certainly, as Indigenous peoples from diverse backgrounds, genders, and sexual orientations, we have not been equally impacted by settler-colonial violence, and I recognize the privileges that I carry. I grieve with and for my relatives who have

been violated by this system in unthinkable ways, and I sometimes grieve feeling powerless to the violence that continues.

Importantly, this research has also shown me that Indigeneity is not solely a marker of risk; to be Indigenous is to come from a legacy of power and perseverance that can never be taken away. To me, the most important revelation from this research is that our power can be accessed in relationship to the land and our people—from wherever we are. I interpret this finding as evidence of the brilliance of our ancestors, who knew that land and kin were central to their wellness, and that our lives should be lived in ways that preserve these resources for our children yet to come. I am grateful to the Indigenous women, two-spirit, trans, and gender diverse people who participated in OHC Toronto, who so clearly demonstrated that these values are still in practice today, and that their relevance transcends space and time. *Chi-miigwech*.



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## Appendix A. Crude Association Tables

The following tables show the crude associations for each of the four statistical models.

**Table A1. Crude relative odds of wellness by relationship to land among women, two-spirit, trans, and gender diverse people of reproductive age in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016**

Variable	OR	95% CI	2-sided P value
Relationship to land	3.6	1.2 to 10.6	0.0209

**Table A2. Crude relative odds of wellness by traditional foods among women, two-spirit, trans, and gender diverse people of reproductive age in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016**

Variable	OR	95% CI	2-sided P value
Traditional foods	6.8	0.8 to 61.5	0.0862

**Table A3. Crude relative odds of wellness by cultural connectedness among women, Two-spirit, trans, and gender diverse people of reproductive age in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016**

Variable	OR	95% CI	2-sided P value
Cultural connectedness	2.1	0.4 to 12.0	0.4200

**Table A4. Crude relative odds of wellness by Indigenous programs and services among women, Two-spirit, trans, and gender diverse people of reproductive age in the “Our Health Counts Toronto” cohort. Toronto, Canada, 2015-2016**

Variable	OR	95% CI	2-sided P value
Indigenous programs and services	16.0	3.3 to 78.6	0.0007



## Appendix B. Response Distribution by Category

The following tables show the response distribution by category for each of the four statistical models. For categorical definitions, see Methods.

**Table B1. Relationship to land model: response distribution by category**

Variables		Outcome variable: wellness	
		0	1
Relationship to land			
	0	106	34
	1	87	81
Abuse			
	0	104	57
	1	89	58
Cultural connectedness			
	0	42	12
	1	151	103
Education			
	0	68	40
	1	125	75
Fragmentation policies			
	0	110	64
	1	83	51
Gender			
	0	33	28
	1	160	87
Income			
	0	150	97
	1	43	18
Indian status			
	0	68	33
	1	125	82
Indigenous programs and services			
	0	15	4
	1	178	111
Mobility			
	0	80	41
	1	113	74
Ability			
	0	101	55

Variables	Outcome variable: wellness	
	0	1
1	92	60
Sexual orientation		
0	34	31
1	159	84
Social support		
0	120	48
1	73	67
Traditional foods		
0	171	99
1	22	16

**Table B2. Traditional foods model: response distribution by category**

Variables	Outcome variable: wellness	
	0	1
Traditional foods		
0	171	99
1	22	16
Abuse		
0	104	57
1	89	58
Cultural connectedness		
0	42	12
1	151	103
Education		
0	68	40
1	125	75
Fragmentation policies		
0	110	64
1	83	51
Gender		
0	33	28
1	160	87
Income		
0	150	97
1	43	18
Indian status		
0	68	33

Variables	Outcome variable: wellness	
	0	1
1	125	82
Indigenous programs and services		
0	15	4
1	178	111
Mobility		
0	80	41
1	113	74
Ability		
0	101	55
1	92	60
Sexual orientation		
0	34	31
1	159	84
Social support		
0	120	48
1	73	67

**Table B3. Cultural connectedness model: response distribution by category**

Variables	Outcome variable: wellness	
	0	1
Cultural connectedness		
0	42	12
1	151	103
Abuse		
0	104	57
1	89	58
Education		
0	68	40
1	125	75
Fragmentation policies		
0	110	64
1	83	51
Gender		
0	33	28
1	160	87
Income		
0	150	97

Variables	Outcome variable: wellness	
	0	1
1	43	18
Indian status		
0	68	33
1	125	82
Indigenous programs and services		
0	15	4
1	178	111
Mobility		
0	80	41
1	113	74
Ability		
0	101	55
1	92	60
Sexual orientation		
0	34	31
1	159	84
Social support		
0	120	48
1	73	67

**Table B4. Indigenous programs and services model: response distribution by category**

Variables	Outcome variable: wellness	
	0	1
Indigenous programs and services		
0	15	4
1	178	111
Abuse		
0	104	57
1	89	58
Education		
0	68	40
1	125	75
Fragmentation policies		
0	110	64
1	83	51
Gender		
0	33	28

Variables		Outcome variable: wellness	
		0	1
1		160	87
Income			
0		150	97
1		43	18
Indian status			
0		68	33
1		125	82
Mobility			
0		80	41
1		113	74
Ability			
0		101	55
1		92	60
Sexual orientation			
0		34	31
1		159	84
Social support			
0		120	48
1		73	67