An Intersectionality-Informed Analysis of Loneliness and Discrimination Experienced by 2S/GBTQ+ People Living With Disabilities Before and During the COVID-19 Pandemic

Anthony Theodore Amato

BA, Concordia University, 2021

A Thesis Submitted in Partial Fulfillment of the

Requirements for the Degree of

MASTER OF ARTS

in the Social Dimensions of Health Program

University of Victoria

An Intersectionality-Informed Analysis of Loneliness and Discrimination Experienced by 2S/GBTQ+ People Living With Disabilities Before and During the COVID-19 Pandemic

Anthony Theodore Amato

BA, Concordia University, 2021

Supervisory Committee

Dr. Nathan J. Lachowsky, Co-Supervisor

School of Public Health and Social Policy

Dr. Kiffer Card, Co-Supervisor

Faculty of Health Sciences, Simon Fraser University

Abstract

Introduction: Social inequities such as loneliness and discrimination due to sexual orientation (herein, discrimination) are prevalent across disabled people and Two-Spirit, Gay, Bisexual and Trans men, Queer and Non-Binary (2S/GBTQ+) communities. However, little is known about how loneliness and discrimination were experienced in Canada at the intersection of disability and 2S/GBTQ+ communities, especially before and during the COVID-19 pandemic.

Method: To address this knowledge gap, four cycles (2019, 2020, 2021, 2022) of cross-sectional, bilingual, community-based Sex Now survey data were used, which included 2S/GBTQ+ people aged 15 years or older and living in Canada. A total of 12,355 2S/GBTQ+ participants responded to loneliness outcomes, and 11,575 to discrimination outcomes. A multi-stage data analysis was conducted. First, crosstabulations and chi-square tests were used to describe and test for differences across outcomes across the four survey cycles. Second, pooled data were analyzed to describe and test for differences in outcomes based on social determinants of health. Third, stratified analyses were repeated for participants living with and without a disability. Finally, only among 2S/GBTQ+ participants living with disabilities, multivariable logistic regression models of each outcome identified 1) temporal trends by survey year, and 2) social determinants of health correlates**.**

Results: There were statistically significant differences in outcomes across survey cycles, which were greater among 2S/GBTQ+ participants living with a disability. Compared with 2019 (before COVID-19), the odds of reporting loneliness were greater for 2S/GBTQ+ participants living with disabilities in 2020 and 2021 (but not 2022). 2S/GBTQ+

participants living with a disability who reported a racialized identity, financial strain, or a gender-expansive identity had greater odds of reporting loneliness. Compared with 2019 (before COVID-19), decreased odds of reporting discrimination were found in 2021 and 2022 (but not 2020). Generally, older 2S/GBTQ+ participants living with a disability were less likely to experience discrimination. 2S/GBTQ+ participants living with disabilities who were racialized, queer versus bisexual identified, and gender-expansive reported greater odds of discrimination.

Conclusions: These findings suggest that 2S/GBTQ+ people living with disabilities were impacted by greater loneliness and lesser discrimination during COVID-19. However, social inequities were also present among 2S/GBTQ+ people living with disabilities. Equitable policy planning is needed to ensure that underserved yet deserving communities are not disproportionally affected by future pandemics and associated public health responses.

Table of Contents

List of Tables and Figures

Prologue

Despite having previously resided on the unceded territories of the lək̓ʷəŋən people and on the lands of Songhees, Esquimalt and W̱SÁNEĆ people and Elders, this thesis was written while living on the lands of the Mohawk and First Nations people in Montreal, Quebec, and on the lands of Indigenous people of Granbury, Texas (e.g., Wichita, Kiowa, Caddo, Comanche, Lipan Apache, and Tonkawa). Living on the lands of various First Peoples has provided me opportunities to reflect on my positionality, privilege, and appreciation, as I describe below:

> I give thanks and appreciation to our planet, for the lands I lay my feet on that allow my family, friends, community and I to live and grow; I am grateful for the clean drinking water that sustain us, and that provide the ability to nurture and grow other living beings and life sources; I am grateful and privileged for the trees that surround us that helps purify the air, provide fresh food, and that help sustain and protect our planet; I am grateful and privileged for the clean and refreshing air I breathe, for sustaining other living beings, and for providing energy and strength; I am appreciative for the animals that surround me, for their teachings, love, and food source that help sustain us; I am appreciative of the birds that fly above me for their beauty and for hearing their chirps every morning; I give my appreciation to the sun, a source of heat and fire, for bringing us light and radiance, for sustaining life and energy, and for allowing me the privilege to see the sun as I awake and live each day; to the stars, I appreciate your beauty and peacefulness it brings me as I stare into the

> night sky, and brings balance to the universe; I am appreciative of the moon, that helps bring balance to the waters and creates tides, helps illuminates our skies, and for helping the growth of plants and trees; I am grateful for my family and community, past, present, and future, for their wisdom, love, strength, and warmth; and lastly, I am grateful for Indigenous people and elders who have and continue to take care of and guided the restoration and protection of lands, water and air, who guide us into reconciliation and decolonial practices, and for honouring their pre-colonial traditions, cultures, language, self-determination and governance that have served their communities for millenniums.

Identifying as a cisgender gay man with a speech impediment, mental health challenges, and chronic headaches, I am sometimes classified as '*able passing*' by outsiders. I acknowledge my privilege of being a Canadian citizen, and the privilege this grants me in terms of travelling across borders freely, feeling safe and secure without fear of deportation, having access to healthy food and clean water, access to healthcare and insurance, and a graduate education. With this, my experiences have been shaped differently than people of other sexual and gender expansive identities, racialized and Indigenous people, and other disabled people. I am privileged, despite holding some marginalized identities, and this has shaped my lived experiences.

While being reflexive of my biases and perspectives, the goal of my thesis is to shed light on the disparities faced by sexual and gender minorities across Canada during COVID-19. I know the last few years have been hard for many. I promise to

disseminate these findings accessibly to inform culturally appropriate and safe interventions and resources.

Acknowledgements

I would like to sincerely give gratitude to the 2S/GBTQ+ Sex Now participants across Canada, and the volunteers and employees within community organizations including the Community-Based Research Centre who supported data collection between 2019-2022. Sex Now surveys have been supported and/or funded by various organizations. Sex Now research received funding support from the Canadian Institutes for Health Research (HBR-422155), REACH Nexus, the Public Health Agency of Canada, and the Canadian HIV Trials Network (CTN 334). The Sex Now 2019 research received funding support from Canadian Blood Services MSM Research Fund, funded by the federal government (Health Canada) and the provincial and territorial ministries of health; the views herein do not necessarily reflect the views of Canadian Blood Services or the federal, provincial, or territorial governments of Canada. I was funded through a CIHR Patient-Oriented Research Graduate Fellowship through BC SUPPORT Island Unit, and a Faculty of Human and Social Development Graduate Student Research Award and Chair in Transgender Studies Scholarship through the University of Victoria.

To the Community-based Health Equity Research Group at the University of Victoria, its affiliates and data analysts, thank you for your research support that made the Sex Now surveys possible; a heartwarming gratitude to everyone involved (Stephanie, Kimia, Ben, Chris, Aeron, Coady, Kimia, Jarvis, Ty, Alexi, Andrés, Anya, and every other person involved in these surveys over the years). To the community advisors who helped guide, provide feedback, and oversee this community-based project, thank you for trusting me with this work, for being vulnerable, for sharing your

experiences with me, and for being part of the process (George, Ahmad, ‘Anonymous’, and ‘Anonymous’).

To my supervisors, Drs. Lachowsky and Card, I appreciate your insights, friendship, and mentorship throughout this journey. The experiential learning you have both provided has equipped me with the knowledge and capacity to complete this thesis, and I have learnt so much about methodologies, community-informed priorities, and the importance of deeply reflecting on my biases, experiences and perspectives. To my undergraduate supervisor, Dr. Gilbert Émond (Concordia University), thank you for encouraging me to keep learning. To my family and siblings, thank you for accepting me and loving the person I am today. And finally, to my husband, Jonathan, thank you for being by my side, for your love, and for your endless support.

And lastly, to the late Dr. Chaudhri (Concordia University), you believed in me and in my abilities, with my disabilities packaged into one, when no one else did – you were, and will always be a ray of hope as I continue on this journey. I will continue to advocate for change for marginalized people, just as you fought for. This piece is in dedication to you.

Background and Statement of the Problem

Compared with the cisgender and heterosexual population in Canada, Two-Spirit people, Gay, Bisexual and Transgender men, and Queer and Non-Binary people (2S/GBTQ+) were more likely to experience a decline in well-being throughout the COVID-19 pandemic (Chatterjee et al., 2020; Statistics Canada, 2020). Meyer's minority stress theory (2003) explains that disparities experienced by 2S/GBTQ+ people are, in part, the result of psychosocial stressors related to (cis)heterosexist oppression and discrimination. Meyer explains that 2S/GBTQ+ people cope with these stressors by building resilient social support networks (both at the community and individual level), but due to COVID-19, concerns have been raised wherein 2S/GBTQ+ communities have been cut off from such support (Brennan et al., 2020; Salerno et al., 2020) and are experiencing greater isolation (Cohen et al., 2020; Rodriguez-Seijas et al., 2020). Compounded with this, inspired by Crenshaw's (1991) writing on intersectionality, key sub-groups of 2S/GBTQ+ people were particularly vulnerable due to experiences of intersecting forms of oppression, stigma, and discrimination related to marginalizations on the basis of class, race, and gender, but also can include Indigeneity and living with HIV. This thesis, supported through community guidance, sheds light on the social inequities reported by various 2S/GBTQ+ sub-communities across Canada during COVID-19.

Literature Review

This literature review starts with a brief description of the COVID pandemic, followed by an overview of theoretical frameworks that are timely and relevant in this work. It continues with the description of empirical works on social factors that affect well-being and have been reported and measured cross-sectionally during the COVID-19 pandemic. When available and possible, levels of social support, discrimination, and loneliness will be contrasted longitudinally.

Brief History of COVID-19 in Canada

As of March 2020, provinces and territories within Canada ordered either a public health emergency or a state of emergency following the emergence of COVID-19 (see the interactive dashboard from the Canadian Institute of Health Information, 2022). In the context of COVID-19, these types of emergencies provide public health and government officials across provinces and territories differential controls and measures (Antle, 2020; Khoury et al., 2022). To avoid transmission of the COVID-19, various public health control measures were put in place at different times such as mask mandates, self-isolation, emergency measures (e.g., curfews, unable to access services), and avoiding non-essential travel (Canadian Institute of Health Information, 2022). One aspect of the pandemic to consider is that curfews, lockdowns and social distancing were differentially mandated provincially and territorially across Canada (e.g., Government of British Columbia, 2023; Ghasemi et al., 2021; Nielson et al., 2022). These regional differences could therefore play a role in understanding the differential impact of loneliness and discrimination.

Theoretical Frameworks

The Institute of Medicine's report highlighted key perspectives that research on sexual and gender minorities should consider (NIH LGBT Research Coordinating Committee, 2013). Thus, I employ minority stress theory, intersectionality, and life course complimented by social resource theory for this thesis.

Minority Stress Theory

In one of the first papers of its kind, Meyer initially described minority stress in the context of mental health among solely gay men (1995). Here, he described direct pathways that cause distress in gay men and asserted that these are not indirect processes. Although Meyer's results were substantiated in 1995, his findings were not formally presented in a theoretical framework; in 2003 the minority stress theory was developed and allowed us to visualize these complex pathways that bring upon psychological distress or well-being. Meyer (2003) explained that sexual minorities (i.e., mostly gay and bisexual men, and lesbian women[1]) tend to experience poorer psychosocial outcomes, distress, and physical health. Multiple facets (e.g., expectations of prejudice, concealment of one's sexual orientation) mediate or moderate contributions to health outcomes. Although not previously considered in Meyer's model, these are heightened when an inequity lens is used (Penman-Aguilar et al., 2016) such as ableism or classism. Changes to Meyer's model have been introduced elsewhere (Amato & Émond, 2023) which include different inequity lenses to understand better the experiences of people with multiple minority statuses and lived experiences with

[1] Note that in Meyer's original model (2003), only people with an LGB identity (lesbian women, gay men, and bisexual people) were included; there was a lack of inclusion among transgender and gender non-conforming people, in addition to people of other marginalized sexual orientations or identities.

oppression. Research has also proposed minority stress in the lens of trans and gender non-conforming people (Hendricks & Testa, 2012; Tebbe & Moradi, 2016), albeit that transgender people were not included in the original minority stress model proposed by Meyer (2003). Other factors such as layered stigma and homophobia (i.e., internalized and externalized) contribute to the reality that sexual minority people tend to experience poorer outcomes compared with the general population (Meyer, 2003).

One important area of the minority stress theory is the role of coping (i.e., through social and community support; Meyer, 2003) and the psychosocial benefits this provides. In the context of COVID-19 and of co-occurring pandemics (e.g., the HIV epidemic), one method of reducing COVID-19 transmission has been through reducing social contacts and engaging in social/physical distancing. Thus, this theory is important in understanding how social support has particularly affected marginalized subgroups of people within 2S/GBTQ+ communities during COVID-19; particularly, the mandated social distancing and stay-at-home orders among people with symptoms in the earlier moments of this pandemic and that continues to disproportionally affect people who are immunocompromised (e.g., some people living with HIV).

Intersectionality

Although the minority stress theory has helped shape our understanding of various factors that affect sexual minority cisgender men's and women's health, the original model (2003) does not consider transgender and non-binary people, or other social locations within our diverse 2S/GBTQ+ community. Indeed, other extensions to Meyer's model have been proposed (see Amato & Émond 2023; see also Lefevor et al., 2019). However, the minority stress theory lacks the way that sociostructural inequities

interact, are modulated, and their effect on marginalized people more broadly. Instead, intersectionality uses a broader lens to examine how power, privilege and oppression interplay to explain the disproportional effect that tends to be experienced by people of intersecting minority identities (Crenshaw, 1991). Initially risen from Black feminist scholarship with a focus on power and (dis)privilege, intersectionality considers systematic racism, sexism, classism, ableism, homophobia, transphobia, and any cis-heteronormative worldview that is used to disempower and discriminate.

Widely used in qualitative work, intersectional considerations examine gender (e.g., transgender man, agender person), sexual orientation (e.g., bisexual, queer, asexual), ethnoracial identities (e.g., African, Caribbean and/or Black; Latino/e/x; South Asian), Indigeneity, HIV status (e.g., positive, negative, undetectable), and age (e.g., young versus older/aging populations; see Abrams et al., 2020) as co-occurring. We recognize that researchers in the field of intersectionality have not systematically come to agreement on whether and how intersectionality should be applied when used in quantitative works (see Bauer et al., 2021; Mena et al., 2019). With this, the inequitable experiences among people with sociocultural identities can be additive on one's health or well-being; however, the sum of its parts can sometimes be greater depending on one's experiences (Purdie-Vaughns & Eibach, 2008). What this implies is that it is not as simple as conducting a 3-way moderation analysis to account for the effects of one's identities on an outcome variable. It is challenging to work through the complexities that intersectionality requires of quantitative work, which is often focused on parsimony and reduction. Its use must be deliberate and reflect people with lived experiences. Beyond statistics, however, the use of intersectionality in quantitative research must also

consider how the results are interpreted and how the analysis is set up; as Else-Quest & Hyde (2016) state, “researchers using an intersectional approach should interpret results within the context of social, historical, and structural inequality” (p. 164).

Life Course Theory

This theory is an important approach to consider in research involving 2S/GBTQ+ people (Institute of Medicine, 2013). Examining social inequities developmentally is important given other sociostructural and systemic differences in the context of maturation (Elder et al., 2003). For example, older 2S/GBTQ+ people will have different experiences than their younger counterparts. The former experienced different stressors over their life course (e.g., living through the HIV epidemic from 1981 to 1996 before the arrival of highly active anti-retroviral therapy; see Forstein, 2013 and Shultze, 2015). This theory also considers how adverse childhood experiences shape the health and well-being of individuals later in life. Differences over the life course is instrumental to understanding differences in social inequities.

Social Resource Theory

Although not a theory proposed by the Institute of Medicine (2013), social resource theory is relevant to this thesis and aligned with the aforementioned frameworks; this theory stipulates that social resources, including their use and accessibility found within social networks, contribute to better socioeconomic outcomes (Lin, 1982; Lin, 2001). COVID-19 demonstrated inequitable conditions such as access to services, resources, and networks; often, access to these resources privileged those with better social positions. As such, socioeconomic and health outcomes disproportionally affected communities across Canada; in particular, historically

marginalized communities have been affected by the sociostructural conditions around the pandemic (e.g., such as not having equitable access to high-quality masks, not able to isolate themselves or take time off from work; Government of Canada, 2023b). It is not surprising that COVID-19 affected various communities disproportionally given differences in social resources (Constantino et al., 2020; Gaynor & Wilson, 2020; Kamalakannan et al., 2021; Moore et al., 2021; Sequist, 2020; Tai et al., 2021)

Well-Being During COVID-19

Now that relevant theoretical frameworks have been introduced and discussed, the following section provides an overview of social factors such as overall well-being, social support, loneliness and discrimination experienced during the COVID-19 pandemic. We begin by discussing social supports, followed by well-being, loneliness, and discrimination.

Social support (i.e., support systems) and discrimination-free environments are social determinants of health critical to one's well-being (Government of Canada, 2022a; Solar & Irwin, 2010). These social factors have been experienced disproportionally during COVID-19 (World Health Organization [WHO], 2021). By this, it is suggested that specific subgroups of people in 2S/GBTQ+ communities are experiencing worse outcomes. For example, people living with HIV in the United States tended to experience worse psychological outcomes compared with people living with HIV in Argentina during COVID-19, possibly due to less social support in the former country (WHO, 2021). Similar findings have been suggested for people living with disabilities who experience higher rates of abuse and neglect (Ahmad et al., 2020; WHO, 2021), both factors associated with poorer well-being.

In other western countries, the well-being among 2S/GBTQ+ people declined when the pandemic began in early 2020 due to forced living situations that were unsafe due to one's sexual and gender identities (Mirabella et al., 2021; Sampogna et al., 2021); specifically, gender nonconforming youth expressed feeling less safe at home (Diaz et al., 2021; Mitchell et al., 2022). Specific to transgender and nonbinary people, the pandemic has caused harm to their well-being; layered stigma has exacerbated this, with continued experiences of violence and sociostructural barriers to accessing gender-affirming and other health care services (Philip, 2021). Other harms include being misgendered by family members and discrimination from accessing care services (e.g., hormone therapy; Mirabella et al., 2021; Sampogna et al., 2021). In Canada, transgender and gender nonconforming people tended to avoid accessing care services, especially if they reported worse mental health (Tami et al., 2022), reported interruptions to hormone therapy or were unable to get referrals for hormones (Trans Pulse Canada COVID Cohort Working Group, 2020).

A national study in the United States followed a sample of heterosexual and sexual minority men and women before and during COVID-19 (Fish et al., 2021). Various assessments were conducted related to facets of well-being such as quality of life and mental health. In unadjusted models, quality of life decreased more for men self-identifying as gay or bisexual, despite remaining stable for other sexual minority men (e.g., asexual), all compared with heterosexual men. Although these between-group differences were not statistically significant in adjusted models that controlled for gender and ethnoracial identity, age, income, region, and relationship and parental status, clinical significance is warranted. Bisexual men also reported greater loneliness

than gay and heterosexual men, while also reporting greater increases in distress throughout the pandemic when pre-pandemic distress levels were accounted for (Fish et al., 2021). These findings highlight differences in factors related to well-being among sexual minority men from pre-COVID-19 to during the pandemic. Similar studies need to examine these association among 2S/GBTQ+ people living in Canada.

Social Support During the COVID-19 Pandemic

Social support remains a social determinant of health that encapsulates and affects the overall well-being of a person, especially 2S/GBTQ+ people (Rainbow Health Ontario, 2019*).* It has been postulated that social support can buffer the effects of loneliness (Grossman et al., 2000) and various forms of discrimination too (Fingerhut, 2018; cf.[2] Carter et al., 2019). The importance of social health, including social networks and social support, cannot be understated (Card et al., 2022).

Sexual and gender minority people have disproportionally reported less perceived social support than cisgender heterosexual people during the pandemic (Moore et al., 2021), while transgender and nonbinary people continue to report not feeling supported at various institutional levels outside of Canada since the onset of COVID-19 (Mirabella et al., 2021). Although, at the population level, the effects of pandemic-related loneliness have been small (Ernst et al., 2022); this suggests that numerous systematic barriers to social connection existed before the pandemic. Note that population-level data fails to capture the experiences of specific marginalized communities who are potentially more vulnerable to the effects of less social support.

[2] cf. is used to contrast sources of information; i.e., denoting an academic or grey literature with results that are different to the initial argument(s).

The centering of Indigenous and Two-Spirit people, ethnoracial, and/or gender nonconforming people is equally scarce and lacking in academic and grey literature within a Canadian context. A commentary from Brennan et al. (2020) suggests that for Indigenous and Two-Spirit people, social distancing could likely worsen the well-being of 2S/GBTQ+ people due to fewer support systems available. Another Canadian study reported that diverse youth with various identities (e.g., Indigenous, Black) had diminished access to support networks due to the pandemic (Abramovich et al., 2021).

Abramovich et al. (2021) explain that many services that once supported 2S/GBTQ+ youth became unavailable during the global pandemic. Using a qualitative design, many participants reported various psychological disparities such as suicidal thoughts and attempts, severe anxiety, and depressive symptoms (Abramovich et al., 2021). The COVID-19 pandemic may have worsened at-risk youths' well-being due to loss of social support and having previously lived with disproportional levels of distress (Diaz et al., 2021). However, without contrasting these with pre-COVID-19 levels, it would be difficult to design scalable, culturally appropriate and gender-affirming interventions as their efficacy would be unclear (i.e., we would not know if the intervention has helped people reduce/improve well-being similar to pre-covid levels, or if the intervention had a greater positive effect and reduced these health inequities beyond pre-COVID-19 levels). As such, it is important to include data from years beyond the COVID-19 pandemic to analyze changes in social support or factors associated with it (see Robinson et al., 2022; see also Beutel et al., 2022). This is thus a limitation in the work by Diaz et al. (2021) and provides further rationale for why more longitudinal or serial cross-sectional studies are needed in Canada.

Discrimination During the COVID-19 Pandemic

It is expected that marginalized 2S/GBTQ+ people with intersecting identities likely experienced greater distress and poorer well-being due to minority- and COVID-19-related stressors caused by, at least in part, discrimination (Kneale & Bécares, 2021). In the United Kingdom, roughly 17% of sexual and gender minorities reported various forms of discrimination due to their gender or sexual orientation during COVID-19 (Kneale & Bécares, 2021). A higher prevalence of discrimination was also seen among sexual and gender minorities in Brazil (Torres et al., 2021) and among sexual and gender minorities with racialized minority identities in Italy (Mattei et al., 2020). In a report oversampled for sexual and gender minorities (Kamal et al., 2021), young sexual and gender minorities reported greater lifetime discrimination and less social support compared with their cisgender and heterosexual counterparts. Using the same comparison group, these authors reported worse mental health outcomes and greater worry related to COVID-19 among sexual and gender minority people. This is of interest because similar trends were reported when considering and adjusting for lifetime discrimination, baseline support systems, and mental health levels measured pre-COVID-19 (Kamal et al., 2021). This suggests that although pre-COVID-19 conditions were accounted for, sexual and gender minorities in the United States continued to report exacerbated health outcomes above and beyond cisgender heterosexual people. This remains unknown in a Canadian context. By understanding specific particularities and nuances within Canada, we can then inform sustainable interventions and strategies to support and reduce discrimination and improve the overall well-being of our communities.

Gender-nonconforming and racialized people (and those at the intersection of both) reported disproportional levels of discrimination when compared with cisgender people. Lerner and Lee (2021) assert that 17.8% of people who identified as Asian or Asian-American[3] experienced discrimination in public spaces in the United States. In addition to discrimination, physical attacks (13.9%) and harassment (54.4%) were equally reported among Asian or Asian-American gender nonconforming people (Lerner & Lee, 2021). When considering age at the intersection of ethnoracial and gender identity, older Asian/Asian American gender diverse adults were more likely to experience unequal treatment than younger persons (25-44 years versus 18-24). It was also reported that non-binary people were more likely to report verbal harassment when compared with self-identifying men (including transgender men); this is in line with other anti-Asian racism reported elsewhere. Gender nonconforming Asian/Asian-American people living with disabilities were also more than twice as likely to experience discrimination compared with people without a disability. These findings thus suggest that people with multiple marginalizations (i.e., Asian or Asian-American, gender identity, disability) were disproportionally affected by the pandemic and reported greater counts of discrimination. One limitation, however, is that *Asian* or *Asian-American* people were homogenized by including them into one single group. To homogenize ethnoracial groups in Asia and in the United States becomes problematic with unique identities and cultural experiences; as denoted by Minkov and Hofstede (2012), one should not attempt to homogenate a group with cultural heterogeneity and variation. Stratifying by specific ethnoracial identity would have been more culturally appropriate

[3] Asian and Asian-American was used by the authors, who grouped *Asian* people into a category without noting specific ethnoracial groups by geographic location (e.g., people from Southeast Asia, South Asia).

and would have provided clearer insight on the experiences of diverse-racialized people in the context of COVID-19. However, this might have been intentional to understand anti-Asian racism more broadly, as a function of COVID-19 being discovered in China. Other limitations include that no other racialized and cultural identities were examined, and that these contexts remain understudied in Canada. Taken together, these discrimination gaps could drive and inform the implementation of diverse intersectional interventions to support marginalized 2S/GBTQ people.

Loneliness During the COVID-19 Pandemic

Social isolation can lead to feelings of loneliness, which is defined as “a state of solitude or being alone”, or therein, the perception of it (Tiwari, 2013, p. 1). However, other research has defined loneliness as the concordance of subjective perceptions around social needs versus the actual state of their social networks, and feelings of uneasiness associated with this mismatch (Peplau & Perlman, 1982; Weiss, 1973). The latter definition will be used to understand how loneliness affected queer persons throughout the pandemic.

Social isolation and loneliness have both played a critical role among 2S/GBTQ+ people (Winwood et al., 2021). In a longitudinal cohort study from Switzerland reported by Marmet et al. (2021), the level of COVID-19-related isolation experienced by sexual minority men was statistically greater than their heterosexual counterparts. Sexual minority men equally had greater levels of distress pre-COVID-19, which included mental health and substance use (Marmet et al., 2021). From a clinical standpoint, as experiencing isolation was not controlled for pre-COVID-19 in the aforementioned study, it is difficult to discern the magnitude of COVID-19-related effects on their level of

isolation in an already at-risk population with higher rates of psychological distress. It remains equally challenging to extrapolate the results out of Switzerland to that of people living in Canada; as contextual elements remain essential in understanding social isolation, more studies are needed within Canada.

Sexual and gender minorities also reported struggling to cope with isolation more than their heterosexual peers (Movement Advancement Project 2020; cf. Mitchell et al., 2022). Although the proportion of participants reporting isolation by Mitchell and colleagues' (2022) remained relatively homogeneous between heterosexual and sexual/gender minority people, the authors grouped both *social isolation* and *interpersonal problems* into one variable. As such, we cannot discern which participants reported feeling isolated from those reporting interpersonal problems, which can include experiences separate from loneliness (e.g., intimate partner violence, conflict, marital or relational satisfaction).

Older 2S/GBTQ+ people may have experienced unique challenges with isolation in Canada throughout the pandemic. Among older HIV-negative gay and bisexual men in the United Kingdom, many reported feelings of loneliness and isolation during the COVID-19 pandemic (48.2%; Hyndman et al., 2021), with others outside Canada reporting fewer social networks and connections due to fewer opportunities for building meaningful connections (Kalichman et al., 2021; Philpot et al., 2021; Veldhuis et al., 2021). However, some participants in one study did report less social isolation (i.e., better social inclusion) among older gay and bisexual men and queer people (Hafford-Letchfield et al., 2021); it was speculated that people "were enjoying lockdown, aware that they had everything they needed, possessing company and security with their

partner and valuing their lifestyle" (p. 1239). Although this was true for some, older transgender people reported stressful situations, social inequities and fewer social interactions (Hafford-Letchfield et al., 2021), with this pattern replicated within other marginalized subpopulations during COVID-19 (Sampogna et al., 2021). The intersections of age, sexual orientation, and/or gender identity are particularly relevant as aging people's experiences seem to differ from younger cisgender sexual minority men. As the former group can struggle with experiences related to stigma and navigating aging, certainly this can play a role in their social connectedness. Another aspect to consider is the impact that retirement homes and long-term care facilities had on the loneliness of older people during the height of the COVID-19 pandemic; experiencing loss and isolation from friends, family, and partners may have lasting effects (e.g., Beogo et al., 2022; Estabrooks et al., 2020; Lindner, 2023). To understand better the experiences of older 2S/GBTQ+ people, contextual studies in Canada are needed.

People living with disabilities have also been affected socially and may have experienced more isolation during COVID-19. In Canada, disability is defined as any individual who reports challenges with "physical, mental, intellectual, cognitive, learning, communication or sensory impairment – or a functional limitation" (Government of Canada, 2022b, para 2). It is important to note, however, that a single and universal definition of disability does not exist (WHO, 2011). From engaging in social distancing and reducing contacts during the COVID-19 pandemic, isolation is predictable and also disproportionally affects people living with disabilities in various contexts and settings: this includes Autistic people who further reduced a potentially smaller social network

(den Houting, 2020); people living with physical or chronic illness who saw increased physical and social isolation (Fettes et al., 2021; Shakespeare et al., 2021); “people with sensory or intellectual impairments” who may have less knowledge of public health guidelines and measures (Kuper et al., 2020, p. 3); older adults living with disabilities who faced challenges accessing services and staying socially connected (Lee & Miller, 2020); and people living with intellectual disabilities who have been marked by ableism in the planning of COVID-19 in Canada (Schormans et al., 2021; Shakespeare et al., 2021). On top of greater pandemic-related isolation and overall loneliness reported, we still do not know how people living with disabilities within 2S/GBTQ+ communities have been affected; little research has examined this in a Canadian context or abroad, with even less research around other social determinants of health important for people living with disabilities.

Indigenous and people identifying with a Two-Spirit placeholder[4] within 2S/GBTQ+ communities have also experienced isolation due to COVID-19 (Sylliboy et al., 2022). Elders reported feelings of loneliness due to public health measures (e.g., lockdowns; Sylliboy et al., 2022) with many Two-Spirit people in one community having reported feeling lonely (Wabanaki Two-Spirit Alliance, 2021). However, very few studies have examined this within Indigenous and Two-Spirit communities in different parts of Canada. Canada-wide level data with proper stratifications during COVID-19 is also scarce for Two-Spirit communities.

[4] This non-Indigenous term is used to organize and encapsulate those who use Two-Spirit to symbolize a fluidity of sexual orientation and/or gender, and to include those who uses it as it relates to changes of roles within specific Indigenous communities (Pruden, 2021).

Summary of Gaps in the Literature

From the literature reviewed, loneliness, less social support, and experiences of discrimination (i.e., related to sexual orientation, gender, race, and disability) appear to have been exacerbated throughout COVID-19 among 2S/GBTQ+ people, regardless of whether in or outside of Canada. Additionally, only select studies included a population-based sample to discern within-group differences (i.e., differences between sexual/gender minorities) across various social outcomes prior to COVID-19. What remains unknown is how these differences in social outcomes vary from pre- to during COVID-19 in Canada across diverse marginalized subgroups (e.g., Indigenous and ethnoracial people, people living with a disability) within 2S/GBTQ+ communities.

To ensure feasibility of this Master's thesis, a sole focus will be placed on loneliness and on discrimination due to sexual orientation; as a gay man with lived experience related to disabilities, discrimination in relation to one's sexual identity is relevant and important to me. As such, I have articulated my second and third research questions as specific to 2S/GBTQ+ people living with disabilities.

Research Questions

With the goal of understanding the impact that the COVID-19 pandemic had on the well-being of diverse 2S/GBTQ+ people, my thesis aims to address the following three research questions:

(1) How have loneliness and experiences of discrimination due to sexual orientation changed for 2S/GBTQ+ people during the COVID-19 pandemic?

(2) How have loneliness and experiences of discrimination due to sexual orientation changed specifically for 2S/GBTQ+ people living with disabilities during the COVID-19 pandemic?

(3) What social determinants of health among 2S/GBTQ+ people living with disabilities are most correlated with loneliness and discrimination due to sexual orientation?

Method

Community Advisors

To ensure that the thesis, its results, and its dissemination remain meaningful and important for communities across Canada, four community advisors were recruited to guide this work. With the help of community organizations such as the Community Based Research Centre (CBRC, n.d.) and Vancouver Island Persons Living with HIV/AIDS Society, diverse 2S/GBTQ+ advisors including those who were Indigenous and persons of colour were recruited. Community advisors were engaged at every step along the way in English, with one-on-one meetings occurring via Zoom. They were renumerated at a rate of $50 per hour per community advisor for every meeting they were engaged in.

Recruitment and Data Collection

Sex Now (CBRC, n.d.) is an annual Canada-wide bilingual (English, French) community-based behavioural and health surveillance survey. Of note, the 2021 version had five languages (i.e., English, French, Spanish, Punjabi, and Traditional and Simplified Chinese) and 2022 was trilingual (i.e., English, French, and Spanish). Self-completed surveys were administered online via SurveyMonkey in 2019 and 2020, online via Qualtrics in 2021, and in-person in 2022. The 2019, 2020, and 2021 online Sex Now surveys were advertised via the email lists of CBRC and other 2S/GBTQ+ community organizations, via social media, and on sociosexual networking apps and websites. The 2022 version of Sex Now recruited participants in-person at 2S/LGBTQ+ pride festivals across Canada; research assistants and CBRC staff travelled across the country to collect these data in partnership with local community organizations.

Participants self-completed in-person surveys on iPads via Qualtrics. These population-based surveys allow us to examine changes over time within our communities using a repeated cross-sectional design, and are not a within-person cohort design.

Sex Now surveys are co-designed and created using a participatory framework (CBRC, 2023). In this, people with lived experiences are actively involved in the process, and power dynamics between university- and community-based researchers are challenged. CBRC is a community-based organization with strong ties to other national and regional 2S/GBTQ+ organizations. Community advisors provide feedback on question domains and content. This ensures that responses and items are meaningful for 2S/GBTQ+ people across Canada. Due to this, some items/questions on the survey cannot be compared at every time point since they evolve in language used or even whether they are included or not.

For my thesis, I conducted a secondary analysis of four cycles of Sex Now data collected from 2019-2022. This feasibility has only been possible with the dedicated and active support of local community organizations throughout the years, and national partners such as CBRC.

Inclusion Criteria

The inclusion criteria evolved across study cycles. As such, people who were included in these analyses were: 1) Two-Spirit people; 2) self-identifying cisgender or transgender men or people reporting another non-woman gender (e.g., non-binary, genderqueer, agender persons); or 3) people reporting a non-heterosexual identity (e.g., gay, bisexual, pansexual, queer, other). Participants in any of the above groups must also have reported having had sex with another self-identifying cisgender or

transgender man in the last five years. Details on exceptions were present in 2019/2021[5], 2020[6], and 2022[7]. All eligible participants had to live in Canada at the time of survey completion, be aged at 15 years or older, and must have provided informed consent prior to participating.

Prioritization of Identities and Group Categorization

As many surveys in Canada focus primarily on majority groups (e.g., white, gay cisgender men) within sexual and gender minority subpopulations, I wanted to increase visibility and representation of minority subgroups (e.g., racialized, bisexual and trans people). With the goal of looking at social inequities about people of different backgrounds and experience, this was important to consider as part of my data coding. Since data for these surveys were already collected, we could not actively oversample for minority identities as others have done (Anderssen & Malterud, 2017). Thus, during the data cleaning process, the *whole assignment, smaller group* method was applied for select-all-that-apply questions (Lee, 2001). This method ensured that if a participant chooses both a majority and minority identity, that only the minority identity will remain during the recoding of the variable (see the prioritization method used by Lachowsky et al., 2020). For instance, if a participant reported both gay and pansexual identities in the select-all-that-apply sexual orientation question, only the one with the lowest overall count would remain; in this case, the pansexual identity would remain for that participant. I acknowledge that this may introduce some bias (Liebler & Halpern-

[5] Had to report having sex with a man in the past 5 years if you said you were straight (even if you also identified as Two-Spirit and straight) in order to remain eligible.
[6] Had to report having sex with a man in the past 5 years only if you reported straight and non-Two-Spirit.
[7] If reported being a trans man or another non-woman gender, intersex, or Two-Spirit, they remained eligible even if they identified as straight and not had had sex with a man. For straight, cis men who did not report being Two-Spirit or intersex, they had to report having a sex partner who was a man (cis or trans) in the past 6 months to remain eligible.

Manners, 2008). Similar reasonings also applied for the coding of variables related to ethnoracial identities, gender identities, and disability subgroups.

Measures

Loneliness

Loneliness-related questions were asked in 2019, 2020, and 2021. Although there is a 20-item UCLA (version 3) scale (Russell, 1996), it was deemed too long to administer in community-based surveys. Thus, the UCLA 3-item scale was used as it is a reliable and valid measure to assess for loneliness and has been used in other population-based surveys (Hughes et al., 2004). The first item asked, '*How often do you feel that you lack companionship?*'; the second, '*How often do you feel left out?*'; and the third, '*How often do you feel isolated from others?*' (Hughes et al., 2004). Each item was scored on a scale from '*Hardly Ever'* first coded as *'1'*, *'Some of the Time*' first coded as '*2*', and '*Often*' first coded as '*3*'. The items were then summed, with possible ranges of loneliness ranging from 3-9 (Hughes et al., 2004). Scores ranging from 3-5 were then categorized as '*Not lonely*' [now coded as '*0*'] and 6-9 categorized as '*Lonely*' [now coded as '*1*'] consistent with previous research (Steptoe et al., 2013). Neither a sensitivity analysis around a potential cut off point nor the use of a continuous measure was utilized; this is because the cut-off of ≥ 6 to categorize loneliness holds the greatest combination of specificity (93%) and sensitivity (45%) of the UCLA-3 (Shiovitz-Ezra & Ayalon, 2011). What this means is that it can correctly classify if a person is lonely or not 86% of the time; although slightly increasing the latter proportion by using a greater cut-off, the sensitivity of the measure reduces to 29% with a cut off of 7 or greater, or 15% with a cut off of 8 or greater (Shiovitz-Ezra & Ayalon, 2011). As such, the cut-off of

six was used. For this variable, participants who did not respond to all three questions were recoded as '*Missing*' (coded as '*9999*'). Internal reliability was acceptable across pooled data (Cronbach alpha = .85) and for each cycle (Cronbach alpha $_{2019}$ = 0.86; Cronbach alpha $_{2020}$ = 0.86; Cronbach alpha $_{2021}$ = 0.83; Tavakol & Dennick, 2011).

Discrimination due to Sexual Orientation

The discrimination due to sexual orientation question was informed by community priorities and community consultations with people who have lived and/or living experience. The wording of the question changed across years, as is expected in community-based research (e.g., Sangalang et al., 2015). This was a binary variable. Participants who reported experiencing discrimination due to sexual orientation checked it off on the survey ['*Yes*', coded as '*1*']. Participants who did not report this left it blank ['*No*', coded as '*0*']. To determine participants who intentionally responded '*No*' versus people who skipped this section voluntarily, I used the question after the set of discrimination questions to determine this; if participants had responded to the next set of questions and left the set of discrimination questions blank, they were recoded into '*No'* (coded as '0'). However, participants who skipped both the set of discrimination questions and did not respond to the next question were coded as '*Missing*' (coded as '9999'). Only participants who self-identified as 18 or older was able to see this question. Participants under 18 were coded as '*ineligible'* (coded as '*8888*').

Age

Participants were grouped into several age categories: *'15-19 years old*', '*20-29 years old*', *'30-39 years old'*, '*40-49 years old*', '*50-64 years old*', and '*65 years and older*'. Age responses over '*120*' were removed from the dataset due to poor data

quality. Values ranged between 15 and 101. 2S/GBTQ+ people aged 65+ have been on the rise demographically in Canada (Canadian AIDS Society, 2006); alongside guidance from community advisors, we saw value in understanding the experiences of older people in the context of aging especially given unique vulnerabilities to COVID-19.

Disability

Two variables were created. The first was a composite binary variable that was created by aggregating all disability subgroups measures in Sex Now 2019-2021; this included hearing-related, memory-related, seeing-related, emotional-related, memory-related, or other disabilities. If a participant reported at least one of these disability subgroups, they were recoded to *'1*' which implied they were living with a disability. Sex Now 2022 asked '*Do you identify as a person with a disability?*', which was coded as '*0*' if a participant responded '*No*', or '*1*' if a participant responded '*Yes*'. Where possible using Sex Now 2019-2021 data, we coded participants' unique disability sub-types for use in analyses related to Research Question #3.

Ethnoracial Identity

A breakdown of responses related to ethnoracial and cultural identity are described below. Please note that responses for this variable were of a select-all-that-apply nature; i.e., participants could choose many of these as a way to self-identify. However, if a participant chose all responses, their responses were discarded and coded as '*7777: poor data quality*'.

ACB. African, Caribbean or Black (ACB) was an option in 2019-2021; in 2022, however, this was replaced with Black. These were merged together into ACB for the purpose of this data analysis with '*Yes'* being coded as '*1*' and '*No'* being coded as '*0'*.

Arab, West Asian or Middle Eastern. Participants who identified as Arab or West Asian in 2019 or 2020, West Asian or North African in 2021, or Middle Eastern in 2022 were all merged into one variable. Although I acknowledge that there are differences between regions in Africa and West Asia, some difficult decisions in collapsing were made to increase the sample size in order to make comparisons with other groups. Participants who self-identified as Arab, West Asian or Middle Eastern with '*Yes'* were coded as '*1'* and '*No'* being coded as '*0'*.

East Asian and Southeast Asian*.* Although these were separate responses from 2019-2021, they were merged together in Sex Now 2022. As such, for the purpose of this data analysis, these two items were merged together. For participants who responded with '*Yes'* being coded as '*1*' or '*No'* coded as '*0'*.

Indigenous. For participants who self-identified as Indigenous in any survey with '*Yes'*, they were coded as '*1*'. Those who did not identify as Indigenous with '*No'* were coded as '*0'*.

Latino/e/x. For participants who responded '*Yes'* to this response option, and who also responded '*No'* to '*white'*, were coded as '*1'*. This was done to avoid conflating Latino/e/x with Hispanic (which could include Spanish-speaking people from Spain, and therefore, European). This was an issue for Sex Now 2019 and 2020. As such, participants who selected both 'Latino/e/x' and 'white' were coded as '*0'*; I acknowledge that this might undercount Latino/e/x participants who reported biracial identities. Participants who responded '*No'* to Latino/e/x were coded as '*0'*.

South Asian. Across year, participants who self-identified as South Asian with '*Yes'* were coded as '*1'* or '*No'* coded as '*0'*.

White. Participants who self-identified as white with '*Yes'* were coded as '*1'* while '*No'* was coded as '*0'*.

Other. Across most years (2019-2021), '*other'* was a response option where participants could list another ethnoracial identity. Their option was then: a) back coded into a pre-existing category (e.g., if someone self-identified as '*other'* and then wrote *''Mexican'* in 2021, they were removed from '*other'* and placed into Latino/e/x; or b) if their response option did not belong in any of the pre-existing categories, they remained in the dataset as '*other'*. Note that in 2022, '*other'* was not a response option, but instead, replaced with *'none of the above'*; thus, participants who selected '*none of the above*' were recoded into '*other'*.

Prefer not to Answer. Participants also had a choice to skip the question by selecting '*prefer not to answer'* in 2019 and 2020. In the dataset, participants who chose this option were coded as '*1'* whereas participants who did not were coded as '*0'.*

With these recoding guidelines in mind, I created two types of ethnoracial/cultural variables with different levels. For the first variable, I needed an ethnoracial/cultural variable to use in the majority-informed analysis (i.e., comparing white people with Black, Indigenous and other racialized people). To achieve this, I combined all racialized people from the aforementioned categories (i.e., ACB; Arab, West Asian or Middle Eastern; East Asian and Southeast Asian; Indigenous; Latino/e/x; South Asian; and other) together and coded them as '*1'*, while participants who only indicated a "white" ethnoracial identity were coded as '0' and used as the referent group. A second variable was created and used a minority-informed lens to focus on racialized people, as per the priorities voiced by the community advisors involved in this thesis. The goal

was to discern differences in loneliness or discrimination within different racialized groups. Using Latino/e/x participants as the referent group, other levels in this single variable included: ACB, Arab/West Asian/Middle Eastern, East Asian or Southeast Asian, Indigenous, South Asian, other racialized individuals, participants who chose 'prefer not to answer', and finally, white. To reiterate, participants were coded into one level only based on prioritization by lowest counts as described earlier. For example, while looking at the total sample, if a participant reported both ACB and Indigenous ethnoracial identities, the group with the lowest count was prioritized in the recode (i.e., ACB in this example).

Financial Strain

The question around financial strain was asked across all four years. This measure was initially proposed as one question out of other factors that should be asked in order to get a complete picture of one's financial status (Pearlin et al., 1981). Over time it has been validated and used alone without other items or questions (Huntley et al., 1993; Okechukwu et al., 2012; Szanton et al., 2008; Szaflarski et al., 2017). The four response options in this question, "*How would you describe your money situation right now?"* were '*Comfortable, with extra', 'Enough, but no extra', 'Have to cut back, and 'Cannot make ends meet'.* For my thesis, this variable was then dichotomized similar to what others have done (Okechukwu et al., 2012). If participants chose either of the first two options, they were labeled as '*financially comfortable'* coded as '0'. If participants chose the latter two, they were labeled as '*financially uncomfortable*' and coded as '*1'*.

Gender Identity

Two nominal variables were created. In one variable, '*cis man*' was coded as '*0*', '*trans man*' as '*1*', '*non-binary*' as '*2*', and '*other genders*' as '*3*'. Across years, some items differed. For example, agender, genderqueer and genderfluid were not asked in 2019. These identities in other years were merged within the non-binary umbrella. Some examples of what was included in '*other genders*' were Two-Spirit and trans masculine. The second variable used a minority-informed lens with '*trans man*' as the referent group and coded as '*0*', '*non-binary*' coded as '*1*', cis man coded as '*2'*, and 'other genders' as '*3*'.

HIV Status

One's HIV status was asked across the four years. The response options were: *'No (I have never been diagnosed with HIV)'* coded as '*0'*, '*Yes (I am living with HIV)'* coded as '*1',* and *'I prefer not to answer*' coded as '*2'*.

Rurality

Rurality was coded into a nominal variable. It was only available in 2019 and 2021, but worded differently. In 2019, '*Small city/town (1,000-29,999 people)*', and '*Rural area (<1,000 people)*' were both classified as '*rural/remote*' (coded as '*0*') while '*Large urban centre (100,000+ people)*' and '*Medium city/town (30,000-99,999 people)*', were coded as '*urban/suburban*' (coded as '*1*'). In 2021, '*Rural area' and 'Remote area*' were both coded as '*0*'. For '*Urban core ("downtown" area)*', '*Urban area (outside of "downtown")*', and '*Suburban area'*, they were all coded as '*1*'. Related questions were not available for 2020 and 2022. I thus used participants' reported postal code forward sortation area (FSA) to determine if they lived in urban versus rural settings. You can

use the second character of one's postal code FSA to determine this (Government of Canada, 2015); a numeric value of '*0*' was coded as living in rural or remote areas versus a value between 1-9 being coded as living in urban/suburban areas. Please note that this method is imperfect and can introduce some misclassification bias (See Appendix A). Many of the "non rural" FSAs seem to also be rural according to population density – this remained a limitation.

Sexual Orientation

Two variables were created for sexual orientation. Across years, some items differed. For example, 'homoflexible' was only available in Sex Now 2022 whereas 'questioning' was only available in Sex Now 2019. The first "gay versus non-gay" variable discerned participants who self-identified as gay with any other sexual orientation; participants who identified as '*gay*' were coded as '*0*', with everyone else coded as '*1*'. The second variable discerned between minority identities, with the reference point set to bisexual identifying participants: Participants who self-identified as '*bisexual*' were coded as '*0*', '*asexual*' coded as '*1*', '*pansexual*' as '*2'*, '*queer*' as '*3*', '*other sexual orientations*' as '*4*', and '*gay'* as '*5'*. Some participants who reported '*other sexual orientations*' identity included '*heteroflexible*', '*homoflexible*', '*questioning*', '*straight*', '*skoliosexual*', and '*Two-Spirit*'. For participants who responded with '*other'*, their option was either: a) back coded into a pre-existing category and removed from '*other'*; or they remained in the '*other'* category if their response option did not belong in any of the pre-existing ones.

Survey Year & COVID-19

Loneliness was asked pre-pandemic (2019) and during COVID-19 (2020-2021).

Discrimination due to sexual orientation was asked pre-pandemic (2019) and during/coming out of COVID-19 (2021, 2022). A dichotomous temporal variable was created with '*pre-pandemic'* (2019) coded as '*0'* while '*during COVID-19'* (2020-2022) was coded as '*1'*.

Data Cleaning, Data Quality, and Prioritizations

Data Cleaning

In each dataset across survey years (2019, 2020, 2021 and 2022) people who were ineligible or who provided no responses to the variables of interest were removed. In each survey cycle, duplicate responses were removed using participant information. Open-text responses (e.g., sexual orientation, other) were back coded by the research team into pre-existing options or coded as other (e.g., if someone reported skoliosexual, it was recoded into other). As not all questions were asked across survey years, questions that were not asked in a particular year were coded as '*9998: Not in survey year'*. Other missing data were coded as '*9999: missing data*'. These datasets were merged into one longitudinal dataset.

Data Quality

Analyses of Missing Data on Dependent Variables. Next, an analysis on the missing cases in the dependent variables were assessed. Plots and chi-squares were used to detect patterns around missingness. These analyses were completed in R (R Core team, 2021) and RStudio (RStudio Team, 2020), using the *finalfit* package (Harrison et al., 2023). The plots exposed patterns of missingness whereas chi-squares tested for associations between observed versus missing data from each dependent variable when predictor variables were included (with two or more levels). Specifically, it

provided an understanding to whether the missing data was: missing completely at random (i.e., no predictor variables were statistically associated with differences in observed versus missing data on the outcome variables); missing at random (i.e., some statistically significant associations between observed and missing values when predictors are added); and missing not at random (i.e., that differences in observed and missing values are not due to tested variables, but from an outside source; see Scheffer, 2002). The purpose of this was to understand how the missing data could possibly affect the results and its interpretation; with missing at random or missing completely at random, these could be ignored (Scheffer, 2002). However, data that is *missing not at* random is difficult to address and could raise questions on the contribution of unmeasured real-world events that contributed to this (Mack et al., 2018). See Table 1, below, for the chi-square analyses on missing data versus observed data from outcome variables when a predictor is added.

Table 1

Chi-Square Analyses on Missing Versus Observed Data by Outcome Variable

Predictors	Missing Data for Loneliness, p-value	Missing Data for Discrimination due to Sexual Orientation, p-value
Age	< .001	< .001
Disability Status	< .001	< .001
Ethnoracial Identity	< .001	< .001
Financial Strain	< .001	< .001
Gender Identity	< .001	< .001
HIV-Status	< .001	.23
Rurality	< .001	.06
Sexual Orientation	< .001	< .001
Survey Year	< .001	.003

When examining the loneliness outcome, most predictors (e.g., disability, gender) had an influence on missing data. For example, cisgender men were more likely to have missing data around loneliness than people of other genders. People living with disabilities were also more likely to have missing data around loneliness. From this, I deduced that the loneliness-related data is not *missing completely at random*, and must be either *missing at random* or *missing not at random*. Taken with the other predictors and the fact that I don't believe there was an unexplained event within the survey that could explain these differences, these differences were likely related to certain subgroups having a more or less likelihood not to answer lonely-related questions (Mack et al., 2018). I thus argue that loneliness-related missing data is *missing at random*. In order to deal with this type of missingness, cases for dependent variables with missing values were deleted (i.e., case deletion; Schafer & Graham, 2002). This implies that instead of using other methods such as multiple imputation with Monte-Carlo simulations (Chen & Chen, 2017) –often time consuming and complex modelling solutions – outcome variables with missing data were disregarded from their respective analysis.

When the discrimination due to sexual orientation outcome was examined, all predictors were statistically associated with differences in missing versus observed data by outcome variable; this implied that being a member of different subgroups increased or decreased one's likely of having missing data around discrimination due to sexual orientation. Although this could imply that the missing data is *missing at random* as was the case for loneliness, I believe this may be *missing not at random*. There is no visual or statistical test that can be run to delineate between the two (Goldberg et al., 2021);

however, I believe this may be *missing not at random* because of something that systematically occurred outside of the questions asked in Sex Now. One factor might be the placement of discrimination-related questions; these tend to be asked towards the end of the survey and this likely contributed to increased missingness across 2S/GBTQ+ people. Research has suggested that survey fatigue (which relates to survey order and length) can contribute to *missing not at random* and cause issues with validity of the measure (Egleston et al., 2011). Although this is something I cannot fix post-hoc, missing cases for discrimination due to sexual orientation were equally erased. Other options such as bootstrapped multiple imputations to create simulations could have been an option too (Schomaker & Heumannb, 2018), but case deletion tends to produce less biased results (Pepinsky, 2018; cf. Mack & Westreich, 2018).

Missing Data on Independent Variables. For missing cases relative to independent variables among participants with loneliness outcome data, a proportion (≤ 10.0%) of missing data was replaced by the mode. 2 missing cases in gender (0.02%); no missing cases in rurality, HIV status, or age; 47 missing cases in ethnoracial identity (0.38%); 579 missing cases in disability (4.69%); 65 missing cases in financial strain (0.53%); and 8 missing cases in sexual orientation (0.06%).

For missing cases relative to independent variables among participants with discrimination due to sexual orientation outcome data, a proportion (≤ 10.0%) of missing data was replaced by the mode. 8 missing cases in gender (0.07%); no missing cases in rurality, HIV status, or age; 40 missing cases in ethnoracial identity (0.35%); 379 missing cases in disability (3.27%); 62 missing cases in financial strain (0.54%); and 13 missing cases in sexual orientation (0.11%).

Model Type and Building. No models were built for Research Question 1 and 2. For Research Question 3, two logistic regression imputed models (i.e., one majority and one minority-informed) were created using a backwards-elimination approach to determine best model fit (see Stoltzfus, 2011) to address loneliness. Model fit was also assessed via a Wald-test (i.e., a value greater than zero suggests that the variables should remain in the model and are significant; Engle, 1984). Alongside this, I also used a pseudo-R-Square (Nagelkerke R^2) to denote the proportion of explained variance. Specific to nominal variables, Nagelkerke R^2 ranges from 0 and 1 (Waler & Smith, 2016) with a larger percentage equating to a larger proportion of variance explained by the model. Using the same parameters above, another two logistic regression models were used for sexual orientation discrimination. Further details and values are provided in the results module, under Research Question 3.

Model Checking. The assumptions below relate to logistic regression. Checking for outliers in binary or categorical data was not assessed as this would be inappropriate and may affect the true modelling estimates (Jennings, 1986). Other met assumptions included having a sufficient sample size, having binary dependent variables, and linearity of independent variables and log odds (which does not apply here, as our independent variables are binary). One assumption was that there be no repeated measures. Although this tends to target within-person analyses at different time points, we cannot guarantee this assumption is met; these surveys are serial cross-sectional and participants may have completed the survey more than once over time. However, other studies have used similar methodologies with large and national sample sizes over time (e.g., Ali et al., 2018; Wang et al., 2019; Xiao et al., 2022).

Next, statistical testing was completed to assess multicollinearity between independent variables; here, inter-correlations between predictors cannot be too large, such that the inter-correlations do not skew the results (Daoud, 2017). Although it is not technically an assumption, multicollinearity can affect the reliability of the results, and thus, should be tested (Long, 2008). With continuous data, a variance inflation factor (VIF) would be used to test for multicollinearity (Daoud, 2017). However, using VIF is not appropriate for nominal data with larger degrees of freedom (Fox et al., 2020). Instead, a generalized variance inflation factor is used for each predictor (GVIF; see Fox & Monette, 1992; Buteikis, 2020). This particular analysis was conducted in R (R Core Team, 2021), RStudio (RStudio Team, 2020) and using the *car* package (Fox et al., 2020) for all relevant predictors based on each outcome. Additional computations are needed to convert the GVIF values back into linear values (Buteikis, 2020; Fox & Monette, 1992) to be able to compare them to the aforementioned standardized cut-off values:

$\left(GVIF^{\left(\frac{1}{2\cdot DF}\right)}\right)^2$*, where DF represents the degrees of freedom in the equation.*

Unsquared estimates were what the *car* package produced (Fox et al., 2020); thus, the squared estimates were calculated via Excel (Microsoft Corporation, 2018). See Table 2 below for the computed GVIF values for each predictor based on outcome variable. Here, we would expect values equal to or nearing a value of one to indicate little-to-no multicollinearity between predictors.

Table 2

Generalized Variance Inflation Factors for Each Predictor by Outcome Variable

Predictors	Loneliness		Discrimination due to Sexual Orientation	
	Degrees of freedom	*GVIF[a], after computations*	*Degrees of freedom*	*GVIF[a], after computations*
Age	5	1.02	5	1.04
Disability Status	1	1.03	1	1.16
Ethnoracial Identity	1	1.02	1	1.20
Financial Strain	1	1.12	1	1.04
Gender Identity	1	1.10	1	1.25
HIV-Status	2	1.02	2	1.03
Rurality	1	1.02	1	1.04
Sexual Orientation	1	1.07	1	1.15
Survey Year	2	1.08	2	1.23

Note. Values were calculated using the formula (Buteikis, 2020; Fox & Monette, 1992)

[a]GVIF = Generalized variance inflation factor.

As this assumption called for little to no multicollinearity, this analysis was run before the choosing of predictors. GVIF values ranged from 1.02-1.25. There was no-to-moderate multicollinearity by each outcome variable. Thus, possible predictors and covariates for multivariate analyses included: age, disability, ethnoracial identity, financial strain, gender, HIV-status, rurality, and survey year.

Ethical Considerations

All questions in the surveys were optional or had a prefer not to answer option. Participants were able to skip any questions and could have terminated the questionnaire at any point, without consequence. As participants could be distressed to some questions related to abuse, discrimination, or other sensitive ones, a warning appeared *before* participants were presented with these questions. Survey responses could be provided anonymously; participants were able to complete the survey without

providing us with their legal name(s). To maintain confidentiality, all responses were collected on Qualtrics or SurveyMonkey and stored on password-protected university servers, which were only accessible to members of the research team. Information is reported using aggregated data to ensures participants' identities are protected and unidentifiable. Sex Now 2019-2022 have been approved by the Human Research Ethics Board at the University of Victoria and/or the Harmonized Ethics Review in British Columbia, Canada: Sex Now 2019 (BC17-487), Sex Now 2020 (20-0135), Sex Now 2021 (20-0420), and Sex Now 2022 (H22-00961).

Indigenous-specific and Two-Spirit analyses were not conducted. Per TCPS 2 Chapter 9 ethics policy for research involving Indigenous people (Panel on Research Ethics, 2023), ample consultations with Indigenous communities were not done to allow the conduct of such analyses (e.g., regarding ethics, priorities, and data ownership).

Analysis Plan and Research Questions

These are pooled data from a serial cross-sectional design (e.g., Aghaizu et al., 2016; Bil et al., 2017; Pan et al., 2016; Patel et al., 2021). All analyses below were conducted via SPSS Statistics for Windows, Version 27.0 (IBM Corp, 2020).

Descriptive Statistics

Crosstabulations were used to measure frequency (n) and proportion (%) between nominal independent variables (sexual orientation, gender identity, ethnoracial identity, age, HIV status, disability status, and rurality) and nominal dependent variables (loneliness and discrimination due to sexual orientation) across survey years.

Research Question 1

***Loneliness*.** One 2_i x 3_j chi-square test was conducted to examine how loneliness changed across survey year (2019, 2020, 2021). Statistically significant results were determined at $p < .05$, with reported effect sizes (Cramer's V). Contingency tables were included, along with a line graph visually depicting the results. Survey years were not merged together and were presented by each available year (2019, 2020, 2021).

***Discrimination due to Sexual Orientation*.** One 2_i x 3_j chi-square test was conducted to examine how discrimination due to sexual orientation changed across survey year (2019, 2021, 2022). Statistically significant results were determined at $p < .05$, with reported effect sizes (Cramer's V). Contingency tables were included, along with a line graph visually depicting the results. Survey years were not merged together and were presented by each available year (2019, 2021, 2022).

Research Question 2

***Loneliness*.** One 2_i x 3_j x 2_k chi-square test was conducted to examine changes in loneliness among 2S/GBTQ+ people living with disabilities compared with people without disabilities. Statistically significant results were determined at $p < .05$, with reported effect sizes (Cramer's V). Contingency tables were included, along with a line graph visually depicting the results.

***Discrimination due to Sexual Orientation*.** One 2_i x 3_j x 2_k chi-square test was conducted to examine changes in discrimination due to sexual orientation among 2S/GBTQ+ people living with disabilities compared with people without disabilities. Statistically significant results were determined at $p < .05$, with reported effect sizes

(Cramer's V). Contingency tables were included, along with line graph visually depicting the results.

Research Question 3

Univariate analyses were conducted using Cramer's V for independent and dependent variables – this determined initial inclusion, wherein statistically significant correlations were $p < .10$. Pooled data from 2019-2022 were then analyzed using multivariable logistic regression models for loneliness. A backwards-elimination approach was used (see Hosmer Jr et al., 2013). Multivariable models were assessed for changes in model fit also using Wald tests. The same process was done for the second outcome, discrimination due to sexual orientation. With this, models were run twice; one using a majority reference group, and another using a minority reference group. For example, when looking at ethnoracial identity within our 2S/GBTQ+ sample living with disabilities, I compared white (referent) to Black, Indigenous, or racialized persons. However, I then ran a second analysis with non-white Latino/e/x (referent) and compared these people with other specific racialized subgroups (e.g., Indigenous; African, Caribbean or Black participants; South Asian). Minority analyses were run for variables such as gender identity, sexual orientation, ethnoracial identity and disability subgroups. These results use an intersectional-informed framework (Young et al., 2020) to better understand how particular subgroups of people within 2S/GBTQ+ communities have been affected before and throughout COVID-19.

Unadjusted (OR) and adjusted odds ratios (aOR) are presented below; AOR describe associations after controlling for covariates. Statistical significance was determined using p values ($p < .05$) and by 95% confidence intervals (95%CI).

Results

Research Question 1: Loneliness

Descriptive Statistics

Using pooled data, 12355 participants responded to questions related to loneliness. The total sample for participants responding to loneliness comprised of 10763 cisgender men (87.13%), 576 transgender men (4.66%), 834 non-binary participants (6.75%) and 180 gender-diverse people (1.46%); when compared by survey years, there were a larger proportion of cisgender men in Sex Now 2020 (*n* = 1541, 88.87%), a larger proportion of transgender men in 2019 (*n* = 402, 5.88%), and a larger proportion of non-binary people in 2021 (*n* = 480, 12.69%).

In terms of sexual orientation, 7598 self-identifying gay participants represented the largest proportion (61.61%), with 1644 (13.33%) self-identifying bisexual participants, and 1453 queer participants (11.78%); compared with other cycles, a larger proportion of gay participants responded to Sex Now 2020 (*n* = 1159, 66.92%), a larger proportion of bisexual participants in 2021 (*n* = 617, 16.31%), and a larger proportion of queer participants in 2019 (*n* = 862, 12.64%).

The largest ethnoracial groups included: white (*n* = 9471, 76.85%); African, Caribbean and Black participants (ACB; *n* = 380, 3.08%); Indigenous participants (*n* = 589, 4.78%); Latino/e/x participants (*n* = 464, 3.77%); East Asian or Southeast Asian participants (*n* = 649, 5.27%); and South Asian participants (*n* = 273, 2.22%).

When stratified by HIV status, 1058 participants living with HIV were included (8.56%), while 11,226 (90.86%) by participants not living with HIV, and 71 (0.57%) for participants who preferred not to answer. When compared by survey year, a greater

proportion of participants not living with HIV responded in 2021 (*n* = 3490, 92.25%), while a greater proportion of participants living with HIV in 2020 (*n* = 192, 11.07%). See Table 3 for a complete overview of the study variables related to loneliness.

Table 3

Descriptive Statistics of Loneliness and Sociodemographics Among Participants who Responded to Loneliness Questions in Sex Now 2019-2021, Imputed and Pooled Data Stratified by Survey Year

	Total Sample N (%)	Survey Year		
		2019 *n (%)*	*2020* *n (%)*	*2021* *n (%)*
Loneliness	12355			
Lonely	6801 (55.12)	3594 (52.56)	1113 (64.19)	2103 (55.59)
Not Lonely	5545 (44.88)	3244 (47.44)	621 (35.81)	1680 (44.41)
Age	12334			
15-19	302 (2.45)	214 (3.13)	20 (1.15)	68 (1.81)
20-29	3154 (25.57)	1995 (29.18)	316 (18.22)	843 (22.41)
30-39	3316 (26.89)	1832 (26.79)	451 (26.01)	1033 (27.46)
40-49	2078 (16.85)	1054 (15.41)	321 (18.51)	703 (18.69)
50-64	2851 (23.11)	1435 (20.99)	518 (29.87)	898 (23.87)
65+	633 (5.13)	308 (4.50)	108 (6.23)	217 (5.77)
Disability Status	12355			
Living with disabilities	8881 (71.88)	5203 (76.09)	1091 (62.92)	2587 (68.38)
No disabilities	3474 (28.12)	1635 (23.91)	643 (37.08)	1196 (31.62)

	Total Sample N (%)	Survey Year		
		2019 *n (%)*	*2020* *n (%)*	*2021* *n (%)*
Ethnoracial Identity	12324			
ACB[a]	380 (3.08)	196 (2.87)	41 (2.38)	143 (3.79)
Arab/West Asian/Middle Eastern	231 (1.87)	115 (1.68)	32 (1.86)	84 (2.23)
East Asian/Southeast Asian	649 (5.27)	318 (4.66)	93 (5.40)	238 (6.31)
Indigenous	589 (4.78)	334 (4.89)	62 (3.60)	192 (5.12)
Latino/e/x	464 (3.77)	219 (3.21)	63 (3.66)	182 (4.82)
South Asian	273 (2.22)	134 (1.96)	41 (2.38)	98 (2.60)
White	9471 (76.85)	5352 (78.37)	1356 (78.75)	2763 (73.23)
Other	215 (1.74)	109 (1.60)	34 (1.97)	72 (1.91)
Prefer not to answer	52 (0.42)	- [b]	- [b]	52 (0.76)
Financial Strain	12355			
Financially comfortable	9056 (73.30)	5000 (73.12)	1274 (73.47)	2782 (73.54)
Not financially comfortable	3299 (26.70)	1838 (26.88)	460 (26.53)	1001 (26.46)
Gender Identity	12353			
Cis man	10763 (87.13)	6066 (88.74)	1541 (88.87)	3156 (83.43)
Trans man	576 (4.66)	402 (5.88)	60 (3.46)	114 (3.01)
Non-binary	834 (6.75)	237 (3.47)	117 (6.75)	480 (12.69)
Other gender expansive persons	180 (1.46)	131 (1.92)	16 (0.92)	33 (0.87)

	Total Sample N (%)	Survey Year		
		2019 *n (%)*	*2020* *n (%)*	*2021* *n (%)*
HIV Status	12355			
Not Living with HIV	11226 (90.86)	6203 (90.71)	1533 (88.41)	3490 (92.25)
Living with HIV	1058 (8.56)	595 (8.70)	192 (11.07)	271 (7.16)
Prefer not to answer	71 (0.57)	40 (0.58)	9 (0.52)	22 (0.58)
Rurality	12341			
Urban/suburban	11494 (93.14)	6530 (95.50)	1631 (94.83)	3333 (88.10)
Rural/remote	847 (6.86)	308 (4.50)	89 (5.17)	450 (11.90)
Sexual Orientation	12337			
Asexual	218 (1.77)	119 (1.74)	30 (1.73)	69 (1.82)
Bisexual	1644 (13.33)	833 (12.21)	194 (11.20)	617 (16.31)
Gay	7598 (61.59)	4140 (60.69)	1159 (66.92)	2299 (60.77)
Pansexual	773 (6.27)	477 (6.99)	76 (4.39)	220 (5.82)
Queer	1453 (11.78)	862 (12.64)	217 (12.53)	374 (9.89)
Other sexual expansive persons	651 (5.28)	391 (5.73)	56 (3.23)	204 (5.39)

Note. N or n (column %) presented.

[a]ACB = African, Caribbean, and/or Black; [b]Not available, questions not asked in survey year.

Main Results

An observed difference in loneliness emerged across years. In 2019, 52.56% of 2S/GBTQ+ participants reported feeling lonely, 64.19% in 2020, and 55.59% in 2021.This difference, compared with people not feeling lonely, was statistically significant, $\chi 2$ (2, N = 12355) = 76.09, p < .001. See Table 4 for the observed and expected counts. A line graph is displayed (see Figure 1). The effect size was deemed weak-to-moderate (Cramer's V = .078; Akoglu, 2018).

Table 4

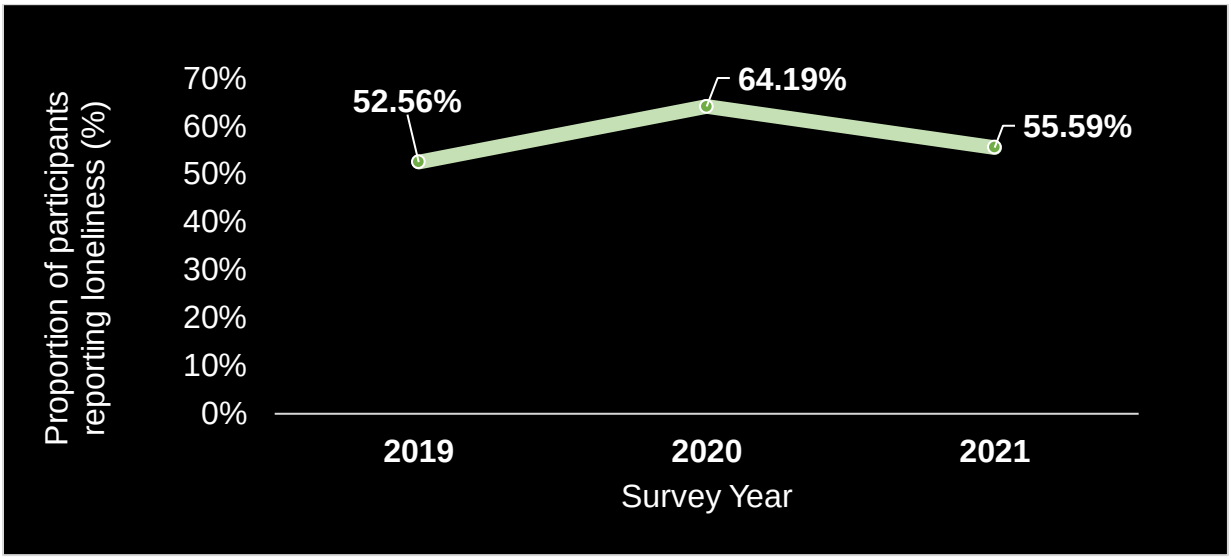
Chi-Square Analysis Using Imputed Data Between Loneliness and Survey Year, Sex Now 2019-2021

Loneliness		Survey Year		
		2019	*2020*	*2021*
Lonely				
	Observed count	3594	1113	2103
	Expected count	3769.1	955.8	2085.2
Not Lonely				
	Observed count	3244	621	1680
	Expected count	3068.9	778.2	1697.8

*Note***.** $\chi 2$ (2, N = 12355) = 76.09, p < .001

Figure 1

Trend Analysis of Loneliness Among 2S/GBTQ+ Participants, Sex Now 2019-2021



Note. A black background with one trendline using a light pastel-green font; this was specifically chosen to increase accessibility and contrast for individuals with seeing-related disabilities (see American Psychological Association [APA], 2022).

Research Question 1: Discrimination due to Sexual Orientation

Descriptive Statistics

Using pooled data, 11575 participants responded to questions related to discrimination due to sexual orientation within the last 12 months. These participants were comprised of 9609 cisgender men (83.04%), 568 transgender men (4.91%), 1225 non-binary participants (10.59%), and 170 participants of other diverse genders (1.47%); when stratifying by survey year, a greater proportion of cisgender men responded to discrimination within Sex Now 2019 (*n* = 5386, 89.08%), and 570 non-binary participants in 2022 (*n* = 570, 29.07%).

With respect to sexual orientation, 6879 self-identifying gay participants comprised the largest sample proportion (59.54%), with 1505 self-identifying bisexual participants (13.03%) and 1410 queer persons (12.20%); when stratified by survey year, a larger proportion of gay (*n* = 2188, 61.37%) and bisexual (*n* = 572, 16.04%) people were in 2021.

The largest ethnoracial groups included: white, (*n* = 8706, 75.31%); African, Caribbean and/or Black persons (ACB; *n* = 383, 3.31%); Indigenous participants (*n* = 589, 5.10%); Latino/e/x participants (*n* = 468, 4.05%); and East Asian or Southeast Asian participants (*n* = 675, 5.84%). When stratified by survey year, a larger proportion of white participants responded in 2019 (*n* = 4771, 78.99%), while Latino/e/x (*n* = 100, 5.35%) and East Asian or Southeast Asian (*n* = 171, 8.71%) participants in 2022. For a complete overview of descriptive data among the full sample and stratified by year, please refer to Table 5 below.

Table 5

Descriptive Statistics of Discrimination and Sociodemographics Among Participants who Responded to Discrimination due to Sexual Orientation in Sex Now 2019, 2021, and 2022, Imputed and Pooled Data Stratified by Survey Year

	Total Sample n (%)	Survey Year		
		2019 n (%)	*2021* n (%)	*2022* n (%)
Discrimination due to Sexual Orientation	11575			
Yes	2848 (24.60)	1556 (25.73)	770 (21.60)	522 (26.59)
No	8727 (75.40)	4491 (74.27)	2795 (78.40)	1441 (73.41)
Age	11575			
15-19	305 (2.63)	116 (1.92)	54 (1.51)	135 (6.88)
20-29	3258 (28.15)	1722 (28.48)	790 (22.16)	746 (38.00)
30-39	3198 (27.63)	1638 (27.09)	989 (27.74)	571 (29.09)
40-49	1824 (15.76)	953 (15.76)	665 (18.65)	206 (10.49)
50-64	2408 (20.80)	1326 (21.93)	863 (24.21)	219 (11.16)
65+	582 (5.03)	292 (4.83)	204 (5.72)	86 (4.38)
Disability Status	11575			
Living with disabilities	7455 (64.41)	4623 (76.45)	2400 (67.32)	432 (22.01)
No disabilities	4120 (35.59)	1424 (23.55)	1165 (32.68)	1531 (77.99)

	Total Sample n (%)	Survey Year		
		2019 n (%)	*2021* n (%)	*2022* n (%)
Ethnoracial Identity	11560			
White	8706 (75.31)	4771 (78.99)	2603 (73.18)	1332 (67.86)
ACB[a]	383 (13.23)	172 (2.85)	135 (3.80)	76 (3.87)
Arab/West Asian/Middle Eastern	214 (1.85)	89 (1.47)	77 (2.16)	48 (2.45)
East Asian/Southeast Asian	675 (5.84)	276 (4.57)	228 (6.41)	171 (8.71)
Indigenous	589 (5.10)	277 (4.59)	179 (5.03)	133 (6.78)
Latino/e/x	468 (4.05)	189 (3.13)	174 (4.89)	105 (5.35)
South Asian	275 (2.38)	115 (1.90)	96 (2.70)	64 (3.26)
Other racialized people	199 (1.72)	100 (1.66)	65 (1.83)	34 (1.73)
Prefer not to answer	51 (0.44)	51 (0.84)	-[b]	-[b]
Financial Strain	11575			
Financially comfortable	8438 (72.90)	4415 (73.01)	2620 (73.49)	1403 (71.47)
Not financially comfortable	3137 (27.10)	1632 (26.99)	945 (26.51)	560 (28.53)
Gender Identity	11572			
Cis man	9609 (83.04)	5386 (89.08)	2975 (83.45)	1248 (63.64)

	Total Sample n (%)	Survey Year		
		2019 n (%)	*2021* n (%)	*2022* n (%)
Trans man	568 (4.91)	348 (5.76)	107 (3.00)	113 (5.76)
Non-binary	1225 (10.59)	201 (3.32)	454 (12.73)	570 (29.07)
Other gender expansive persons	170 (1.47)	111 (1.84)	29 (0.81)	30 (1.53)
HIV Status	11575			
Not Living with HIV	10615 (91.71)	5476 (90.56)	3288 (92.23)	1851 (94.29)
Living with HIV	894 (7.72)	546 (9.03)	256 (7.18)	92 (4.69)
Prefer not to answer	66 (0.57)	25 (0.41)	21 (0.59)	20 (1.02)
Rurality	11566			
Urban	10807 (93.44)	5773 (95.47)	3152 (88.42)	1882 (96.32)
Rural/remote	759 (6.56)	274 (4.53)	413 (11.58)	72 (3.68)
Sexual Orientation	11554			
Asexual	276 (2.39)	105 (1.74)	62 (1.74)	109 (5.57)
Bisexual	1505 (13.03)	716 (11.87)	572 (16.04)	217 (11.09)
Gay	6879 (59.54)	3698 (61.30)	2188 (61.37)	993 (50.77)
Pansexual	834 (7.22)	422 (6.99)	209 (5.86)	203 (10.38)
Queer	1410 (12.20)	765 (12.68)	347 (9.73)	298 (15.24)

	Total Sample n (%)	Survey Year		
		2019 n (%)	*2021* n (%)	*2022* n (%)
Other sexual expansive persons	650 (5.63)	327 (5.42)	187 (5.25)	136 (6.95)

Note. N or n (column %) presented.

[a]Not available, questions not asked in survey year; [b]ACB = African, Caribbean, and/or Black.

Main Results

When examining the change over time in discrimination based on sexual orientation, significant results emerge. A quarter (25.73%) of 2S/GBTQ+ participants reported discrimination due to sexual orientation in 2019, with this value decreasing slightly to 21.60% in 2021, and then increasing slightly in 26.59% in 2022. This difference, when compared with people not reporting discrimination due to sexual orientation, was statistically significant, $\chi 2$ (2, N = 11575) = 25.68, p < .001. See Table 5 for the expected and observed counts. A line graph is below (see Figure 2). Although statistically significant, the effect size was deemed very weak-to-weak (Cramer's V = .047; Akoglu, 2018).

Table 6

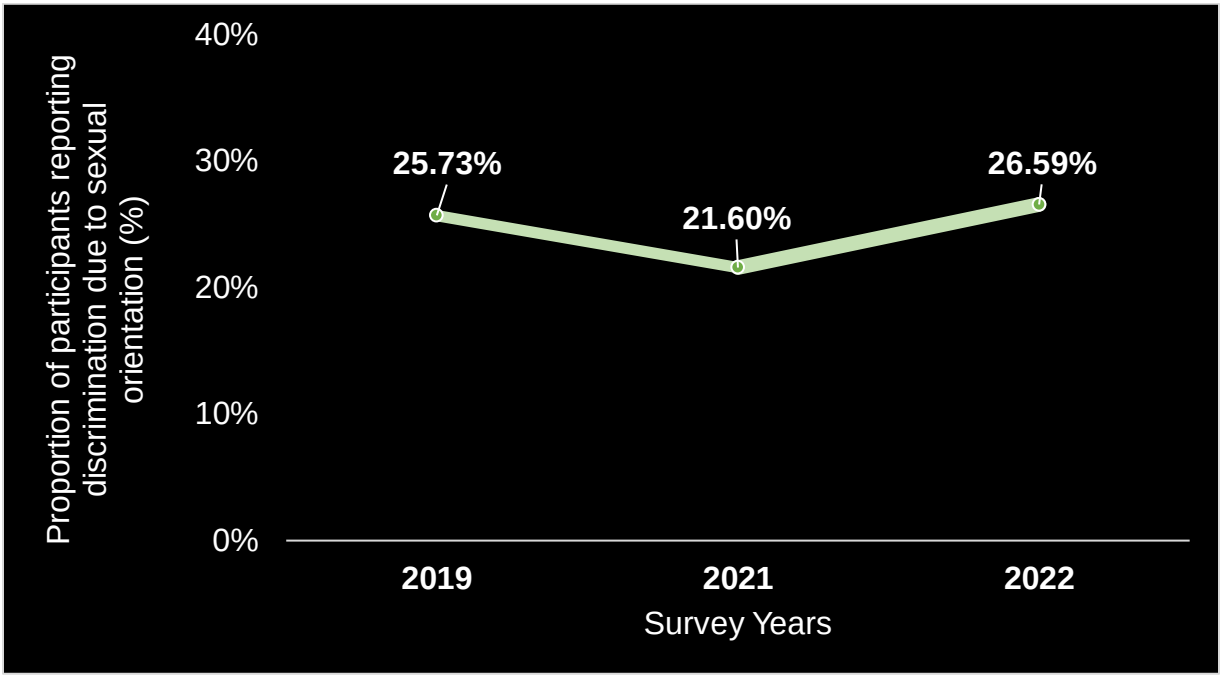
Chi-Square Analysis Using Imputed Data Between Discrimination due to Sexual Orientation and Survey Year, Sex Now 2019, 2021-2022

Discrimination due to Sexual Orientation		Survey Year		
		2019	*2021*	*2022*
Yes				
	Observed count	1556	770	522
	Expected count	1487.85	877.16	482.99
No				
	Observed count	4491	2795	1441
	Expected count	4559.15	2687.84	1480.01

Note. $\chi 2$ (2, N = 11575) = 25.68, p < .001

Figure 2

Trend Analysis of Discrimination due to Sexual Orientation Among 2S/GBTQ+ Participants, Sex Now 2019, 2021, and 2022



Note. A black background with one trendline using a light pastel-green font; this was specifically chosen to increase accessibility and contrast for individuals with seeing-related disabilities (see APA, 2022).

Research Question 2: Loneliness

Descriptive Statistics

An overview of descriptive statistics related to 2S/GBTQ+ participants living with a disability is found in Table 7. All age groups saw an increase in reported loneliness between 2019 and 2020, respectively: 2S/GBTQ+ participants aged 15-19 (72.08% vs 81.25%), aged 20-29 (65.68% vs 77.13%), aged 30-39 (61.54% vs 77.43%), aged 40-49 (55.91% vs 69.95%), aged 50-64 (51.19% vs 67.53%) and 65 and older (38.86% vs

60.32%) all reported increases in loneliness. Most groups reported decreases in loneliness from 2020 and 2021, with the exception of 2S/GBTQ+ participants living with disabilities aged 15-19 (81.25% vs 90.57%).

Loneliness by disability subgroups was also examined. 2S/GBTQ+ participants by each disability subgroup reported an increase in loneliness between 2019 and 2020, respectively; participants with disabilities related to mobility (64.96% vs 79.65%), seeing (42.19% vs 71.05%), hearing (59.91% vs 69.70%), memory (62.84% vs 76.36%), emotion (59.58% vs 77.57%), and participants with other disabilities (52.23% vs 61.28%) all reported increases in loneliness. Overall, however, participants living with disabilities did also report decreases in loneliness from 2020 to 2021.

Loneliness among 2S/GBTQ+ participants living with a disability also differed by sexual orientation between 2019 and 2020, respectively: Asexual (74.76% vs 76.00%), bisexual (58.15% vs 68.87%), gay (56.41% vs 71.03%), pansexual (66.74% vs 74.60%), queer (62.69% vs 75.88%), and other participants with a disability (66.90% vs 81.58%) reported increases in loneliness. These groups reported less loneliness in 2021 compared with 2020.

Table 7

Descriptive Statistics of 2S/GBTQ+ Participants Living With Disabilities who Responded to Loneliness Questions in Sex Now 2019-2021, Imputed Data Stratified by Survey Year

	Frequency (n) and Proportion (%)	Loneliness by Year					
		2019		*2020*		*2021*	
Loneliness		*Not lonely*	*Lonely*	*Not lonely*	*Lonely*	*Not lonely*	*Lonely*
Age							
15 to 19	n	55	142	3	13	5	48
	%	27.92	72.08	18.75	81.25	9.43	90.57
20 to 29	n	554	1060	51	172	186	436
	%	34.32	65.68	22.87	77.13	29.90	70.10
30 to 39	n	520	832	65	223	236	452
	%	38.46	61.54	22.57	77.43	34.30	65.70
40 to 49	n	336	426	58	135	172	300
	%	44.09	55.91	30.05	69.95	36.44	63.56
50 to 64	n	512	537	100	208	250	329
	%	48.81	51.19	32.47	67.53	43.18	56.82
65 and older	n	140	89	25	38	83	77
	%	61.14	38.86	39.68	60.32	51.88	48.13

Loneliness	Frequency (n) and Proportion (%)	Loneliness by Year					
		2019		*2020*		*2021*	
		Not lonely	*Lonely*	*Not lonely*	*Lonely*	*Not lonely*	*Lonely*
Disability Subgroups							
Mobility-related	n	356	660	23	90	107	245
	%	35.04	64.96	20.35	79.65	30.40	69.60
Seeing-related	n	248	181	11	27	69	100
	%	57.81	42.19	28.95	71.05	40.83	59.17
Hearing-related	n	427	638	10	23	43	52
	%	40.09	59.91	30.30	69.70	45.26	54.74
Memory-related	n	486	788	65	210	345	589
	%	37.67	62.84	23.64	76.36	36.94	63.06
Emotion-related	n	386	569	72	249	146	331
	%	40.42	59.58	22.43	77.57	30.61	69.39
Other disabilities	n	214	234	115	182	215	303
	%	47.77	52.23	38.72	61.28	41.51	58.49
Ethnoracial Identity							
ACB[a]	n	52	99	8	21	44	50
	%	34.44	65.56	27.59	72.41	46.81	53.19
Arab, West Asian,	n	21	63	3	17	14	40
Middle Eastern	%	25.00	75.00	15.00	85.00	25.93	74.07

Loneliness	Frequency (n) and Proportion (%)	Loneliness by Year					
		2019		*2020*		*2021*	
		Not lonely	*Lonely*	*Not lonely*	*Lonely*	*Not lonely*	*Lonely*
East Asian,	n	67	131	11	41	38	97
Southeast Asian	%	33.84	66.16	21.15	78.85	28.15	71.85
Indigenous	n	96	192	16	33	53	101
	%	33.33	66.67	32.65	67.35	34.42	65.58
Latino/e/x	n	63	113	10	30	41	70
	%	35.80	64.20	25.00	75.00	36.94	63.06
South Asian	n	33	66	5	20	14	51
	%	33.33	66.67	20.00	80.00	21.54	78.46
White	n	1731	2325	240	598	708	1210
	%	42.68	57.32	28.64	71.36	36.91	63.09
Other racialized	n	33	64	7	21	24	27
identities	%	34.02	65.98	25.00	75.00	47.06	52.94
Prefer not to answer	n	18	28	- [b]	- [b]	- [b]	- [b]
	%	39.13	60.87	- [b]	- [b]	- [b]	- [b]

	Frequency (n) and Proportion (%)	Loneliness by Year					
		2019		*2020*		*2021*	
Loneliness		*Not lonely*	*Lonely*	*Not lonely*	*Lonely*	*Not lonely*	*Lonely*
Financial Strain							
Financially	n	1690	1842	230	508	212	610
comfortable	%	47.85	52.15	31.17	68.83	25.79	74.21
Not financially	n	427	1244	72	281	720	1032
comfortable	%	25.55	74.45	20.40	79.60	41.10	58.90
Gender Identity							
Cis man	n	1905	2573	265	648	797	1237
	%	42.54	57.46	29.03	70.97	39.18	60.82
Transgender man	n	113	261	10	46	24	79
	%	30.21	69.79	17.86	82.14	23.30	76.70
Non-binary	n	58	173	23	85	107	315
	%	25.11	74.89	21.30	78.70	25.36	74.64
Other gender	n	41	78	4	10	8	20
expansive persons	%	34.45	65.55	28.57	71.43	28.57	71.43
HIV Status							
Not Living with HIV	n	1884	2800	252	683	856	1518
	%	40.22	59.78	26.95	73.05	36.06	63.94

	Frequency (n) and Proportion (%)	Loneliness by Year					
		2019		*2020*		*2021*	
Loneliness		*Not lonely*	*Lonely*	*Not lonely*	*Lonely*	*Not lonely*	*Lonely*
Living with HIV	n	220	270	49	101	76	121
	%	44.90	55.10	32.67	67.33	38.58	61.42
Prefer not to answer	n	13	16	1	5	4	12
	%	44.83	55.17	16.67	83.33	25.00	75.00
Rurality							
Rural/remote	n	106	141	12	43	121	197
	%	42.91	57.09	21.82	78.18	38.05	61.95
Urban/suburban	n	2011	2945	289	743	815	1454
	%	40.58	59.42	28.00	72.00	35.92	64.08
Sexual Orientation							
Asexual	n	26	77	6	19	18	42
	%	25.24	74.76	24.00	76.00	30.00	70.00
Bisexual	n	262	364	33	73	157	231
	%	41.85	58.15	31.13	68.87	40.46	59.54
Gay	n	1315	1702	199	488	554	955
	%	43.59	56.41	28.97	71.03	36.71	63.29
Pansexual	n	142	285	16	47	56	130

Loneliness	Frequency (n) and Proportion (%)	Loneliness by Year					
		2019		*2020*		*2021*	
		Not lonely	*Lonely*	*Not lonely*	*Lonely*	*Not lonely*	*Lonely*
Queer	%	33.26	66.74	25.40	74.60	30.11	69.89
	n	272	457	41	129	89	207
Other sexual expansive persons	%	37.31	62.69	24.12	75.88	30.07	69.93
	n	96	194	7	31	62	86
	%	33.10	66.90	18.42	81.58	41.89	58.11

Note. *n* denotes frequency whereas *%* denotes a proportion.

[a] ACB = African, Caribbean, and/or Black; [b] Not available, question not asked in survey year.

Main Results

As this chi-square analysis used a 2_i x 3_j x 2_k design, the analysis was split into two parts; one for individuals with a disability (1_i x 3_j x 2_k) and one for individuals not living with a disability (1_i x 3_j x 2_k; see Table 8). The total effect size is then presented.

Firstly, among people living with at least one disability, there was an observed difference across cycles related to loneliness. 3086 2S/GBTQ+ participants living with disabilities (59.31%) reported feeling lonely in 2019, 789 (72.32%) in 2020, and 1651 (63.82%) in 2021. This difference, when compared with participants not feeling lonely, was statistically significant, $\chi 2$ (2, N = 8881) = 68.87, p < .001. The magnitude of this effect size for people living with disabilities was weak-to-moderate (Cramer's V = .09; Akoglu, 2018).

Secondly, 508 participants living without a disability reported feeling lonely in 2019 (31.07%), 324 (50.39%) in 2020, and 452 (37.79%) in 2021. This, when compared with participants who reported not feeling lonely, was statistically significant, $\chi 2$ (2, N = 3474) = 74.46, p < .001. The magnitude of the effect size for participants not living with disabilities was moderate-to-strong (Cramer's V = .15; Akoglu, 2018).

The difference in effect sizes between persons living with or without a disability across loneliness and survey years was statistically significant, with a weak-to-moderate total effect size (Cramer's V = .08; Akoglu, 2018). Figure 3 displays 2S/GBTQ+ participants reporting loneliness by disability status.

Table 8

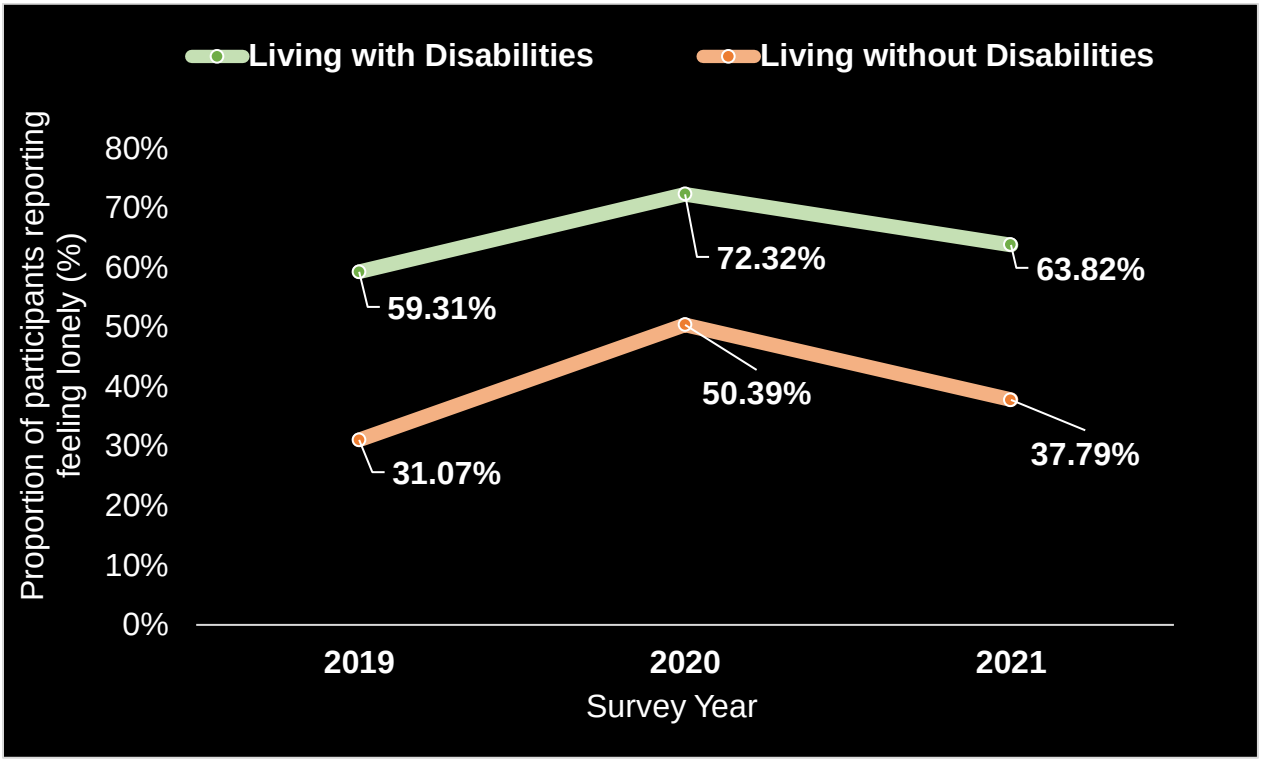
Chi-Square Analysis Using Imputed Data Between Disability, Survey Year and Loneliness in Sex Now 2019-2021

Disability	Loneliness	Survey Year		
		2019	*2020*	*2021*
Living with a disability*	Feeling lonely			
	Observed count	3086	789	1651
	Expected count	3237.4	678.8	1609.7
	Not feeling lonely			
	Observed count	2117	302	936
	Expected count	1965.6	412.2	977.3
Living without a disability**	Feeling lonely			
	Observed count	508	324	452
	Expected count	604.3	237.7	442.0
	Not feeling lonely			
	Observed count	1127	319	744
	Expected count	1030.7	405.3	754.0

* $\chi 2$ (2, N = 8881) = 68.87, p < .001; ** $\chi 2$ (2, N = 3474) = 74.46, p < .001

Figure 3

Trend Analysis of Loneliness Among 2S/GBTQ+ Participants Living With or Without Disabilities, Sex Now 2019-2021



Note. A black background with two trendlines using a pastel-green and pastel-orange font; these were specifically chosen to increase accessibility and contrast for individuals with seeing-related disabilities (see APA, 2022).

Research Question 2: Discrimination due to Sexual Orientation

Descriptive Statistics

An overview of descriptive statistics related to 2S/GBTQ+ participants living with a disability is found in Table 9. Most age groups reported a decrease in reported discrimination due to sexual orientation between 2019 and 2021, respectively: 2S/GBTQ+ participants aged 15-19 (51.89% vs 48.72%), aged 20-29 (37.87% vs

35.99%), aged 40-49 (25.14% vs 18.64%), and aged 50-64 (18.78% vs 17.06%) all reported a decrease in discrimination. However, 2S/GBTQ+ participants living with a disability and aged 30-39 (28.00% vs 28.46%) or 65 and older (10.23% vs 13.51%) did report an increase in discrimination. Between 2021 and 2022, all age groups reported an increase in discrimination due to sexual orientation, respectively: participants aged 15-19 (48.72% vs 62.00%), aged 20-29 (35.99% vs 42.18%), aged 30-39 (28.46% vs 40.45%), aged 40-49 (18.64% vs 19.44%), aged 50-64 (17.06% vs 20.59%) and 65 and older (13.51% vs 16.67%).

Discrimination by disability subgroup were also included. 2S/GBTQ+ participants by each disability subgroup reported decreases in discrimination due to sexual orientation between 2019 and 2021, respectively; participants with disabilities related to mobility (30.30% vs 29.94%), seeing (22.37% vs 18.18%), hearing (30.17% vs 17.98%), memory (30.42% vs 27.14%), or participants with other disabilities (27.94% vs 19.76%) all reported a decrease in discrimination. However, 2S/GBTQ+ participants living with an emotion-related (24.23% vs 27.89%) disability reported an increase in discrimination due to sexual orientation from 2019 to 2021. In 2022, data related to disability subgroups were not asked of participants and thus no analysis by subgroup is possible.

Discrimination among 2S/GBTQ+ participants living with a disability also differed by financial status between 2019, 2021, and 2022. People who reported being financially uncomfortable did report an initial decrease in discrimination due to sexual orientation between 2019 and 2021, respectively (35.21% vs 34.30%). However, discrimination increased between 2021 and 2022 (34.30% vs 43.40%).

As this section covers discrimination due to sexual orientation, I also examined differences between 2S/GBTQ+ participants living with disabilities related to sexual identities. Between 2019 and 2021, 2S/GBTQ+ participants who identified with an asexual (40.22% vs 33.96%), bisexual (28.28% vs 17.29%), pansexual (42.06% vs 28.81%), queer (40.62% vs 36.63%), and/or other diverse identities (26.23% vs 18.94%) reported less discrimination due to sexual orientation. While all of the aforementioned groups reported an increase in discrimination between 2021 and 2022, for gay men, however, a steady slight increase was observed between 2019, 2021, and 2022 (23.22% vs 24.89% vs 28.70%).

Table 9

Descriptive Statistics of 2S/GBTQ+ Participants Living With Disabilities who Responded to Discrimination due to Sexual Orientation in Sex Now 2019, 2021, and 2022, Imputed Data Stratified by Survey Year

	Frequency (n) and Proportion (%)	Survey Year					
		2019		*2021*		*2022*	
Experienced Discrimination		*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Age							
15 to 19	n	51	55	20	19	19	31
	%	48.11	51.89	51.28	48.72	38.00	62.00
20 to 29	n	868	529	370	208	122	89
	%	62.13	37.87	64.01	36.99	57.82	42.18
30 to 39	n	882	343	465	185	53	36
	%	72.00	28.00	71.54	28.46	59.55	40.45
40 to 49	n	524	176	358	82	29	7
	%	74.86	25.14	81.36	18.64	80.56	19.44
50 to 64	n	796	184	452	93	27	7
	%	81.22	18.78	82.94	17.06	79.41	20.59
65 and older	n	193	22	128	20	10	2
	%	89.77	10.23	86.49	13.51	83.33	16.67

	Frequency (n) and Proportion (%)	Survey Year					
		2019		*2021*		*2022*	
Experienced Discrimination		*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Disability Subgroups							
Mobility	n	635	276	241	103	-[a]	-[a]
	%	69.70	30.30	70.06	29.94	-[a]	-[a]
Seeing	n	302	87	135	30	-[a]	-[a]
	%	77.63	22.37	81.82	18.18	-[a]	-[a]
Hearing	n	655	283	73	16	-[a]	-[a]
	%	69.83	30.17	82.02	17.98	-[a]	-[a]
Memory	n	787	344	588	219	-[a]	-[a]
	%	69.58	30.42	72.86	27.14	-[a]	-[a]
Emotion	n	641	205	331	128	-[a]	-[a]
	%	75.77	24.23	72.11	27.89	-[a]	-[a]
Other	n	294	114	398	98	-[a]	-[a]
	%	72.06	27.94	80.24	19.76	-[a]	-[a]
Ethnoracial Identity							
Latino/e/x	n	103	48	78	26	9	5
	%	68.21	31.79	75.00	25.00	64.29	35.71
ACB[b]	n	84	51	57	31	10	6

	Frequency (n) and Proportion (%)	Survey Year					
		2019		*2021*		*2022*	
Experienced Discrimination		*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
	%	62.22	37.78	64.77	35.23	62.50	37.50
Arab, West Asian, Middle	n	40	23	34	14	4	5
Eastern	%	63.49	36.51	70.83	29.17	44.44	55.56
Indigenous	n	144	96	94	48	21	29
	%	60.00	40.00	66.20	33.80	42.00	58.00
East Asian, Southeast Asian	n	123	49	98	29	7	6
	%	71.51	28.49	77.17	22.83	53.85	46.15
South Asian	n	51	34	39	25	4	1
	%	60.00	40.00	60.94	39.06	80.00	20.00
White	n	2672	967	1362	418	200	117
	%	73.43	26.57	76.52	23.48	63.09	36.91
Other racialized identities	n	62	26	29	14	5	3
	%	70.45	29.55	67.44	32.56	62.50	37.50
Prefer not to answer	n	30	14	-[a]	-[a]	-[a]	-[a]
	%	68.18	31.82	-[a]	-[a]	-[a]	-[a]

	Frequency (n) and Proportion (%)	Survey Year					
		2019		*2021*		*2022*	
Experienced Discrimination		*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Financial Strain							
Financially comfortable	n	2348	784	1293	346	140	80
	%	74.97	25.03	78.89	21.11	63.64	36.36
Not financially comfortable	n	966	525	500	261	120	92
	%	64.79	35.21	65.70	34.30	56.60	43.40
Gender Identity							
Cis man	n	2988	1014	1463	421	108	37
	%	74.66	25.34	77.65	22.35	74.48	25.52
Transgender man	n	183	140	68	28	20	22
	%	56.66	43.34	70.83	29.17	47.62	52.38
Non-binary person	n	90	106	249	147	123	110
	%	45.92	54.08	62.88	37.12	52.79	47.21
Other gender expansive	n	52	49	13	11	8	3
persons	%	51.49	48.51	54.17	45.83	72.73	27.27
HIV Status							
Not living with HIV	n	2963	1190	1639	560	239	165
	%	71.35	28.65	74.53	25.47	59.16	40.84

	Frequency (n) and Proportion (%)	Survey Year					
		2019		*2021*		*2022*	
Experienced Discrimination		*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Living with HIV	n	340	112	145	41	19	5
	%	75.22	24.78	77.96	22.04	79.17	20.83
Prefer not to answer	n	11	7	9	6	2	2
	%	61.11	38.89	60.00	40.00	50.00	50.00
Rurality							
Rural/remote	n	164	61	212	70	17	5
	%	72.89	27.11	75.18	24.82	77.27	22.73
Urban/suburban	n	3150	1248	1581	537	243	165
	%	71.62	28.38	74.65	25.35	59.56	40.44
Sexual Orientation							
Asexual	n	55	37	35	18	22	23
	%	59.78	40.22	66.04	33.96	48.89	51.11
Bisexual	n	388	153	287	60	29	14
	%	71.72	28.28	82.71	17.29	67.44	32.56
Gay	n	2080	629	1065	353	77	31
	%	76.78	23.22	75.11	24.89	71.30	28.70
Pansexual	n	219	159	126	51	38	38
	%	57.94	42.06	71.19	28.81	50.00	50.00

Experienced Discrimination	Frequency (n) and Proportion (%)	Survey Year					
		2019		*2021*		*2022*	
		No	*Yes*	*No*	*Yes*	*No*	*Yes*
Queer	n	386	264	173	100	66	52
	%	59.38	40.62	63.37	36.63	55.93	44.07
Other sexual expansive	n	180	64	107	25	26	14
persons	%	73.77	26.23	81.06	18.94	65.00	35.00

Note. *n* denotes frequency whereas *%* denotes a proportion.

[a] Not available, question not asked in survey year; [b] ACB = African, Caribbean, and/or Black

Main Results

As this chi-square analysis used a $2_i \times 3_j \times 2_k$ design, the analysis was split into two parts: one for individuals with a disability ($1_i \times 3_j \times 2_k$) and another for individuals not living with a disability ($1_i \times 3_j \times 2_k$; see Table 10). When examining discrimination due to sexual orientation comparing people living with or without disabilities, a difference across survey years was observed.

Firstly, 1309 (28.31%) of participants living with disabilities reported discrimination due to sexual orientation in 2019, 607 (25.29%) in 2021, and 172 (39.81%) in 2022. This difference, when compared with participants living with disabilities who did not report discrimination due to sexual orientation, was statistically significant, $\chi 2$ (2, N = 7455) = 38.87, p < .001. The magnitude of the effect size among participants living with a disability respective of discrimination across years was weak-to-moderate (Cramer's V = .07; Akoglu, 2018).

Secondly, 247 participants not living with a disability (17.35%) reported experiencing discrimination due to sexual orientation in 2019, while 163 (13.99%) in 2021, and 350 (22.86%) in 2022 – as such, most participants across cycles not living with disabilities reported fewer cases of discrimination due to sexual orientation. When comparing participants not living with disabilities but who either reported or did not report experiencing discrimination due to sexual orientation, this was statistically significant, $\chi 2$ (2, N = 4120) = 36.35, p < .001. The magnitude of the effect size among participants not living with a disability was also weak-to-moderate (Cramer's V = .09; Akoglu, 2018).

The total difference between people living with and without a disability was statistically significant across discrimination and survey years, with a weak total effect size (Cramer's V = .05; Akoglu, 2018). See Figure 4 for a graphical representation of this trend.

Table 10

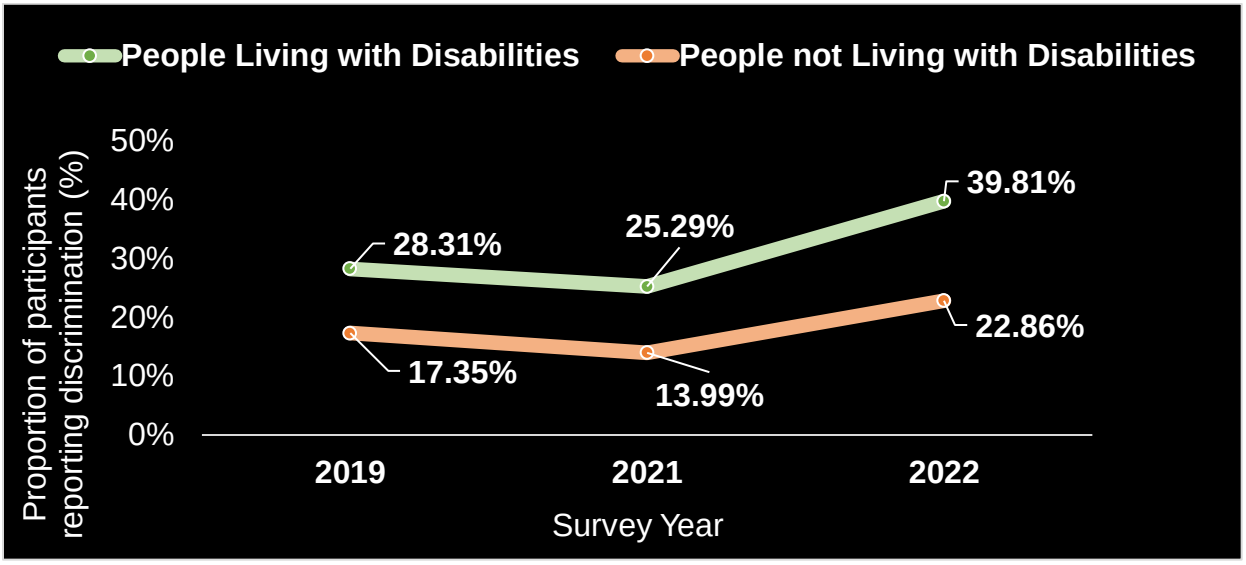
Chi-Square Analysis Using Imputed Data Between Discrimination due to Sexual Orientation and Survey Year Among 2S/GBTQ+ Participants Living With or Without a Disability, Sex Now 2019, 2021-2022

Disability	Discrimination due to Sexual Orientation		Survey Year		
			2019	*2021*	*2022*
Living with a disability*	Reporting discrimination				
		Observed	1309	607	172
		Expected	1294.8	672.2	121.0
	Not reporting discrimination				
		Observed	3314	1793	260
		Expected	3328.2	1727.8	311.0
Not living with a disability**	Reporting discrimination				
		Observed	247	163	350
		Expected	262.7	214.9	282.4
	Not reporting discrimination				
		Observed	1177	1002	1181
		Expected	1161.3	950.1	1248.6

* $\chi 2$ (2, N = 7455) = 38.87, p < .001; ** $\chi 2$ (2, N = 4120) = 36.35, p < .001

Figure 4

Trend Analysis of Discrimination due to Sexual Orientation Among 2S/GBTQ+ Participants Living With or Without Disabilities, Sex Now 2019, 2021, and 2022



Note. A black background with two trendlines using a pastel-green and pastel-orange font; these were specifically chosen to increase accessibility and contrast for individuals with seeing-related disabilities (see APA, 2022).

Research Question 3

Next, a series of Cramer's V effect sizes were used to examine the univariate association between possible predictors and outcome variables to determine covariate-selection for multivariate modelling. Although generalized variance inflation factors were previously calculated to test for inter-correlations between predictors to reduce or avoid multicollinearity, Cramer's V values were strictly used to test for univariate associations between nominal variables. I thus examined the univariate association of predictors among two outcomes. Cramer's V correlations are depicted below in Table 11.

Statistically significant ($p < 0.10$) predictors from Table 11 were initially included in model building.

Table 11

Cramer's V Values Between Predictor and Outcome Variables Among 2S/GBTQ+ Participants Living With a Disability

Predictors	Loneliness	Discrimination due to Sexual Orientation
Age	.13*	.20*
Disability Subgroup	.11*	.07*
Ethnoracial Identity	.06*	.07*
Financial Strain	.18*	.12*
Gender Identity	.10*	.17*
HIV Status	.02*	.04*
Rurality	.004	.01
Sexual Orientation	.05*	.11*
Survey Year	.09*	.07*

*** *p* < .10**

Statistically significant predictors and covariates from Table 11 were then added in multivariable models to see how changes in variable selection affected the model fit using a backwards-elimination approach (see Stoltzfus, 2011). To reiterate, model fit was also assessed via a Wald-test (Engle, 1984). Pseudo-R-Square (i.e., Nagelkerke R^2) were also used to report the proportion of explained variance (Waler & Smith, 2016). This process in model building was repeated twice per outcome using imputed data and produced: an unadjusted and adjusted model for loneliness (Table 12); one adjusted model for loneliness (minority-informed; Table 13); an unadjusted and adjusted

model for discrimination (Table 14); and one adjusted model for discrimination (minority-informed; Table 15). Non-imputed models can be found in Appendix B and C.

Loneliness

Unadjusted and adjusted pooled models with single imputations are presented in Table 12. Following the backwards-elimination approach, the Wald tests suggested good model fit (with values greater than zero). The Nagelkerke [pseudo]-R^2 value was .0115, for the unadjusted model, suggesting 1.15% of explained variance. The adjusted model reported a Pseudo R^2 value of .0813, thereby explaining 8.13% of model variance, whereby .0959 or 9.59% for minority analyses. See Table 13 for the minority-informed analysis with adjusted values.

Compared with 2019, the odds of reporting feeling lonely were greater for 2S/GBTQ+ participants living with disabilities in 2020 and 2021 in both unadjusted (*aOR* = 1.49, *95CI%* = [1.35-1.63]) and adjusted models (*aOR* = 1.55, *95CI%* = [1.41-1.71]). Age was also statistically salient among sexual and gender minority men and other diverse people living with disabilities in adjusted models: compared with 20–29-year-olds, 40–49-year-old participants (*aOR* = 0.77, *95CI%* = [0.67-0.90]), 50–64-year-old participants (*aOR* = 0.62, 95CI% = [0.54-0.71]) and older participants aged 65+ years (*aOR* = 0.44, *95CI%* = [0.35, 0.55]) all reported decreased odds of feeling lonely. Adolescents aged 15-19, however, reported increased odds of feeling lonely (*aOR* = 1.45, *95CI%* = [1.06-1.97]) compared with participants aged 20-29. No statistically significant differences were found among 2S/GBTQ+ participants living with disabilities aged 30-39 compared with 20-29.

Ethnoracial identity was salient in its association with loneliness. 2S/GBTQ+ participants living with disabilities who identified as Black, Indigenous or racialized (compared with white persons living with a disability) reported increased odds of feeling lonely (*aOR* = 1.12, *95CI%* = [1.00-1.26]). When using a minority-informed lens, Arab, West Asian and/or Middle Eastern (*aOR* = 1.79, 95%CI = [1.11-2.87]) and East and/or Southeast Asian (*aOR* = 1.42, 95%CI = [1.00-1.99]) participants had increased odds of reporting feeling lonely compared with Latino/e/x 2S/GBTQ+ persons living with disabilities No other within-group differences emerged when compared with Latino/e/x participants.

Gender and financial strain were both salient in their association with loneliness. Among 2S/GBTQ+ people living with disabilities, gender expansive persons (compared to cis men; *aOR* = 1.29, *95%CI* = [1.12-1.48]) and participants with financial strain (compared to financially comfortable participants; *aOR* = 2.18, *95%CI* = [1.96-2.42) both reported increased odds of feeling lonely. When using a minority-informed lens, there were no statistically significant odds of feeling lonely among people living with a disability between trans men and people of diverse genders (e.g., non-binary, other gender-expansive people; p >.05).

As Research Question 3 only examines loneliness among 2S/GBTQ+ participants living with disabilities, a minority-informed analysis was also conducted to understand differences between disability subgroups. Compared with 2S/GBTQ+ people with a mobility-related disability, 2S/GBTQ+ participants with either a seeing-related (*aOR* = 0.47, *95%CI* = [0.38-0.57]), hearing-related (*aOR* = 0.82, *95%CI* = [0.69-

0.97]), or other disabilities (*aOR* = 0.60, *95%CI* = [0.51-0.72]), all reported decreased odds of feeling lonely.

Table 12

Unadjusted and Adjusted Logistic Regression Models for Loneliness Among 2S/GBTQ+ Participants Living With a Disability, Imputed Pooled Data From Sex Now 2019-2021

Model	Unadjusted Model With Imputations				Adjusted Model With Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*	*N*	*aOR*[a]	*95%CI*[b]	*p-value*
Survey Years	8301				8252			
2019		ref.	ref.			ref.	ref.	
2020 and 2021		1.49	1.35, 1.63	**< .001**		1.55	1.41, 1.71	**< .001**
2022	-[c]				-[c]			
Age								**< .001**
20-29		-[d]	-[d]	-[d]		ref.	ref.	
15-19		-[d]	-[d]	-[d]		1.45	1.06, 1.97	**.02**
30-39		-[d]	-[d]	-[d]		0.92	0.81, 1.05	.20
40-49		-[d]	-[d]	-[d]		0.77	0.67, 0.90	**< .001**
50-64		-[d]	-[d]	-[d]		0.62	0.54, 0.71	**< .001**
65+		-[d]	-[d]	-[d]		0.44	0.35, 0.55	**< .001**
Ethnoracial Identity								
White		-[d]	-[d]	-[d]		ref.	ref.	
Racialized persons		-[d]	-[d]	-[d]		1.12	1.00, 1.26	**<.05**
Financial Strain								
Comfortable		-[d]	-[d]	-[d]		ref.	ref.	

Model	Unadjusted Model With Imputations				Adjusted Model With Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*	*N*	*aOR*[a]	*95%CI*[b]	*p-value*
Not comfortable		-[d]	-[d]	-[d]		2.18	1.96, 2.42	**< .001**
Gender Identity								
Cis man		-[d]	-[d]	-[d]		ref.	ref.	
Other gender expansive persons		-[d]	-[d]	-[d]		1.29	1.12, 1.48	**< .001**

Notes. Not lonely was used as the referent group. Survey years was the primary independent variable; variables for the adjusted model were chosen using a backwards-elimination approach and dependent on model fit. The constant (y-intercept) was included in each model, but not shown in the table. Statistically significant values ($p < .05$) are bolded for readability purposes.

[a]*aOR* = Adjusted Odds Ratio; [b]*95%CI* = 95% Confidence Interval. [c]Not available, not asked in survey year**;** [d]Not included in unadjusted model.

Table 13

Adjusted Logistic Regression Minority-Informed Model for Loneliness Among 2S/GBTQ+ Participants Living With a Disability, Imputed Pooled Data From Sex Now 2019-2021

Model	Adjusted Model With Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Survey Years	8252			
2019		ref.	ref.	
2020 and 2021		1.63	1.47, 1.82	**< .001**
2022	-[c]			
Age				**< .001**
20-29		ref.	ref.	
15-19		1.44	1.06, 1.96	**.02**
30-39		0.91	0.80, 1.04	.17
40-49		0.78	0.68, 0.92	**.002**
50-64		0.62	0.54, 0.72	**< .001**
65+		0.42	0.34, 0.53	**< .001**
Disability Subgroups				**< .001**
Mobility-related		ref.	ref.	
Seeing-related		0.47	0.38, 0.57	**< .001**
Hearing-related		0.82	0.69, 0.97	**.02**
Memory-related		0.86	0.74, 1.00	> .05
Emotion-related		0.86	0.73, 1.01	> .05
Other disabilities		0.60	0.51, 0.72	**< .001**
Ethnoracial Identity				**.02**
Latino/e/x		ref.	ref.	
ACB[d]		0.90	0.63, 1.30	.58
Arab/West Asian/Middle Eastern		1.79	1.11, 2.87	**.02**
East Asian/Southeast Asian		1.42	1.00, 1.99	**< .05**

Model	Adjusted Model With Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Indigenous		1.04	0.76, 1.43	.82
South Asian		1.35	0.89, 2.03	.16
White		1.01	0.79, 1.30	.92
Other racialized persons		1.11	0.73, 1.69	.62
Prefer not to answer		0.92	0.47, 1.80	.80
Financial Strain				
Comfortable		ref.	ref.	
Not comfortable		2.10	1.89, 2.34	**< .001**
Gender Identity				**.04**
Trans man		ref.	ref.	
Non-binary person		1.03	0.79, 1.35	.83
Cis man		0.90	0.66, 1.01	.06
Other gender expansive persons		0.82	0.60, 1.35	.59

Notes. Not lonely was used as the referent group. Survey years was the primary independent variable; variables for the adjusted model were chosen using a backwards-elimination approach and dependent on model fit. Disability subgroups were only included in Table 13 with the goal of applying a minority-informed lens. The constant (y-intercept) was included in each model, but not shown in the table. Statistically significant values ($p < .05$) are bolded for readability purposes.

[a]*aOR* = Adjusted Odds Ratio; [b]*95%CI* = 95% Confidence Interval. [c]Not available, not asked in survey year**;** [d]ACB = African, Caribbean, and/or Black.

Discrimination due to Sexual Orientation

Table 14, below, describes each model in detail related to discrimination due to sexual orientation. Table 15 describes this model with a minority-informed lens. Adjusted pooled models with single imputations are presented in-text. Following the backwards-elimination approach, the Wald tests suggested good model fit (with values greater than zero). The Nagelkerke [pseudo]-R^2 value was less than 1.00% of explained variance for the unadjusted model. The adjusted model, however, denoted a Pseudo R^2 value of .0855, thereby explaining 8.55% of model variance; for the minority-informed analysis, the model explained .0926 or 9.26% of the variance.

Using pooled data, I compared discrimination due to sexual orientation from 2019 to 2021/2022. Compared with 2019, 2S/GBTQ+ participants living with disabilities did not report statistically significant differences in discrimination due to sexual orientation in 2021/2022 in the unadjusted model; however, decreased odds of reporting discrimination were found in 2021/2022 in the adjusted model (*aOR* = 0.89, *95%CI* = [0.79-0.99]) compared with 2019.

I observed that specific social determinants of health were salient in their association with discrimination due to sexual orientation. Age was statistically significant when compared with 2S/GBTQ+ participants living with a disability aged 20–29: 2S/GBTQ+ participants living with a disability aged 30–39 (*aOR* = 0.73, *95%CI* = [0.64-0.84]), 40–49 (*aOR* = 0.59, *95%CI* = [0.50-0.70]), 50–64 (*aOR* = 0.45, *95%CI* = [0.38-0.53]), and 65 and older (*aOR* = 0.31, *95%CI* = [0.22-0.43]) all had decreased odds of reporting discrimination due to sexual orientation. However, younger adolescents/adults

(15–19) had increased odds of reporting discrimination due to sexual orientation (*aOR* = 1.66, *95%CI* = [1.22-2.26]).

Ethnoracial identity was also a salient social determinant of health for discrimination. Black, Indigenous or other racialized self-identifying participants living with a disability (compared with white persons living with a disability; *aOR* = 1.28, *95%CI* = [1.13-1.45]) had increased odds of reporting discrimination due to sexual orientation. When using a minority lens, within-group differences emerged among racialized persons (group difference $p < .001$); specifically, South Asian 2S/GBTQ+ participants living with a disability had increased odds of reporting discrimination due to sexual orientation than their Latino/e/x counterparts living with a disability (*aOR* = 1.59, *95%CI* = [1.01-2.49]).

Gender identity was also found to be a salient social determinant of health for discrimination. Gender expansive persons had increased odds of reporting discrimination due to sexual orientation when compared with cis men (*aOR* = 1.59, *95%CI* = [1.37-1.84]). Using a minority-informed lens revealed one statistically significant difference related to discrimination due to sexual orientation when compared with trans men living with a disability: other gender expansive persons living with a disability had increased odds of reporting discrimination (*aOR* = 1.58, *95%CI* = [1.03-2.43]).

Sexual orientation was also found to be a salient social determinant of health associated with discrimination. Compared with gay participants living with a disability, all other sexual expansive persons living with a disability had increased odds of reporting discrimination due to sexual orientation (*aOR* = 1.17, *95%CI* = [1.04-1.32]). When using

a minority-lens to compare bisexual persons living with a disability to specific sexual identities, only queer participants living with a disability (*aOR* = 1.52, *95%CI* = [1.22-1.89]) had increased odds of reporting discrimination due to sexual orientation.

As Research Question 3 only examines discrimination among 2S/GBTQ+ participants living with disabilities, a minority-informed analysis was also conducted to understand differences between disability subgroups. Compared with 2S/GBTQ+ people with a mobility-related disability, 2S/GBTQ+ participants with either a seeing-related (*aOR* = 0.62, *95%CI* = [0.48-0.80]), emotion-related (*aOR* = 0.75, *95%CI* = [0.62-0.90]), or other disabilities (*aOR* = 0.80, *95%CI* = [0.65-0.99]), all had decreased odds of reporting discrimination due to sexual orientation. When comparing hearing-related or memory-rated with mobility-related disabilities among 2S/GBTQ+ participants, no statistically significant differences emerged.

Table 14

Unadjusted and Adjusted Logistic Regression Models for Discrimination due to Sexual Orientation Among 2S/GBTQ+ Participants Living With a Disability, Imputed Pooled Data From Sex Now 2019, 2021-2022

Model	Unadjusted Model With Imputations				Adjusted Model With Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*	*N*	*aOR*[a]	*95%CI*[b]	*p-value*
Survey Years	7076				7053			
2019		ref.	ref.			ref.	ref.	
2021 and 2022		1.00	0.90, 1.12	.95		0.89	0.79, 0.99	**.04**
2020	-[c]				-[c]			
Age								**< .001**
20-29		-[d]	-[d]	-[d]		ref.	ref.	
15-19		-[d]	-[d]	-[d]		1.66	1.22, 2.26	**.001**
30-39		-[d]	-[d]	-[d]		0.73	0.64, 0.84	**< .001**
40-49		-[d]	-[d]	-[d]		0.59	0.50, 0.70	**< .001**
50-64		-[d]	-[d]	-[d]		0.45	0.38, 0.53	**< .001**
65+		-[d]	-[d]	-[d]		0.31	0.22, 0.43	**< .001**
Ethnoracial Identity								
White		-[d]	-[d]	-[d]		ref.	ref.	
Racialized persons		-[d]	-[d]	-[d]		1.28	1.13, 1.45	**< .001**
Financial Strain								
Comfortable		-[d]	-[d]	-[d]		ref.	ref.	

Model	Unadjusted Model With Imputations				Adjusted Model With Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*	*N*	*aOR*[a]	*95%CI*[b]	*p-value*
Uncomfortable		-[d]	-[d]	-[d]		1.40	1.25, 1.57	**< .001**
Gender Identity								
Cis man		-[d]	-[d]	-[d]		ref.	ref.	
Other gender expansive persons		-[d]	-[d]	-[d]		1.59	1.37, 1.84	**< .001**
Sexual Orientation								
Gay		-[d]	-[d]	-[d]		ref.	ref.	
Other sexual expansive persons		-[d]	-[d]	-[d]		1.17	1.04, 1.32	**.008**

Notes. Not reporting discrimination due to sexual was used as the referent group. Survey years was the primary independent variable; variables for the adjusted model were chosen using a backwards-elimination approach and dependent on model fit. The constant (y-intercept) was included in each model, but not shown in the table. Statistically significant values ($p < .05$) are bolded for readability purposes.

[a]*aOR* = Adjusted Odds Ratio; [b]*95%CI* = 95% Confidence Interval; [c]Not available, not asked in survey year**;** [d]Not included in unadjusted model.

Table 15

Adjusted Logistic Regression Minority-Informed Model for Discrimination due to Sexual Orientation Among 2S/GBTQ+ Participants Living With a Disability, Imputed Pooled Data From Sex Now 2019, 2021-2022

Model	Adjusted Model With Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Survey Years	6641			
2019		ref.	ref.	
2021 and 2022		0.91	0.80, 1.04	.18
2020	-[c]			
Age				**< .001**
20-29		ref.	ref.	
15-19		1.51	1.05, 2.16	**.03**
30-39		0.70	0.61, 0.81	**< .001**
40-49		0.58	0.49, 0.69	**< .001**
50-64		0.42	0.35, 0.51	**< .001**
65+		0.27	0.19, 0.39	**< .001**
Disability Subgroups				**.002**
Mobility-related		ref.	ref.	
Seeing-related		0.62	0.48, 0.80	**< .001**
Hearing-related		0.92	0.76, 1.11	.39
Memory-related		0.85	0.71, 1.01	.06
Emotion-related		0.75	0.62, 0.90	**.003**
Other disabilities		0.80	0.65, 0.99	**.04**
Ethnoracial Identity				**< .001**
Latino/e/x		ref.	ref.	
ACB[d]		1.35	0.90, 2.03	.15
Arab/West Asian/Middle Eastern		1.05	0.63, 1.76	.86
East Asian/Southeast Asian		0.75	0.50, 1.13	.17

Model	Adjusted Model With Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Indigenous		1.28	0.89, 1.84	.19
South Asian		1.59	1.01, 2.49	**.04**
White		0.91	0.67, 1.22	.51
Other racialized persons		1.10	0.67, 1.81	.70
Prefer not to answer		0.99	0.47, 2.08	.97
Financial Strain				
Comfortable		ref.	ref.	
Uncomfortable		1.38	1.22, 1.55	**< .001**
Gender Identity				**< .001**
Trans man		ref.	ref.	
Non-binary person		1.16	0.88, 1.53	.29
Cis man		0.82	0.65, 1.03	.08
Other gender expansive persons		1.58	1.03, 2.43	**.04**
Sexual Orientation				**< .001**
Bisexual		ref.	ref.	
Asexual		1.25	0.85, 1.86	.26
Pansexual		1.25	0.97, 1.61	.08
Queer		1.52	1.22, 1.89	**< .001**
Gay		1.01	0.85, 1.08	.89
Other sexual expansive persons		0.80	0.59, 1.08	.15

Notes. Not reporting discrimination due to sexual was used as the referent group. Survey years was the primary independent variable; variables for the adjusted model were chosen using a backwards-elimination approach and dependent on model fit; although survey year was removed in step four of the backwards elimination, I used data from step three in order to retain this variable in the model. The constant (y-intercept) was included in each model, but not shown in the table. Statistically significant values ($p < .05$) are bolded for readability purposes.

[a]*aOR* = Adjusted Odds Ratio; [b]*95%CI* = 95% Confidence Interval; [c]Not available, not asked in survey year; [d]ACB = African, Caribbean and/or Black.

Discussion

Loneliness and Discrimination Among 2S/GBTQ+ People

I examined loneliness (2019, 2020, 2021) and discrimination over time (2019, 2021, 2022) among 2S/GBTQ+ participants; I observed statistically significant differences across outcomes. Regarding loneliness, almost 53% of 2S/GBTQ+ participants reported feeling lonely in 2019, over 64% in 2020, and almost 56% in 2021. Loneliness seemed to be highest in 2020 during the first stages of COVID-19, and subsided thereafter - similar to baseline levels. It is possible that loneliness was highest in 2020 due to isolation, stay-at-home measures, and social distancing efforts due to COVID-19 (Brennan et al., 2020); however, other factors such as utilizing better coping mechanisms could have played a role in decreasing loneliness throughout 2021 (Hoffart et al., 2022).

When examining the change over time in discrimination based on sexual orientation, almost 26% of participants reported discrimination in 2019, almost 22% in 2021, and almost 27% in 2022. A possible reason to explain an increase, however slight, in discrimination in 2022 could be the mpox epidemic that predominantly affected 2S/GBTQ+ people (Centers for Disease Control and Prevention, 2023) – of course, this epidemic was not limited to one group of people. However, discrimination around sexual orientation and stigma during mpox ravaged through several communities across Canada (Bresge, 2022; Toronto Public Health, 2022). Of note, while statistically significant, the effect size was very weak-to-weak and results should be interpreted with caution.

Loneliness Among 2S/GBTQ+ People With Disabilities

I examined loneliness (2019, 2020, 2021) and discrimination over time (2019, 2021, 2022) among 2S/GBTQ+ participants living with disabilities. With a focus on 2S/GBTQ+ participants living with a disability, over 59% reported feeling lonely in 2019, over 72% in 2020, and almost 64% in 2021. At its peak, over 72% of these participants experienced loneliness. When we compare effect sizes between people living with disabilities and abled participants, a statistically significant difference emerged. This difference in loneliness was worse among our 2S/GBTQ+ participants living with disabilities, and speaks to the disproportional social impact created by COVID-19 and its policies (see Lebrasseur et al., 2021 and Heinze et al., 2021 for disabled contexts outside of 2S/GBTQ+ communities).

I used multivariate logistic regression models to examine which social determinants of health were associated with loneliness among 2S/GBTQ+ participants living with disabilities. Compared with 2019, the odds of reporting loneliness were greater for in 2020 and 2021 – this was consistent across unadjusted and adjusted models. Looking at the pooled results showed that most age groups (including older adults) reported fewer odds for loneliness outcome compared with 20-29-year-old-participants. The finding around how older 2S/GBTQ+ men living with disabilities experienced less loneliness was found within a different sample (i.e., older lesbian, gay, bisexual, and transgender women living with chronic illness or disabilities), as described by Westwood et al. (2022):

> Although some older lesbians were finding life difficult before and during lockdown, what is striking is the ways in which many were not only coping well,

> but thriving, both before and during lockdown. This is also important to note, because very often the narratives about older lesbians and older LGBT+ people more broadly involve “tragedy” narratives of loneliness, [and] isolation… (p. 518)

In their qualitative study of 149 participants, although some did struggle with loneliness throughout the pandemic, others also thrived and found ways to connect with others. This might have occurred within our sample of older 2S/GBTQ+ participants living with disabilities too and speaks to their resilience. However, other literature points to challenges that older 2S/GBTQ+ people living with disabilities or chronic illness faced throughout the pandemic (e.g., Lindner, 2023; Moreno et al., 2023; Westwood et al., 2021). These differences could be contextual. For example, one study with respondents living with disabilities (although not 2S/GBTQ+ specific) found that the association between engaging in COVID-19-related measures and loneliness is contextually-dependent, and can be either positive or negative (Maroto et al., 2023).

As young 2S/GBTQ+ participants living with disabilities also reported greater odds for loneliness than 20-29-year-olds in our sample, this may be because of a disruption to their daily lives and confinement orders (see Aishworiya & Kang, 2021 for an example of non-2S/LGBTQ+ youth living with disabilities). Research is lacking around 2S/GBTQ+ youth living with disabilities throughout the pandemic; as such, more research is needed to understand their needs, priorities, and factors associated with their well-being.

Among other differences in loneliness were related to gender and ethnoracial variables. Racialized and/or gender-expansive 2S/GBTQ+ participants living with disabilities reported increased odds of feeling lonely compared with white participants of

the same cohort. Using an intersectionally-informed lens bound by structures of colonialism, racism, ableism, heterosexism and transphobia (Crenshaw, 1991) could explain an increased odds in loneliness in and factors associated with it (e.g., Ayim, 2023; Levandowski et al., 2022; Lund et al., 2020). Very few studies exist that examines loneliness and isolation at the intersection of race, sexual and gender identities, and disability in the context of COVID-19 (abroad, and within Canada). More work is needed to understand the experiences of these underserved populations.

As I also conducted minority-informed analysis to understand differences in loneliness between disability subgroups within 2S/GBTQ+ communities, persons with mobility-related disabilities experienced increased odds compared with all other disability subgroups (i.e., seeing-related, hearing-related, memory-related, emotion-related, or other disabilities). Previous research has found that persons living with physical disabilities (which is part of mobility-related disabilities; e.g., Shumway-Cook et al., 2002) have, when compared to the general population, reported increased odds in loneliness (e.g., Rokach et al., 2006). However contrary to my findings, when the experiences of persons with visible versus invisible disabilities are compared, it is likely that persons living with invisible disabilities face greater social inequities such as stigma and isolation (Green et al., 2005; Hendry et al., 2022; Joachim & Acorn, 2000; Olney & Brockelman, 2005); this might be as the social aspects of persons living with disabilities social are affected by the beliefs and actions of others, thereby causing fewer social interactions and increasing isolation (Green et al., 2005; Hendry et al., 2022; Zheng et al., 2016). In our sample of 2S/GBTQ+ persons living with physical disabilities, isolation might have been caused, at least partially, by barriers such as a lack of accessibility in

physical spaces and environments. For example, other literature has looked at the association of lack of accessibility of spaces and found that when such arises, loneliness among persons with disabilities is exacerbated (e.g., Gómez-Zúñiga et al., 2023; Macdonald et al., 2018; Tough et al., 2018). In the context of COVID-19, a number of physical spaces were shut down or inaccessible which could have further contributed to feelings of loneliness among 2S/GBTQ+ persons living with physical disabilities – of course, the latter statement would apply not only to persons living with physical disabilities, but could apply to any person living a disability (e.g., Devita et al., 2020; Jesus et al., 2021).

Discrimination Among 2S/GBTQ+ People With Disabilities

When examining discrimination due to sexual orientation among 2S/GBTQ+ participants living with a disability, 28.31% reported it in 2019, 25.29% in 2021, and 39.81% in 2022. Although it decreased slightly in 2021, it increased in 2022 much greater than the 2019 baseline. As suggested earlier, this may be because of mpox (Toronto Public Health, 2022) and the discrimination that ensued throughout the epidemic around sexualization and sexual contacts within 2S/GBTQ+ communities; however, when taking an intersectional lens, it is possible that facets of ableism contributed to this increase during an epidemic that predominantly affected, although not limiting of, 2S/GBTQ+ persons. When I compared the effect sizes of 2S/GBTQ+ participants living with disabilities to their 2S/GBTQ+ non-disabled counterparts, a statistically significant difference emerged. Given the staggering increase in 2022, it is likely that ableism related to perceptions, misconceptions and false narrativities around sexuality (e.g., heterosexism, inability to assert or be sexual) played a role in

subsequent experiences of discrimination due to sexual orientation (e.g., Barnett, 2017; Toft et al., 2020) during the height of an epidemic within gender and sexual expansive communities across Canada.

I used multivariate logistic regression models to examine which social determinants of health were associated with discrimination due to sexual orientation among 2S/GBTQ+ participants living with disabilities. Compared with 2019, the odds of reporting discrimination were not statistically different in 2021 and 2022 in the adjusted model. There was no other reported literature on trends of discrimination due to sexual orientation in Canada, however. An interpretive lens that might explain this finding is that due to the COVID-19 pandemic and associated restrictions, it is possible that this essentially shielded the disabled community from increased discrimination, but also contributed to the reduction of support networks which could increase loneliness. More persons were either off work or working remotely too, which aligns with the experience of less discrimination but greater loneliness. Another possible reason for no statistically significant odds of reported discrimination might be the characteristics of the sampled population; given that a large majority of persons living with a disability also identified as white, this might have played a role related to their experiences and treatment as disabled 2S/GBTQ+ people due to less entrenched structures such as colonialism and racism compared to racialized people (Table 9; Crenshaw, 1991; cf. Vo, 2022). There were a roughly 3% decrease in white disabled persons in 2021 and 2022 compared to 2019; perhaps a larger sample related to ethnicity and Indigeneity would drive the effect size up and exacerbate odds of reporting discrimination.

When examining salient social determinants of health in their association with discrimination, most age groups (except for 15-19-year-olds) reported fewer odds compared with 20-29-year-olds. I can thus surmise that young adults aged 20-29 have greater odds of experiencing discrimination than most age groups, and given that they make up a larger proportion of respondents, more supports, and awareness and inclusion initiatives are needed to reduce discrimination at different levels (e.g., at work, while accessing healthcare services, within college and universities) especially for 2S/GBTQ+ young adults living with disabilities (e.g., Carliner & Walsh, 2023; Daley et al., 2020; Tam, 2022; Tam et al., 2022). Furthermore, supports at various systems are equally needed for younger 2S/GBTQ+ participants living with disabilities (aged 15-19) as they reported greater odds of discrimination compared with participants aged 20-29.

Other racialized 2S/GBTQ+ participants living with a disability reported increased odds of reporting discrimination due to sexual orientation compared with white persons. South Asian participants also reported increased odds of loneliness when compared with their Latino/e/x counterparts. Sparce research has examined these relationships using an intersectionally-informed lens (i.e., examining 2S/GBTQ+, disability, and race or cultural identities), either with quantitative or qualitative designs (Martino et al., 2023; Vo, 2022). One paper suggested that the creation of leisure spaces that were not diverse (in race and ability) reproduced discrimination (Martino et al., 2023). The second research paper examined sexual and gender minority leisure spaces at the intersection of gender, race and disability; however, the two-way interaction predicting discrimination was not statistically significant (Vo, 2022). The non-statistically significant interaction, as the author speculated, could be because of insufficient power within the sample; as

such, more rigorous research, with larger diverse samples, is required to understand discrimination using an intersectional lens. However, I surmise that coupled with theories of intersectionality – considering structural issues of racism, colonialism, ableism, transphobia, and heterosexism –, and minority stress related to discrimination, my results seem to fit what is expected theoretically (Amato & Émond, 2023; Crenshaw, 1991; Holliman et al., 2023; Meyer, 1995; Meyer, 2003).

Unsurprisingly, gender identity was also found to be a salient social determinant of health for discrimination. 2S/GBTQ+ disabled people who reported any other gender-expansive identity had greater odds of discrimination compared with their cis-disabled counterparts; in minority-informed analyses, any other gender-expansive identity reported greater odds of discrimination than trans men. Using structural equation modelling, Vo (2022) denotes that “the simple slope analysis suggested that disability significantly predicted intersectional discrimination for both cisgender and [transgender and non-conforming] TGNC participants”, with a stronger effect found among their cisgender counterparts (p. 183). This falls in line with my results, whereby disabled gender-expansive people experienced greater odds of discrimination. The analysis by Vo (2022) examined all sexual and gender minority people altogether, whereas mine was limited to 2S/GBTQ+ people. This methodological difference in my sample could limit the experiences of all sexual and gender minority people.

When comparing 2S/GBTQ+ participants living with a mobility-related disability, 2S/GBTQ+ with any other reported disability (i.e., seeing-related, emotion-related, or other disabilities) experienced fewer odds of discrimination due to sexual orientation. Very little research exists that examines discrimination at the intersection of disability

subgroup and 2S/GBTQ+ identities and seeks to understand differences by disability subtype (e.g., Mulcahy et al., 2022). Mulcahy et al. (2022) compared differences in disability subgroups by cisgender and transgender people related to unmet healthcare needs. It is more common for disability research within 2S/GBTQ+ spaces to measure one type of disability, creating a composite variable of several disability subtypes, or to understand disability as a whole and compare it to non-disabled people (e.g., Conover et al., 2019; Fredriksen-Goldsen, 2012; Kattari et al., 2017; Nakkeeran & Nakkeeran, 2018; Navarro et al., 2024). In a Trans Pulse Canada report, for example, authors compared discrimination due to disability within trans and non-binary communities among disabled people, people who have a disability or chronic illness but do not categorize it as such, and people without disabilities (Navarro et al., 2023). As no available data existed comparing disability subtypes within 2S/GBTQ+ spaces and related to discrimination, I contrasted my results on disability subtypes with non-2S/GBTQ+ disability research. Jung et al. (2021) examined disability subtypes (e.g., physical-external, sensory or speech, physical-internal, or mental-related disabilities) in their association with risk for depression symptomology; although not discrimination-specific, both discrimination and symptoms of depression are associated or related to well-being (Berghe et al., 2010; Fingerhut et al., 2010; Galderisi et al., 2015; Handlovsky et al., 2023a; Meyer, 2003). At baseline, adjusted hazard ratios revealed no statistically significant associations between depression symptoms and each disability subtype when compared with participants reporting a physical-external disability (Jung et al., 2021). This suggests that participants living with disabilities, irrespective of disability subtypes, were not at greater or lesser of a risk for depression symptoms as

an overall group. At the two-year follow-up, participants with physical-internal disabilities reported greater risk for depression symptoms, while those with mental health-related disabilities reported less risk for depression, both compared with participants living with physical-external disabilities. Our results might be different due to the measured outcomes (i.e., discrimination versus depression), or the presence of 2S/GBTQ+ participants in my research which adds another layer of complexity in terms of experienced discrimination from an intersectionally-informed lens (Crenshaw, 1991). The way the disability subtypes were operationalized and classified into groups by Jung et al. (2022) also differs from my research; as such, these might play a role in subsequent analyses when conducting within-group differences.

To summarize, my main findings are two-fold. Firstly, compared with 2019, the odds of reporting loneliness were greater for 2S/GBTQ+ participants living with disabilities in 2020 and 2021; specifically, 2S/GBTQ+ participants living with a disability who reported a racialized identity, financial strain, or a gender-expansive identity had greater odds of reporting loneliness. Lastly, compared with 2019, decreased odds of reporting discrimination were found in 2021 and 2022. Generally, older 2S/GBTQ+ participants living with a disability, and participants with either a seeing-related, emotion-related, or other disabilities, all reported fewer odds in experienced discrimination. 2S/GBTQ+ participants living with disabilities who were racialized, queer versus bisexual identified, and gender-expansive reported greater odds of discrimination.

Implications and Future Directions

From these results, evidence-based psychosocial and community interventions are needed to mitigate the negative effects of COVID-19, while also considering levels of isolation pre and peri-COVID-19 to measure the utility of the intervention beyond this pandemic in question. This is not to say that we need to get to levels of loneliness from before COVID-19, but rather, to have a benchmark in place which allows us to critical reflect on if an intervention was valuable in attenuating social inequities. A psychosocial or community intervention targeting loneliness among 2S/GBTQ+ persons with disabilities and chronic illness can increase community connectedness, provide purpose, and broadening social networks; these could include online peer-support groups, community-based, or recreational programs (Adler-Ben Dor & Savaya, 2007; Amato et al., 2024; Bessaha et al., 2020; Haslam et al., 2016; Lochner et al., 2013; Van Asselt-Goverts et al., 2018; Windle et al., 2011; cf. Struchen et al., 2011; cf. van Gestel-Timmermans et al., 2012). These interventions must be evidence-based, age appropriate, culturally and racially sensitive, and accessible (e.g., Bessaha et al., 2020; Perone et al., 2020).

Social inequities in loneliness and discrimination were present among 2S/GBTQ+ people living with different disability subtypes, in different racialized communities, and identifying with different sexual orientations or genders. In short, social inequities persisted within the 2S/GBTQ+ population through COVID-19. Efforts are needed to consider and implement, community-informed, equitable policies within Canada that do not disproportionally affect underserved and marginalized populations (e.g., Kemei et al., 2023; Majnemer et al., 2021; Mladenov & Brennan, 2021; Pettinicchio et al., 2021;

Vo & McKenzie, 2023). Alongside this, we must do better to create accessible environments for both visibly and invisibly disabled 2S/GBTQ+ people; this can attenuate loneliness by making it easier for others to connect socially with other queer and disabled people, while also increasing independence (Bridger, 2020; Kelly et al., 2019; Marchigiani, 2021; Roulstone & Morgan, 2014). To tackle discrimination, creating diverse campaigns with clear messaging must be a priority; these campaigns must tackle preconceived notions and beliefs using an intersectionally-informed lens and simultaneously tackle racism, transphobia, ableism, and heterosexism (Crenshaw, 1991; Miller et al., 2004; Pinfold et al., 2005; Thornicroft, 2006). This messaging would target persons without disabilities, and/or persons outside of sexual and gender-expansive communities with the goal of enhancing inclusion and breaking down stereotypes. One approach currently in the works is being outsourced for the Women and Gender Equality Canada non-profit organization (“2SLGBTQI+ Anti-Stigma Awareness Marketing Campaign”, 2023a).

One implication from this work is that it provides a better understanding of the complexities of social life that queer disabled persons experienced through the pandemic; from experiencing resilience and less discrimination from being isolated (i.e., due to COVID-19 protocols, engaging in self-quarantine, and working remotely), to on the flip side, also experiencing vulnerabilities from the effects of loneliness. This balance of resilience and vulnerability impacts queer disabled persons overall well-being, and should be considered when creating equitable policies to be enacted during public health emergencies.

More research is needed to understand the experiences of 2S/GBTQ+ people living with disabilities around various factors that affect well-being, such as discrimination due to sexual orientation. Moreover, although most research will compare disabled people to their abled counterparts – which is important and reinforces that persons are affected by disability because of *barriers* (Shakespeare, 2006), we do not learn anything novel besides that barriers exist compared with abled bodied people. Research comparing disability subtypes related to measures of well-being can provide nuances on particular challenges or barriers that they experience compared with other disabilities. For example, comparing persons with an emotional-related disability to that of visual-related disability. These within-group comparisons are essential to understanding the experiences of underserved disabled populations.

Strengths and Limitations

Strengths

This work has many strengths; this work utilized community-based methodologies to increase capacity building within research settings which included, in part, gathering needs and priorities of the sexual and gender expansive community, the co-creation of questions for every version of Sex Now, disseminating the work in appropriate ways, etc. This work is done by, with, and for community.

This thesis is also one of the first works that sheds light on population-level trends of loneliness and discrimination among 2S/GBTQ+ persons living with disabilities in Canada. Using this pre- and peri-pandemic data with large sample sizes enabled me to perform intersectionally-informed analyses across variables. In addition to being methodologically-driven (i.e., using theories of minority stress, intersectionality, social

resources, and life course), the intersectionally-informed analyses were essential to understand social inequities that exist within underserved and deserving communities in Canada.

Another strength within this work included understanding differences among disabled persons by subgroup instead of the often comparisons with abled bodied participants. Making comparison within-group allowed me to understand differences in loneliness and discrimination experienced by diverse persons of various (dis)abilities without homogenizing the experiences of all disabled persons; understanding these differences are vital to allocating resources and creating specific interventions to address social inequities among disabled persons in Canada.

Limitations

The limitation of this work is that due to the aggregated nature of our results, despite stratifying by subgroups, we cannot understand all of the nuances and contextual elements important for the well-being of these diverse communities; qualitative analyses provide the ability to contextualize findings based on social location, experiences related to stigma and discrimination, and other sociohistorical and structural elements (e.g., Handlovsky et al., 2023b).

Another reported issue is with the cross-sectional data being analysed; causality cannot be assessed due to temporality (Rindfleisch et al., 2008). In addition, interpretation of such data must be done with caution to ensure that associations are not over-interpreted and that they remain that, mere associations. However, repeated cross-sectional data does provide an overview of changes experienced within our 2S/GBTQ+ community, and valuable data for underserved and deserving communities.

As women were excluded, this research fails to examine social inequities among self-identifying cis or trans women within sexual and gender minority communities. The Sex Now surveys, although they have improved its inclusion criteria alongside community priorities, still does not allow self-identifying women to participate.

Another aspect to consider is with the theoretical underpinnings I included in this research. As per the NIH LGBT Research Coordinating Committee (2013), four theoretical perspectives are essential to include in research among gender and sexual-expansive persons. I employed Meyer's minority stress theory (2003), intersectionality (Crenshaw, 1991), life course theory (Elder et al., 2003), social resource theory (Lin, 1982; Lin, 2001). I did not include a socio-ecological theory as I did not utilize a syndemic approach (Batchelder et al., 2015; Gesesew et al., 2021); however, this could have been utilized to better understand co-occurring environmental, social, cultural, and structural dynamics in their relationship with loneliness or discrimination.

Lastly, I did not control or exclude participants who could have participated in more than one survey year, across survey years. In this pooled analysis of cross-sectional data, it would be statistically relevant to control for such factors especially for within and between-group comparisons.

Conclusion

Findings from this thesis revealed population-level social determinants of health and changes over time relevant to disabled and 2S/GBTQ+ communities who experienced social inequities during COVID-19. This knowledge advocates for supports and equity-informed policy decisions that support people with lived or living experience. It is with hope that dedicated advocates, clinicians, and researchers see changes come

to fruition that support underserved and deserving 2S/GBTQ+ disabled communities across Canada.

References

Abramovich, A., Pang, N., Moss, A., Logie, C. H., Chaiton, M., Kidd, S. A., & Hamilton, H. A. (2021). Investigating the impacts of COVID-19 among LGBTQ2S youth experiencing homelessness. *Plos One*, *16*(9), e0257693. https://doi.org/10.1371/journal.pone.0257693

Abrams, J. A., Tabaac, A., Jung, S., & Else-Quest, N. M. (2020). Considerations for employing intersectionality in qualitative health research. *Social Science & Medicine*, *258*, 113138. https://doi.org/10.1016/j.socscimed.2020.113138

Adler-Ben Dor, I., & Savaya, R. (2007). Community rehabilitation for persons with psychiatric disabilities: Comparison of the effectiveness of segregated and integrated programs in Israel. *Psychiatric Rehabilitation Journal*, 31(2), 139–148. https://doi.org/10.2975/31.2.2007.139.148

Aghaizu, A., Wayal, S., Nardone, A., Parsons, V., Copas, A., Mercey, D., Hart, G., Gilson, R., & Johnson, A. M. (2016). Sexual behaviours, HIV testing, and the proportion of men at risk of transmitting and acquiring HIV in London, UK, 2000–13: A serial cross-sectional study. *The Lancet HIV*, *3*(9), E431–E440. https://doi.org/10.1016/S2352-3018(16)30037-6

Ahmad, K., Erqou, S., Shah, N., Nazir, U., Morrison, A. R., Choudhary, G., & Wu, W. -C. (2020). Association of poor housing conditions with COVID-19 incidence and mortality across US counties. *PLoS One*, *15*(11), e0241327. https://doi.org/10.1371/journal.pone.0241327

Aishworiya, R., & Kang, Y. Q. (2021). Including children with developmental disabilities in the equation during this COVID-19 pandemic. *Journal of Autism and*

Developmental Disorders, *51*, 2155–2158. https://doi.org/10.1007/s10803-020-04670-6

Akoglu, H. (2018). User's guide to correlation coefficients. *Turkish Journal of Emergency Medicine*, *18*(3), 91–93. https://doi.org/10.1016/j.tjem.2018.08.001

Ali, M. K., Bullard, K. M., Saydah, S., Imperatore, G., & Gregg, E. W. (2018). Cardiovascular and renal burdens of prediabetes in the USA: Analysis of data from serial cross-sectional surveys, 1988–2014. *The Lancet Diabetes & Endocrinology*, *6*(5), 392–403. https://doi.org/10.1016/S2213-8587(18)30027-5

Amato, A. T., & Émond, G. (2023). A systematic review of psychosocial challenges for MSM living with HIV among diverse and intersecting minorities. *Canadian Journal of Human Sexuality*, *32*(3), 340–354 https://doi.org/10.3138/cjhs.2022-0048

Amato, A. T., Wonsiak, T., Handlovsky, I., Ferlatte, O., Kia, H., & Oliffe, J. L. (2024). Cultivating psychological well-being amongst older gay men: A qualitative exploration. *SSM-Qualitative Research in Health*, *5*, 100403. https://doi.org/10.1016/j.ssmqr.2024.100403

Anderssen, N., & Malterud, K. (2017). Oversampling as a methodological strategy for the study of self-reported health among lesbian, gay and bisexual populations. *Scandinavian Journal of Public Health*, *45*(6), 637–646. https://doi.org/10.1177/1403494817717407

Antle, R. (2020, March 26). What is a public health emergency, and how is it different from a state of emergency? *CBC News*. https://www.cbc.ca/news/canada/newfoundland-labrador/nl-public-health-emergency-vs-soe-1.5509916

APA. (2022). *Accessible use of color in figures*. https://apastyle.apa.org/style-grammar-guidelines/tables-figures/colors

Ayim, E. (2023). *Black disabled people and mental health: Intersectionality of racism, COVID-19, and disability. An autoethnographic journey*. [Unpublished doctoral dissertation]. University of Manitoba. https://mspace.lib.umanitoba.ca/server/api/core/bitstreams/3a1b5283-80b9-4192-8e65-fe1aabf03ec2/content

Barnett, J. P. (2017). Intersectional harassment and deviant embodiment among Autistic adults: (Dis)ability, gender and sexuality. *Culture, Health & Sexuality*, *19*(11), 1210–1224. https://doi.org/10.1080/13691058.2017.1309070

Batchelder, A. W., Gonzalez, J. S., Palma, A., Schoenbaum, E., & Lounsbury, D. W. (2015). A social ecological model of syndemic risk affecting women with and at-risk for HIV in impoverished urban communities. *American Journal of Community Psychology*, *56*, 229–240. https://doi.org/10.1007/s10464-015-9750-y

Bauer, G. R., Churchill, S. M., Mahendran, M., Walwyn, C., Lizotte, D., & Villa-Rueda, A. A. (2021). Intersectionality in quantitative research: A systematic review of its emergence and applications of theory and methods. *SSM-Population Health*, *14*, 100798. https://doi.org/10.1016/j.ssmph.2021.100798

Beogo, I., Tchouaket, E. N., Sia, D., Bationo, N. J. C., Collin, S., Tapp, D., Kassim, S. A., Ramdé, J., & Gagnon, M. P. (2022). Promising best practices implemented in long-term care homes during COVID-19 pandemic to address social isolation and loneliness: A scoping review protocol. *BMJ Open*, *12*(1), e053894. http://dx.doi.org/10.1136/bmjopen-2021-053894

Berghe, W. V., Dewaele, A., Cox, N., & Vincke, J. (2010). Minority-specific determinants of mental well-being among lesbian, gay, and bisexual youth. *Journal of Applied Social Psychology*, *40*(1), 153–166. https://doi.org/10.1111/j.1559-1816.2009.00567.x

Bessaha, M. L., Sabbath, E. L., Morris, Z., Malik, S., Scheinfeld, L., & Saragossi, J. (2020). A systematic review of loneliness interventions among non-elderly adults. *Clinical Social Work Journal*, *48*, 110–125. https://doi.org/10.1007/s10615-019-00724-0

Beutel, M. E., Hettich, N., Ernst, M., Schmutzer, G., Tibubos, A. N., & Braehler, E. (2021). Mental health and loneliness in the German general population during the COVID-19 pandemic compared to a representative pre-pandemic assessment. *Scientific Reports*, *11*, 14946. https://doi.org/10.1038/s41598-021-94434-8

Bil, J. P., Prins, M., Stolte, I. G., Dijkshoorn, H., Heijman, T., Snijder, M. B., Davidovich, U., & Zuure, F. R. (2017). Usage of purchased self-tests for HIV and sexually transmitted infections in Amsterdam, the Netherlands: Results of population-based and serial cross-sectional studies among the general population and sexual risk groups. *BMJ Open*, *7*(9), e016609. https://doi.org/10.1136/bmjopen-2017-016609

Brennan, D. J., Card, K., Collict, D., Jollimore, J., & Lachowsky, N. J. (2020). How might social distancing impact gay, bisexual, queer, trans and two-spirit men in Canada? *AIDS and Behavior*, *24*, 2480–2482. https://doi.org/10.1007/s10461-020-02891-5

Bresge, A. (2022, May 28). *LGBTQ2S+ advocates fear monkeypox stigma could 'spread like a virus'*. The Canadian Press. https://www.ctvnews.ca/health/lgbtq2s-advocates-fear-monkeypox-stigma-could-spread-like-a-virus-1.5920896

Bridger, O. (2020). *Attitudinal barriers to disability and the loneliness and social Isolation of physically disabled people in Reading*. University of Reading. https://research.reading.ac.uk/participation-lab/wp-content/uploads/sites/131/Unorganized/Bridger-2020-Attitudinal-barriers-to-disability-and-loneliness.pdf

Bronfenbrenner, U. (1994). Ecological models of human development. *International Encyclopedia of Education*, *3*(2), 37–43.

Buteikis, A. (2020). *Practical econometrics and data science*. Vilnius University. http://web.vu.lt/mif/a.buteikis/wp-content/uploads/PE_Book/

Canadian AIDS Society. (2006). *Ageing well, ageism and gay men*. https://www.rainbowhealthontario.ca/wp-content/uploads/2009/05/Aging-Well.pdf

Canadian Institute of Health Information. (2022). *Canadian COVID-19 intervention timeline.* https://www.cihi.ca/en/canadian-covid-19-intervention-timeline

Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council. (2022). *Tri-Council Policy Statement Ethical Conduct for Research Involving Humans*. https://ethics.gc.ca/eng/documents/tcps2-2022-en.pdf

Card, K., Yu, C., Frost, A., Refol, J., & Bombaci, P. (2022). *Evidence brief – How does loneliness affect health?* Canadian Alliance for Social Connection and Health. https://static1.squarespace.com/static/60283c2e174c122f8ebe0f39/t/63e6732b44

9fa8543b07cfeb/1676047148032/CSCG_Evidence+Brief_Health+Impacts+of+Loneliness.pdf

Carliner, J., & Walsh, B. (2023). *Innovating for inclusion: 2SLGBTQ+ outreach and programming at the University of Toronto Libraries.* International Federation of Library Associations and Institutions. https://repository.ifla.org/bitstream/123456789/2806/1/s10-2023-carliner-en.pdf

Carter, S. P., Allred, K. M., Tucker, R. P., Simpson, T. L., Shipherd, J. C., & Lehavot, K. (2019). Discrimination and suicidal ideation among transgender veterans: The role of social support and connection. *LGBT Health*, *6*(2), 43–50. https://doi.org/10.1089/lgbt.2018.0239

CBRC. (n.d.). *Sex Now survey*. https://www.cbrc.net/sex_now

CBRC. (2023). *CBRC's research principles*. https://www.cbrc.net/cbrcs_research_principles

Centers for Disease Control and Prevention. (2023). *Potential risk for new mpox cases*. https://emergency.cdc.gov/han/2023/han00490.asp

Chatterjee, S., Biswas, P., & Guria, R. T. (2020). LGBTQ care at the time of COVID-19. *Diabetes & Metabolic Syndrome*, *14*(6), 1757–1758. https://doi.org/10.1016/j.dsx.2020.09.001

Chen, D. G., & Chen, J. D. (Eds.). (2017). *Monte-Carlo simulation-based statistical modeling*. Springer. https://link.springer.com/content/pdf/10.1007/978-981-10-3307-0.pdf

Cohen, R. I. S., & Bosk, E. A. (2020). Vulnerable youth and the COVID-19 pandemic. *Pediatrics*, *146*, e20201306. https://doi.org/10.1542/peds.2020-1306

Conover, K. J., & Israel, T. (2019). Microaggressions and social support among sexual minorities with physical disabilities. *Rehabilitation Psychology*, *64*(2), 167–178. https://doi.org/10.1037/rep0000250

Constantino, J. N., Sahin, M., Piven, J., Rodgers, R., & Tschida, J. (2020). The impact of COVID-19 on individuals with intellectual and developmental disabilities: Clinical and scientific priorities. *American Journal of Psychiatry*, *177*(11), 1091–1093. https://doi.org/10.1176/appi.ajp.2020.20060780

Crenshaw, K. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Review*, *43*, 1241–1299. https://doi.org/10.2307/1229039

Daley, A., Brotman, S., MacDonnell, J. A., & St. Pierre, M. (2020). A framework for enhancing access to equitable home care for 2SLGBTQ+ communities. *International Journal of Environmental Research and Public Health*, *17*(20), 7533. https://doi.org/10.3390/ijerph17207533

Daoud, J. I. (2017). Multicollinearity and regression analysis. *Journal of Physics: Conference Series*, *949*, 012009. https://doi.org/10.1088/1742-6596/949/1/012009

den Houting, J. (2020). Stepping out of isolation: Autistic people and COVID-19. *Autism in Adulthood*, *2*(2), 103–105. https://doi.org/10.1089/aut.2020.29012.jdh

Diaz, A., Baweja, R., Bonatakis, J. K., & Baweja, R. (2021). Global health disparities in vulnerable populations of psychiatric patients during the COVID-19 pandemic. *World Journal of Psychiatry*, *11*(4), 94–108. https://doi.org/10.5498/wjp.v11.i4.94

Egleston, B. L., Miller, S. M., & Meropol, N. J. (2011). The impact of misclassification due to survey response fatigue on estimation and identifiability of treatment effects. *Statistics in Medicine*, *30*(30), 3560–3572. https://doi.org/10.1002/sim.4377

Elder, G.H., Johnson, M.K., Crosnoe, R. (2003). The emergence and development of life course theory. In J. T. Mortimer, M. J. Shanahan (Eds.), *Handbook of the Life Course*. *Handbooks of Sociology and Social Research*. Springer. https://doi.org/10.1007/978-0-306-48247-2_1

Else-Quest, N. M., & Hyde, J. S. (2016). Intersectionality in quantitative psychological research: I. Theoretical and epistemological issues. *Psychology of Women Quarterly*, *40*(2), 155–170. https://doi.org/10.1177/0361684316629797

Emlet, C. A., Shiu, C., Kim, H. J., & Fredriksen-Goldsen, K. (2017). Bouncing back: Resilience and mastery among HIV-positive older gay and bisexual men. *The Gerontologist*, *57*(1, Suppl.), S40–S49. https://doi.org/10.1093/geront/gnw171

Engle, R. F. (1984). Wald, likelihood ratio, and Lagrange multiplier tests in econometrics. *Handbook of Econometrics*, *2*, 775–826. https://doi.org/10.1016/S1573-4412(84)02005-5

Ernst, M., Niederer, D., Werner, A. M., Czaja, S. J., Mikton, C., Ong, A. D., Rosen, T., Brähler, E., & Beutel, M. E. (2022). Loneliness before and during the COVID-19 pandemic: A systematic review with meta-analysis. *American Psychologist*, *77*(5), 660–677. https://doi.org/10.1037/amp0001005

Estabrooks, C. A., Straus, S. E., Flood, C. M., Keefe, J., Armstrong, P., Donner, G. J., Boscart, V., Ducharme, F., Silvius, J. L., & Wolfson, M. C. (2020). Restoring trust:

COVID-19 and the future of long-term care in Canada. *Facets*, *5*(1), 651–691. https://doi.org/10.1139/facets-2020-0056

Fettes, L., Bayly, J., de Bruin, L. M., Patel, M., Ashford, S., Higginson, I. J., & Maddocks, M. (2021). Relationships between prolonged physical and social isolation during the COVID-19 pandemic, reduced physical activity and disability in activities of daily living among people with advanced respiratory disease. *Chronic Respiratory Disease*, *18*. https://doi.org/10.1177/14799731211035822

Fingerhut, A. W., Peplau, L. A., & Gable, S. L. (2010). Identity, minority stress and psychological well-being among gay men and lesbians. *Psychology & Sexuality*, *1*(2), 101–114. https://doi.org/10.1080/19419899.2010.484592

Fingerhut, A. W. (2018). The role of social support and gay identity in the stress processes of a sample of caucasian gay men. *Psychology of Sexual Orientation and Gender Diversity*, *5*(3), 294–302. https://doi.org/10.1037/sgd0000271

Fish, J. N., Salerno, J., Williams, N. D., Rinderknecht, R. G., Drotning, K. J., Sayer, L., & Doan, L. (2021). Sexual minority disparities in health and well-being as a consequence of the COVID-19 pandemic differ by sexual identity. *LGBT Health*, *8*(4), 263–272. https://doi.org/10.1089/lgbt.2020.0489

Forstein, M. (2013). Aids: A history. *Journal of Gay & Lesbian Mental Health*, *17*(1), 40–63. https://doi.org/10.1080/19359705.2013.740212

Fox, J., & Monette, G. (1992). Generalized collinearity diagnostics. *Journal of the American Statistical* Association, *87*(417), 178–183. https://doi.org/10.1080/01621459.1992.10475190

Fox, J., Weisberg, S., & Price, B. (2020). *Car: Companion to applied regression*. R package version 3.0-8. https://cran.r-project.org/web/packages/car/

Fredriksen-Goldsen, K. I., Kim, H. J., & Barkan, S. E. (2012). Disability among lesbian, gay, and bisexual adults: Disparities in prevalence and risk. *American Journal of Public Health*, *102*(1), e16–e21. https://doi.org/10.2105/AJPH.2011.300379

Galderisi, S., Heinz, A., Kastrup, M., Beezhold, J., & Sartorius, N. (2015). Toward a new definition of mental health. *World Psychiatry*, *14*(2), 231–233. https://doi.org/10.1002/wps.20231

Gaynor, T. S., & Wilson, M. E. (2020). Social vulnerability and equity: The disproportionate impact of COVID-19. *Public Administration Review*, *80*(5), 832–838. https://doi.org/10.1111/puar.13264

Gesesew, H. A., Mwanri, L., Stephens, J. H., Woldemichael, K., & Ward, P. (2021). COVID/HIV co-infection: A syndemic perspective on what to ask and how to answer. *Frontiers in Public Health*, *9*, 623468. https://doi.org/10.3389/fpubh.2021.623468

Ghasemi, A., Daneman, N., Berry, I., Buchan, S. A., Soucy, J. P., Sturrock, S., & Brown, K. A. (2021). *Impact of a nighttime curfew on overnight mobility*. MedRxiv. https://doi.org/10.1101/2021.04.04.21254906

Goldberg, S. B., Bolt, D. M., & Davidson, R. J. (2021). Data missing not at random in mobile health research: Assessment of the problem and a case for sensitivity analyses. *Journal of Medical Internet Research*, *23*(6), e26749. https://doi.org/10.2196/26749

Gómez-Zúñiga, B., Pousada, M., & Armayones, M. (2023). Loneliness and disability: A systematic review of loneliness conceptualization and intervention strategies. *Frontiers in Psychology*, *13*, 1040651. https://doi.org/10.3389/fpsyg.2022.1040651

Government of British Columbia. (2023). *Province-wide restrictions*. https://www2.gov.bc.ca/gov/content/covid-19/info/restrictions

Government of Canada. (2015). *Forward sortation area—Definition*. https://ised-isde.canada.ca/site/office-superintendent-bankruptcy/en/statistics-and-research/forward-sortation-area-fsa-and-north-american-industry-classification-naics-reports/forward-sortation-area-definition

Government of Canada. (2022a). *Social determinants of health and health inequalities*. https://www.canada.ca/en/public-health/services/health-promotion/population-health/what-determines-health.html

Government of Canada. (2022b). *Consulting persons with disabilities. Annex: Understanding disabilities*. https://www.canada.ca/en/employment-social-development/programs/accessible-canada-regulations-guidance/consultation/key-concepts.html

Government of Canada. (2023a). *2SLGBTQI+ anti-stigma awareness marketing campaign*. https://canadabuys.canada.ca/en/tender-opportunities/award-notice/cb-7848-2903334

Government of Canada. (2023b). *Summary of evidence supporting COVID-19 public health measures*. https://www.canada.ca/en/public-

health/services/diseases/2019-novel-coronavirus-infection/guidance-documents/summary-evidence-supporting-covid-19-public-health-measures.html

Green, S., Davis, C., Karshmer, E., Marsh, P., & Straight, B. (2005). Living stigma: The impact of labeling, stereotyping, separation, status loss, and discrimination in the lives of individuals with disabilities and their families. *Sociological Inquiry*, *75*(2), 197–215. https://doi.org/10.1111/j.1475-682X.2005.00119.x

Grossman, A. H., D'Augelli, A. R., & Hershberger, S. L. (2000). Social support networks of lesbian, gay, and bisexual adults 60 years of age and older. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *55*(3), P171–P179. https://doi.org/10.1093/geronb/55.3.P171

Hafford-Letchfield, T., Toze, M., & Westwood, S. (2021). Unheard voices: A qualitative study of LGBT+ older people experiences during the first wave of the COVID-19 pandemic in the UK. *Health & Social Care in the Community*, *30*(4), E1233–E1243. https://doi.org/10.1111/hsc.13531

Handlovsky, I., Wonsiak, T., & Amato, A. T. (2023a). Older, self-identifying gay men's conceptualisations of psychological well-being (PWB): A Canadian perspective. *Nursing Philosophy*, *25*(1), e12466. https://doi.org/10.1111/nup.12466

Handlovsky, I., Wonsiak, T., Amato, A. T., Halpin, M., Ferlatte, O., & Kia, H. (2023b). Between two pandemics: Older, gay men's experiences across HIV/AIDS and COVID-19. *SSM-Qualitative Research in Health*, *3*, 100233. https://doi.org/10.1016/j.ssmqr.2023.100233

Harrison, E., Drake, T., & Ots, R. (2023). *Finalfit: Quickly create elegant regression results tables and plots when modelling*. R package version 1.0.6. https://github.com/ewenharrison/finalfit

Haslam, C., Cruwys, T., Haslam, S. A., Dingle, G., & Chang, M. X.-L. (2016). Groups 4 Health: Evidence that a social-identity intervention that builds and strengthens social group membership improves mental health. *Journal of Affective Disorders*, *194*, 188–195. https://doi.org/10.1016/j.jad.2016.01.010.

Heinze, N., Hussain, S. F., Castle, C. L., Godier-McBard, L. R., Kempapidis, T., & Gomes, R. S. (2021). The long-term impact of the COVID-19 pandemic on loneliness in people living with disability and visual impairment. *Frontiers in Public Health*, *9*, 738304. https://doi.org/10.3389/fpubh.2021.738304

Hendricks, M. L., & Testa, R. J. (2012). A conceptual framework for clinical work with transgender and gender nonconforming clients: An adaptation of the minority stress model. *Professional Psychology: Research and Practice*, *43*(5), 460–467. https://doi.org/10.1037/a0029597

Hendry, G., Wilson, C., Orr, M., & Scullion, R. (2022). “I just stay in the house so I don’t need to explain”: A qualitative investigation of persons with invisible disabilities. *Disabilities*, *2*(1), 145–163. https://doi.org/10.3390/disabilities2010012

Hoffart, A., Johnson, S. U., & Ebrahimi, O. V. (2022). Loneliness during the COVID-19 pandemic: change and predictors of change from strict to discontinued social distancing protocols. *Anxiety, Stress, & Coping*, *35*(1), 44–57. https://doi.org/10.1080/10615806.2021.1958790

Holliman, B. D., Stransky, M., Dieujuste, N., & Morris, M. (2023). Disability doesn't discriminate: Health inequities at the intersection of race and disability. *Frontiers in Rehabilitation Sciences*, *4*, 1075775. https://doi.org/10.3389/fresc.2023.1075775

Hosmer Jr, D. W., Lemeshow, S., & Sturdivant, R. X. (2013). *Applied logistic regression* (3rd ed.). John Wiley & Sons. https://doi.org/10.1002/9781118548387

Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, *26*(6), 655–672. https://doi.org/10.1177/0164027504268574

Huntley, J., Ostfeld, A. M., Taylor, J. O., Wallace, R. B., Blazer, D., Berkman, L. F., Evans, D. A., Kohout, J., Lemke, J. H., Scherr, P. A., & Korper, S. P. (1993). Established populations for epidemiologic studies of the elderly: Study design and methodology. *Aging Clinical and Experimental Research*, *5*, 27–37. https://doi.org/10.1007/BF03324123

Hyndman, I., Nugent, D., Whitlock, G. G., McOwan, A., & Girometti, N. (2021). COVID-19 restrictions and changing sexual behaviours in HIV-negative MSM at high risk of HIV infection in London, UK. *Sexually Transmitted Infections*, *97*(7), 521–524. http://dx.doi.org/10.1136/sextrans-2020-054768

IBM Corp. (2020). *IBM SPSS Statistics for Windows, Version 27.0*.

Jesus, T. S., Bhattacharjya, S., Papadimitriou, C., Bogdanova, Y., Bentley, J., Arango-Lasprilla, J. C., Kamalakannan, S., & Refugee Empowerment Task Force, International Networking Group of the American Congress of Rehabilitation

Medicine. (2021). Lockdown-related disparities experienced by people with disabilities during the first wave of the COVID-19 pandemic: Scoping review with thematic analysis. *International Journal of Environmental Research and Public Health*, *18*(12), 6178. https://doi.org/10.3390/ijerph18126178

Jennings, D. E. (1986). Outliers and residual distributions in logistic regression. *Journal of the American Statistical Association*, *81*(396), 987–990. https://doi.org/10.1080/01621459.1986.10478362

Joachim, G., & Acorn, S. (2000). Stigma of visible and invisible chronic conditions. *Journal of Advanced Nursing*, *32*(1), 243–248. https://doi.org/10.1046/j.1365-2648.2000.01466.x

Jung, S. W., Yoon, J. H., & Lee, W. (2021). Predictors for depressive symptoms by four types of disability. *Scientific Reports*, *11*(1), 19371. https://doi.org/10.1038/s41598-021-98765-4

Kalichman, S. C., El-Krab, R., Shkembi, B., Kalichman, M. O., & Eaton, L. A. (2021). Prejudicial beliefs and COVID-19 disruptions among sexual minority men living with and not living with HIV in a high SARS-CoV-2 prevalence area. *Translational Behavioral Medicine*, *11*(7), 1310–1317. https://doi.org/10.1093/tbm/ibab050

Kamal, K., Li, J. J., Hahm, H. C., & Liu, C. H. (2021). Psychiatric impacts of the COVID-19 global pandemic on US sexual and gender minority young adults. *Psychiatry Research*, *299*, 113855. https://doi.org/10.1016/j.psychres.2021.113855

Kamalakannan, S., Bhattacharjya, S., Bogdanova, Y., Papadimitriou, C., Arango-Lasprilla, J. C., Bentley, J., Jesus, T. S., & Refugee Empowerment Task Force, International Networking Group of the American Congress of Rehabilitation

Medicine. (2021). Health risks and consequences of a COVID-19 infection for people with disabilities: Scoping review and descriptive thematic analysis. *International Journal of Environmental Research and Public Health*, *18*(8), 4348. https://doi.org/10.3390/ijerph18084348

Kattari, S. K., Walls, N. E., & Speer, S. R. (2017). Differences in experiences of discrimination in accessing social services among transgender/gender nonconforming individuals by (dis)ability. *Journal of Social Work in Disability & Rehabilitation*, *16*(2), 116–140. https://doi.org/10.1080/1536710X.2017.1299661

Kelly, D., Steiner, A., Mazzei, M., & Baker, R. (2019). Filling a void? The role of social enterprise in addressing social isolation and loneliness in rural communities. *Journal of Rural Studies*, *70*, 225–236. https://doi.org/10.1016/j.jrurstud.2019.01.024

Kemei, J., Tulli, M., Olanlesi-Aliu, A., Tunde-Byass, M., & Salami, B. (2023). Impact of the COVID-19 pandemic on black communities in Canada. *International Journal of Environmental Research and Public Health*, *20*(2), 1580. https://doi.org/10.3390/ijerph20021580

Khoury, L., Klein, A., Couture-Ménard, M. E., & Hammond, K. (2022). Governments' accountability for Canada's pandemic response. *Journal of Public Health Policy*, *43*(2), 222–233. https://doi.org/10.1057/s41271-022-00350-0

Kneale, D., & Bécares, L. (2021). Discrimination as a predictor of poor mental health among LGBTQ+ people during the COVID-19 pandemic: Cross-sectional analysis of the online Queerantine study. *BMJ Open*, *11*(6), e049405. http://dx.doi.org/10.1136/bmjopen-2021-049405

Kuper, H., Banks, L. M., Bright, T., Davey, C., & Shakespeare, T. (2020). Disability-inclusive COVID-19 response: What it is, why it is important and what we can learn from the United Kingdom's response. *Wellcome Open Research*, *5*(79). https://doi.org/10.12688/wellcomeopenres.15833.1

Lachowsky, N. J., Saxton, P. J., Dickson, N. P., Hughes, A. J., Jones, R. G., Clark, T. C., Ho, E., Summerlee, A. J. S., & Dewey, C. E. (2020). Ethnicity classification systems for public health surveys: Experiences from HIV behavioural surveillance among men who have sex with men. *BMC Public Health*, *20*, 1433. https://doi.org/10.1186/s12889-020-09517-4

Lebrasseur, A., Fortin-Bédard, N., Lettre, J., Bussières, E. L., Best, K., Boucher, N., Hotton, M., Beaulieu-Bonneau, S., Mercier, C., Lamontagne, M.-E., & Routhier, F. (2021). Impact of COVID-19 on people with physical disabilities: A rapid review. *Disability and Health Journal*, *14*(1), 101014. https://doi.org/10.1016/j.dhjo.2020.101014

Lee, H., & Miller, V. J. (2020). The disproportionate impact of COVID-19 on minority groups: A social justice concern. *Journal of Gerontological Social Work*, *63*(6-7), 580–584. https://doi.org/10.1080/01634372.2020.1777241

Lee, S. M. (2001). *Using the new racial categories in the 2000 Census: A kids count/PRB report on Census 2000*. The Annie E. Casey Foundation and the Population Reference Bureau. https://eric.ed.gov/?id=ED452296

Lefevor, G. T., Boyd-Rogers, C. C., Sprague, B. M., & Janis, R. A. (2019). Health disparities between genderqueer, transgender, and cisgender individuals: An

extension of minority stress theory. *Journal of Counseling Psychology*, *66*(4), 385–395. https://doi.org/10.1037/cou0000339

Lerner, J. E., & Lee, J. J. (2021). Transgender and gender diverse (TGD) Asian Americans in the United States: Experiences of violence, discrimination, and family support. *Journal of Interpersonal Violence*, *37*(21-22), NP21165–NP21188. https://doi.org/10.1177/08862605211056721

Levandowski, B. A., Miller, S. B., Ran, D., Pressman, E. A., & Van der Dye, T. (2022). Piling it on: Perceived stress and lack of access to resources among US-based LGBTQ+ community members during the COVID-19 pandemic. Plos One, *17*(7), e0271162. https://doi.org/10.1371/journal.pone.0271162

Liebler, C. A., & Halpern-Manners, A. (2008). A practical approach to using multiple-race response data: A bridging method for publicuse microdata. *Demography*, *45*(1), 143–55. https://doi.org/10.1353/dem.2008.0004

Lin, N. (1982). Social resources and instrumental action. In P. V. Marsden & N. Lin (Eds.), *Social structure and network analysis* (pp. 131–45). Sage.

Lin, N. (2001). *Social capital. A theory of social structure and action.* Cambridge University Press.

Lindner, S. (2023). *"It's little moments": An interpretative phenomenological exploration of LGBT elders' loneliness during COVID* (Publication No. 30574082) [Doctoral dissertation, The University of Nebraska-Lincoln]. ProQuest Dissertations Publishing.

Lochner, C., Stein, D. J., Raikes, J., & Pearson, C. (2013). Consumer advocacy meetings: An innovative therapeutic tool. *Annals of Clinical Psychiatry*, *25*(2), 91–96. https://www.aacp.com/article/buy_now/?id=138

Long, R. G. (2008). The crux of the method: Assumptions in ordinary least squares and logistic regression. *Psychological Reports*, *103*(2), 431–434. https://doi.org/10.2466/pr0.103.2.431-434

Lund, E. M., Forber-Pratt, A. J., Wilson, C., & Mona, L. R. (2020). The COVID-19 pandemic, stress, and trauma in the disability community: A call to action. *Rehabilitation Psychology*, *65*(4), 313. https://doi.org/10.1037/rep0000368

Macdonald, S. J., Deacon, L., Nixon, J., Akintola, A., Gillingham, A., Kent, J., Mathews, D., Ismail, A., Sullivan, S., Dore, S., & Highmore, L. (2018). 'The invisible enemy': Disability, loneliness and isolation. *Disability and Society*, *33*(7), 1138–1159. https://doi.org/10.1080/09687599.2018.1476224

Mack, C., Su, Z., & Westreich, D. (2018). Types of missing data. *In Managing missing data in patient registries: Addendum to registries for evaluating patient outcomes: A user's guide* (3rd ed.). Agency for Healthcare Research and Quality. https://www.ncbi.nlm.nih.gov/books/NBK493614/

Majnemer, A., McGrath, P. J., Baumbusch, J., Camden, C., Fallon, B., Lunsky, Y., Miller, S. P., Sansone, G., Stainton, T., Sumarah, J., Thomson, D., & Zwicker, J. (2021). Time to be counted: COVID-19 and intellectual and developmental disabilities—An RSC policy briefing. *Facets*, *6*(1), 1337–1389. https://doi.org/10.1139/facets-2021-0038

Marchigiani, E. (2021). Healthy and caring cities. Accessibility for all and the role of urban spaces in re-activating capabilities. In A. Gabauer, S. Knierbein, N. Cohen, H. Lebuhn, K. Trogal, T. Viderman, & T. Haas (Eds.), *Care and the City. Encounters with Urban Studies* (pp. 75-87). Routledge. https://doi.org/10.4324/9781003031536

Marmet, S., Wicki, M., Gmel, G., Gachoud, C., Bertholet, N., & Studer, J. (2021). Sexual minority orientation is associated with greater psychological impact due to the COVID-19 crisis—Evidence from a longitudinal cohort study of young Swiss men. *Frontiers in Public Health*, *9*, 692884. https://doi.org/10.3389/fpubh.2021.692884

Maroto, M., Pettinicchio, D., Chai, L. and Holmes, A. (2023), ""A rollercoaster of emotions": Social distancing, anxiety, and loneliness among people with disabilities and chronic health conditions". In A. C. Carey, S. E. Green & L. Mauldin (Eds.), *Disability in the time of pandemic* (Vol. 13, pp. 49-73). Leads, UK: Emerald Publishing. https://doi.org/10.1108/S1479-354720230000013004

Marziali, M. E., Card, K. G., McLinden, T., Wang, L., Trigg, J., & Hogg, R. S. (2020). Physical distancing in COVID-19 may exacerbate experiences of social isolation among people living with HIV. *AIDS and Behavior*, *24*, 2250–2252. https://doi.org/10.1007/s10461-020-02872-8

Mattei, G., Russo, T., Addabbo, T., & Galeazzi, G. M. (2021). The COVID-19 recession might increase discriminating attitudes toward LGBT people and mental health problems due to minority stress. *International Journal of Social Psychiatry*, *67*(4), 400–401. https://doi.org/10.1177/0020764020960770

Mena, E., Bolte, G., & on behalf of the Advance Gender Study Group. (2021). Intersectionality-based quantitative health research and sex/gender sensitivity: A scoping review. *International Journal for Equity in Health*, *18*, 199. https://doi.org/10.1186/s12939-019-1098-8

Meyer, I. H. (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior*, *36*, 38–56. https://doi.org/10.2307/2137286

Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*, *129*, 674–697. https://doi.org/10.1037/0033-2909.129.5.674

Microsoft Corporation. (2018). *Microsoft Excel*. https://office.microsoft.com/excel

Miller, P., Parker, S., & Gillinson, S. (2004). *Disablism: How to tackle the last prejudice* (pp. 61-68). Demos.

Minkov, M., & Hofstede, G. (2012). Is national culture a meaningful concept? Cultural values delineate homogeneous national clusters of in-country regions. *Cross-Cultural Research*, *46*(2), 133–159. https://doi.org/10.1177/1069397111427262

Mirabella, M., Senofonte, G., Giovanardi, G., Lingiardi, V., Fortunato, A., Lombardo, F., & Speranza, A. M. (2021). Psychological well-being of trans* people in Italy during the COVID-19 pandemic: Critical issues and personal experiences. *Sexuality Research and Social Policy*, *19*, 1808–1818. https://doi.org/10.1007/s13178-021-00633-3

Mitchell, K. J., Ybarra, M. L., Banyard, V., Goodman, K. L., & Jones, L. M. (2022). Impact of the COVID-19 pandemic on perceptions of health and well-being

among sexual and gender minority adolescents and emerging adults. *LGBT Health*, *9*(1), 34–42. https://doi.org/10.1089/lgbt.2021.0238

Mladenov, T., & Brennan, C. S. (2021). Social vulnerability and the impact of policy responses to COVID-19 on disabled people. *Sociology of Health & Illness*, *43*(9), 2049–2065. https://doi.org/10.1111/1467-9566.13379

Moore, S. E., Wierenga, K. L., Prince, D. M., Gillani, B., & Mintz, L. J. (2021). Disproportionate impact of the COVID-19 pandemic on perceived social support, mental health and somatic symptoms in sexual and gender minority populations. *Journal of Homosexuality*, *68*(4), 577–591. https://doi.org/10.1080/00918369.2020.1868184

Moreno, A., Belhouari, S., & Dussault, A. (2023). A systematic literature review of the impact of COVID-19 on the health of LGBTQIA+ older adults: Identification of risk and protective health factors and development of a model of health and disease. *Journal of Homosexuality*, 1–35. https://doi.org/10.1080/00918369.2023.2169851

Movement Advancement Project. (2020). *The disproportionate impacts of COVID-19 on LGBTQ households in the U.S.: Results from a July/August 2020 national poll.* https://www.lgbtmap.org/2020-covid-lgbtq-households

Mulcahy, A., Streed Jr, C. G., Wallisch, A. M., Batza, K., Kurth, N., Hall, J. P., & McMaughan, D. J. (2022). Gender identity, disability, and unmet healthcare needs among disabled people living in the community in the United States. International *Journal of Environmental Research and Public Health*, *19*(5), 2588. https://doi.org/10.3390/ijerph19052588

Nakkeeran, N., & Nakkeeran, B. (2018). Disability, mental health, sexual orientation and gender identity: understanding health inequity through experience and difference. *Health Research Policy and Systems*, *16* (Suppl 1), 9–19. https://doi.org/10.1186/s12961-018-0366-1

Navarro, J., Hallarn, J., Liang, B., Adams, N., Zaitzow, J., Brooks, K., Legare-Tremblay, E., Johnson, T., Pyne, J., Mahendran, M., Smith, M., Churchill, S., Lopez, C., Scheim, C., & Bauer, G. (2024). *Health and well-being among disabled trans and non-binary people*. Trans Pulse Canada. https://transpulsecanada.ca/results/report-health-and-well-being-among-disabled-trans-and-non-binary-people/

Nielsen, D. E., Labonté, K., Karamanoglu, I., Han, H. Y., Tavanaei, M., Duhamel, P. G., Agellon, L. B., Paquet, C., & Dube, L. (2022). Longitudinal patterns of food procurement over the course of the COVID-19 pandemic: Findings from a Canadian online household survey. *Frontiers in Public Health*, *9*, 752204. https://doi.org/10.3389/fpubh.2021.752204

NIH LGBT Research Coordinating Committee. (2013). *Consideration of the Institute of Medicine (IOM) report on the health of lesbian, gay, bisexual, and transgender (LGBT) individuals*. National Institutes of Health. https://report.nih.gov/sites/report/files/docs/LGBT%20Health%20Report_FINAL_2013-01-03-508%20compliant.pdf

Okechukwu, C. A., El Ayadi, A. M., Tamers, S. L., Sabbath, E. L., & Berkman, L. (2012). Household food insufficiency, financial strain, work–family spillover, and depressive symptoms in the working class: The work, family, and health network

study. *American Journal of Public Health*, *102*(1), 126–133. https://doi.org/10.2105/AJPH.2011.300323

Olney, M. F., & Brockelman, K. F. (2005). The impact of visibility of disability and gender on the self-concept of university students with disabilities. *Journal of Postsecondary Education and Disability*, *18*(1), 80–91. https://files.eric.ed.gov/fulltext/EJ846383.pdf

Pan, S., Xu, J.-J., Han, X.-X., Zhang, J., Hu, Q.-H., Chu, Z.-X., Hai, Y.-Q., Mao, X., Yu, Y.-Q., Geng, W.-Q., Jiang, Y.-J., & Shang, H. (2016). Internet-based sex-seeking behavior promotes HIV infection risk: A 6-year serial cross-sectional survey to MSM in Shenyang, China. *BioMed Research International*, 2860346. https://doi.org/10.1155/2016/2860346

Panel on Research Ethics. (2023). *Tri-Council policy statement: Ethical conduct for research involving humans – TCPS 2 (2022).* https://ethics.gc.ca/eng/policy-politique_tcps2-eptc2_2022.html

Patel, E. U., Solomon, S. S., Lucas, G. M., McFall, A. M., Srikrishnan, A. K., Kumar, M. S., Iqbal, S. H., Saravanan, S., Paneerselvam, N., Balakrishnan, P., Laeyendecker, O., Celentano, D. D., & Mehta, S. H. (2021). Temporal change in population-level prevalence of detectable HIV viraemia and its association with HIV incidence in key populations in India: A serial cross-sectional study. *The Lancet HIV*, 8(9), E544–E553. https://doi.org/10.1016/S2352-3018(21)00098-9

Pearlin, L. I., Menaghan, E. G., Lieberman, M. A., & Mullan, J. T. (1981). The stress process. *Journal of Health and Social Behavior*, 337–356. https://doi.org/10.2307/2136676

Penman-Aguilar, A., Talih, M., Huang, D., Moonesinghe, R., Bouye, K., & Beckles, G. (2016). Measurement of health disparities, health inequities, and social determinants of health to support the advancement of health equity. *Journal of Public Health Management and Practice*, *22*(1, Suppl.), S33–S42. https://doi.org/10.1097/PHH.0000000000000373

Pepinsky, T. B. (2018). A note on listwise deletion versus multiple imputation. *Political Analysis*, *26*(4), 480–488. https://doi.org/10.1017/pan.2018.18

Peplau, L. A., & Perlman, D. (Eds.). (1982). *Loneliness: A sourcebook of current theory, research and therapy*. John Wiley & Sons. https://peplau.psych.ucla.edu/wp-content/uploads/sites/141/2017/07/Perlman-Peplau-98.pdf

Perone, A. K., Ingersoll-Dayton, B., & Watkins-Dukhie, K. (2020). Social isolation loneliness among LGBT older adults: Lessons learned from a pilot friendly caller program. *Clinical Social Work Journal*, *48*(1), 126–139. https://doi.org/10.1007/s10615-019-00738-8

Pettinicchio, D., Maroto, M., & Lukk, M. (2021). Perceptions of Canadian federal policy responses to COVID-19 among people with disabilities and chronic health conditions. *Canadian Public Policy*, *47*(2), 231–251. https://doi.org/10.3138/cpp.2021-012

Philip, B. V. (2021). Impact of covid-19 on transgender persons: The need for an inclusive approach. *International Journal of Sexual Health*, *33*(3), 248–267. https://doi.org/10.1080/19317611.2021.1906375

Philpot, S. P., Holt, M., Murphy, D., Haire, B., Prestage, G., Maher, L., Bavinton, B. R., Hammoud, M. A., Jin, F., & Bourne, A. (2021). Qualitative findings on the impact

of COVID-19 restrictions on Australian gay and bisexual men: Community belonging and mental well-being. *Qualitative Health Research*, *31*(13), 2414–2425. https://doi.org/10.1177/10497323211039204

Pinfold, V., Byrne, P., & Toulmin, H. (2005). Challenging stigma and discrimination in communities: A focus group study identifying UK mental health service users' main campaign priorities. *International Journal of Social Psychiatry*, *51*(2), 128–138. https://doi.org/10.1177/00207640050567

Pruden, H. (2021, March 26). *Decolonizing research: Collecting two-spirit data in culturally affirming ways* [Knowledge Translation Webinar Series]. Michael Smith Health Research BC & Arthritis Research Canada. https://www.msfhr.org/1/webinar/decolonizing-research-collecting-two-spirit-data-in-culturally-affirming-ways

Purdie-Vaughns, V., & Eibach, R. P. (2008). Intersectional invisibility: The distinctive advantages and disadvantages of multiple subordinate-group identities. *Sex Roles*, *59*, 377–391. https://doi.org/10.1007/s11199-008-9424-4

R Core Team. (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/

Rainbow Health Ontario. (2019*). Health equity impact assessment: LGBT2SQ populations supplement*. Government of Ontario. https://www.health.gov.on.ca/en/pro/programs/heia/docs/heia_lgbt2sqpopulations_en.pdf

Rindfleisch, A., Malter, A. J., Ganesan, S., & Moorman, C. (2008). Cross-sectional versus longitudinal survey research: Concepts, findings, and guidelines. *Journal of Marketing Research*, *45*(3), 261–279. https://doi.org/10.1509/jmkr.45.3.261

Robinson, E., Sutin, A. R., Daly, M., & Jones, A. (2022). A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic in 2020. *Journal of Affective Disorders*, *296*, 567–576. https://doi.org/10.1016/j.jad.2021.09.098

Rodriguez-Seijas, C., Fields, E. C., Bottary, R., Kark, S. M., Goldstein, M. R., Kensinger, E. A., Payne, J. D., & Cunningham, T. J. (2020). Comparing the impact of COVID-19-related social distancing on mood and psychiatric indicators in sexual and gender minority (SGM) and non-SGM individuals. *Frontiers in Psychiatry*, *11*, 590318. https://doi.org/10.3389/fpsyt.2020.590318

Rokach, A., Lechcier-Kimel, R., & Safarov, A. (2006). Loneliness of people with physical disabilities. *Social Behavior and Personality: An International Journal*, *34*(6), 681–700. https://doi.org/10.2224/sbp.2006.34.6.681

Roulstone, A., & Morgan, H. (2014). Accessible public spaces for the 'not obviously disabled'. Jeopardised selfhood in an era of welfare retraction. In K. Soldatic, H. Morgan, & A. Roulstone (Eds.), *Disability, spaces, and places of policy exclusion* (pp. 64-79). Routledge

RStudio Team. (2020). *RStudio: Integrated development for R*. RStudio. http://www.rstudio.com/

Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, *66*(1), 20–40. https://doi.org/10.1207/s15327752jpa6601_2

Salerno, J. P., Devadas, J., Pease, M., Nketia, B., & Fish, J. N. (2020). Sexual and gender minority stress amid the COVID-19 pandemic: Implications for LGBTQ young persons' mental health and well-being. *Public Health Reports*, *135*(6), 721–727. https://doi.org/10.1177/0033354920954511

Sampogna, G., Ventriglio, A., Di Vincenzo, M., Del Vecchio, V., Giallonardo, V., Bianchini, V., & Fiorillo, A. (2021). Mental health and well-being of LGBTQ+ people during the COVID-19 pandemic. *International Review of Psychiatry, 34*(3-4), 432–438. https://doi.org/10.1080/09540261.2021.2019686

Sangalang, C. C., Ngouy, S., & Lau, A. S. (2015). Using community-based participatory research to identify health issues for Cambodian American youth. *Family & Community Health, 38*(1), 55–65. https://doi.org/10.1097/FCH.0000000000000056

Santinele Martino, A., Moumos, E., Ulicki, N., & Robbins, M. (2023). The experiences of 2SLGBTQ+ adults labeled with intellectual and/or developmental disabilities when navigating mainstream queer social spaces. *Journal of Homosexuality*, 1–20. https://doi.org/10.1080/00918369.2023.2276320

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, *7*(2), 147–177. https://doi.org/10.1037//1082-989X.7.2.147

Scheffer, J. (2002). Dealing with missing data. *Research Letters in the Information and Mathematical Sciences*, *3*, 153–160. https://mro.massey.ac.nz/handle/10179/4355

Schomaker, M., & Heumann, C. (2018). Bootstrap inference when using multiple imputation. *Statistics in Medicine*, *37*(14), 2252–2266. https://doi.org/10.1002/sim.7654

Schormans, A. F., Hutton, S., Blake, M., Earle, K., & Head, K. J. (2021). Social isolation continued: Covid-19 shines a light on what self-advocates know too well. *Qualitative Social Work*, *20*(1-2), 83–89. https://doi.org/10.1177/1473325020981755a

Sequist, T. D. (2020). The disproportionate impact of COVID-19 on communities of color. *NEJM Catalyst Innovations in Care Delivery*, *1*(4). https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0370

Shakespeare, T. (2006). The social model of disability. *The Disability Studies Reader*, *2*, 197–204.

Shakespeare, T., Ndagire, F., & Seketi, Q. E. (2021). Triple jeopardy: Disabled people and the COVID-19 pandemic. *The Lancet*, *397*(10282), 1331–1333. https://doi.org/10.1016/S0140-6736(21)00625-5

Shiovitz-Ezra, S., & Ayalon, L. (2012). Use of direct versus indirect approaches to measure loneliness in later life. *Research on Aging*, *34*(5), 572–591. https://doi.org/10.1177/0164027511423258

Shultze, H. (2015). *Surviving AIDS. Cultural trauma among middle-aged gay men in New York City*. Publikationen der Deutschen Gesellschaft für Soziologie.

https://publikationen.soziologie.de/index.php/kongressband_2014/article/view/131

Shumway-Cook, A., Patla, A. E., Stewart, A., Ferrucci, L., Ciol, M. A., & Guralnik, J. M. (2002). Environmental demands associated with community mobility in older adults with and without mobility disabilities. *Physical Therapy*, *82*(7), 670–681. https://doi.org/10.1093/ptj/82.7.670

Solar, O., & Irwin, A. (2010). *A conceptual framework for action on the social determinants of health*. World Health Organization. https://www.who.int/publications/i/item/9789241500852

Statistics Canada. (2020). *Experiences of discrimination during the COVID-19 pandemic* (no. 11-001-X). The Daily. https://www150.statcan.gc.ca/n1/en/daily-quotidien/200917/dq200917a-eng.pdf?st=pTzE6oSV

Steptoe, A., Shankar, A., Demakakos, P., & Wardle, J. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences*, *110*(15), 5797–5801. https://doi.org/10.1073/pnas.1219686110

Stoltzfus, J. C. (2011). Logistic regression: A brief primer. *Academic Emergency Medicine*, *18*(10), 1099–1104. https://doi.org/10.1111/j.1553-2712.2011.01185.x

Struchen, M. A., Davis, L. C., Bogaards, J. A., Hudler-Hull, T., Clark, A. N., Mazzei, D. M., Sander, A. M., & Caroselli, J. S. (2011). Making connections after brain injury: Development and evaluation of a social peer-mentoring program for persons with traumatic brain injury. *Journal of Head Trauma Rehabilitation*, *26*(1), 4–19. https://doi.org/10.1097/HTR.0b013e3182048e98

Sylliboy, J. R., Bird, N., Butler, E., Wilmot, K., & Perley, G. (2022). Two-Spirits' response to COVID-19: Survey findings in Atlantic Canada identify priorities and developing practices. *International Journal of Indigenous Health*, *17*(1), 14–25. https://doi.org/10.32799/ijih.v17i1.36724

Szaflarski, M., Hansen, B., Bebin, E. M., & Szaflarski, J. P. (2017). Social correlates of health status, quality of life, and mood states in patients treated with cannabidiol for epilepsy. *Epilepsy & Behavior*, *70*, P364–P369. https://doi.org/10.1016/j.yebeh.2016.12.033

Szanton, S. L., Allen, J. K., Thorpe Jr, R. J., Seeman, T., Bandeen-Roche, K., & Fried, L. P. (2008). Effect of financial strain on mortality in community-dwelling older women. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *63*(6), S369–S374. https://doi.org/10.1093/geronb/63.6.S369

Tai, D. B. G., Shah, A., Doubeni, C. A., Sia, I. G., & Wieland, M. L. (2021). The disproportionate impact of COVID-19 on racial and ethnic minorities in the United States. *Clinical Infectious Diseases*, *72*(4), 703–706. https://doi.org/10.1093/cid/ciaa815

Tam, M. W., Pilling, M. D., MacKay, J. M., Gos, W. G., Keating, L., & Ross, L. E. (2022). Development and implementation of a 2SLGBTQ+ competent trauma-informed care intervention. *Journal of Gay & Lesbian Mental Health*, 1–25. https://doi.org/10.1080/19359705.2022.2141936

Tam, S. (2022). In A. Bourns & E. Kucharski (Eds.), *Caring for LGBTQ2S people. A clinical guide* (2nd ed.). University of Toronto Press.

Tami, A., Ferguson, T., Bauer, G. R., & Scheim, A. I. (2022). Avoidance of primary healthcare among transgender and non-binary people in Canada during the COVID-19 pandemic. *Preventive Medicine Reports*, *27*, 101789. https://doi.org/10.1016/j.pmedr.2022.101789

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

Tebbe, E. A., & Moradi, B. (2016). Suicide risk in trans populations: An application of minority stress theory. *Journal of Counseling Psychology*, *63*(5), 520–533. https://doi.org/10.1037/cou0000152

Thornicroft, G. (2006). *Actions speak louder...Tackling discrimination against people with mental illness*. Mental Health Foundation. https://eliminatestigma.org/wp-content/uploads/Actions-Speak-Louder.pdf

Tiwari, S. C. (2013). Loneliness: A disease? *Indian Journal of Psychiatry*, *55*(4), 320–322. https://doi.org/10.4103/0019-5545.120536

Toft, A., Franklin, A., & Langley, E. (2020). ‘You're not sure that you are gay yet’: The perpetuation of the ‘phase’ in the lives of young disabled LGBT+ people. *Sexualities*, *23*(4), 516–529. https://doi.org/10.1177/1363460719842135

Toronto Public Health. (2022). *Mpox stigma & discrimination*. https://www.toronto.ca/wp-content/uploads/2022/08/8d54-MPoxStigmaFactSheet3AODA.pdf

Torres, J. L., Gonçalves, G. P., Pinho, A. D. A., & Souza, M. H. D. N. (2021). The Brazilian LGBT+ Health Survey: Methodology and descriptive results. *Cadernos de Saude Publica* [*Reports in Public Health*], *37*(9), e00069521. https://doi.org/10.1590/0102-311X00069521

Tough, H., Brinkhof, M. W. G., Siegrist, J., and Fekete, C. (2018). The impact of loneliness and relationship quality on life satisfaction: A longitudinal dyadic analysis in persons with physical disabilities and their partners. *Journal of Psychosomatic Research*, *110*, 61–67. https://doi.org/10.1016/j.jpsychores.2018.04.009

Trans Pulse Canada COVID Cohort Working Group (2020). *Impact of COVID-19 on health care access for transgender and non-binary people in Canada.* https://transpulsecanada.ca/results/report-impact-of-covid-19-on-health-care-access-for-transgender-and-non-binary-people-in-canada/

van Asselt-Goverts, A. E., Embregts, P. J. C. M., & Hendriks, A. H. C. (2018). Evaluation of a social network intervention for people with mild to borderline intellectual disabilities. J*ournal of Applied Research in Intellectual Disabilities*, *31*(2), e229–e243. https://doi.org/10.1111/jar.12318.

van Gestel-Timmermans, H., Brouwers, E. P. M., van Assen, M. A. L. M., & van Nieuwenhuizen, C. (2012). Effects of a peer-run course on recovery from serious mental Illness: A randomized controlled trial. *Psychiatric Services*, *63*(1), 54–60. https://doi.org/10.1176/appi.ps.201000450.

Veldhuis, C. B., Nesoff, E. D., McKowen, A. L. W., Rice, D. R., Ghoneima, H., Wootton, A. R., Papautsky, E. L., Arigo, D., Goldberg, S., & Anderson, J. C. (2021). Addressing the critical need for long-term mental health data during the COVID-19 pandemic: Changes in mental health from April to September 2020. *Preventive Medicine*, *146*, 106465. https://doi.org/10.1016/j.ypmed.2021.106465

Vo, T. D. (2023). A quantitative examination of intersectional discrimination, wellbeing, and resilience among diverse 2SLGBTQ+ people within 2SLGBTQ+ leisure spaces. *Journal of Policy Research in Tourism, Leisure and Events*, *15*(2), 172–192. https://doi.org/10.1080/19407963.2022.2042817

Vo, T. D., & McKenzie, C. (2023). A community-based study to set the policy agenda for the well-being of 2GSBTQ+ men in Ontario, Canada. *Community Development Journal*, *58*(4), 679–698. https://doi.org/10.1093/cdj/bsad016

Wabanaki Two-Spirit Alliance. (2021). *Final report: Survey on Covid-19 Impacts with the Two-Spirit community of Wabanaki, 2021*. http://w2sa.ca/covid-report-2021

Walker, D. A., & Smith, T. J. (2016). Nine pseudo R2 indices for binary logistic regression models. *Journal of Modern Applied Statistical Methods*, *15*(1), 848–854. https://digitalcommons.wayne.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=2326&context=jmasm#page=855

Wang, M., Luo, X., Xu, S., Liu, W., Ding, F., Zhang, X., Wang, L., Liu, J., Hu, J., & Wang, W. (2019). Trends in smoking prevalence and implication for chronic diseases in China: serial national cross-sectional surveys from 2003 to 2013. *The Lancet Respiratory Medicine*, *7*(1), 35–45. https://doi.org/10.1016/S2213-2600(18)30432-6

Weiss, R. S. (1973). *Loneliness: The experience of emotional and social isolation*. The MIT Press.

Westwood, S., Hafford-Letchfield, T., & Toze, M. (2021). *The impact of COVID-19 on older lesbian, gay, bisexual and/or trans+ (LGBT+) people in the UK: A rapid*

response scoping study - Summary report. University of York. https://strathprints.strath.ac.uk/75332/2/Westwood_etal_2021_The_impact_of_Covid_19_on_older_lesbian_gay_bisexual_and_or_trans_people_summary_report.pdf

Westwood, S., Hafford-Letchfield, T., & Toze, M. (2022). Physical and mental well-being, risk and protective factors among older lesbians/gay women in the United Kingdom during the initial COVID-19 2020 lockdown. *Journal of Women & Aging*, *34*(4), 501–522. https://doi.org/10.1080/08952841.2021.1965456

WHO. (2011). *World report on disability.* https://www.who.int/publications/i/item/9789241564182

WHO. (2021*). COVID-19 and the social determinants of health and health equity: Evidence brief*. https://www.who.int/publications/i/item/9789240038387

Windle, K., Francis, J., & Coomber, C. (2011). *Preventing loneliness and social isolation: Interventions and outcomes*. Social Care Institute for Excellence. https://lx.iriss.org.uk/sites/default/files/resources/scie_briefing39.pdf

Winwood, J. J., Fitzgerald, L., Gardiner, B., Hannan, K., Howard, C., & Mutch, A. (2021). Exploring the social impacts of the COVID-19 pandemic on people living with HIV (PLHIV): A scoping review. *AIDS and Behavior*, *25*(12), 4125–4140. https://doi.org/10.1007/s10461-021-03300-1

Xiao, J., Cheung, J. K., Wu, P., Ni, M. Y., Cowling, B. J., & Liao, Q. (2022). Temporal changes in factors associated with COVID-19 vaccine hesitancy and uptake among adults in Hong Kong: Serial cross-sectional surveys. *The Lancet Regional*

Health-Western Pacific, *23*, 100441. https://doi.org/10.1016/j.lanwpc.2022.100441

Young, R., Ayiasi, R. M., Shung-King, M., & Morgan, R. (2020). Health systems of oppression: Applying intersectionality in health systems to expose hidden inequities. *Health Policy and Planning*, *35*(9), 1228–1230. https://doi.org/10.1093/heapol/czaa111

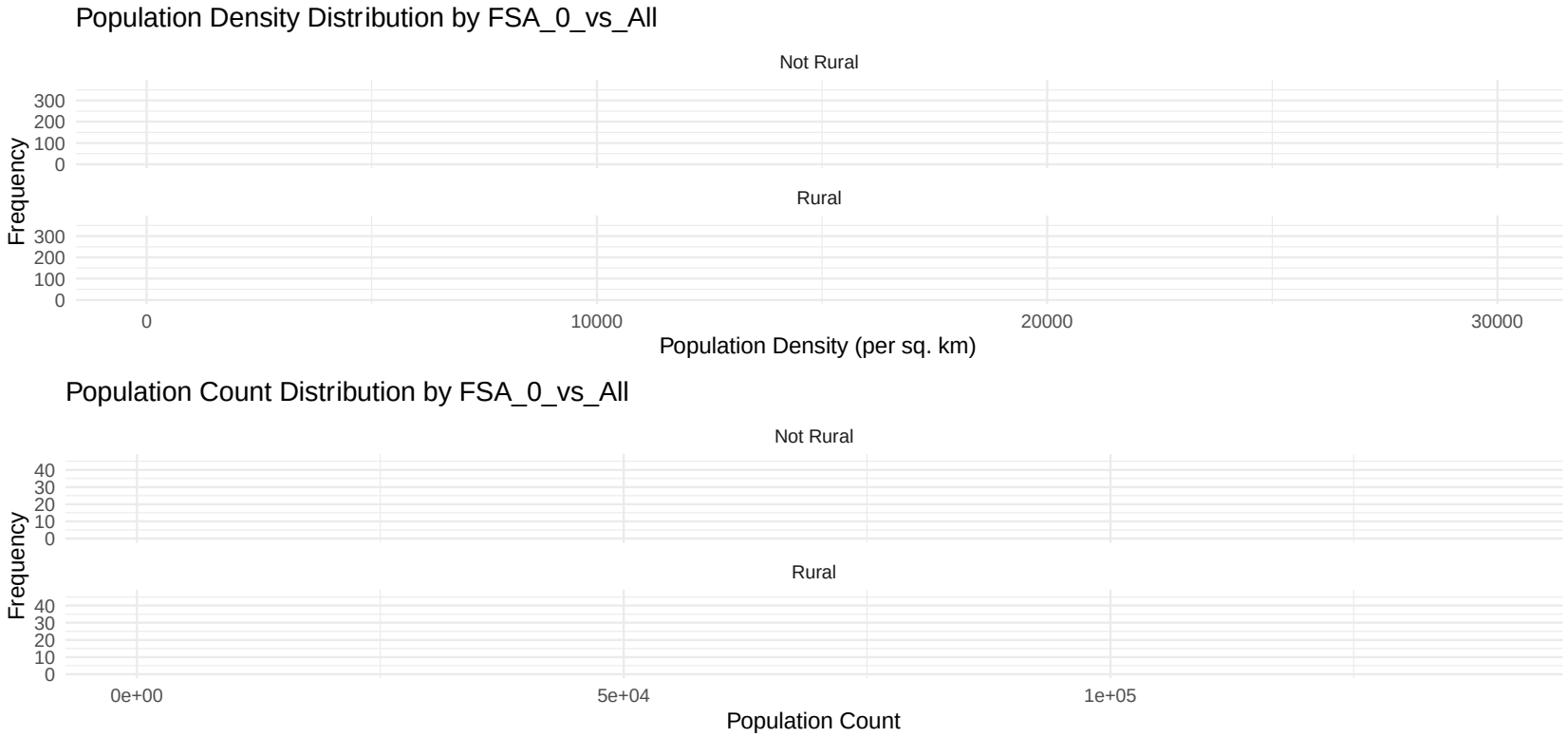
Zhang, Z. (2016). Missing data imputation: Focusing on single imputation. *Annals of Translational Medicine*, *4*(1), 1–8. https://doi.org//10.3978/j.issn.2305-5839.2015.12.38

Zheng, Q., Tian, Q., Hao, C., Gu, J., Tao, J., Liang, Z., Chen, X.-L., Fang, J., Ruan, J., Ai, Q., & Hao, Y. (2016). Comparison of attitudes toward disability and people with disability among caregivers, the public, and people with disability: Findings from a cross-sectional survey. *BMC Public Health*, 16, 1024–1034. https://doi.org/10.1186/s12889-016-3670-0

Appendix A: Rurality Distribution

Figure 5

Rurality and Population Count and Density



Note. This suggests that among participants who would be classified as non-rural based on FSA (i.e., forward sortation areaalone), some seem to be rural. This creates some classification bias.

Appendix B: Unadjusted and Adjusted Loneliness Models Without Imputations, Sex Now 2019-2021

Table 16

Unadjusted and Adjusted Logistic Regression Models for Loneliness Among 2S/GBTQ+ Persons Living With a Disability, Without Imputed Pooled Data From Sex Now 2019-2021

Model	Unadjusted Model Without Imputations				Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*	*N*	*aOR*[a]	*95%CI*[b]	*p-value*
Survey Years	8301				8173			
2019		ref.	ref.			ref.	ref.	
2020 and 2021		1.49	1.35, 1.63	**< .001**		1.55	1.41, 1.71	**< .001**
2022	-[c]				-[c]			
Age								**< .001**
20-29		-[d]	-[d]	-[d]		ref.	ref.	
15-19		-[d]	-[d]	-[d]		1.42	1.04, 1.93	**.03**
30-39		-[d]	-[d]	-[d]		0.92	0.81, 1.05	.23
40-49		-[d]	-[d]	-[d]		0.77	0.67, 0.90	**< .001**
50-64		-[d]	-[d]	-[d]		0.63	0.55, 0.72	**< .001**
65+		-[d]	-[d]	-[d]		0.45	0.36, 0.56	**< .001**
Ethnoracial Identity								
White		-[d]	-[d]	-[d]		ref.	ref.	
Racialized persons		-[d]	-[d]	-[d]		1.12	1.00, 1.25	.05

Model	Unadjusted Model Without Imputations				Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*	*N*	*aOR*[a]	*95%CI*[b]	*p-value*
Financial Strain								
Comfortable		-[d]	-[d]	-[d]		ref.	ref.	
Not comfortable		-[d]	-[d]	-[d]		2.19	1.97, 2.43	**< .001**
Gender Identity								
Cis man		-[d]	-[d]	-[d]		ref.	ref.	
Other gender expansive persons		-[d]	-[d]	-[d]		1.29	1.12, 1.48	**< .001**

Notes. Not lonely was used as the referent group. Survey years was the primary independent variable; variables for the adjusted model were chosen using a backwards-elimination approach and dependent on model fit. The constant (y-intercept) was included in each model, but not shown in the table. Statistically significant values ($p < .05$) are bolded for readability purposes.

[a]*aOR* = Adjusted Odds Ratio; [b]*95%CI* = 95% Confidence Interval. [c]Not available, not asked in survey year.

[d]Not available, unadjusted model.

Table 17

Adjusted Logistic Regression Minority-Informed Model for Loneliness Among 2S/GBTQ+ Persons Living With a Disability, Without Imputed Pooled Data From Sex Now 2019-2021

Model	Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Survey Years	8173			
2019		ref.	ref.	
2020 and 2021		**1.63**	1.47, 1.82	**< .001**
2022	-[c]			
Age				**< .001**
20-29		ref.	ref.	
15-19		1.41	1.04, 1.93	**< .03**
30-39		0.92	0.81, 1.05	.20
40-49		0.79	0.68, 0.92	**.002**
50-64		0.63	0.55, 0.73	**< .001**
65+		0.43	0.34, 0.54	**< .001**
Disability Subgroups				**< .001**
Mobility-related		ref.	ref.	
Seeing-related		0.47	0.38, 0.58	**< .001**
Hearing-related		0.82	0.69, 0.97	**.02**
Memory-related		0.86	0.74, 1.00	.06

Model	Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Emotion-related		0.87	0.74, 1.02	.09
Other disabilities		0.61	0.51, 0.72	**< .001**
Ethnoracial Identity				**.03**
Latino/e/x		ref.	ref.	
ACB[d]		0.91	0.63, 1.30	.60
Arab/West Asian/Middle Eastern		1.69	1.05, 2.72	**.03**
East Asian/Southeast Asian		1.41	1.00, 1.99	**< .05**
Indigenous		1.05	0.76, 1.44	.79
South Asian		1.38	0.91, 2.08	.13
White		1.01	0.79, 1.31	.92
Other racialized persons		1.12	0.73, 1.70	.61
Prefer not to answer		0.92	0.47, 1.81	.82
Financial Strain				
Comfortable		ref.	ref.	
Not comfortable		2.11	1.90, 2.35	**< .001**
Gender identity				**.04**
Trans man		ref.	ref.	
Non-binary person		1.02	0.78, 1.33	.90
Cis man		0.81	0.66, 1.00	> .05

Model	Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Other gender expansive persons		0.88	0.59, 1.33	.54

Notes. Not lonely was used as the referent group. Survey years was the primary independent variable; variables for the adjusted model were chosen using a backwards-elimination approach and dependent on model fit. The constant (y-intercept) was included in each model, but not shown in the table. Statistically significant values ($p < .05$) are bolded for readability purposes.

[a]*aOR* = Adjusted Odds Ratio; [b]*95%CI* = 95% Confidence Interval. [c]Not available, not asked in survey year; [d]ACB = African, Caribbean, and/or Black.

Appendix C: Unadjusted and Adjusted Discrimination Models Without Imputations, Sex Now 2019, 2021-2022

Table 18

Unadjusted and Adjusted Logistic Regression Models for Discrimination due to Sexual Orientation Among 2S/GBTQ+ Persons Living With a Disability, Without Imputed Pooled Data From Sex Now 2019, 2021-2022

Model	Unadjusted Model Without Imputations				Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*	*N*	*aOR*[a]	*95%CI*[b]	*p-value*
Survey Years	7076				6983			
2019		ref.	ref.			ref.	ref.	
2021 and 2022		1.00	0.90, 1.12	.95		0.89	0.79, 1.00	**< .05**
2020	-[c]				-[c]			
Age								**< .001**
20-29		-[d]	-[d]	-[d]		ref.	ref.	
15-19		-[d]	-[d]	-[d]		1.67	1.23, 2.28	**.001**
30-39		-[d]	-[d]	-[d]		0.73	0.63, 0.83	**< .001**
40-49		-[d]	-[d]	-[d]		0.58	0.49, 0.69	**< .001**
50-64		-[d]	-[d]	-[d]		0.45	0.38, 0.53	**< .001**
65+		-[d]	-[d]	-[d]		0.31	0.22, 0.43	**< .001**
Ethnoracial Identity								
White		-[d]	-[d]	-[d]		ref.	ref.	
Racialized persons		-[d]	-[d]	-[d]		1.27	1.13, 1.44	**< .001**

Model	Unadjusted Model Without Imputations				Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*	*N*	*aOR*[a]	*95%CI*[b]	*p-value*
Financial Strain								
Comfortable		-[d]	-[d]	-[d]		ref.	ref.	
Uncomfortable						1.40	1.26, 1.57	**< .001**
Gender Identity								
Cis man		-[d]	-[d]	-[d]		ref.	ref.	
Other gender expansive persons		-[d]	-[d]	-[d]		1.57	1.36, 1.83	**< .001**
Sexual Orientation								
Gay		-[d]	-[d]	-[d]		ref.	ref.	
Other sexual expansive persons		-[d]	-[d]	-[d]		1.17	1.04, 1.32	**.01**

Note. Not lonely was used as the referent group. Each demographic-related model was adjusted by a combination of different variables depending on model fit (e.g., age, ethnoracial/cultural identity, gender). All models were adjusted by survey year. Statistically significant values ($p < .05$) are bolded for readability purposes.

[a]*aOR* = Adjusted Odds Ratio; [b]*95%CI* = 95% Confidence Interval; [c]ACB = African, Caribbean and/or Black; [d]Not available, unadjusted model.

Table 19

Adjusted Logistic Regression Minority-Informed Model for Discrimination due to Sexual Orientation Among 2S/GBTQ+ Persons Living With a Disability, Without Imputed Pooled Data From Sex Now 2019, 2021-2022

Model	Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Survey Years	6581			
2019		ref.	ref.	
2021 and 2022		0.92	0.80, 1.05	.20
2020	-[c]			
Age				**< .001**
20-29		ref.	ref.	
15-19		1.53	1.07, 2.19	**.02**
30-39		0.69	0.60, 0.80	**< .001**
40-49		0.57	0.48, 0.69	**< .001**
50-64		0.42	0.35, 0.50	**< .001**
65+		0.28	0.19, 0.39	**< .001**
Disability Subgroups				**.004**
Mobility-related		ref.	ref.	
Seeing-related		0.62	0.48, 0.80	**< .001**
Hearing-related		0.90	0.74, 1.10	.31
Memory-related		0.85	0.71, 1.01	.06
Emotion-related		0.75	0.62, 0.91	**.003**
Other disabilities		0.80	0.65, 0.99	**.04**
Ethnoracial Identity				**< .001**
Latino/e/x		ref.	ref.	
ACB[d]		1.35	0.90, 2.03	.15
Arab/West Asian/Middle Eastern		1.09	0.64, 1.83	.76
East Asian/Southeast Asian		0.75	0.50, 1.12	.16

Model	Adjusted Model Without Imputations			
	N	*aOR*[a]	*95%CI*[b]	*p-value*
Indigenous		1.29	0.90, 1.86	.17
South Asian		1.55	0.99, 2.44	.06
White		0.91	0.67, 1.22	.51
Other racialized persons		1.10	0.67, 1.81	.69
Prefer not to answer		0.99	0.47, 2.09	.98
Financial Strain				
Comfortable		ref.	ref.	
Uncomfortable		1.38	1.23, 1.56	**< .001**
Gender Identity				**< .001**
Trans man		ref.	ref.	
Non-binary person		1.15	0.88, 1.51	.31
Cis man		0.82	0.66, 1.04	.10
Other gender expansive persons		1.59	1.04, 2.44	**.03**
Sexual Orientation				**< .001**
Bisexual		ref.	ref.	
Asexual		1.27	0.86, 1.88	.23
Pansexual		1.26	0.98, 1.62	.07
Queer		1.53	1.23, 1.91	**< .001**
Gay		1.02	0.85, 1.23	.81
Other sexual expansive persons		0.81	0.60, 1.10	.18

Notes. Not reporting discrimination due to sexual was used as the referent group. Survey years was the primary independent variable; variables for the adjusted model were chosen using a backwards-elimination approach and dependent on model fit; although survey year was removed in step four of the backwards elimination, I used data from step three in order to retain this variable in the model. The constant (y-intercept) was included in each model, but not shown in the table. Statistically significant values ($p < .05$) are bolded for readability purposes.

[a]*aOR* = Adjusted Odds Ratio; [b]*95%CI* = 95% Confidence Interval. [c]Not available, not asked in survey year; [d]ACB = African, Caribbean, and/or Black.