Addressing Health Inequities in Cannabis Research: Developing an Inclusion Tool to Support the Production of Gender-Inclusive Public Health Research

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Abstract Using a critical discourse analysis (CDA) of the Canadian Centre on Substance Use and Addiction (CCSA) corporate reports, infographics, reports, and report summaries, the research examines the relationship between gender and cannabis consumption among Canadian youth. The CDA evaluates gender inclusion supported by the application of the gender inclusion scale (GIS). A total of 44 CCSA publications focused on cannabis consumption were scored on the GIS to assess the gender inclusion of CCSA research. The data highlighted apparent gender differences supporting the recognized need for gender inclusion in public health research. Gender plays a significant role in cannabis consumption; the CCSA research concludes that male cannabis consumers face elevated susceptibility to adverse health risks and detrimental harms associated with cannabis consumption. The heightened susceptibility to harm and risk correlated with male cannabis consumers is the product of (masculine) drug cultures, drug-taking risk behaviour influenced by gender roles, and gendered perceptions of risks related to drugs. The research recognizes the critical value of gender inclusion in public health research, developing a GIS Tool to provide a resource to employ gender-inclusive research production, GIS score identification, and identify areas where gender inclusion could be improved in effective incorporation within public health research. The GIS Tool is not limited to cannabis research but can be transferred to all public health research environments. The research proposes gender inclusion as a means to better safeguard Canadians, specifically Canadian youth, from cannabis-related disadvantageous risks and harms, calling for comprehensive gender-inclusive work to inform guiding Canadian policies and practices.

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1. Introduction

Defined by the *Cannabis Act (Act)*, cannabis references a cannabis plant, "any part of a cannabis plant," "any substance or mixture of substances that contains or has on it any part of such a plant," and "any substance that is identical" to a plant (Legislative Services Branch, 2022, Cannabis Act, Schedule 1, Subsection 2(1) and 151(1)). Cannabis is referenced by numerous names, including marijuana, weed, or hash (Canadian Centre on Substance Use and Addiction, 2022c). A cannabis plant "means a plant that belongs to the genus Cannabis (plante de cannabis)" (Legislative Services Branch, 2022, Cannabis Act 2(1)). Dried cannabis is "any part of a cannabis plant that has been subjected to a drying process, other than seeds (cannabis séché; Legislative Services Branch, 2022, Cannabis Act 2(1)). Regular use of cannabis refers to the consumption of cannabis weekly, daily, or more frequently over an extended period, ranging from months to years (Gabrys, 2019). The consumption of cannabis can reference consumption through smoking, vaporization (i.e. vaping), ingestion (i.e. edibles), oral application of tinctures, or topical application (i.e. oil; Canadian Centre on Substance Use and Addiction, 2022c).

The Canadian Centre on Substance Use and Addiction (CCSA) was established as an Act of Parliament to aid the provision of national leadership related to substance use, including cannabis consumption, to provide innovative and effective solutions to address associated harms facing Canadians (Canadian Centre on Substance Use and Addiction, 2022h). The work of the CCSA identifies the role and impact of gender in youth cannabis consumption, shaping the consumption, health (physical, mental, and cognitive), cannabis dependence, cannabis use disorder (CUD), perception of risk, risk-taking, environments of consumption, purchasing, methods of consumption, and quantity of consumption (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2021b; Konefal, 2019; Gabrys, 2019; Beirness & Porath-Waller, 2019). Youth are defined as individuals under the age of 18 (Government of Canada, 2021). The following research discusses the results of critical discourse analysis (CDA) results of the CCSA publicized corporate reports, infographics, reports, and report summaries. The CCSA aforementioned publications were included if published within- or following- the year 2018 and focused on cannabis (Mullet, 2018; Canadian Centre on Substance Use and Addiction, 2022h). The CCSA database is accessible to the public, providing access to a plethora of publication types. A total of 44 CCSA publications were included in the CDA. The CDA focuses on the relationship between gender and cannabis among youth, specifically focusing on how the aforementioned relationship impacts youth cannabis consumption and, thus, youth health. The CDA utilizes the Gender Inclusion Scale (GIS) to assess the CCSA's publications' inclusion of gender in analyzed work.

Gender refers to "socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender-diverse people" (Candian Centre of Substance Use and Addiction, 2019g, p.6). Research conducted by the CCSA (2020k) has identified that 18.7% of young males consume cannabis, significantly higher than the reported 11.1% of females who consume cannabis (Canadian Centre on Substance Use and Addiction, 2020k). Gender influences the perception of cannabis and risk-taking behaviour associated with cannabis, placing males at greater risk of associated danger in relation to female cannabis consumption (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2021b; Gabrys, 2019; Beirness & Porath-Waller, 2019). Notably, males have reported an earlier age of initiation of cannabis consumption and a higher frequency of cannabis consumption than females (Wallingford et al., 2019b). Thus clear, the role

of gender in cannabis consumption impacting the perception, risk-taking behaviour, age of initiation, and rate of consumption among youth (Canadian Centre on Substance Use and Addiction, 2020k; Wallingford et al., 2019b; Gabrys, 2019; Beirness & Porath-Waller, 2019). Notwithstanding, the inclusion of gender is primarily gapped between information delivered in the CCSA corporate reports, reports, and report summaries compared to infographics, evident utilizing the support of the GIS to score each publication's inclusion of gender.

The CCSA reports identify the role of gender in cannabis consumption, including how gender impacts consumption, overall health (physical, mental, and cognitive), potential dependence and perceptions of risk and risk-taking practices (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2021b; Konefal, 2019; Gabrys, 2019; Beirness & Porath-Waller, 2019). However, the CCSA reports and infographics do not take a gender-clear approach, sidestepping how young Canadian males and females conceive of, consume, and fare when consuming cannabis. As defined by the GIS, for publications to be considered gender-clear, the information must identify gender inequities impacting individuals, further exploring and addressing areas to transform the harmful role and impact of gender -norms and -relations (Greaves et al., 2014). Gender-clear inclusion is the paramount inclusion of gender on the GIS. The CCSA's role is to aid the provision of Canadian leadership related to cannabis consumption; it is the CCSA's responsibility to provide effective solutions to address the associated harms facing young Canadian males and females (Canadian Centre on Substance Use and Addiction, 2020h). Thus knowing the role and impact of gender in cannabis consumption, gender must be acknowledged and included in the CCSA's work, influencing the rules and guidelines that aim to protect the health of young Canadians.

The application of the GIS to the following CDA supported the analysis of gender inclusion with the CCSAs work, identifying and supporting the need for gender inclusion to better and best protect Canadian youth from the negative impacts of cannabis consumption. The research advocates for gender inclusion, supported by the application of the GIS Tool to all public health and related work. The GIS Tool provides a resource to researchers and others to assess the gender inclusion of respective works. The GIS Tool serves as a resource within the public health setting, the offerings are transferable and research driven.

Notably, the following research acknowledges the emphasis on the adverse health risks and impacts associated with cannabis consumption. The research acknowledges that there are numerous health benefits associated with cannabis consumption (Canadian Centre on Substance Use and Addiction, 2020d; Canadian Centre on Substance Use and Addiction, 2023).

2. Background and Literature Review

2.1 The Legalization of Cannabis: The Cannabis Act

The *Act* amends the Controlled Drugs and Substance Act, the Criminal Code, and other Acts (Legislative Services Branch, 2022). Established on October 17, 2018, the legalization of cannabis is guided by the *Act*, implementing strict regulations and restrictions related to cannabis and protecting public health and public safety (Legislative Services Branch, 2022; Health Canada, 2018a; Government of Canada, 2021). The outlined purposes of the *Act* are cited in Table 1. Outlined Purposes of The *Act.*

The *Act* aims to accomplish the above-mentioned outlined purposes (reference Table 1. Outlined Purposes of The Act) by facilitating legal access to cannabis to individuals 18 years of age or older (Health

Canada, 2018a). Under the *Act*, the protection of public health is facilitated through the creation of strict regulations and public education (Government of Canada, 2021). A notable regulation under the *Act* includes the responsibility of each province and territory to develop, implement, maintain, and enforce safety measures which may include the increase of minimum age to purchase, possess, consume, grow, share, and make cannabis and cannabis-containing products (Government of Canada, 2021; Health Canada, 2018a). A significant commitment by the Government of Canada to public health education includes targeting youth public education about the health and safety risks of the consumption of cannabis (Government of Canada, 2021).

Table 1. Outlined Purposes of The *Act*

Restricting the access to cannabis of young people, in an effort to protect their health;
Protecting young people from the positive persuasion or influence to use cannabis;
Provide a guide to facilitate the licit production of cannabis;
Minimize illicit cannabis-related activities;
Reduce cannabis-related injustices on the criminal justice system of Canada;
Provide access to licit, quality-controlled cannabis;
Promote the health risks associated with cannabis use to the public

Cited from the Legislative Services Branch (2022).

Criminal penalties outlined within the *Act* note specific penalties for individuals who make cannabis available to youth, aiming to keep cannabis away from youth (Government of Canada, 2021). Individuals who give or sell cannabis to individuals under 18 can face up to 14 years in jail. Individuals who use youth to commit cannabis-related offences can face up to 14 years in jail. The *Act* focuses on preventing youth from accessing cannabis, enforcing age restrictions and restricting the promotion of cannabis to individuals under the age of 18, mitigating the health risks associated with cannabis consumption (Government of Canada, 2021).

2.2 Identified Health Risks Associated with Cannabis Consumption

A common form of cannabis consumption is inhaling cannabis smoke (Wallingford et al., 2019b). Research has identified cannabis smoke to have numerous negative health impacts, specifically on an individual's lungs (Canadian Centre on Substance Use and Addiction, 2020c). Negative health impacts can include a greater incidence of chronic coughing, wheezing, phlegm production, a sore throat, chest tightness, and hoarse voice (Canadian Centre on Substance Use and Addiction, 2020c; Renard, 2021; Canadian Centre on Substance Use and Addiction, 2022h).

Short-term effects of cannabis may include but are not limited to an individual's inability to drive a car or operate equipment, learning and memory challenges, and negative mental health experiences (Konefal, 2019; Hartman, 2013; World Health Organization, 2016). The driving of a car or operation of equipment is impaired due to the negative impact of cannabis on an individual’s reaction time, coordination, concentration, and induction of drowsiness (Hall & Degenhardt, 2009; Hartman, 2013). The learning and memory of an individual who has consumed cannabis have been shown to impair thinking, concentration, memory, and decision-making (World Health Organization, 2016; Solowiji et al., 2011). The impairments, as mentioned earlier, can impact an individual's ability to perform in an academic or professional environment due to cannabis-related brain impairments (Solowiji et al., 2011). Cannabis

consumption can potentially negatively impact an individual's short-term mental health. Cannabis-related euphoria can induce feelings of anxiety or panic among consumers (World Health Organization, 2016). At a rarity, cannabis consumption can trigger psychotic episodes in which consumers experience paranoia and hallucinations (World Health Organization, 2016; Centers for Disease Control and Prevention, 2021b).

Cannabis consumption varies in response based on consumption. Following consumption, individuals commonly experience euphoria and relaxation, perception changes, and time distortion (Konefal, 2019). Often the attention span, focus, and memory of an individual who has consumed cannabis are challenged (Konefal, 2019). Individuals who have consumed cannabis also experience an increased heart rate and a rise in blood pressure (Konefal, 2019).

The long-term risks associated with cannabis consumption can impact an individual's physical and mental health (Health Canada, 2021a; Renard, 2021). Physical health is at risk as cannabis can modify the lungs, impacting a consumer's ability to breathe and altering digestion and pulmonary functioning (Health Canada, 2021a; Prince & Conner, 2019). The consumption and exposure to cannabis smoke long-term are related to the worsening of respiratory symptoms, correlated with frequent episodes of chronic bronchitis (Canadian Centre on Substance Use and Addiction, 2020c). Consumption of cannabis through vaporization (i.e. vaping) is related to severe lung and pulmonary illnesses (Canadian Centre on Substance Use and Addiction, 2020c). Further, regular cannabis consumption long-term can increase an individual's risk of developing psychosis and schizophrenia, regardless of their familial history (Canadian Centre on Substance Use and Addiction, 2020e). Though there is no extensive support, the research has found some evidence of a link between cannabis smoke and strokes and heart attacks, associated potentially with the inflammation of arteries (Renard, 2021).

The consumption of cannabis at a daily long-term consumption rate is correlated with noticeable cognitive impairments (Gabrys, 2019). Notably, the brain continues to develop until age 25, subjecting younger individuals to having adverse cognitive effects from cannabis consumption compared to adults with matured brains (Konefal, 2019; Canadian Centre on Substance Use and Addiction, 2018). Cognitively, the learning and memory of an individual are challenged for individuals who consume cannabis regularly; the aforementioned challenges are reported not to be fully reversible once experienced (Gabrys, 2019). Regular cannabis consumption is also related to alterations in the brain's natural reward pathways, associated with changes to an individual's motivation and increases their risk for cannabis dependence (Gabrys, 2019).

The mental health of an individual is placed at risk as cannabis is correlated with addiction development, CUD, and problematic cannabis use, often associated with the development of anxiety and depression (Health Canada. 2021; Centers for Disease Control and Prevention, 2021b; Feingold & Weinstein, 2021; Crippa et al., 2009). Research has identified that using cannabis products with higher levels of THC can place mental health at greater risk over time (Health Canada, 2021; Freeman & Winstock, 2015). Notably, research publication by Health Canada also supports that stopping or reducing the use of cannabis is correlated with improved mental health (Health Canada, 2021a).

The biological system in the brain is affected by cannabis consumption, impacting the development of young people's brains (Health Canada, 2021a). The associated harm is experienced due to cannabis's impact on brain development. The brain has not fully developed until age 25 (Health Canada, 2021a). The onset of serious health issues is

correlated with cannabis consumption before age 25 (Health Canada, 2021a). Often, cannabis consumption among young people is associated with cannabis dependence and poor cognitive functioning (Hall, 2020). Adverse acute effects can include anxiety, depression, paranoia, self-harm, and suicide (Health Canada, 2021a; Hall, 2020). The cannabis effect on young people can impact educational attainment and occupational choice due to negative brain impact and acute effects (Hall, 2020). Research has identified that cannabis can impact young students' ability to study negatively (Health Canada, 2018b).

The negative effects of cannabis and young people are heightened with earlier initiation and frequent consumption (Health Canada, 2021a; Leung et al., 2020). Research has identified that early-age consumption of cannabis can result in irreversible harm (Health Canada, 2021a). Elevated risk is concluded to be impacted by earlier rather than later cannabis use (Fergusson et al., 1996; McCaffrey et al., 2010). The consumption of cannabis regularly (weekly, daily, or more frequently) at an early age increases young people's risk of developing addictive behaviours (Health Canada, 2021a).

Cannabis poisoning is related to the overconsumption or accidental consumption of cannabis. Cannabis poisoning in not been found to be fatal but rather dangerous. Young people are at greater risk of cannabis poisoning. Cannabis poisoning symptoms include "chest pain, rapid heartbeat, nausea/vomiting, psychotic episode, respiratory depression, and severe anxiety and/or panic attack" (Health Canada, 2021a, Cannabis poisoning). Further, the effects occasionally subject individuals to hospitalization (Centers for Disease Control and Prevention, 2020).

2.3 Young People and Cannabis Consumption

Following the legalization of cannabis and the development of the *Act*, the legislation and regulations enforced the requirement to better understand the view and use of cannabis among Canadians. To obtain the aforementioned data, Health Canada curated the Canadian Cannabis Survey (CCS) to garner insights about the use of cannabis and related cannabis behaviours (Health Canada, 2021b). Reference Table 2. CCS Question Subjects.

Table 2. CCS Question Subjects

Exposure to second-hand cannabis smoke or vapour;
Home growing or preparation of edibles in or around home;
Types of cannabis products and portable devices used for vaping;
Frequency of obtaining cannabis from legal and illegal sources and amount of money spent; and
Cannabis use in the context of the Coronavirus disease 2019 (COVID-19) pandemic.

Cited from Health Canada (2021b).

The CCS recruits individuals by phone, selected from a randomized list of Canadian telephone numbers. Respondents are required to pass a screening questionnaire online. The selected participants are then sent a link to a survey by email or short message service (SMS). It took participants approximately 12 to 25 minutes to complete the survey, dependent on if they had or had not consumed cannabis within the past 12 months (Health Canada, 2021b).

Within the 2020 CCS 10, 822 Canadians were consulted. Out of the 10 822 participants, 858 were between the ages of 16 to 19 years of age (Health Canada, 2021b). 44% of 16 to 19-year-olds reported using

cannabis in the past 12 months. Of the 44%, males were more likely to have consumed cannabis than females (31% to 23%, respectively). Of the 16 to 19-year-olds, 21% reported daily or almost daily consumption of cannabis (Health Canada, 2021b). Notably, females were 3% more likely than males to consume cannabis at this rate (23% to 20%, respectively). Of the 16-19-year-olds, 12% reported driving a vehicle within two hours of smoking cannabis and four hours of ingesting cannabis (Health Canada, 2021b). Similar to the reported use of cannabis, males reported a higher driving rate than females under the influence of cannabis (19% to 9%; Health Canada, 2021b). The CCS highlights the tenacious role of gender in cannabis consumption. Under a comprehensive review of young males reported cannabis consumption, it is critical that public health leader Health Canada fruitage gender-clear strategies to protect the health and safety of both young males and females. The heightened risk young males place themselves at compared to young females (Health Canada, 2021b). The production of gender-clear strategies identifies the inequities males and females experience focused on gender, exploring and addressing the impact of gender -norms and -relations (Greaves et al., 2014).

Prior to the legalization of cannabis, in 2016-2017, Nova Scotia young people reported the highest prevalence of cannabis use in Canada, with approximately 20% of young people consuming cannabis (Cooke et al., 2020e). A research study conducted in 2020 concluded that young people, specifically students between the grades of 10-12, were three times as likely to consume cannabis than students between the grades of 7-9. The prevalence percentage for students in grades 10-12 students is 44.6%, whereas the prevalence percentage for students in grades 7-9 is 12.1% (Cooke et al., 2020e). Of the grades 7-12 students who reported using cannabis, more than one in three reported that they use cannabis at a minimum once a week. The most common form of cannabis use was smoking (94%), eating cannabis in food (41%), and vaping (24%; Cooke et al., 2020e). In Nova Scotia, 74% of young people reported that cannabis was fairly or very easy to obtain (Cooke et al., 2020e). Among Nova Scotia students, the prevalence of consumption between males and females is similar. However, males' prevalence is greater than females, 30.1% and 28.3%, respectively. Males had a marginally younger age of cannabis initiation than females, with males starting at 16.7- and females at 16.8- years of age (Cooke et al., 2020e).

Newfoundland and Labrador students reported, in 2016-2017, the second-highest prevalence of Cannabis use in Canada, with approximately 15% of students have used cannabis (Cooke et al., 2020d). The prevalence of cannabis use among grades 10-12 students was 36.8%, and among students in grades 7-9, 7.9% (Cooke et al., 2020d). Similar to Nova Scotia young people, of the cannabis consumers between grades 7-12, more than one in three reported using cannabis at minimum once a week (Cooke et al., 2020e; Cooke et al., 2020d). Parallel to Nova Scotia's young people, the most common form of cannabis use was smoking (94%). However, Newfoundland and Labrador young people favoured vaping cannabis (38%) over eating cannabis in food (35%), unlike Nova Scotia young people. Again, similar to Nova Scotia young people, 72% reported that cannabis was fairly or very easy to obtain (Cooke et al., 2020d). The prevalence of male cannabis use is higher than female cannabis use, at 24.5% compared to 21% respectively. The mean age of initiation between males and females varied by 0.2 years, with males' average age of initiation at 16.5- and females at 16.7- years of age (Cooke et al., 2020d).

After Nova Scotia and Newfoundland and Labrador young people, Saskatchewan young people report the third highest prevalence of cannabis use in Canada. Students between the grades of 10-12 reported

a prevalence rate four times higher than students between the grades of 7-9, at 34.6% versus 8.1% (Cooke et al., 2020i). Again, similar to the young people of Nova Scotia and Newfoundland and Labrador, Saskatchewan students who reported smoking between grades 7-12 additionally reported using cannabis at a minimum once a week (Cooke et al., 2020i). The most common form of use was smoking (like Nova Scotia and Newfoundland and Labrador young people; 92%; Cooke et al., 2020e; Cooke et al., 2020d; Cooke et al., 2020i), followed by dabbing it (40%), and then vaping it (32%; Cooke et al., 2020i). Again, a large portion of young people, 54%, reported that cannabis was fairly or very easy to obtain (Cooke et al., 2020i). Male cannabis use is 1.6% higher than female cannabis use, 23% to 21.4%, respectively (Cooke et al., 2020i). The mean age of initiation for males was 16.4- and 15.9- years for females (Cooke et al., 2020i). A difference of 0.5 years between males and females is the largest reported gap among the top three provinces with the highest prevalence of cannabis use (Cooke et al., 2020e; Cooke et al., 2020d; Cooke et al., 2020i).

British Columbia, Manitoba, and Prince Edward Island (P.E.I.) are reported to be the provinces with the fourth highest prevalence of cannabis use (Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020g). In British Columbia, 13% of students reported cannabis consumption, parallel to the student-reported statistics in both Manitoba and P.E.I. (Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020g). Students in grades 10-12 reported a 23.8% higher prevalence of cannabis use than students in grades 7-9, 30% to 6.2%, respectively (Cooke et al., 2020b). Again, like the top three provinces with a reported prevalence of cannabis use, students who reported using cannabis between grades 7-12 were consuming cannabis at a minimum of once a week (Cooke et al., 2020e; Cooke et al., 2020d; Cooke et al., 2020i; Cooke et al., 2020b). Like Nova Scotia, young people preferred smoking cannabis (92%), then eating it in foods (50.5%), followed by vaping it (46%; Cooke et al., 2020e; Cooke et al., 2020b). As the previous provinces discussed, 57% of the young people reported that cannabis was fairly or very easy to obtain (Cooke et al., 2020e; Cooke et al., 2020d; Cooke et al., 2020i; Cooke et al., 2020b). British Columbia males and females varied slightly in the prevalence of cannabis use, at 19.7% for males and 17.7% for females. The mean age for initiation between males and females varied slightly, with a 0.1-year age difference, with males starting at 16.6- and females starting at 16.5- years (Cooke et al., 2020b).

British Columbia, Manitoba, and P.E.I. are reported to be the provinces with the fourth highest prevalence of cannabis use (Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020g). Parallel to British Columbia and P.E.I., 13% of Manitoba students reported cannabis use (Cooke et al., 2020b; Cooke et al., 2020c). The students of Manitoba do not vary from British Columbia, with a larger gap in prevalence between grades 10-12 students and grade 7-9 students; the reported prevalence is 27.1% and 7.1%, respectively (Cooke et al., 2020c). Similar to the previous provinces discussed, of the students between grades 7-12 that use cannabis, 36.1% report using cannabis at a minimum of once a week (Cooke et al., 2020c). Like Nova Scotia and British Columbia young people, Manitoba young people prefer smoking cannabis (93%), followed by eating it in foods (39%) and then vaping it (32%; Cooke et al., 2020c). Again, it is reported by Manitoba young people that it is fairly or very easy to obtain cannabis (58%). Notably, Manitoba females have a higher prevalence percentage than males in terms of cannabis use at 20.4% versus 15% (Cooke et al., 2020c). Though females reported a higher prevalence use percentage, the mean age of initiation for males remains earlier than females at 15.6- for males and 16.4- years of age for females (Cooke et al., 2020c).

British Columbia, Manitoba, and P.E.I. are reported to be the provinces with the fourth highest prevalence of cannabis use (Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020g). Again, P.E.I. young people report 13% using cannabis, equivalent to the percentage of British Columbia and Manitoba. Again, the grades 10-12 students of P.E.I. have a five times greater prevalence of cannabis use than the grade 7-9 students, reporting 32.2% versus 6.6%, respectively (Cooke et al., 2020g). Of the students in grades 7-12 that report cannabis use, they report using cannabis at a minimum of once a week, most commonly smoking it (95%), followed by vaping it (37%), and then eating it in foods (31%), similar to the consumption patterns of New Foundland and Labrador students (Cooke et al., 2020d; Cooke et al., 2020g). Repeatedly reported, researchers identify that approximately two-thirds of students (59%) report that cannabis is fairly or very easy to obtain (Cooke et al., 2020e; Cooke et al., 2020d; Cooke et al., 2020i; Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020g). Unlike Manitoba, and like the other provinces discussed previously, the prevalence among males is larger than females at 21.4% versus 18.2% (Cooke et al., 2020g). The mean age of initiation for males was 16.7- and 16.9 years of age for females (Cooke et al., 2020g).

Alberta reported the third lowest prevalence of cannabis use among young people in Canada, with approximately 10.2% of young Albertans reporting using cannabis (Cooke et al., 2020a). Though reporting low prevalence, similar patterns are observed in provinces with high prevalence rates, like Nova Scotia, Newfoundland and Labrador, Saskatchewan, British Columbia, Manitoba, and P.E.I., Alberta students between the grades of 10-12 report a greater prevalence of students in grades 7-9, 27.7% versus 4.5%, again with approximately two-thirds reporting using cannabis at a minimum of once a week (Cooke et al., 2020e; Cooke et al., 2020d; Cooke et al., 2020i; Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020g; Cooke et al., 2020a). Again, we additionally observe that Alberta still faces large reports of young people reporting cannabis fairly or very easy to obtain (59%; Cooke et al., 2020a). Males in Alberta more prevalently consume cannabis than females, 16.1% versus 15.9% (Cooke et al., 2020a). The males of Alberta have a mean age of initiation of 16.8 years of age, whereas the females' mean average age of initiation is 17.2 years of age (Cooke et al., 2020a).

Of Quebec young people, one in ten reports consuming cannabis (Cooke et al., 2020h). Of the one in ten young people that consume cannabis, 27% report that they consume cannabis a minimum of once a week, prefer to smoke (91%) then eat it (26%), followed by vaping it (25%; Cooke et al., 2020h). This pattern is observed in Nova Scotia, British Columbia, and Manitoba (Cooke et al., 2020e; Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020h). Similar to the previous provinces mentioned, young people report that it is fairly or very easy to obtain cannabis (52%; Cooke et al., 2020h). The prevalence of cannabis use is higher among males than females, 17.7% versus 14.3%, respectively. The mean age of initiation for males was 16- males and 16.2- years for females (Cooke et al., 2020h).

Less than 10% of Ontario's young people consume cannabis (Cooke et al., 2020f). Before the legalization of cannabis, in 2016-2017, Ontario young people (specifically students) reported the lowest prevalence of cannabis consumption in Canada. In 2020, it was identified that 25% of grade 7-12 Ontario students consumed cannabis. Among young people between grades 7-12 in Ontario, one in three students report consuming cannabis a minimum of once a week. Of the same population of Ontario students, 94% reported having smoked to consume cannabis, 44% consuming cannabis in food, and 33% vaped cannabis (Cooke et al., 2020f). 58% of Grade 10-12 Ontario students report that obtaining

cannabis was fairly easy or very easy to obtain (Cooke et al., 2020f). The male prevalence percentage in Ontario is 16.1%, and for females is 14.1% (Cooke et al., 2020f). The average age of cannabis initiation was 16.5- for males and 17.1- years for females (Cooke et al., 2020f).

The previous statistics discussed in section 2.3.2 Canadian Centre on Substance Use and Addiction (CCSA) Provincial Patterns and Trends in Cannabis Use Among Young People are summarized in the following Table 1. CCSA Provincial Patterns and Trends in Cannabis Use Among Young People Summary. The table, as mentioned earlier, covers the prevalence of past-year cannabis use among young people, highlights the consumption differences between male and female consumers, and the mean age of initiation related to cannabis use for both males and females. The CCSA provincial patterns and trends culminate in support for the significant role of gender in cannabis consumption, headlining the distinctive cannabis consumption patterns and trends when comparing males and females.

Table 3. CCSA Provincial Patterns and Trends in Cannabis Use Among Young People Summary

Province	Prevalence of Past-Year Cannabis Use		Mean Age of Initiation Related to Cannabis Use	
	Male	Female	Male	Female
Nova Scotia	30.1%	28.3%	16.7 years	16.8 years
Newfoundland and Labrador	24.5%	21.0%	16.5 years	16.7 years
Saskatchewan	23.0%	21.4%	16.4 years	15.9 years
British Columbia	19.7%	17.7%	16.6 years	16.5 years
Manitoba	15.0%	20.4%	15.6 years	16.4 years
Prince Edward Island	21.4%	18.2%	16.7 years	16.9 years
Alberta	16.1%	15.9%	16.8 years	17.2 years
Quebec	17.7%	14.3%	16.0 years	16.2 years
Ontario	16.1%	14.1%	16.5 years	17.1 years

2.4 Recognition of the Need for Research on Young People's Gender Differences in Risk-Taking Behaviours

Young people around the age of legal cannabis consumption experience a transitionary period of pediatric to adult care (Schuiteman et al., 2020). During this period, young people experience numerous lifestyle changes, including, but not limited to, substance consumption, mental health, physical health, and sleep patterns, placing them at a heightened risk of poor health, chronic disease development, mortality, morbidity, cardiovascular disease development, respiratory disease development, and the onset of diabetes (Greig & Teiller, 2019; Lau, 2013). Youth additionally experience biological and psychological changes during this period (Greig & Teiller, 2019). During this transitionary period, youth encounter personal health autonomy, occasionally resulting in

greater risk-taking behaviours, negatively impacting youth's health (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2021b; Gabrys, 2019; Beirness & Porath-Waller, 2019).

Within health research, a plethora of data support the identification of high-risk health engagement males take, compared to females. As outlined previously in section 2.4.1 *Young People Health Autonomy,* there are numerous lifestyle changes that young people experience. To expand on the aforementioned lifestyle changes, substance consumption may include consuming alcohol, tobacco, e-cigarettes, cannabis and illicit drugs, and caffeine and/or energy drinks (Greig & Tellier, 2019). Changes in mental health may include the onset of depression and the onset of anxiety. Changes in physical health may include physical activity. The studied research clarifies that males struggle during this transitionary period of health autonomy to manage their health, often failing to meet the recommended health guidelines (Greig & Tellier, 2019).

Statistics Canada reports that 33.5% of young males drink heavily weekly (Statistics Canada, 2019a). Heavily drinking is classified as consuming more than 15 drinks per week (Centers for Disease Control and Prevention, 2021a). Canada recommends that 15 drinks or less be consumed in a week for males (Health Canada, 2021c). To drink in Canada, individuals must be 18 or 19, depending on the province the individual is located within (Centers for Disease Control and Prevention, 2022a). 23% of Canadian males report tobacco consumption (World Bank, 2018). Canada recommends no tobacco consumption and has strategies to decrease tobacco consumption (Health Canada, 2022). Young males consume the most e-cigarette vaping episodes daily, averaging 23.63 episodes per day (Al-Hamdani et al., 2020). Canada established the national minimum age to consume e-cigarette vaping products to be 18 years of age (Health Canada, 2018c). However, Canada has stated that e-cigarette vaping harms health (Health Canada, 2020). Between 20 to 24, 26% of males reported daily consumption of cannabis intake, 6% higher than the consumption of females (Health Canada, 2021b). Cannabis cannot be consumed until 18 or 19 years of age, varying from province to province (Government of Canada, 2021). Of males, 20% exceed the recommended limit of caffeine per day (Government of Canada, 2022). Health Canada recommends that young people intake no more than 400 mg of caffeine daily (Health Canada, 2012). In the context of mental health, 10.7% of males aged 15 to 24 report being depressed (Findlay, 2017). Additionally, 5% of males report having anxiety (Batarrseh et al., 2020). However, researchers have identified a large gap between mental health reports and suicide among males, inferring that mental health data is often misreported (Oliffe & Phillips, 2008). Only 15.7% of males aged 18 to 39 partake in the daily recommended duration of physical activity (Statistics Canada, 2019b). Failing to partake in daily recommended physical activity subjects men to poor health (Kruk, 2009).

Research indicates the majority of cannabis consumers are male (Calakos et al., 2017; Dahl & Sandberg, 2015; Cuttler et al., 2016), despite cannabis with gendered drug culture being associated with feminine and gender-neutral values (Dahl & Sandberg, 2015). Males highly reported regular and higher frequency cannabis consumption in comparison to females (Konefal, 2019). Associated with the higher rates of cannabis consumption are the adverse health risks males experience (Wallingford et al., 2019b). Male consumers report a higher prevalence of cannabis consumption and CUD than female consumers (Calakos et al., 2017). However, the consumption of cannabis as a drug is associated with traditional masculine practices, as males historically seek the excitement and risk-taking associated with drug consumption and occasional violence. Because of these

masculine behavioural practices, females are often excluded from drug culture (Dahl & Sandberg, 2015). The exclusion of females from the drug culture protects females from the adverse health impacts of drug consumption. The following research findings highlight the health impacts of cannabis consumption on males due to their high consumption practice (Wallingford et al., 2019b). Thus, it is critical that in alignment with the *Act,* Canada focuses on mitigating the adverse health outcomes associated with cannabis consumption, targetting young males through gender-clear research(Legislative Services Branch, 2022).

Males were likelier to consume cannabis using joints/blunts, vaporizers, and concentrates. Females were more likely to consume cannabis using pipes and oral administration. Compared to females, males were more likely to report an increase in appetite, feelings of enthusiasm, altered time perception, and increased musicality following the consumption of cannabis (Cuttler et al., 2016). Additionally, females reported concerns about their public image and cannabis consumption (Canadian Centre on Substance Use and Addiction, 2021b). Males, in the context of cannabis risk-taking, are larger risk-takers in comparison to females; risks are often related to illicit cannabis purchasing and consumption, drug-impaired driving, the quantity of cannabis consumed, and consuming both cannabis and alcohol simultaneously (Canadian Centre on Substance Use and Addiction, 2021b; Canadian Centre on Substance Use and Addiction, 2020b; Gabrys, 2019; Beirness & Porath-Waller, 2019).

As evident in the observed research, clear gender differences are prevalent among cannabis consumption between males and females. Gender clearly impacts youth cannabis consumption (Wallingford et al., 2019b), mental health (Canadian Centre on Substance Use and Addiction, 2021b), cannabis dependence, CUD development (Konefal, 2019), the perception of risk associated with cannabis (Wallingford et al., 2019b), the environment in which cannabis is consumed (Canadian Centre on Substance Use and Addiction, 2021b), the purchasing practices of cannabis (Canadian Centre on Substance Use and Addiction, 2021b), the method in which an individual consumes cannabis (Wallingford et al., 2019b), the consumption of cannabis and alcohol simultaneously (Gabrys, 2019), drug-impaired driving (Beriness & Porath-Waller, 2019), and the quantity of cannabis consumed (Canadian Centre on Substance Use and Addiction, 2021b). Notably, the Canadian Government fails to acknowledge these gender differences in the context of the strict regulations and public education efforts under the *Act* (Legislative Services Branch, 2022). The *Act* acknowledges young people, aiming to protect their health through the production of strict regulations and public education (Health Canada, 2018a). However, the enforced safety measures do not consider gender, failing to consider the role gender plays in the safety of young people (Health Canada, 2018a). Thus, gender must be acknowledged to understand best the gendered experiences that impact cannabis consumption to protect the health and safety of Canadians. By understanding the gender differences in the context of cannabis consumption, research-supported publications from the CCSA, Public Health, and other critical players informing the *Act* will be best to inform the *Act* to fulfill and support the *Act*'s protection of public safety, specifically targeting young males (Legislative Services Branch, 2022).

2.5 The Canadian Centre on Substance Use and Addiction

CCSA was created by an Act of Parliament in 1988 (Canadian Centre on Substance Use and Addiction, 2022f). The CCSA is a "non-government organization to provide national leadership on substance use and to

advance solutions to address alcohol- and other drug-related harms" (Canadian Centre on Substance Use and Addiction, 2022f). The "CCSA reports to Parliament through the Minister of Health" (Canadian Centre on Substance Use and Addiction, 2022f) and is integral to the knowledge acquired to inform Canadian government policy and practice. Under the *Focused on the Future: Strategic Plan 2021-2026,* the CCSA aims to contribute to a healthier Canadian society by reducing harms associated with problematic substance use, including cannabis use. The CCSA works towards understanding Canadians' substance use and creating awareness of substance use issues (Canadian Centre on Substance Use and Addiction, 2022g).

The CCSA focuses on issues related to alcohol, cannabis, cocaine, gambling, methamphetamines, opioids, prescription drugs, substance use in Canada, and treatment, support, and recovery (Canadian Centre on Substance Use and Addiction, 2022a). Focusing on cannabis, the CCSA identifies cannabis to be the second most used substance in Canada, following alcohol (Canadian Centre on Substance Use and Addiction, 2022a). The legalization of cannabis in 2018 created a demand for the CCSA to dedicate research to understanding the impact that cannabis has on Canadians to minimize the risks and harms of cannabis consumption while maximizing the benefits of cannabis consumption (Canadian Centre on Substance Use and Addiction, 2022a).

3. Methodology

3.1 Critical Discourse Analysis

A CDA is a qualitative analytical approach to studying communication, exploring and explaining the power of discourses in perpetuating social inequalities. The approach is founded on the notion that language is purposeful, highlighting the power resource of language (Mullet, 2018). Reference Table 4. CDA Characterizations.

Table 4. CDA Characterizations

Problem-oriented focus;
Analysis of semiotic data;
The view that power relations are discursive to some extent;
The view that discourses are situated in time and place;
The idea that expressions of language are never neutral;
Analysis that is systematic, interpretive, descriptive, and explanatory; and
Interdisciplinary and eclectic methodologies.

Cited from Mullet (2018).

The critical aspect of a CDA is defined by the ambition to convey knowledge to provide individuals with the tools to reflect and gain awareness of social inequalities. A CDA focuses on power, exploring the hidden power relationships in discourses and their respective influences (Mullet, 2018). Power influences can be exercised on "knowledge, beliefs, understandings, ideologies, norms, attitudes, values, and plans" (Mullet, 2018, p.4). The discourse aspect of a CDA is defined by information that expresses "ways of knowing, experiencing, and valuing the world" (Mullet, 2018, p.4). There are a plethora of formats that discourses can take the form of; some include, but are not limited to, policies, written texts, research papers, verbal words, visual images, and multimedia. Discourses may perpetuate inequality due to representation differences, positively representing one group whilst negatively representing another (Mullet, 2018). The analysis aspect of a CDA is defined by the critical perspective of the discourse. Analytical

tools are used to understand better the language used, defining how power is communicated. Commonly, word appearance, topics, and keywords are targeted. The analysis of a CDA varies depending on the research goals but, more importantly, the data sources that are being explored (Mullet, 2018).

The following framework used to support the analysis of the CDA is adapted from Mullet's (2018) General Analytical Framework for CDA.

Selection of discourse. To initiate the CDA, the identification of discourse related to health injustice and/or inequality was identified. The research discourse discusses the gender differences in youth cannabis consumption to inform better the production of cannabis regulations and cannabis-related public information guided by the *Act*.

Locate and prepare data sources. The data sources selected and prepared for analysis were curated through the CCSA database. The CCSA database was filtered for publications (excluding news, web pages, videos, and podcasts) focused on the subject of cannabis. Of the publications selected (corporate reports, infographics, reports, and report summaries), the whole text was focused on identifying both major and subthemes relevant to the subject of cannabis.

Exploration of the background of each text. The examination of data accounted for the historical context and production of data. Each piece of data selected was published around the time of the legalization of cannabis in Canada. Thus, each piece of data was selected if meeting the criteria of being published within- or following- the year 2018, with the subject of focus of cannabis (Government of Canada, 2021). The production of the CCSA text adds to the knowledge of the Canadian government to inform policy and practice. The CCSA further aims to gain an understanding of Canadians' substance use to continue to add to their knowledge (Canadian Centre on Substance Use and Addiction, 2022f).

Code texts and identification of overarching themes. Each piece of data was thematically coded to identify the defining themes of the research. Both major themes and subthemes were identified through this form of qualitative coding. The thematic data was then organized in relation to one another to identify the connections between major themes and subthemes, specifically focusing on the inclusion of gender within the work.

Analyzations of the internal relations of the text. The language used within the data was analyzed, focusing on the inclusion of gender. The data was classified within a GIS to assess the degree of inclusion of gender among each piece of data. The GIS evaluated the inclusion of gender in the research design, data collection, analysis, and written/visual reporting in each analyzed CCSA publication. The GIS supports the improvements of gender inclusivity within CCSA publications, bettering the CCSA's provision of innovative and effective solutions to address the cannabis consumption-associated harms facing Canadians.

Analyzation of external relations in text. The social relations that impact social practices and structures were examined and identified through the text analysis. The texts analyzed included the CCSA corporate reports, reports, infographics, and report summaries. The impact of the text is discussed, forming a foundational understanding of the impact and role of gender in cannabis consumption.

Interpretation of the data. The themes identified are holistically analyzed, focusing on their power role related to the external and internal relations in the text. The focus of interpretation is to identify gaps in current knowledge and questions and identify key insights.

3.2 The Canadian Centre on Substance Use and Addiction Data Collection

The CCSA database is accessible to the public under the domain ccsa.ca. The website

provides the public access to various resources, including publications, news, web pages, videos, and podcasts produced by the CCSA. Publications were further filtered by subject to be focused on cannabis. Of the cannabis publications, the results were further filtered to include corporate reports, infographics, reports, and report summaries, excluding bibliographies, brochures, charts, guides, guidelines, meeting summaries, policy briefs, posters, speaking notes, tools, toolkits, topic summaries, and workbooks. Of the selected publications to be included in the CDA, the publication must meet the criteria of being published within- or following- the year 2018, around the time of the legalization of cannabis for relevance (Government of Canada, 2021). In summary, inclusion criteria included:

(1) Database: CCSA
(2) Resource Type: Publication
(3) Subject: Cannabis
(4) News Type: Corporate reports, infographics, reports, and report summaries
(5) Publication Date: Within- or following- the year 2018.

The CCSA database was selected due to its value and focus. The CCSA was established as an Act of Parliament to provide national leadership related to substance use to provide innovative and effective solutions to address harms related to alcohol- and other drug-related harms facing Canadians (Canadian Centre on Substance Use and Addiction, 2022h). The CCSA focuses on creating a healthier Canada by reducing harms related to problematic substance use (Canadian Centre on Substance Use and Addiction, 2022h). The CCSA plans to execute their focus with their commitment to developing its understanding of substance use issues and creating awareness around the aforementioned issues identified (Canadian Centre on Substance Use and Addiction, 2022h). The CCSA collaborates with Canadian scientists, service providers, policymakers, law enforcement, and Canadians with lived and living experiences of substance use. The CCSA reports to Parliament through the Minister of Health, making the CCSA critical in establishing cannabis regulations and health education (Canadian Centre on Substance Use and Addiction, 2022h).

Publications, specifically those focused on cannabis, were selected due to the nature of the research focus. Notably, corporate reports, reports, and report summaries were selected due to their in-depth acquisition of knowledge related to cannabis consumption. The data discussed in each respective report share the CCSA research with readers, allowing researchers (and readers) to understand Canada's youth's current cannabis consumption. The corporate reports, reports, and report summaries identify critical research findings that develop and contribute to Parliament's foundational knowledge of cannabis, informing the future of Canadian cannabis consumption. Further, the reports included in this study intensely focus on Canada's youth, specifically youth cannabis health effects and youth harm reduction related to cannabis consumption. The corporate reports, reports, and report summaries stand as foundational knowledge that influences the development of infographics. The infographics serve to protect the public's health and safety related to cannabis consumption through public education and awareness. The infographics share critical information with the public in a summarized format paired with visualizations to attract attention and share knowledge.

Publications were included if published within- or following- the year 2018, around the time of the legalization of cannabis consumption in Canada (Government of Canada, 2021). Publications were limited in inclusion due to the relevance of findings related to youth's perception of cannabis. Before legalization, the illicit nature of cannabis made the substance limited in access.

Following the legalization, while illicit to minors, the licit nature of cannabis has made the substance highly accessible and available to Canadians (Canadian Centre on Substance Use and Addiction, 2022c). The CCSA Provincial Patterns and Trends in Cannabis Use Among Young People reports published in 2020 identified that youth report cannabis as fairly or very easy to obtain (Cooke et al., 2020a; Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020d; Cooke et al., 2020e; Cooke et al., 2020f; Cooke et al., 2020h; Cooke et al., 2020i).

Following the application of inclusion criteria (reference 3.2.1. The Canadian Centre on Substance Use and Addiction Database Inclusion Criteria), the inclusion of publications within the study is comprised of one corporate report, 15 infographics, 22 reports, and six report summaries. A total of 44 publications were included in the research study. Each piece's texts were read whole and thematically analyzed, identifying both major and sub-themes relevant to the subject of focus, cannabis. More specifically, major themes and subthemes were focused on data and findings related to the role and impact of gender in youth cannabis consumption. Further, male youth was greatly focused on during the process of theme identification.

Comprehensive tables outlining the inventory of publications included within the study can be referenced in Table 5. Inventory of CCSA Report, Report Summary, and Corporate Report Publications Examined and Table 6. Inventory of CCSA Infographic Publications Examined. The tables include the publication's year of release, name, type, and keywords.

Table 5. Inventory of CCSA Report, Report Summary, and Corporate Report Publications Examined

Year of Release	Publication Name	Publication Type	Keywords
2018	The Majority of Canadians Don't Plan to Consume Legal Cannabis, Canadian Insights into Cannabis Legalization	Report	Cannabis
2019	Cannabis Use, Harms and Perceived Risks among Canadian Students (Technical Report)	Report	Cannabis, Health Effects, Youth
2019	Cannabis Use, Harms and Perceived Risks among Canadian Students (Report at a Glance)	Report Summary	Cannabis, Health Effects, Youth
2019	Clearing the Smoke on Cannabis: Regular Use and Cognitive Functioning	Report	Cannabis, Health Effects
2019	Clearing the Smoke on Cannabis: Regular Use and Mental Health	Report	Cannabis, Mental Health
2019	Clearing the Smoke on Cannabis: Cannabis Use and Driving – An Update	Report	Cannabis, Impaired Driving
2020	Provincial Patterns and Trends in Cannabis Use among Youth: Nova Scotia	Report	Cannabis, Youth
2020	Provincial Patterns and Trends in Cannabis Use among Youth: Saskatchewan	Report	Cannabis, Youth
2020	Provincial Patterns and Trends in Cannabis Use among Youth: Alberta	Report	Cannabis, Youth

2020	Provincial Patterns and Trends in Cannabis Use among Youth: British Columbia	Report	Cannabis, Youth
2020	Provincial Patterns and Trends in Cannabis Use among Youth: Manitoba	Report	Cannabis, Youth
2020	Provincial Patterns and Trends in Cannabis Use among Youth: Newfoundland and Labrador	Report	Cannabis, Youth
2020	Provincial Patterns and Trends in Cannabis Use among Youth: Prince Edward Island	Report	Cannabis, Youth
2020	Provincial Patterns and Trends in Cannabis Use among Youth: Quebec	Report	Cannabis, Youth
2020	Provincial Patterns and Trends in Cannabis Use among Youth: Ontario	Report	Cannabis, Youth
2020	COVID-19 and Cannabis Smoking and Vaping: Four Things You Should Know [report]	Report	Cannabis. COVID-19, Vaping
2020	COVID 19, Alcohol and Cannabis Use [report]	Report	Alcohol, Cannabis, COVID-19
2020	Clearing the Smoke on Cannabis: Edible Cannabis Products, Cannabis Extracts and Cannabis Topicals	Report	Cannabis, Health Effects
2020`	Psychotic Disorder and Cannabis Use: Canadian Hospitalization Trends, 2006–2015 [Report in Short]	Report Summary	Cannabis, Mental Health, Substance Use Disorders
2020	Clearing the Smoke on Cannabis: Respiratory and Cardiovascular Effects of Cannabis Smoking [report]	Report	Cannabis, Health Effects
2020	The Effects of Cannabis Smoking: What You Need to Know [report in short]	Report Summary	Cannabis, Health Effects
2020	Cannabis Communication Guide Impact Story	Corporate Report	Cannabis, Youth
2021	Differences in Cannabis Perceptions among Canadian Adolescent Boys and Girls [report]	Report	Cannabis Youth
2021	Cannabis Research in Times of Legalization: What's on the Agenda	Report	Cannabis
2022	How People Living in Canada Consume and Acquire Cannabis: Assessing Progress in Minimizing Harms and Establishing a Safe Supply Chain (Report at a Glance)	Report Summary	Cannabis, Harm Reduction
2022	Trends in Cannabis Use Prior to First Admission to Inpatient Psychiatry in Ontario, Canada, Between 2007 and 2017 (Report at a Glance)	Report Summary	Cannabis, Mental Health
2022	Public Safety and Cannabis: Taking Stock of Knowledge Since Legalization: A Virtual Cannabis Policy Research Symposium Report	Report	Cannabis, Policy

2022	Clearing the Smoke on Cannabis: Cannabis Use During Pregnancy and Breastfeeding	Report	Cannabis, Women
2022	Clearing the Smoke on Cannabis: Highlights	Report Smmary	Cannabis, Health Effects

Table 6. Inventory of CCSA Infographic Publications Examined

Year of Release	Publication Name	Publication Type	Keywords
2019	Cannabis Use among Canadian Students [infographic]	Infographic	Cannabis, Health Effects, Youth
2019	Cannabis: Inhaling vs Ingesting [infographic]	Infographic	Cannabis, Vaping
2019	How To Safely Store Your Cannabis [infographic]	Infographic	Cannabis
2019	Know the Health Risks of Cannabis [infographic]	Infographic	Cannabis, Health Effects
2019	Edible Cannabis: Always Read the Label [infographic]	Infographic	Cannabis, Harm Reduction
2019	However You Use It, Cannabis is Cannabis [infographic]	Infographic	Cannabis, Health Effects
2020	Cannabis and Other Substances [Infographic]	Infographic	Cannabis, Health Effects
2020	Cannabis and Your Medications [Infographic]	Infographic	Cannabis, Prescription Drugs, Health Effects
2020	COVID-19, Alcohol and Cannabis Use [infographic]	Infographic	Alcohol, Cannabis, COVID-19
2020	COVID-19 and Cannabis: How to Reduce Your Risk [infographic]	Infographic	Cannabis, COVID-19, Health Effects
2020	COVID-19 and Cannabis Smoking: 4 Things You Should Know [infographic]	Infographic	Cannabis, COVID-19, Vaping
2020	Psychiatric Conditions and Cannabis Use [infographic]	Infographic	Cannabis, Mental Health, Substance Use Disorders
2021	Cannabis Perceptions among Canadian Adolescent Boys and Girls [infographic]	Infographic	Cannabis, SGBA+, Youth
2022	Mental Health and Substance Use During COVID-19: Spotlight on Youth [infographic]	Infographic	Cannabis, COVID-19, Mental Health, Youth
2022	Psychiatry Admissions and Cannabis Use [infographic]	Infographic	Cannabis, Mental Health

3.3 The Role of Gender in Cannabis Consumption

Gender refers to "socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender-diverse people" (Canadian Centre on Substance Use and Addiction, 2019g, p.6). Gender references socially constructed roles of males, females, and other gender identities (Alvesson & Billing, 2003). Sex refers to "a set of biological attributes in humans and animals. It is primarily associated with physical and psychological features, including chromosomes, gene expression, hormone levels and function, and reproductive and sexual anatomy. Sex is usually categorized as female or male. However, there is some variation in the biological attributes that comprise sex and how they are expressed" (Canadian Centre on Substance Use and Addiction, 2019g, p.6). Sex references the biological differences between males and females based on reproductive organs and chromosomes (Pardue & Wizemann, 2001). The CCSA states, "gender is often conceptualized as a binary (girl/woman and boy/man), yet there is diversity in how individuals and groups understand, experience and express it" (Canadian Centre on Substance Use and Addiction, 2019g, p.6). Due to the collection of data sourced from the CCSA database, all data included within the study conceptualizes gender as a binary (girl/woman and boy/man) but understands there is diversity related to the experiences of gender (Canadian Centre on Substance Use and Addiction, 2019). The Sex, Gender and Equity Analyses, published by the CCSA (2019), further discuss the intersections between sex and gender and the influence these two factors play in the effectiveness of education and protection related to substance use.

Gender plays a large role in cannabis interactions and experiences, impacting youth cannabis consumption (Wallingford et al., 2019b). Male youth are more likely than female youth to show signs of poor mental health, most commonly severe signs of depression related to cannabis consumption (Konefal, 2019). Correlated with cannabis consumption and depression is CUD, thus placing males at risk of development (Konefal, 2019). Males are also more likely to develop cannabis dependence due to regular consumption (Konefal, 2019). The male perception of risk associated with cannabis varies significantly in comparison to the female perception of risk associated with cannabis (Wallingford et al., 2019b). Male youth have reported an earlier initiation age, higher consumption frequency, and greater engagement of risk-based action correlated with their low perception of cannabis risk (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2019b). Females reported greater concern related to cannabis consumption risk, impacting their actions to engage in safer cannabis consumption (Canadian Centre on Substance Use and Addiction, 2020b). Male youth, in comparison to female youth, reported a competitive environment of cannabis consumption, discussing how males often taunted other males to consume large amounts of cannabis in competition (Canadian Centre on Substance Use and Addiction, 2021b; Canadian Centre on Substance Use and Addiction, 2021a). Males have reported their sense of responsibility to purchase cannabis, as it is seen as a dangerous activity (Canadian Centre on Substance Use and Addiction, 2021b). The form of cannabis consumption is also influenced by gender. Males commonly consume cannabis through smoking, edibles, vaping, electronic cigarettes, water pipes, and drinks (Wallingford et al., 2019b). Females have reported consuming cannabis through edibles, concerned about their public image associated with other forms of cannabis consumption (Canadian Centre on Substance Use and Addiction, 2020b). Though both male

and female drivers have reported having engaged in "crossing," consuming alcohol and cannabis together, research has identified that males "cross" 2% more than females, placing them at greater risk of harm (Wallingford et al., 2019b). Males, in comparison to females, were more likely to drive a car following cannabis consumption and get in a car whose driver had consumed cannabis (Wallingford et al., 2019b; Beirness & Porath-Waller, 2019).

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The youth male and female cannabis consumption experiences are different, thus need dedicated gender research and publications to protect the health and safety of youth best. A significant outlined purpose of the *Act* is to "promote the health risks associated with cannabis use to the public" (reference Table 1. Outlined Purposes of The *Act*). The health risks that impact male and female youth vary significantly, thus critical that the gendered health risks impacting males and females be specifically communicated to each gender population. Thus critical is the acknowledgement of gender within research and publications impacting the *Act* and the health and safety of male and female youth related to cannabis consumption. Applying a GIS is critical to ensure the preeminence of gender inclusion in research and publications.

3.4 Gender Inclusion Scale

Applying the GIS, the 44 CCSA publications selected were assigned an inclusion score. The GIS is critical in the identification of gender

inclusion within the selected publications. The GIS is comprised of five gender inclusion scores associated with varying levels of gender inclusion. Score one represents texts that are *gender injustice*, perpetuating gender -inequities, -inequalities, and -discrimination. Score two represents texts that are *gender-simple*, neglecting to consider the role and impact of gender norms and relations. Score three represents *gender-conscious*, acknowledging the role and impact of gender norms and relations, though failing to address the associated inequities individuals experience. Score four represents texts that are *gender-trained*, supporting and understanding the role of gender norms and relations, examining the varied needs of individuals associated with gender. Score five represents texts that are *gender-clear*, identifying gender inequities impacting individuals and further exploring and addressing areas to transform the harmful role and impact of gender norms and relations. Reference Table 7. Gender Inclusion Scale Defined. Each CCSA publication is given a score based on its level of gender inclusion. Reference Table 8 Gender Inclusion Scale and CCSA Corporate Reports, Reports, and Report Summaries Inclusion Score and Table 9. Gender Inclusion Scale and CCSA Infographics Inclusion Score to identify each CCSA publication's inclusion score.

The GIS is included in Table 8. Gender Inclusion Scale and CCSA Corporate Reports, Reports, and Report Summaries Inclusion Scores and Table 9. Gender Inclusion Scale and CCSA Infographics Inclusion Score. The scales are adapted from the work of Greaves, Pederson, & Poole (2014) within the CCSA article titled Sex, Gender and Equity Analyses (2019).

Table 7. Gender Inclusion Scale Defined

Gender Inclusion Scale Score	Gender Inclusion Definition and Criteria
Gender Injustice	Perpetuates gender -inequities, -inequalities, and -discrimination.
Gender-Simple	Neglects to consider the role and impact of gender norms and relations.
Gender-Conscious	Acknowledges the role and impact of gender norms and relations, though fails to address the associated inequities individuals experience.
Gender-Trained	Supports and understands the role of gender norms and relations, examining the varied needs of individuals associated with gender.
Gender-Clear	Identifies gender inequities impacting individuals, further exploring and addressing areas to transform the harmful role and impact of gender norms and relations.

Included in Table 8. Gender Inclusion Scale and CCSA Corporate Reports, Reports, and Report Summaries Inclusion Score is one corporate report, 22 reports, and six report summaries. Of the 22 reports, 9 focus on province-specific data.

Table 8. Gender Inclusion Scale and CCSA Corporate Reports, Reports, and Report Summaries Inclusion Score

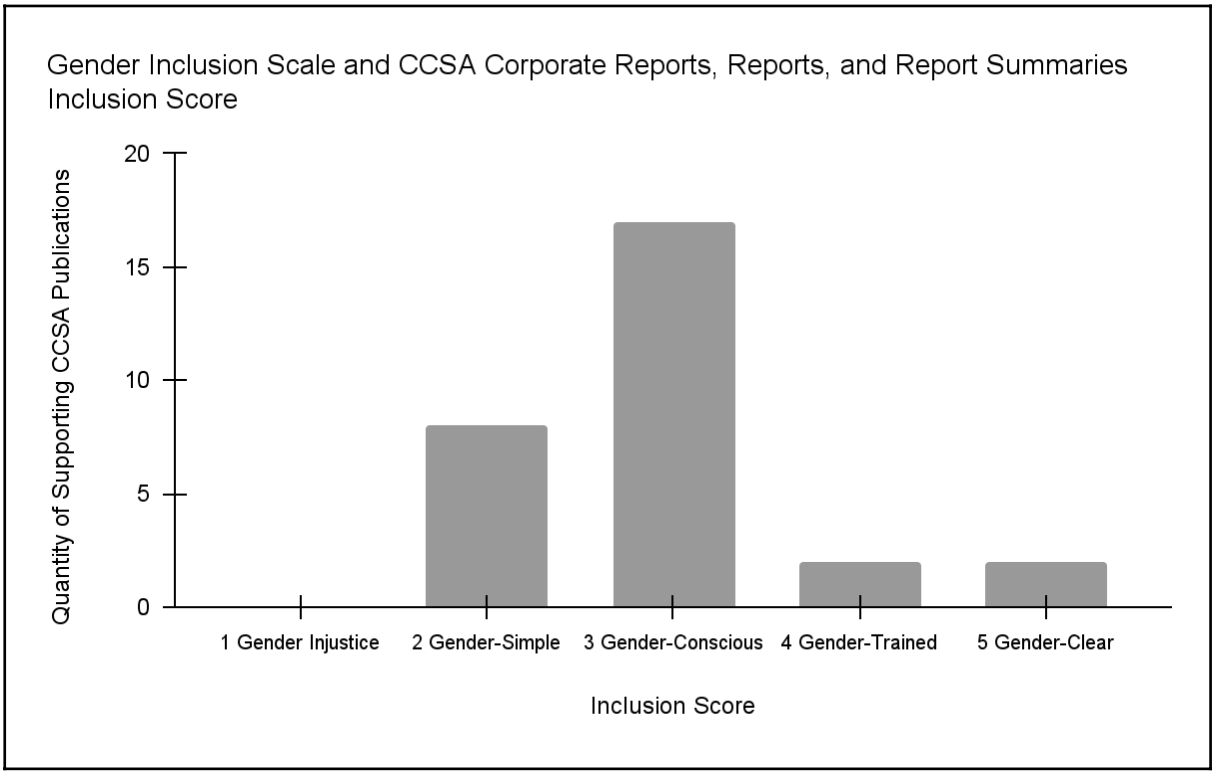
Inclusion Score	Inclusion Criteria	Supporting CCSA Publications
1	Gender Injustice: perpetuates gender -inequities, -inequalities, and -discrimination.	
2	Gender-Simple: neglects to consider the role and impact of gender norms and relations.	Clearing the smoke on cannabis: Regular use and cognitive functioning (Gabrys, 2019): recommends the need for sex and gender research Covid-19 and cannabis smoking and vaping: Four things you should know [report] (Canadian Centre on Substance Use and Addiction, 2020h): does not acknowledge gender Covid 19, alcohol and cannabis use [report] (Canadian Centre on Substance Use and Addiction, 2020f): does not acknowledge gender Clearing the Smoke on Cannabis: Respiratory and Cardiovascular Effects of Cannabis Smoking (Renard, 2021): does not acknowledge gender The effects of cannabis smoking: What you need to know [report in short] (Canadian Centre on Substance Use and Addiction, 2020l): does not acknowledge gender Cannabis Communication Guide Impact Story (Canadian Centre on Substance Use and Addiction, 2020c): does not acknowledge gender Cannabis Research in Times of Legalization: What's on the Agenda (Zwicky, et al., 2021): does not acknowledge gender Public safety and cannabis: Taking stock of knowledge since legalization: A virtual cannabis policy research symposium report (Canadian Centre on Substance Use and Addiction, 2022g): does not acknowledge gender
3	Gender-Conscious: acknowledges the role and impact of gender norms and relations, though fails to address the associated	The majority of Canadians don't plan to consume legal cannabis, Canadian insights into cannabis legalization (Canadian Centre on Substance Use and Addiction, 2018): gender differences with cannabis consumption

	inequities individuals experience.	Cannabis use, harms and perceived risks among Canadian students (Wallingford et al., 2019a): gender different cannabis indicators Clearing the smoke on cannabis: Regular use and mental health (Konefal, 2019): gender differences with cannabis interactions Psychotic disorder and cannabis use: Canadian hospitalization trends, 2006–2015 [report in short] (Canadian Centre on Substance Use and Addiction, 2020k): gender differences with hospitalizations realted to cannabis consumption Provincial patterns and trends in cannabis use: Alberta (Cooke et al., 2020a): acknowledge gender differences of cannabis consumption Provincial patterns and trends in cannabis use: British Columbia (Cooke et al., 2020b): acknowledge gender differences of cannabis consumption Provincial patterns and trends in cannabis use: Manitoba (Cooke et al., 2020c): acknowledge gender differences of cannabis consumption Provincial patterns and trends in cannabis use: Newfoundland and Labrador (Cooke et al., 2020d): acknowledge gender differences of cannabis consumption Provincial patterns and trends in cannabis use: Nova Scotia (Cooke et al., 2020e): acknowledge gender differences of cannabis consumption Provincial patterns and trends in cannabis use: Ontario (Cooke et al., 2020f): acknowledge gender differences of cannabis consumption Provincial patterns and trends in cannabis use: Prince Edward Island (Cooke et al., 2020g): acknowledge gender differences of cannabis consumption Provincial patterns and trends in cannabis use: Quebec (Cooke et al., 2020h): acknowledge gender differences of cannabis consumption

		Provincial patterns and trends in cannabis use: Saskatchewan (Cooke et al., 2020i): acknowledge gender differences of cannabis consumption How people living in Canada consume and acquire cannabis: Assessing progress in minimizing harms and establishing a safe supply chain (report at a glance) (Canadian Centre on Substance Use and Addiction, 2022d): male attitudes and actions related to cannabis consumption Trends in cannabis use prior to first admission to inpatient psychiatry in Ontario, Canada, between 2007 and 2017 (report at a glance) (Canadian Centre on Substance Use and Addiction, 2022j): acknowledges gender different cannabis psychiatry health impacts Clearing the smoke on cannabis: Cannabis use during pregnancy and breastfeeding (Canadian Centre on Substance Use and Addiction, 2022b): acknowledges the impact of cannabis and pregnancy Clearing the smoke on cannabis: Highlights. Canadian Centre on Substance Use and Addiction (Canadian Centre on Substance Use and Addiction, 2022c): acknowledges gender differences with cannabis consumption
4	Gender-Trained: supports and understands the role of gender norms and relations, examining the varied needs of individuals associated with gender.	Cannabis use, harms and perceived risks among Canadian students. Ottawa, ON: Canadian Centre on Substance Use and Addiction (Technical Report; Wallingford et al., 2019b): gender different contextual and behavioural factors associated with cannabis use Clearing the smoke on cannabis, cannabis use and driving (Beirness & Porath-Waller, 2019): male drug impaired (cannabis) driving risk-taking
5	Gender-Clear: identifies gender inequities impacting individuals, further exploring and addressing areas to transform the harmful role and impact of gender norms and relations.	Clearing the smoke on cannabis: Edible cannabis products, cannabis extracts and cannabis topicals (Canadian Centre on Substance Use and Addiction, 2020d): gender differences to influence prevention and harm reduction messaging Differences in cannabis perceptions among Canadian adolescent boys and girls [report] (Canadian Centre on Substance Use and Addiction, 2021b): addresses gender norms, roles, and relations affecting cannabis consumption among young males and females

The included corporate reports, reports, and report summaries clearly provide a foundational understanding of knowledge that is classified as gender-conscious, gender-trained, and gender-clear. Of the 29 corporate reports, reports, and report summaries, 17 (27.6%) publications were gender-conscious, acknowledging gender differences associated with cannabis purchasing and consumption (Canadian Centre on Substance Use and Addiction, 2018; Wallingford et al., 2019a; Konefal, 2019; Canadian Centre on Substance Use and Addiction, 2020k; Cooke et al., 2020a; Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020d; Cooke et al., 2020e; Cooke et al., 2020f; Cooke et al., 2020g; Cooke et al., 2020h; Cooke et al., 2020i; Canadian Centre on Substance Use and Addiction, 2022d; Canadian Centre on Substance Use and Addiction, 2022j; Canadian Centre on Substance Use and Addiction, 2022d; Canadian Centre on Substance Use and Addiction, 2022c), and impact, 2 (6.9%) of publications were gender-trained, acknowledging social and behavioural factors that have an impact on the gender differences of cannabis conumption (Wallingford et al., 2019b; Beirness & Porath-Waller, 2019), and 2 (6.9%) of publications were gender-clear, acknowledging gender norms, roles and relations impacting cannabis consumption (Canadian Centre on Substance Use and Addiction, 2020d; Canadian Centre on Substance Use and Addiction, 2021b

Figure 1. Gender Inclusion Scale and CCSA Corporate Reports, Reports, and Report Summaries Inclusion Score



Included in Table 9. GIS and CCSA Infographics Inclusion Score is 15 infographics. Of the 15 infographics, four specifically acknowledge youth (Canadian Centre on Substance Use and Addiction, 2019b; Canadian Centre on Substance Use and Addiction, 2020f; Canadian Centre on Substance Use and Addiction, 2021a; Canadian Centre on Substance Use and Addiction, 2022a).

Figure 2. Gender Inclusion Scale and CCSA Corporate Reports, Reports, and Report Summaries Inclusion Score

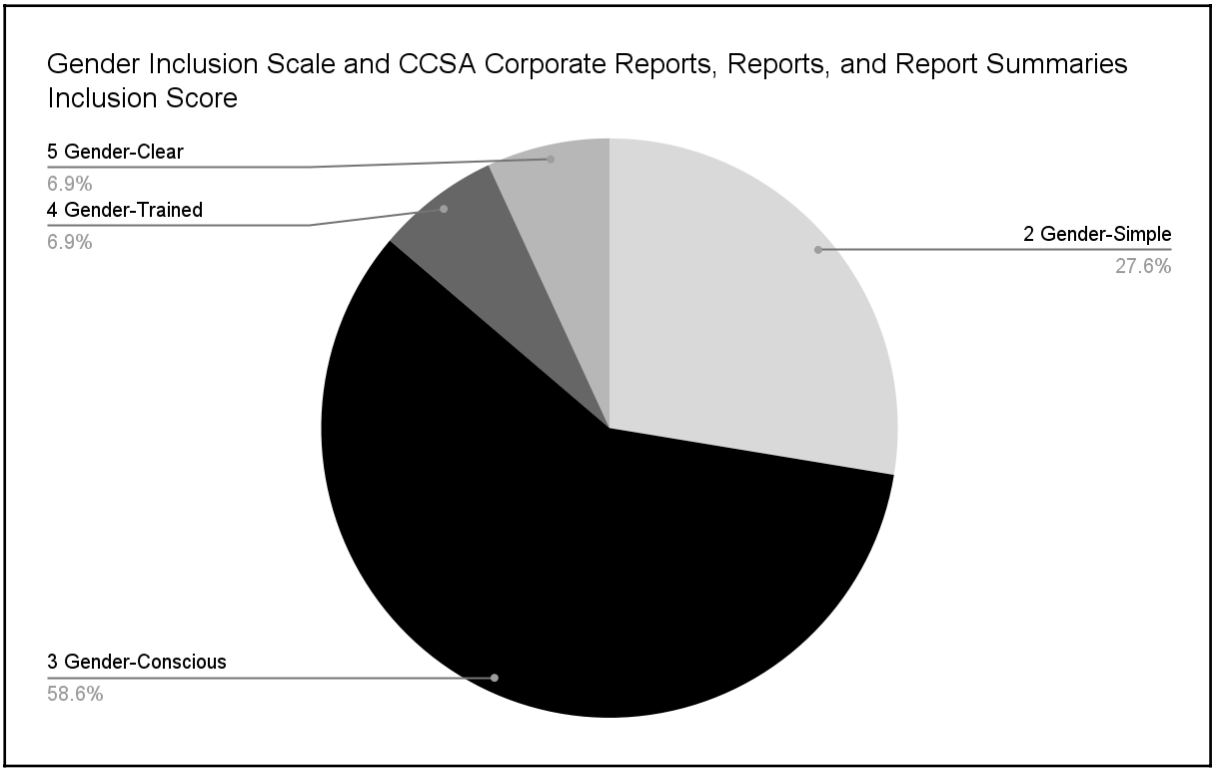


Table 9. Gender Inclusion Scale and CCSA Infographics Inclusion Score

Inclusion Score	Inclusion Criteria	Supporting CCSA Publications
1	Gender Injustice: perpetuates gender -inequities, -inequalities, and -discrimination.	
2	Gender-Simple: neglects to consider the role and impact of gender norms and relations.	Cannabis: Inhaling vs Ingesting (Canadian Centre on Substance Use and Addiction, 2019a): does not acknowledge gender How To Safely Store Your Cannabis (Canadian Centre on Substance Use and Addiction, 2019d): does not acknowledge gender Know the Health Risks of Cannabis (Canadian Centre on Substance Use and Addiction, 2019f): does not acknowledge gender Edible Cannabis: Always Read the Label (Canadian Centre on Substance Use and Addiction, 2019c): does not acknowledge gender

		However You Use It, Cannabis is Cannabis (Canadian Centre on Substance Use and Addiction, 2019e): does not acknowledge gender Cannabis and Other Substances (Canadian Centre on Substance Use and Addiction, 2020a): does not acknowledge gender Cannabis and Your Medications (Canadian Centre on Substance Use and Addiction, 2020b): does not acknowledge gender COVID-19, Alcohol and Cannabis Use (Canadian Centre on Substance Use and Addiction, 2020e): does not acknowledge gender COVID-19 and Cannabis: How to Reduce Your Risk (Canadian Centre on Substance Use and Addiction, 2020g): does not acknowledge gender COVID-19 and Cannabis: 4 Things You Should Know (Canadian Centre on Substance Use and Addiction, 2020i): does not acknowledge gender Psychiatric Conditions and Cannabis Use (Canadian Centre on Substance Use and Addiction, 2020j): does not acknowledge gender Mental Health and Substance Use During COVID-19: Spotlight on Youth: (Canadian Centre on Substance Use and Addiction, 2022e): does not acknowledge gender
3	Gender-Conscious: acknowledges the role and impact of gender norms and relations, though fails to address the associated inequities individuals experience.	Cannabis Use among Canadian Students (Canadian Centre on Substance Use and Addiction, 2019b): acknowledges male risks Psychiatry Admissions and Cannabis Use (Canadian Centre on Substance Use and Addiction, 2022i): acknowledges male risks
4	Gender-Trained: supports and understands the role of gender norms and relations, examining the varied needs of individuals associated with gender.	Cannabis Perceptions among Canadian Adolescent Boys and Girls (Canadian Centre on Substance Use and Addiction, 2021a): acknowledges male and female gender differences and norms

5	Gender-Clear: identifies gender inequities impacting individuals, further exploring and addressing areas to transform the harmful role and impact of gender norms and relations.	

The included infographics provide a minimal understanding of gender, evident by their predominant publication classification of gender-simple. Of the 15 infographics, 12 (80%) were gender-simple, not acknowledging the role of gender in their work (Canadian Centre on Substance Use and Addiction, 2019a; Canadian Centre on Substance Use and Addiction, 2019d; Canadian Centre on Substance Use and Addiction, 2019f; Canadian Centre on Substance Use and Addiction, 2019c; Canadian Centre on Substance Use and Addiction, 2019e; Canadian Centre on Substance Use and Addiction, 2020a; Canadian Centre on Substance Use and Addiction, 2020b; Canadian Centre on Substance Use and Addiction, 2020e; Canadian Centre on Substance Use and Addiction, 2020g; Canadian Centre on Substance Use and Addiction, 2020i; Canadian Centre on Substance Use and Addiction, 2020j; Canadian Centre on Substance Use and Addiction, 2022e), two (13.3%) were gender-conscious (Canadian Centre on Substance Use and Addiction, 2019b; Canadian Centre on Substance Use and Addiction, 2022i), and one (6.7%) was gender-trained, acknowledging the impact of gender norms (Canadian Centre on Substance Use and Addiction, 2021a). Notably, no gender-clear was published.

Figure 3. Gender Inclusion Scale and CCSA Infographics Inclusion Score

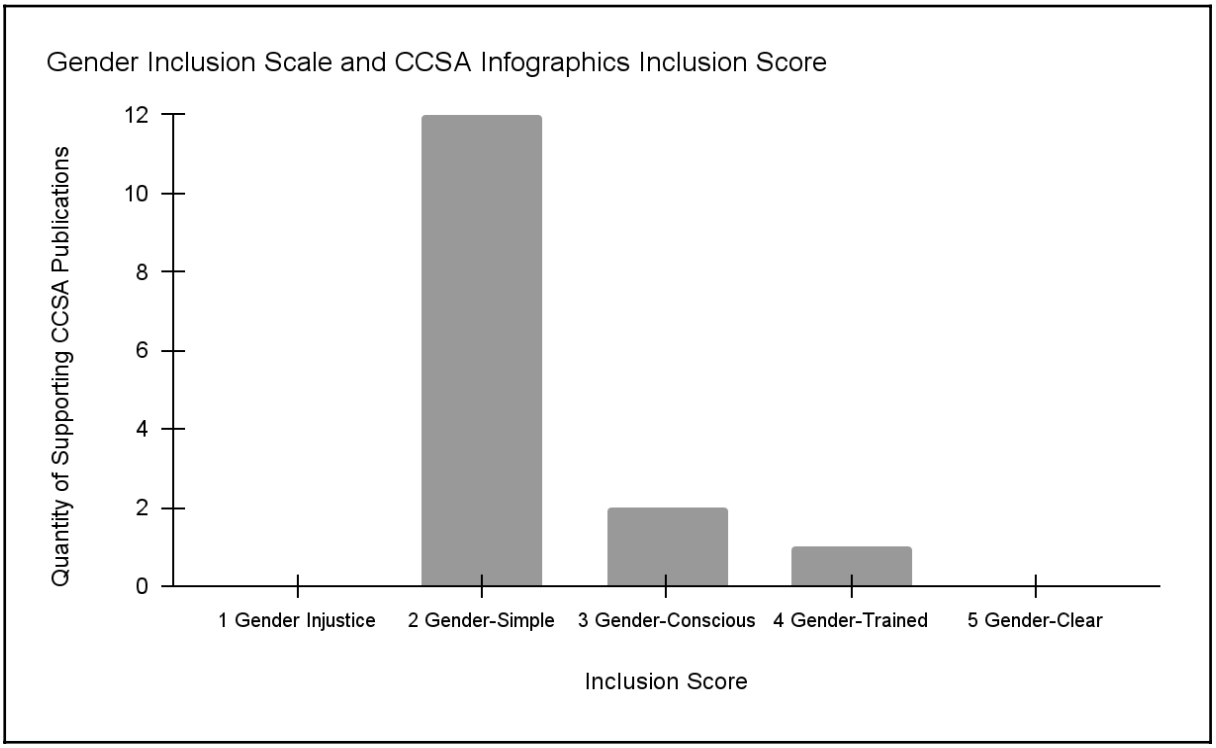
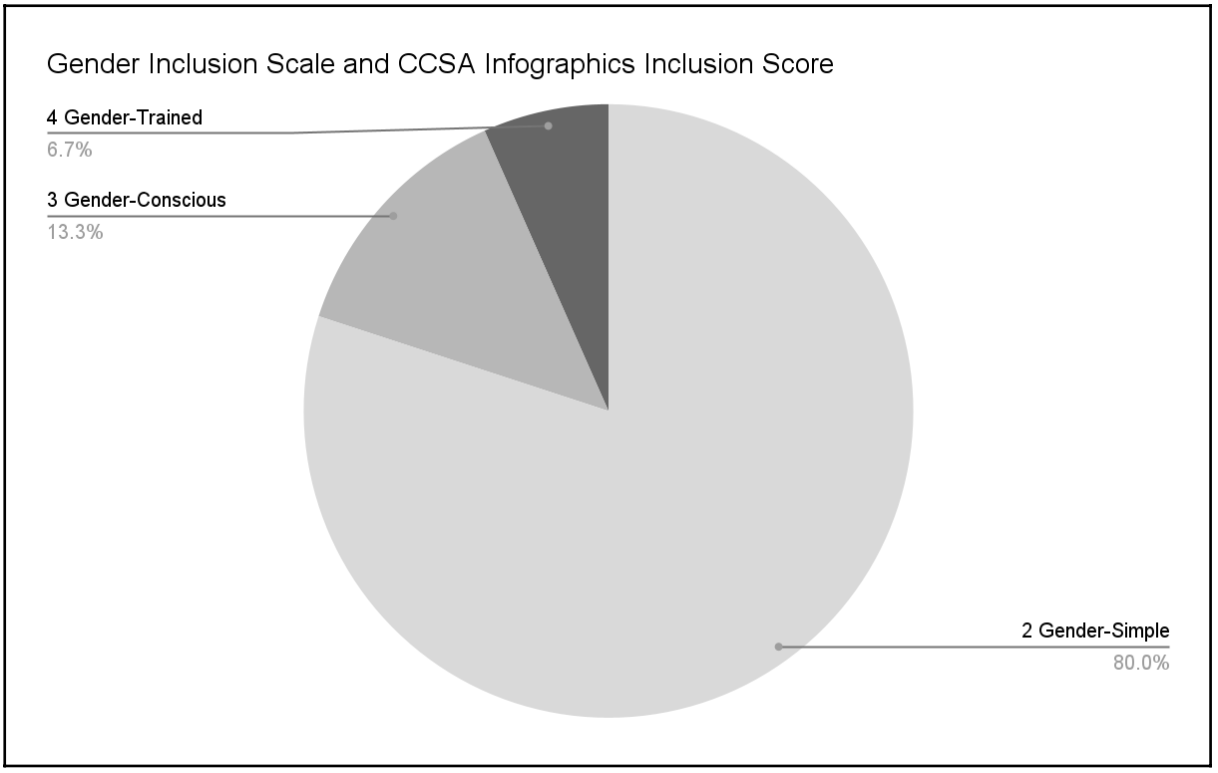


Figure 4. Gender Inclusion Scale and CCSA Infographics Inclusion Score



4. Results and Analysis

4.1 Cannabis Consumption Among Young People

The consumption of cannabis, a psychoactive substance, is highly used among Canadian youth (Wallingford et al., 2019b). According to Health Canada, prior to the legalization of cannabis, youth reported consuming cannabis more than twice the reported use of adults aged 25 and older (Wallingford et al., 2019b). Canadian youth cannabis consumption is among the highest in developed countries (Wallingford et al., 2019b). Notably, among the youth population, cannabis use is more prevalent among male youth than female youth (Wallingford et al., 2019b). Of male youth, 18.7% reported consuming cannabis, compared to 11.1% of female youth who reported consumption (Canadian Centre on Substance Use and Addiction, 2020k). Before legalization, male youth in the past decade had reported a higher increase in consumption than female youth, 9.9% to 7.9%, respectively (Canadian Centre on Substance Use and Addiction, 2022j). The previously reported cannabis consumption statistics of male youth consumption are alarming, placing male youth at great risk of adverse health outcomes associated with cannabis consumption (Wallingford et al., 2019b). The Canadian Tobacco, Alcohol, and Drugs Survey (CTADS) reported that 14.8% of Canadian youth had consumed cannabis at least once within the past year. Approximately one-third of the 14.8% of youth cannabis consumers reported daily or almost daily use (Beirness & Porath-Waller, 2019). A clear risk is identified for youth related to cannabis consumption, specifically highlighting the adverse health risks of male youth due to greater consumption, comparatively to female youth (Wallingford et al., 2019b).

4.2 Impact of Cannabis Consumption Associated with Early Initiation

The CCSA corporate reports, reports, and report summaries highlight the long-lasting impact of early cannabis consumption, exploring and explaining the health risks associated with cannabis use, specifically regular cannabis use. Regular cannabis use places youth at the greatest place of risk, as the impact of cannabis consumption is more likely to be long-lasting and dominant in brain development (Konefal, 2019). Notably, the brain continues to develop until the age of 25. Thus, the CCSA finds it critical to delay the initiation of youth cannabis consumption and reduce the consumption of cannabis among youth to facilitate brain development and mitigate associated health risks (Konefal, 2019). The CCSA identified a plethora of studies that have found that the majority of Canadian youth reported consuming cannabis prior to the age of 18 (Wallingford et al., 2019b). Notably, the CCSA has associated early age initiation with a greater frequency of cannabis consumption and a greater risk of adverse health harms (Wallingford et al., 2019b).

The adverse health harms associated with cannabis consumption can include but are not limited to, impaired cognitive function, mental health challenges, negative physical health outcomes, increased risk of psychological disorders, development of cannabis dependence, and associated risk-based behaviour (due to a youth's high nature; Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2020c; Canadian Centre on Substance Use and Addiction, 2020k). The CCSA reports that one in six Canadian youth who consume cannabis regularly will develop a cannabis dependence, placing them at a greater risk of later developing a CUD (Canadian Centre on Substance Use and Addiction, 2020k).

As previously stated, the brain continues development until about the age of 25 years, therefore, placing youth who consume cannabis susceptible to the adverse cognitive effects that are associated with cannabis (Gabrys, 2019; Konefal, 2019). A research study conducted by Gabrys (2019) concluded that youth who consume cannabis before the age of 16 are at the greatest risk of the onset of adverse cognitive impairment (Gabrys, 2019). Impaired cognitive functioning is a highly researched adverse health effect of cannabis consumption. Associated with impaired cognitive function is youth's engagement in risky behaviours whilst high, placing themselves and others at potential risk (Wallingford et al., 2019b). Further, youth who consume cannabis have learning and memory deficits due to decreased cognitive functioning (Gabrys, 2019). While a younger age of initiation is associated with the development of cannabis dependence and a greater risk of development of CUD, long-term cannabis use can further contribute to the progressive decline of an individual's learning ability and memory (Canadian Centre on Substance Use and Addiction, 2020k; Gabrys, 2019). The aforementioned adverse cognitive development associated with cannabis consumption has been suggested by research evidence that the impact is not entirely reversible, challenging youth cannabis consumers for the entirety of their lives (Gabrys, 2019).

Research reported data indicates that individuals who consume cannabis were more likely to report symptoms of anxiety, specifically if cannabis consumers initiated consumption prior to the age of 15 and continued regular use throughout their youth and early adulthood (Konefal, 2019). The CCSA in 2020 concluded that daily or almost daily cannabis consumption increases an individual's risk of developing a dependence on cannabis and is highly associated with adverse mental health (Canadian Centre on Substance Use and Addiction, 2020k). The CCSA has reported that 18.7% of young males (and 11.1% of young females) consume

cannabis at a regular rate of consumption, placing males at a heightened risk for adverse mental health (Canadian Centre on Substance Use and Addiction, 2020k). A critical point to be raised related to cannabis consumption and mental health, both male and female youth specifically note adverse mental health as a reason for consumption. The youth population speaks about how their cannabis consumption is related to relieving their personal mental health issues and stress (Canadian Centre on Substance Use and Addiction, 2021b). The impact of cannabis consumption on young people's mental health places them at great risk of adverse health impacts (Canadian Centre on Substance Use and Addiction, 2022c).

Associated with young initiation of cannabis consumption is the risk young people take on for developing psychotic disorders. The early age of cannabis initiation is associated with schizophrenia and psychosis onset (Konefal, 2019). Psychotic disorders were the most commonly reported condition that is associated with cannabis consumption hospitalizations. The hospitalizations of psychotic disorders associated with cannabis consumption continue to increase as cannabis consumption at an early age persists (Canadian Centre on Substance Use and Addiction, 2020k). The CCSA reported that the aforementioned hospitalizations have the potential to be related to the development of high-potency cannabis products that are now available to the Canadian population (Canadian Centre on Substance Use and Addiction, 2020k). Identified by Table 3. CCSA Provincial Patterns and Trends in Cannabis Use Among Young People Summary, males commonly have a younger mean age of initiation related to cannabis use compared to females, placing young males at greater risk of associated psychotic disorder development (Konefal, 2019).

4.3 Young Male Cannabis Consumption

According to the CCSA, no scientific literature defines regular cannabis use. The CCSA discusses that their definition of regular cannabis use is "weekly or more frequent use over periods of months or years and poses a risk for adverse health effects (Konefal, 2019, p.2)." Other terms commonly used interchangeably by regular cannabis use include frequent use, chronic use, and long-term use (Konefal, 2019). The CCSA defines heavy cannabis use as a reference to "daily or more frequent use, and can be a sign of dependence and CUD (Konefal, 2019, p.2)." Regular cannabis use was highly reported by male students in comparison to female students (Konefal, 2019). Thus, males are at greater risk due to their more prevalent cannabis consumption. Cannabis is a potentially addictive drug due to its associated feeling of reward that it induces following consumption, leading to a risk of addiction (Gabrys, 2019).

Males reported consuming cannabis more frequently than females daily, weekly, and monthly (Wallingford et al., 2019a). The statistical consumption trend continues to be reported as a male's age (Wallingford et al., 2019a). The earlier initiation age of cannabis consumption and continued consumption by young males can lead to cannabis dependence (Wallingford et al., 2019b). The high rate of cannabis consumption among males associated with masculine gender cannabis experiences places males at a significantly higher risk of developing cannabis dependence compared to females (Wallingford et al., 2019b). The research of Wallingford et al. (2019b) discusses how the previously mentioned risk is often associated with a lack of knowledge of risks associated with cannabis consumption, specifically impairment and addiction (Wallingford et al., 2019b). Thus, males are at a greater risk of adverse impacts related to cannabis consumption than females due to the masculine-gendered cannabis experiences and the male lack of risk understanding associated with cannabis (Wallingford et al., 2019b).

Because males' more significant risk of health adversity and subjection to addiction correlated with higher consumption prevalence and reported earlier initiation age of cannabis consumption, it is critical that gender-clear research and publications be prioritized. The prioritization of youth males serves to better protect the health of young males through the alignment of the *Act* to promote the health risks associated with cannabis consumption.

4.4 Male Perception of Cannabis

Wallingford et al. (2019b) describe the perception of risk associated with cannabis consumption as a critical indicator in monitoring the likelihood of use following legalization (Wallingford et al., 2019b). Research continues to identify that youth under the influence of cannabis or youth around other youth under the influence of cannabis place themselves at physical, mental, and cognitive health harm (Wallingford et al., 2019b). The research supported health harms increase the perceived risk individuals potentially possess. However, it was reported that many young people lack clarity on the harmful impacts of cannabis consumption (Wallingford et al., 2019b). The perceived risk associated with cannabis consumption is significantly higher when comparing students in grade seven to grade 12 (Wallingford et al., 2019b). Younger students often classify cannabis consumption as a great risk, whereas older students perceive the consumption of cannabis to be a slight or moderate risk (Wallingford et al., 2019b). Overall, males reported a lower perception of risk than females (Wallingford et al., 2019b). The *Act*'s proposed outline purpose is to "promote the health risks associated with cannabis use to the public" (Reference Table 1. Outlined Purposes of The *Act*). The previous data by Wallingford et al. (2019b) highlights the need for the *Act* to better target older male students to protect their health and safety related to cannabis consumption.

The perception of risk related to cannabis consumption plays a large role in the consumption of cannabis. Research identifies the continuation of male cannabis consumption from youth to young adulthood (Wallingford et al., 2019a). As young males continue to consume cannabis at an early age, cannabis consumption is normalized, neglecting the educate today's youth on the risk associated with cannabis, impacting their perception of cannabis (Wallingford et al., 2019a; Wallingford et al., 2019b). The normalization of cannabis consumption among young males is eminently concerning, facilitating the continuation of young males engaging in cannabis consumption, and heightening their risk for adverse health outcomes. Wallingford et al. (2019b) research is classified as gender-trained on the GIS. The research understands the role that gender norms and roles play in the consumption of cannabis, identifying and understanding the powerful role gender norms play in youth experiences (Greaves et al., 2014). The acknowledgement of gender norms adds to inform the *Act* of the differing gendered experiences male and female cannabis consumers are subject to. Young males are experiencing a cycle of continued and growing cannabis consumption correlated with cannabis consumption normalization (Wallingford et al., 2019a; Wallingford et al., 2019b). The *Act* to best protect young males from "the positive persuasion or influence to use cannabis" (reference Table 1. Outlined Purposes of The *Act*) needs to address the gender norms and roles that play a part in the male cannabis experience. Gender-clear research identifying the gender inequities associated with the male cannabis experience should be explored to address how masculine gender inequities are harmfully impacting masculine gender norms.

Research has indicated that males following the consumption of cannabis are more at risk for engaging in poor decision-making, classified as risk-based and

impulsive decision-making (Gabrys, 2019). The result of this commonly reported decision-making by males is a normalized perception of low risk associated with cannabis consumption. The impact of this gender normality subjects young males to continue and often increase cannabis consumption because of their lack of knowledge of the risks associated with such consumption (Wallingford et al., 2019b). The lower perception of risk males associate with cannabis consumption may be related to their earlier age of initiation and higher frequency of cannabis consumption in comparison to females (Wallingford et al., 2019b). Males reportedly consider cannabis to be a risk, harm, or problem when they have passed out or vomited due to cannabis consumption (Canadian Centre on Substance Use and Addiction, 2021b). In comparison to females, the male consideration of perceived cannabis-related harm requires further cannabis consumption, greatly increasing male consumers' risk of related adverse health outcomes (Canadian Centre on Substance Use and Addiction, 2021b). The harm males place themselves at as a result of the low perception of cannabis consumption risk can include the low perception of danger associated with driving following cannabis consumption (drug-impaired driving) and placing themselves in dangerous situations when purchasing and obtaining illicit cannabis (Canadian Centre on Substance Use and Addiction, 2021b).

As follows, it is evident that males lack the education and awareness to accurately inform their perception of cannabis consumption-related risk, negatively impacting their health. Work dedicated to identifying what social and environmental inequities impact the male gender normality of risk-based and impulsive decision-making related to cannabis consumption is needed. Unpacking the social and environmental influences contributing to the male perception of cannabis consumption harm can transform the male perception to protect male health better. Conducting gender-clear work supports identifying gender inequities and exploring the related result that influences the gender norms of male cannabis consumers (and female cannabis consumers; Greaves et al., 2014; Canadian Centre on Substance Use and Addiction, 2021b).

The perception of risk associated with cannabis consumption between males and females differs vastly. The early age of cannabis consumption initiation, high frequency of cannabis consumption, and normalized engagement in risk-based behaviour following cannabis consumption is evidence of males' low-risk perception of cannabis consumption (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2019b). Comparatively, females often consume cannabis at a later age compared to males, and report a low frequency of cannabis consumption in comparison to males, perceive a higher risk associated with cannabis consumption (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2019b). Female gender norms and roles that influence behaviours following cannabis consumption differ greatly from male norms and roles, thus the male experience. Male cannabis consumers report risk associated with cannabis when a cannabis consumer has passed out or vomited because of consumption, whereas female cannabis consumers report risk to be associated with cannabis consumers consuming cannabis alone (Canadian Centre on Substance Use and Addiction, 2021b). The risk threshold of males is far greater than females, placing male cannabis consumers at greater risk of health harm because of a lower perception of risk. For male cannabis consumers to view risk and harm related to cannabis consumption, they must experience physical harm (i.e. passing out), whereas female cannabis consumers, to view risk and harm related to cannabis consumption, do not place themselves in a

position of physical harm (Canadian Centre on Substance Use and Addiction, 2021b).

Related to the male and female differing perception of cannabis, in a social context, both males and females reported consuming cannabis in the form of edibles; however, female edible consumers reported consuming edibles as they were concerned about their image publicly, while males reported consuming cannabis edibles as another form of cannabis consumption (Canadian Centre on Substance Use and Addiction, 2020b). Notably, both male and female edible consumers understood the risks associated with edible consumption (Canadian Centre on Substance Use and Addiction, 2020b). Females reported a greater concern for the previously mentioned risk than males (Canadian Centre on Substance Use and Addiction, 2020b). In a study conducted by the CCSA (2021b), female cannabis consumers reported that their lower consumption of cannabis, in comparison to males, can be correlated with their perception of how their social environments may view or judge them (Canadian Centre on Substance Use and Addiction, 2021b). No report about male cannabis consumers' perception of viewership or judgement related to cannabis consumption was identified (Canadian Centre on Substance Use and Addiction, 2021b). The previously mentioned study by the CCSA in 2021 is classified as meeting gender-clear criteria on the GIS (Canadian Centre on Substance Use and Addiction, 2021b; reference Table 8. Gender Inclusion Scale and CCSA Corporate Reports, Reports, and Report Summaries Inclusion Score). The utilization of work that is classified as gender clear to inform the *Act* best fulfills the *Act*'s outlined purposes, understanding and acknowledging the gender inequities that impact male and female cannabis consumers.

4.5 Male Risk-Taking and Cannabis

The legalization of cannabis provided legal access to cannabis to consume for Canadians meeting the age criteria, providing alternative legal access to cannabis (as opposed to previous illicit purchases; Government of Canada, 2021). However, the CCSA reports that individuals have continued to purchase cannabis through illegal channels (Canadian Centre on Substance Use and Addiction, 2022d). Of these individuals, the majority identified as males (Canadian Centre on Substance Use and Addiction, 2022d). Males have reported that they feel a sense of responsibility to obtain cannabis as it is perceived as a dangerous activity (Canadian Centre on Substance Use and Addiction, 2021b). This sense of responsibility males feel it is a result of the masculine gender practices of drug culture. Drug consumption is often related to violence, creating a gender relation that males are the individuals who must engage (Dahl & Sandberg, 2015). It is reported that females are more discreet in their action of acquiring cannabis, whereas males are more likely to announce their acquisition, often posting videos on social media of them consuming cannabis (i.e. Snapchat; Canadian Centre on Substance Use and Addiction, 2021b). This announcement is tied to male gender inequities of feeling pressure to defend and display their masculinity (Greaves et al., 2014).

More specifically, males who were not college nor university graduates reported consuming cannabis on a regular basis (Canadian Centre on Substance Use and Addiction, 2022d). The purchase of cannabis through the illegal channel was reported to be cheaper and of higher cannabis quality (Canadian Centre on Substance Use and Addiction, 2022d). Of individuals who purchased cannabis illegally, few believed that cannabis sales should not be government-regulated (Canadian Centre on Substance Use and Addiction, 2022d). It is critical that the motivated actions of illicit purchase of cannabis associated with

masculinity (the male sense of responsibility to obtain cannabis), regular consumption, and perception of quality be addressed with gender-clear work. The value of gender-clear work best engages males through addressing and acknowledging the influence of gender inequities and gender norms they experience related to their cannabis purchasing action, specifically health-harming action (Greaves et al., 2014).

Gender reportedly plays an immense role in the report on methods of cannabis consumption. For both male and female cannabis consumers, consumption by smoking was the most common form, followed by edibles and vaping (Wallingford et al., 2019b). Edibles are reported to increase an individual's risk of over-consumption and, thus, cannabis-related intoxication and impairment (Canadian Centre on Substance Use and Addiction, 2020b). The appearance of edibles in food or beverage format increases an individual's risk of unintentional digestion. Edibles risk being digested by children due to their appearance (Canadian Centre on Substance Use and Addiction, 2020b). Male cannabis consumers reported significant cannabis consumption by electronic cigarettes, water pipes, or consuming cannabis in a drink, while female cannabis consumers did not (Wallingford et al., 2019b). Notably, male cannabis consumers reported greater methods of cannabis consumption compared to female cannabis consumers.

As previously discussed, female cannabis consumers commonly reported consuming cannabis while with others, whereas males report consuming cannabis both among others and alone during any time of the week (Canadian Centre on Substance Use and Addiction, 2021b). The cannabis consumption methods male and female cannabis consumers practice are influenced by the gender norms and related masculine and feminine social and environmental pressures they experience. The experiences of male and female cannabis consumers differ greatly based on the method of cannabis consumption; it is critical that work explore the gender inequities tied to the impact of the aforementioned gender norms. Specifically, gender-clear work should target understanding the motivated action males are exposed to that correlated with their electronic cigarette, water pipe, and edible consumption, as the previously mentioned methods of cannabis consumption of dominantly reported by male cannabis consumers (Wallingford et al., 2019b).

Alcohol and cannabis are reported to be the most used psychoactive substances by Canadians (Gabrys, 2019). Both young -males and -females have reported consuming the aforementioned psychoactive substances simultaneously, referred to as “crossing” (Canadian Centre on Substance Use and Addiction, 2021b). The “crossing” of psychoactive substances produces a greater risk of adverse health outcomes due to the increased amount of psychoactive substances consumed (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2022e; Canadian Centre on Substance Use and Addiction, 2020e). Specifically, an individual's attention and memory face greater adversity in “crossing” (Gabrys, 2019). The risks of “crossing” surpass the risks of either alcohol or cannabis alone (Wallingford et al., 2019b). A survey collected data from the young -males and -females of British Columbia reported 5.6% of respondents to have “crossed” the weekend prior. There were 2% more males who reported having combined alcohol and cannabis than females, 6.6% and 4.6%, respectively (Wallingford et al., 2019b). The “crossing” of alcohol and cannabis is identified to heighten the risk of either alcohol or cannabis alone, thus placing “crossing” as a great associate of adverse health outcomes and physical-, mental-, and cognitive- health harm (Wallingford et al., 2019b). Research by the CCSA has identified that 2% of males reported having engaged in “crossing” in comparison to

females, placing them at a greater risk of harm (Wallingford et al., 2019b). A factor that may influence male cannabis consumers' greater report of “crossing” in comparison to female cannabis consumers is male cannabis consumers' lower perception of risk associated with cannabis and their normalized risk-based behaviour following cannabis consumption (Wallingford et al., 2019b; Gabrys, 2019). The application of gender-clear criteria to guide future work is critical to understand better the masculine gender norms and the resulting inequities that are impacting the actions of male cannabis consumers.

Driving following the consumption of cannabis is classified as drug-impaired driving (Beirness & Porath-Waller, 2019). Drug-impaired driving is defined as “the operation of a motor vehicle while one’s ability is adversely affected by a drug, including illegal drugs, legal drugs, prescription drugs, over-the-counter medications and volatile inhalants such as toluene or nitrous oxide” (Beirness & Porath-Waller, 2019, p.2). Drug-impaired driving is illegal in Canada and classified as a criminal offence (Beirness & Porath-Waller, 2019). The impairments of action associated with cannabis consumption place cannabis consumers driving at a greater risk of harm. Notable performance deficits can include decreased abilities to react, visually function, concentrate, memorize, and pay attention to the environment on the road (Beirness & Porath-Waller, 2019; Canadian Centre on Substance Use and Addiction, 2019e; Canadian Centre on Substance Use and Addiction, 2019f). Among young drivers, driving following the consumption of cannabis was reported to be more common than driving following the consumption of alcohol (Beirness & Porath-Waller, 2019). Approximately 20% of young drivers reported having driven a car following the consumption of cannabis; this statistic was more frequently reported among males (Wallingford et al., 2019b; Beirness & Porath-Waller, 2019). Further, males were more likely to be a passenger of a driver who had consumed cannabis than females (Beirness & Porath-Waller, 2019).

The role of gender in the relationship of driving following the consumption of cannabis is clear, supported by the more common report of male cannabis consumers driving after consumption. The *Act* outlines to both “minimize illicit cannabis-related activities; reduce cannabis-related injustices on the criminal justice system of Canada; [and] promote the health risks associated with cannabis use to the public” (reference Table 1. Outlined Purposes of The *Act*). The report of male drug-impaired drivers counters the outlined purposes of the *Act*, enlightening Parliament that further work needs to be dedicated to understanding the role that gender plays in the conversation of cannabis.

Male and female cannabis-related risk-taking is seemingly influenced by gender norms and practices. The male perception of risk associated with cannabis is significantly lower than the female perception, with males using physical health harm as a threshold determinant of harm (Wallingford et al., 2019b). Aside from the male threshold of harm following consumption, male cannabis consumers have consistently reported a lower perception if the risk associated with cannabis consumption reflected in their earlier age of initiation, increased consumption frequency, and high report of risk-based activities following consumption (i.e. driving; Wallingford et al., 2019b). Males’ lack of perceived risk associated with cannabis consumption subjects males at greater risk associated with adverse impacts (Wallingford et al., 2019b). The gender norms of male cannabis consumers perpetuate the gender inequities they experience related to risk-based and impulsive behaviour associated with adverse harm (Gabrys, 2019). The gender inequities of male cannabis consumers not only impact the health and safety of the male cannabis consumer but place others at

potential risk of health and safety harm (Wallingford et al., 2019b).

4.6 Social Influence of Cannabis Consumption Experienced By Young Males

Cannabis is most commonly reported to be purchased by males (Canadian Centre on Substance Use and Addiction, 2021b). Because of the masculine behavioural practices that are tied to drug culture, males report a sense of responsibility to purchase cannabis because of the task tie to dangerous activity (Dahl & Sandberg, 2015; Canadian Centre on Substance Use and Addiction, 2021b). The discussed masculine behavioural practices are constructed because of gender norms influencing the actions of males and females. Male cannabis consumers have reported succumbing to dangerous tasks because of masculine gender norms; males often feel pressured to display masculinity or face taunting (Canadian Centre on Substance Use and Addiction, 2021b; Canadian Centre on Substance Use and Addiction, 2021a). Both males and females report to acknowledge that gender plays a large role in the purchasing of cannabis (Canadian Centre on Substance Use and Addiction, 2021b). Acknowledging the role that gender plays in cannabis is critical to better understanding the role and impact gender norms and inequities have on cannabis purchasing. The development of understanding and unpacking the role of gender in relation to cannabis purchasing will better protect young males in the *Act* guidelines. Male and female cannabis consumers and purchasers differ greatly.

As reported in 2021, social media has a role in the purchasing of cannabis. Both male and female social media users reported that it is more common for males to share their consumption, purchase, or sell cannabis on social media (Canadian Centre on Substance Use and Addiction, 2021b). Overall, it was reported that males share more content related to cannabis on their social media (Canadian Centre on Substance Use and Addiction, 2021b). Though males, compared to females, are more commonly reported to be the purchasers, consumers of cannabis, and sharers of cannabis content on social media, males have spoken at length about their fear of being judged or obtaining a bad social reputation that may impact their future (i.e. sports scholarships; Canadian Centre on Substance Use and Addiction, 2021b). Male cannabis purchasers and consumers report fears and apprehension about their actions, yet they continue to report the action. It can be observed that the male gender normality of defending male masculinity plays a role in cannabis purchasing and related action (Canadian Centre on Substance Use and Addiction, 2021b; Canadian Centre on Substance Use and Addiction, 2021a).

Social media not only plays a role in the purchasing of cannabis but in the consumption of cannabis (Canadian Centre on Substance Use and Addiction, 2021b). Young males and females discussed how cannabis was commonly positively portrayed on social media and other online platforms, contributing to the creation of curiosity among the younger population (Canadian Centre on Substance Use and Addiction, 2021b). This curiosity because of cannabis portrayal on social media and related platforms goes against the cardinal focus of the *Act* to protect young people from cannabis (Legislative Services Branch, 2022; Health Canada, 2018a; Government of Canada, 2021).

The male masculine experience of consuming cannabis varies significantly from the female feminine experience. Males have dominantly reported feeling a strong social pressure to consume large quantities of cannabis, a feeling minimally reported by females (Canadian Centre on Substance Use and Addiction, 2021b). For young males, cannabis consumption was correlated with the desire to connect with others and be part of a social group (Canadian Centre on Substance Use and Addiction, 2021b). Additionally,

young males discussed consuming cannabis under the influence of their peers and feeling a sense of peer pressure to partake (Canadian Centre on Substance Use and Addiction, 2021b). Gender norms and roles contribute to the masculine-associated feelings of pressure males experience. The competitive nature, risk-based action, and danger associated with drug consumption pressures males to display their masculinity with consumption (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2021b). Male and female cannabis consumers have reported that within the cannabis-consuming environment, methods of cannabis consumption are gendered, with regulated methods of cannabis consumption being associated with feminine practice (i.e. vaping) and unregulated methods of cannabis consumption are associated with masculine practice (i.e. edible drinks; Canadian Centre on Substance Use and Addiction, 2021b; Wallingford et al., 2019b). The unregulated methods of cannabis consumption that males commonly experience place male cannabis consumers at risk of over-consumption and cannabis-related intoxication and impairment (Canadian Centre on Substance Use and Addiction, 2020b). This social pressure to consume cannabis males report is the product of young males gender norms supporting the questioning of male-associated masculinity. The reported amount of cannabis consumption by male cannabis consumers articulated supports the cardinal need for gender-focused gender-clear data, research, and insights to inform the guidance of the *Act* to protect males and females best.

Males have commonly reported cannabis consumption through bongs, smoking, edibles, vaping, electronic cigarettes, water pipes, and edible drinks (Canadian Centre on Substance Use and Addiction, 2021b; Wallingford et al., 2019b). Male cannabis consumers frequently discussed creating and building their own hand-crafted bonds using household materials, commonly apples (Canadian Centre on Substance Use and Addiction, 2021b). Associated with cannabis consumption using a bong, male cannabis consumers spoke at length about the competitive nature tied to bong consumption. “Bong hit” competitions are quite common in practice, correlated with a large quantity of cannabis consumption (Canadian Centre on Substance Use and Addiction, 2021b; Canadian Centre on Substance Use and Addiction, 2021a). Specifically, young male cannabis consumers discussed how their masculinity was questioned or taunted if not taking “bong hits.” As previously discussed, bong hits are a highly unregulated form of cannabis consumption, subjecting consumers to cannabis-related intoxication and impairment (Canadian Centre on Substance Use and Addiction, 2021b; Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2020b). The discussed associated competitiveness young males report negatively is related to the impact that gender plays in cannabis consumption. This gender impact focused on masculinity negatively impacts male cannabis consumers within the cannabis consumption space. The gender inequities within the drug culture of cannabis negatively impact male consumers because of ties to masculinity, forcing male consumers, specifically young male consumers, to feel pressure to “prove” their masculinity through “bong hit” competitions.

4.7 Negative Health Impacts for Males

As previously explored, cannabis is associated with both short-term effects and long-term risks (reference section 2.2.1 Short-Term Effects and section 2.2.2 Long-Term Risks). Notable short-term effects of cannabis can include but are not limited to, feelings of euphoria and relaxation, changes in an individual's perception, time distortion, challenged attention and memory, and physical changes such as an increase in heart rate, blood pressure, and impaired motor

functioning (Konefal, 2019). Specific to regular cannabis consumers, common health risks include coughing, wheezing, throat soreness, chest tightening, and a hoarse voice (Renard, 2021). The greater quantity of cannabis consumption increases the consumer's risk of psychosis, comprised of delusions, paranoia, and disassociation (Konefal, 2019).

It is commonly reported that males consume cannabis on a regular basis, inducing mild but measurable impacts on their cognitive functioning (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2022c). Cannabis consumption induces changes in the brain's natural reward pathways, altering an individual's brain structure (Canadian Centre on Substance Use and Addiction, 2022c). Because of males' common consumption, male cannabis consumers place themselves at greater risk of attention deficits (Gabrys, 2019). Research highlights the prevalent cannabis consumption of young males, placing young male cannabis consumers in positions of greater health risks associated with cannabis use in comparison to female cannabis consumers (Wallingford et al., 2019b). It is critical an understand that the motivations behind greater and regular cannabis consumption are tied to male consumers. The impact of gender is needed to be unpacked to start understanding the role and influence that gender plays in cannabis consumption, tied to the impacts of cannabis consumption. By understanding the role of gender with young males prior to cannabis consumption, an understanding can be developed for young male cannabis consumers mitigating the health impacts of cannabis consumption. The previous work discussed demands that research meets gender-clear criteria, exploring and addressing the role that gender plays in impacting gender -norms and -relations with masculine drug culture.

Depression is defined as "persistent depressed mood or anhedonia (i.e., lack of interest or pleasure in all or most activities; Konefal, 2019, p.5). Research has indicated that depression is often related to regular cannabis consumption among young male cannabis consumers (Konefal, 2019). Analysis of depression has concluded that consuming cannabis before the age of 25 is commonly correlated with severe signs of depression, placing young males at the greatest risk of depression development (because of early ages of cannabis consumption initiation; Konefal, 2019; Wallingford et al., 2019b). CUD is the product of regular cannabis consumers' development of cannabis dependence (Canadian Centre on Substance Use and Addiction, 2020k). Cannabis consumers with CUD often show signs of depression (Konefal, 2019). Notably, the consumption of cannabis has been tightly tied to negatively influencing consumers' mental health, often resulting in signs of depression (Konefal, 2019). Among males, suicidal ideation and cannabis consumption have been reported, concluding that males have a higher rate of suicide completion associated with cannabis consumption (Konefal, 2019). The discussed research notes the impacting role of gender in the conversation of cannabis consumption. It is critical that work be dedicated to understanding this role to understand better the resources needed to support male cannabis consumers' mental health.

Cannabis-related hospitalizations are heavily populated by males aged 15 to 24, accounting for approximately 65% of hospitalizations (Canadian Centre on Substance Use and Addiction, 2020k). Following the legalization of cannabis in 2018, hospitalization correlated with cannabis consumption increased by 250%, reportedly commonly tied to mental and behavioural disorders (Legislative Services Branch, 2022; Canadian Centre on Substance Use and Addiction, 2020k). Of young males specifically, 18.7% report regularly consuming cannabis (Canadian Centre on Substance Use and Addiction, 2020k). Psychotic disorders were more commonly reported, accounting for

approximately 33% of hospitalizations (Canadian Centre on Substance Use and Addiction, 2020k). The increase in hospitalizations is potentially tied to Canada's continued and growing production of high-potency cannabis (Canadian Centre on Substance Use and Addiction, 2020k). Reflecting on the growing hospitalization statistics reported by male cannabis consumers is an increasing demand to understand better the role gender plays in the perception of cannabis consumption initiation and associated cannabis risk. The need to explore the role that gender plays in cannabis consumption is once again brought up.

4.8 Biological Male Differences

When CUD has developed, individuals face changes to their risk-taking and brain activity (Gabrys, 2019). It is recommended that individuals seek treatment once CUD has onset (Gabrys, 2019). CUD is associated with cannabis consumers who consume cannabis because of cannabis dependence (Canadian Centre on Substance Use and Addiction, 2020k). Approximately 16% of young male and female cannabis consumers will develop cannabis dependence, increasing their later-in-life risk of CUD development (Canadian Centre on Substance Use and Addiction, 2020k). CUD is highly prevalent among male cannabis consumers, specifically male cannabis consumers who initiated cannabis consumption at an early age (Wallingford et al., 2019b). Commonly male cannabis consumers' response and tolerance of higher quantities of cannabis are tied to CUD development (Wallingford et al., 2019b). Further, as previously discussed, young males have reported a high frequency of "crossing" alcohol and cannabis, increasing their risk for CUD development (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2020f). Upon the development of CUD, individuals face changes to their risk-taking and behaviour activities (Gabrys, 2019). It is recommended that individuals seek treatment once CUD has onset (Gabrys, 2019). Male cannabis consumers, from a biological perspective, place themselves at greater risk of health harm associated with cannabis consumption.

To discuss biological male differences, sex and gender play a role in the interaction of cannabis (Konefal, 2019). Biological factors that influence the health effects of cannabis consumption can include metabolism, hormones, anatomy, and/or organ function (Canadian Centre on Substance Use and Addiction, 2021b). As previously discussed, cannabis is associated with short-term effects and long-term risks; reference section 2.2.1 Short-Term Effects and section 2.2.2 Long-Term Risks. Regular consumption of cannabis has been correlated with the development or symptomology of schizophrenia and psychosis among males (Konefal, 2019; Canadian Centre on Substance Use and Addiction, 2022i; Canadian Centre on Substance Use and Addiction, 2020j). Individuals who have developed or have had symptoms of schizophrenia and psychosis commonly consume cannabis frequently (Konefal, 2019). Clinical research by Konefal (2019) has identified that in comparison to females, the male onset of schizophrenia and psychosis is earlier in age (Konefal, 2019). Again it is concluded that male cannabis consumers, from a biological perspective, place themselves at greater risk of negative health effects following the consumption of cannabis.

4.9 Associated Challenges for Males Seeking Help Related to Cannabis

A common feeling males report is a sense of pressure to consume cannabis (Canadian Centre on Substance Use and Addiction, 2021b). Cannabis consumption was reported to be strongly associated with masculinity, reported by both males and females (Canadian Centre on Substance Use and Addiction,

2021b). Thus, the consumption of cannabis for males is tied to their masculinity, making the limitation or declination of consumption feel as though their male masculinity may be jeopardized (Canadian Centre on Substance Use and Addiction, 2021b). The sense of pressure males experience related to cannabis is not limited to consumption. However, males report feeling pressure to sell, purchase, and competitively consume cannabis (Canadian Centre on Substance Use and Addiction, 2021b). This discussed sense of pressure creates a barrier for males to seek help related to cannabis consumption (Canadian Centre on Substance Use and Addiction, 2018).

Approximately 16% of Canadians reported that they lack knowledge related to cannabis, specifically failing to understand the adverse impacts of cannabis consumption (Canadian Centre on Substance Use and Addiction, 2018). In connection with this reported lack of knowledge, males reported a low perceived risk of cannabis-related health harm (Wallingford et al., 2019b). This low perceived risk of cannabis-related health harm contributes to males' continued report of decreasing perceived cannabis-related risk and growing consumption of cannabis associated with cannabis dependence and CUD as males age (Wallingford et al., 2019b). Research suggests that you are not made aware of the risks associated with cannabis consumption, specifically drug-impaired driving, secondhand smoke, regulations on cannabis, addiction to cannabis, and cannabis intoxication (Wallingford et al., 2019b). When individuals do not understand the harms related to cannabis, individuals cannot seek help.

As reported in 2021 by the CCSA, when young males were asked how they would help a friend with identified problematic cannabis use, males commonly responded that they would provide a form of shelter as an alternative to addressing their friend's cannabis use with a form of authority. Males reported feeling like they would be a more effective resource to help their friends than figures of authority (Canadian Centre on Substance Use and Addiction, 2021b). This reported a feeling of help by males created a barrier to males being able to provide resources to help friends and others with problematic cannabis use. Other males reported helping they would take aggressive approaches such as breaking their friend's method of cannabis consumption (i.e. breaking their bong) or cutting their friend off from their dealer (Canadian Centre on Substance Use and Addiction, 2021b). This reported behaviour by males to fail to seek authoritative and professional cannabis-related support can be correlated with masculine ties to be independent, not wanting their friend or their masculinity to be questioned related to the masculine nature of cannabis drug culture (Dahl & Sandberg, 2015).

4.10 Inclusion Scores: Corporate Reports, Reports, and Report Summaries Versus Infographics

Using a GIS, 44 CCSA publications were assigned a GIS inclusion score, used to analyze and understand the relationship between the inclusion of gender within the CCSA publications. This method utilizes a mixed-methods approach, including conducting a qualitative CDA and using quantitative visualizations to support content analysis (Williams, 2007). The GIS was adapted from Greaves, Pederson, & Poole's (2019) work within the CCSA article titled Sex, Gender and Equity Analyses (2019). The GIS classifies each publication using a scoring system. Score one represents texts that are gender injustice, perpetuating gender -inequities, -inequities, and -discrimination. Score two represents texts that are gender-simple, neglecting to consider the role and impact of gender norms and relations. Score three represents gender-conscious, acknowledging the role and impact of gender norms and relations, though fails to address the

associated inequities individuals experience. Score four represents texts that are gender-trained, supporting and understanding the role of gender norms and relations, examining the varied needs of individuals associated with gender. Score five represents texts that are gender-clear, identifying gender inequities impacting individuals and further exploring and addressing areas to transform the harmful role and impact of gender norms and relations, reference Table 7. Gender Inclusion Scale Defined.

The achievement of inclusion is the goal of CCSA research, moving projects from being gender injustice (score one) to gender-clear (score five; Candian Centre of Substance Use and Addiction, 2019g). The achievement of gender-clear research addresses gender inequities, facilitating inclusion within research and improving both male and female health (Candian Centre of Substance Use and Addiction, 2019g).

Corporate reports, reports, and report summaries cover the research conducted by the CCSA on their reduction of harms associated with problematic substance use, specifically cannabis consumption (Canadian Centre on Substance Use and Addiction, 2022g). The aim of the work is to gain a better understanding of Canadians' cannabis usage (Canadian Centre on Substance Use and Addiction, 2022g). The corporate reports, reports, and report summaries share the CCSA's in-depth understanding of cannabis consumption (Canadian Centre on Substance Use and Addiction, 2022g). Of the 29 corporate reports, 12 keywords were associated with the publications. The most prevalent keyword appearance was “cannabis,” with 29 appearances, followed by “youth,” with 13 appearances, and “health effects,” with seven appearances. Reference Table 10. Corporate Reports, Reports, and Report Summaries Keyword Appearances for the full list of keywords with associated appearances.

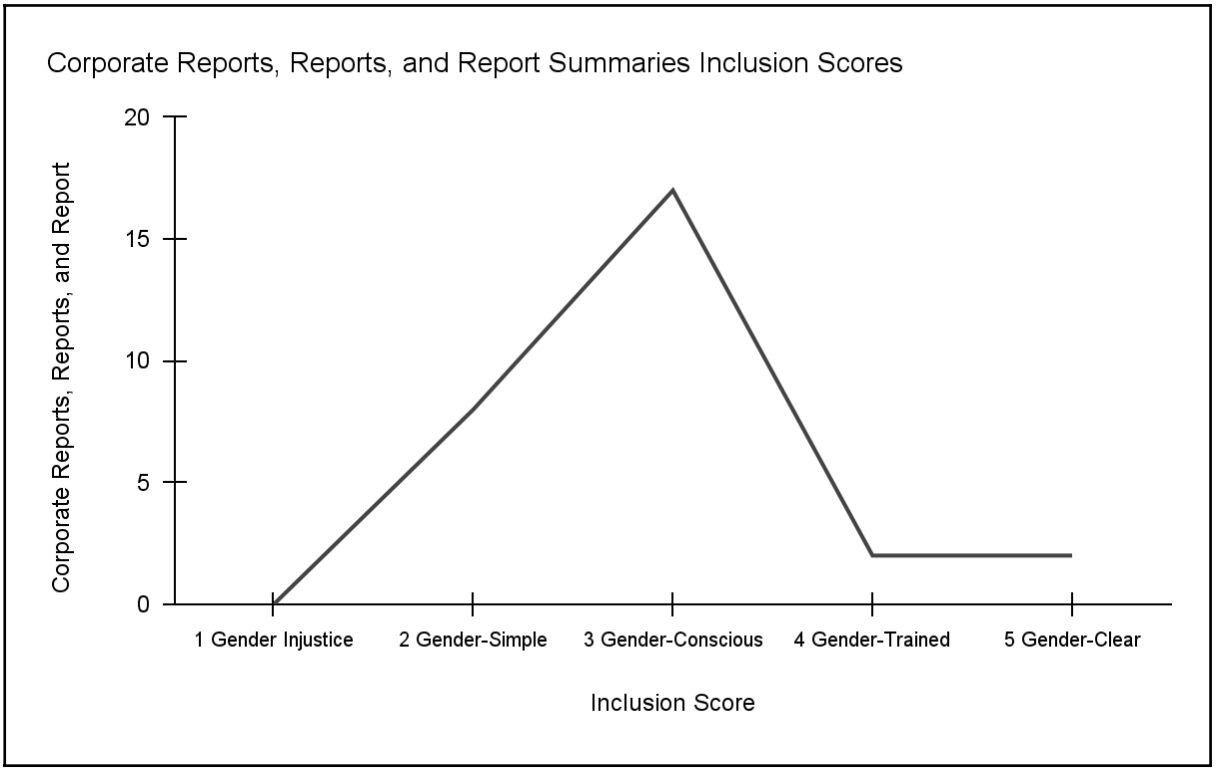
Table 10. Corporate Reports, Reports, and Report Summaries Keyword Appearances

Keyword	# of Appearances
Cannabis	29
Youth	13
Health Effects	7
Mental Health	3
COVID-19	2
Impaired Driving	1
Vaping	1
Alcohol	1
Substance Use Disorder	1
Harm Reduction	1
Policy	1
Women	1

The most prevalent inclusion score for the observed CCSA corporate reports, reports, and report summaries was three, gender-conscious, with 17 publications matching classification criteria, reference Table 8. Gender Inclusion Scale and CCSA Corporate Reports, Reports, and Report Summaries Inclusion Score (Canadian Centre on Substance Use and Addiction, 2018; Wallingford et al., 2019a; Konefal, 2019; Canadian Centre on Substance Use and Addiction, 2020k; Cooke et al., 2020a; Cooke et al., 2020b; Cooke et al., 2020c; Cooke et al., 2020d; Cooke et al., 2020e; Cooke et al., 2020f; Cooke et al., 2020g; Cooke et al., 2020h; Cooke et al., 2020i; Canadian Centre on Substance Use and Addiction, 2022d; Canadian Centre on Substance Use and Addiction, 2022j; Canadian Centre on Substance Use and Addiction, 2022d; Canadian Centre on Substance Use and Addiction, 2022c). Figure 5. Corporate

Reports, Reports, and Report Summaries Inclusion Scores display the need for gender inclusion, with only two reports achieving a score of four, gender-trained (Wallingford et al., 2019b; Beirness & Porath-Waller, 2019), and two reports achieving a score of five, gender-clear (Canadian Centre on Substance Use and Addiction, 2020d; Canadian Centre on Substance Use and Addiction, 2021b).

Figure 5. Corporate Reports, Reports, and Report Summaries Inclusion Score



The average score of the corporate reports, reports, and report summaries was 2.93, classified as score three gender-conscious. On the continuum of the GIS, there is potential to achieve inclusive research that is score four, gender-trained, and score five, gender-clear (Candian Centre of Substance Use and Addiction, 2019g).

Average Score Corporate Reports, Reports, and Report Summaries Formula: m = [(inclusion score one x number of corporate reports, reports, and report summaries scored one) + inclusion score two x number of corporate reports, reports, and report summaries scored two) + (inclusion score three x number of corporate reports, reports, and report summaries scored three) + (inclusion score 4 x number of corporate reports, reports, and report summaries scored four) + (inclusion score five x number of corporate reports, reports, and report summaries scored five)] / number of corporate reports, reports, and report summaries.

2.93 = [(1X0) + (2X8) + (3X17) + (4X2) + (5X2)] / 29

Covered in the corporate reports, reports, and report summaries included information on:

(1) Cannabis consumption among young people;
(2) The impact of cannabis consumption with early initiation;
(3) Specific information on young male cannabis consumption;
(4) The male perception of cannabis;
(5) Male risk-taking and cannabis;

(6) The social influence of cannabis consumption experienced by young males;
(7) Negative health impacts for males associated with cannabis consumption;
(8) Biological male differences impacting cannabis consumption; and
(9) Associated challenges for males seeking help related to cannabis consumption.

Infographics share critical information with the public about the harms related to problematic substance use, specifically cannabis consumption (Canadian Centre on Substance Use and Addiction, 2022g). The CCSA infographics aim to protect the health and safety of the public by sharing critical information through the written word and visualizations. Of the 15 infographics, 11 keywords were associated with the publications. The most prevalent keyword appearance was "cannabis," with 15 appearances, followed by "health effects," with six appearances, and "COVID-19," with four appearances. Reference Table 11. Infographics Keyword Appearances for the full list of keywords and associated appearances.

Table 11. Infographics Keyword Appearances

Keyword	# of Appearances
Cannabis	15
Health Effects	6
COVID-19	4
Youth	3
Mental Health	3
Vaping	2
Harm Reduction	1
Perscription Drugs	1
Alcohol	1
Substance Use Disorder	1
SGBA+	1

The most prevalent inclusion score for the observed CCSA infographics was two, gender-simple, with 12 publications matching classification criteria, reference Table 9. Gender Inclusion Scale and CCSA Infographics Inclusion Score (Canadian Centre on Substance Use and Addiction, 2019a; Canadian Centre on Substance Use and Addiction, 2019d; Canadian Centre on Substance Use and Addiction, 2019f; Canadian Centre on Substance Use and Addiction, 2019c; Canadian Centre on Substance Use and Addiction, 2019e; Canadian Centre on Substance Use and Addiction, 2020a; Canadian Centre on Substance Use and Addiction, 2020b; Canadian Centre on Substance Use and Addiction, 2020e; Canadian Centre on Substance Use and Addiction, 2020g; Canadian Centre on Substance Use and Addiction, 2020i; Canadian Centre on Substance Use and Addiction, 2020j; Canadian Centre on Substance Use and Addiction, 2022e). Figure 6. Infographics Inclusion Scores display the need for gender inclusion, with only two reports achieving a score of three, gender-conscious (Canadian Centre on Substance Use and Addiction, 2019b; Canadian Centre on Substance Use and Addiction, 2022i), one report achieving a score of four, gender-trained (Canadian Centre on Substance Use and Addiction, 2021a), and no reports achieving score five, gender-clear.

The average score of the infographics was 2.27, classified as gender simple. On the continuum of the GIS, there is potential to achieve inclusive research that is score three, gender-conscious, score four, gender-trained, and score five, gender-clear (Candian Centre of Substance Use and Addiction, 2019g).

Average Score Infographics Formula: m = [(inclusion score one x number of

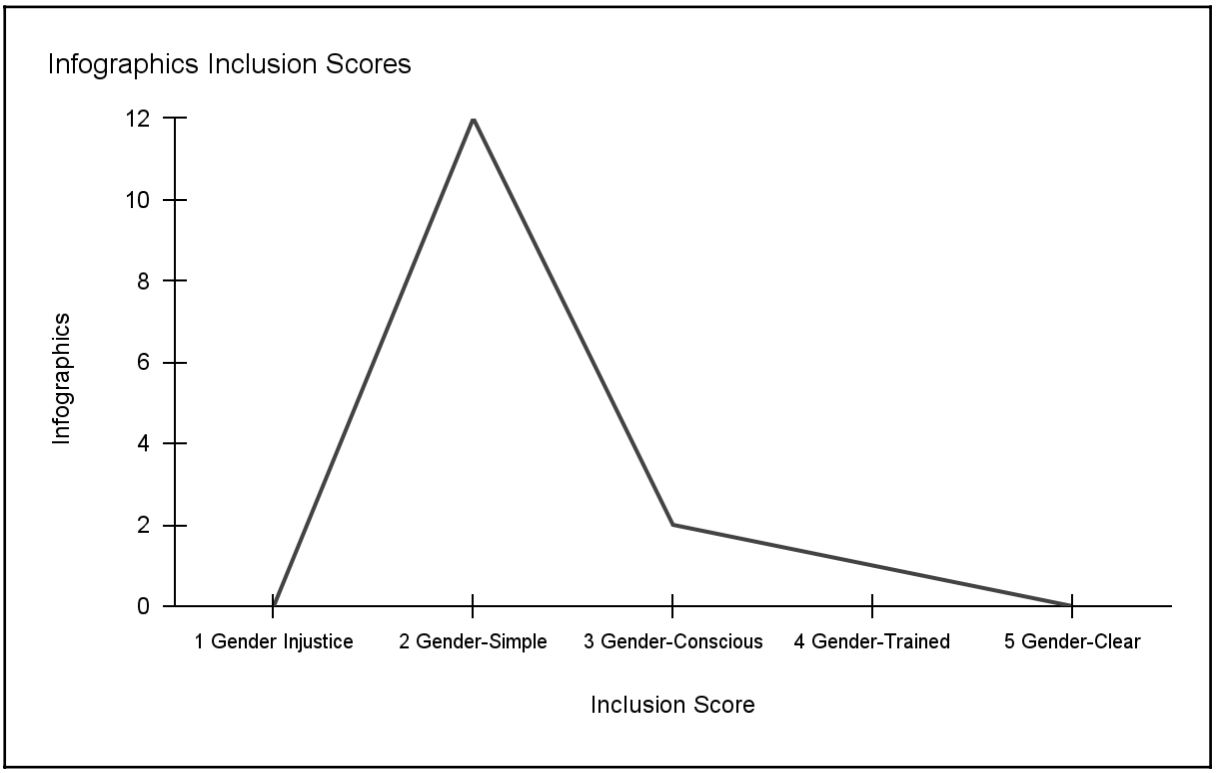
infographics scored one) + inclusion score two x number of infographics scored two) + (inclusion score three x number of infographics scored three) + (inclusion score 4 x number of infographics scored four) + (inclusion score five x number of infographics scored five)] / number of corporate reports, reports, and report summaries.

2.27 = [(1X0) + (2X12) + (3X2) + (4X1) + (5X0)] / 15

Covered by the infographics included brief information on:

(1) Cannabis use among students;
(2) Methods of cannabis consumption;
(3) Safety related to cannabis;
(4) Health risks associated with cannabis;
(5) Cannabis and alcohol;
(6) Harm reduction related to cannabis consumption;
(7) Male and female perceptions of cannabis;
(8) Cannabis and COVID-19; and
(9) Cannabis and mental health.

Figure 6. Infographics Inclusion Scores

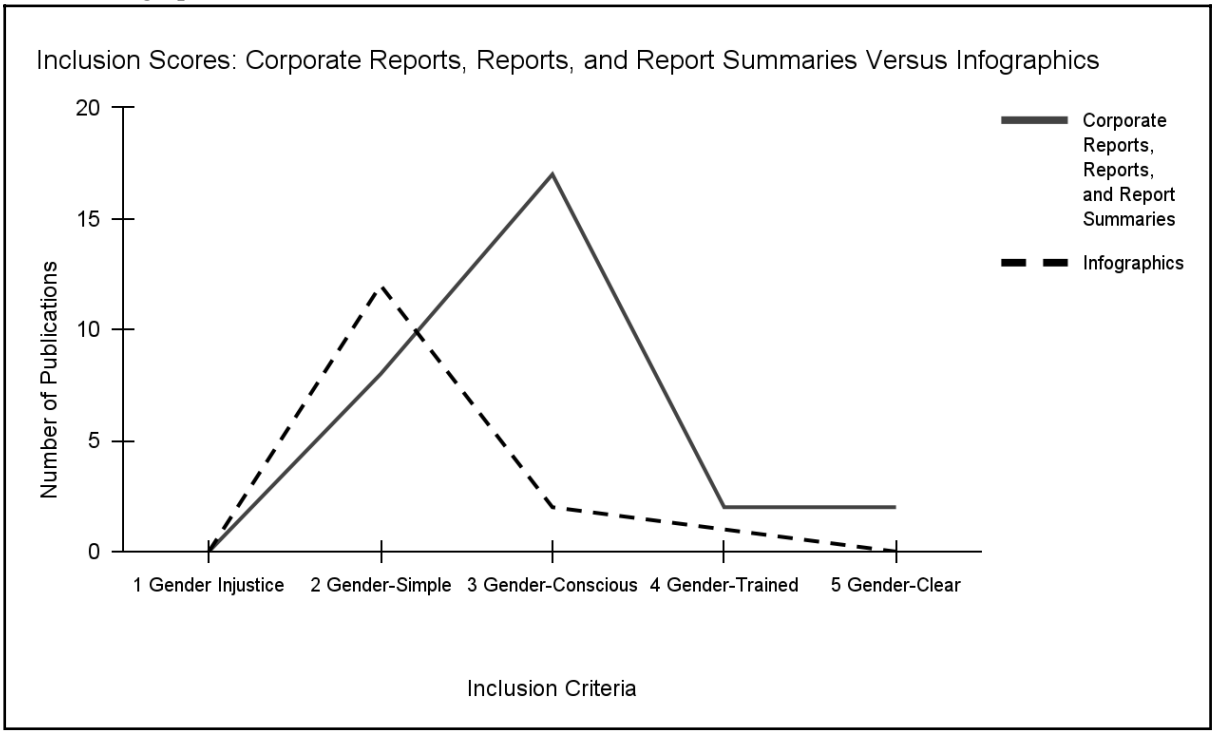


To note, there are very clear gaps in the depth of knowledge between the CCSA corporate reports, reports, and report summaries in comparison to the CCSA infographics. To provide context, corporate reports, reports, and report summaries are written documents of text with varying lengths. In contrast, the standard infographics analyzed are comprised of one page, filled with written and visual information. The reports provide a plethora of data to analyze and serve as a strong foundational knowledge to readers and researchers. In contrast, the infographics provide limited data to analyze due to the restricted length and nature of visual information. Compared to infographics, there are clear gaps in the depth of information delivered between the corporate reports, reports, and report summaries. The reports provide a much deeper source of knowledge

on the relationship between gender and cannabis consumption.

All analyzed CCSA publications comprising corporate reports, infographics, reports, and report summaries need improved gender inclusion. A clear gap is observed between the inclusion of gender within the report information in comparison to the infographic information. When averaging the corporate reports, reports, and report summaries GIS inclusion scores, the average score is score three, gender-conscious (reference section 4.10.2 Corporate Reports, Reports, and Report Summaries Inclusion Scores average formula). When averaging the infographics GIS inclusion scores, the average score is score two, gender-simple (reference section 4.10.3 Infographics Inclusion Scores average formula. Reference Figure 7. Inclusion Score: Comparison Between Corporate Reports, Reports, and Report Summaries Versus Infographics to see a visual comparison of the corporate reports, reports, and report summaries versus the infographics.

Figure 7. Inclusion Score: Comparison Between Corporate Reports, Reports, and Report Summaries Versus Infographics



Visualized in Figure 7. Inclusion Score: Comparison Between Corporate Reports, Reports, and Report Summaries Versus Infographics, the corporate reports, reports, and report summaries average a higher GIS inclusion score in comparison to the infographics. The report's GIS inclusion score average is gender-conscious (score three), whereas the infographic's GIS inclusion score average is gender-simple (score two). However, when plotting the timeline of publications on a scatter plot, visualized in Figure 8. Inclusion Score: Timeline, it is evident that corporate reports, reports, and report summaries are trending to lower inclusion scores from 2018-2022, trending down, whereas infographics are trending to higher inclusion scores from 2018-2022, trending up. It is critical to acknowledge the differences in the quantities of publications. The corporate reports, reports, and report summaries comprise 29 publications, whereas the infographics comprise 15 publications. It is critical that the gender-inclusive GIS gender-clear research of the corporate reports, reports, and report summaries, specifically for

males, are represented among the infographics publications. Further, researchers and other stakeholders must work to improve gender inclusion in the future; gender-inclusive work can serve to protect the health of Canadians better.

The CCSA associates each publication with a keyword or a series of keywords. Keywords serve as an overview of the information discussed within each publication. The corporate reports, reports, and report summaries featured 12 keywords. The infographics featured 11 keywords. Among all of the analyzed publications, "cannabis" was the prevalent keyword, with "youth," "health effects," "COVID-19," and "mental health" being common keywords in addition.

Figure 8. Inclusion Score: Timeline

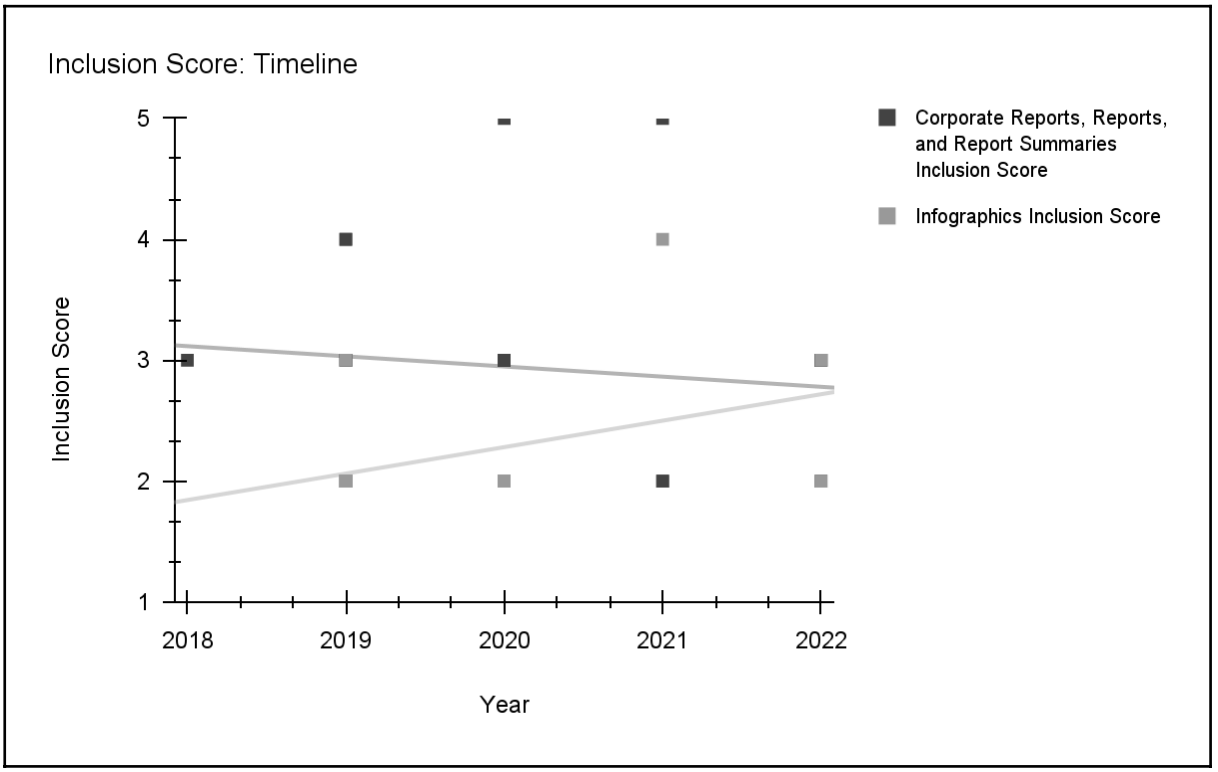


Table 12. Keyword Appearances: Corporate Reports, Reports, and Infographics Versus Infographics

Keyword	# of Appearances in Corporate Reports, Reports, and Report Summaries	# of Appearances in Infographics
Cannabis	29	15
Youth	13	3
Health Effects	7	6
COVID-19	2	4
Mental Health	3	3
Vaping	1	2

Alcohol	1	1
Substance Use Disorder	1	1
Harm Reduction	1	1
Impaired Driving	1	0
Policy	1	0
Women	1	0
Perscription Drugs	0	1
SGBA+	0	1

Notably, a large gap in keyword inclusion of the keyword "youth" is observed. On average, 45% of the corporate reports, reports, and report summaries focused on youth, whereas only 20% of the infographics focused on youth. Targeting youth, specifically male youth, is critical in the education, protection of health, and facilitation of safety related to cannabis, the goal of The Cannabis Act (Legislative Services Branch, 2022; Health Canada, 2018a; Government of Canada, 2021). The CCSA corporate reports, reports, and report summaries cover critical information related to the impact of cannabis consumption, specific to young males.

4.11 Limitations

Limitations of this research include but are not limited to the varying amount and strength of cannabis in numerous forms (i.e. joint), self-reported cannabis data, lack of cannabis smoke exposure to evaluate full impact, and minimal research to support long-term regular smokers. Cannabis strength can vary based on the product, greatly impacting the experience of the consumer (Renard, 2021). Research has indicated that subjects who consume cannabis often underreport the quantity of cannabis they consume (Renard, 2021). Further, research has identified a lack of support in studying younger individuals in relation to cannabis consumption due to their lack of significant exposure to cannabis (Renard, 2021).

5. Conclusion

The application of the GIS to the CDA analyses the primary gap of information delivered with the examined CCSA corporate reports, reports, and report summaries compared to the examined CCSA infographics. Apparent gender differences were distinguished among the work of CCSA -corporate reports, -reports, -report summaries, -provincial patterns and trends, and CCS results, supporting the recognized need for gender inclusion within the *Act*, public health work informing the *Act*, and public health research. Gender clearly impacts youth cannabis consumption, identified and discussed at length within the CCSA corporate reports, reports, and report summaries, and briefly among CCSA infographics; specifically the age of initiation, mental health, cannabis dependence, CUD development, the perception of risk associated with cannabis, the environment in which cannabis consumed, the purchasing of cannabis, the purchasing practices of cannabis, the method of cannabis consumption, "crossing," drug-impaired driving, and quantity of cannabis (Wallingford et al., 2019b; Canadian Centre on Substance Use and Addiction, 2021b; Konefal, 2019;

Gabrys, 2019; Beriness & Porath-Waller, 2019).

Within the environment of cannabis consumption, the CCSA data concludes that male cannabis consumers face elevated susceptibility to health risks and detrimental harms related to cannabis consumption. The consumption of cannabis is strongly tied to conventional masculine -norms, -practices, and -behaviours, specifically masculine risk-taking with drug consumption. Because of traditionally gendered drug cultures, females are often excluded from environments of drug consumption, protecting them from the deleterious impacts of drug (i.e. cannabis) consumption (Wallingford et al., 2019b; Dahl & Sandberg, 2015). The analyzed research of this study has highlighted males exhibit greater propensities for risk-taking, compared to females, in environments of cannabis consumption, specifically male youth compared to female youth. Risks frequently associated with male cannabis consumption include illicit cannabis purchasing and consumption, drug-impaired driving, the quantity of cannabis consumption, and "crossing" (Canadian Centre on Substance Use and Addiction, 2021b; Canadian Centre on Substance Use and Addiction, 2020b; Gabrys, 2019; Beirness & Porath-Waller, 2019). The perception of risk associated with cannabis consumption by male youth possesses a significant impact correlated to male youth cannabis consumption. The analyzed CCSA corporate reports, reports, and report summaries discuss the persistent cannabis consumption patterns observed in male adolescents through young adulthood (Wallingford et al., 2019a). As male youth continue to consume cannabis from a young age, cannabis and cannabis consumption becomes normalized (influencing the male perception of cannabis); in contrast, the same normalization is not as prevalent among female cannabis consumers (Wallingford et al., 2019a; Wallingford et al., 2019b). This discussed normalization of cannabis consumption among male youth subjects male youth fails to be addressed by governing bodies protecting Canadians (i.e. The *Act*), specifically Canadian youth, from the harms related to cannabis; the governing bodies need to support their work with gender-inclusive gender-clear research. In alignment with the *Act*, Canada must focus on mitigating the adverse health risks associated with cannabis consumption, supported by the production of gender-inclusive gender-clear research (Legislative Services Branch, 2022). Gender-clear work as outlined by the GIS embodies work that identifies gender inequities that impact individuals of varying gender identities. The work explores and addresses areas in environments (i.e. drug culture) that can transform the harmful role and impact that gender -norms and -relations play in the environment.

The research proposes gender inclusion as a means to better safeguard Canadians, specifically Canadian youth, from the adverse health risks and harmful impacts of cannabis consumption. It is critical governing bodies influencing the safety and protection of Canadians related to cannabis (i.e. The *Act*) recognize gender as an influential factor influencing the gendered experiences within environments of cannabis consumption. The *Act*, along with other public health research sources, policies, and practices, need to be better informed with a comprehensive knowledge and understanding of the role, impact, and correlations of gender within environments of cannabis consumption to better guide and determine the protection of Canadians, specifically Canadian youth's health and safety.

The application of the GIS effectively supported the CDA focus on the correlation between cannabis consumption and gender of Canadian youth. The GIS is comprised of five scores associated with differing levels of gender inclusion; scores for least to most inclusive include gender injustice, gender-simple, gender-conscious,

gender-trained, and gender-clear. The research recognizes the critical value of including gender within public health research. The GIS can be applied to a wide range of research-based work, including written, verbal, and visual information. The GIS facilitates the production of gender-inclusive research, the evaluation of gender inclusion, and identifies areas requiring improvement to include gender better.

The research study recognizes the critical value of gender inclusion within public health research, yielding a GIS Tool to employ gender-inclusive research production, GIS score identification, and identified areas where gender inclusion could be improved in effective incorporation within public health research. The GIS Tool offers a guiding checklist for users to apply in the initial stages of research development to serve as a resource for assessing gender inclusion and guiding their future work. The GIS Tool establishes clear criteria for each GIS score, allowing users to comprehend and classify the extent of gender inclusion their work has achieved. The GIS Tool is research-driven, serving as a resource that can be used among a plethora of research environments. The GIS Tool is not limited to cannabis research but can be transferred to all research within the public health research environment. Reference Table 13. GIS Tool.

Gender plays a significant role within the environments of youth, emphasizing the critical demand for gender-inclusive gender clear research to inform policies to address persistent gender inequities and correlate with adverse health risks and harm. The research study highlights the significant value of identifying, exploring, and understanding gendered experiences to protect Canadians' health better. Gender-clear work challenges gendered -stereotypes and -biases, advocating for a gender-inclusive future. To achieve gender inclusion, it is critical that the role of gender be understood within the environment. The application of the GIS Tool facilitates users in the outlining of gender-inclusive research, identification of gender-inclusion of work, and identifying ways to improve the gender-inclusion of their work. The GIS Tool, Gender Inclusion Checklist, further serves as a preliminary checklist to guide work to ensure gender-inclusive gender-clear work production. The GIS Score and Evaluation serve to guide users in scoring and evaluating their work, providing the characterizations and components of each score.

Table 13. Gender Inclusion Scale (GIS) Tool

Gender Inclusion Scale (GIS) Tool
Gender Inclusion Checklist
☐ Gendered experiences within the environment are explored in depth, considering the role that gender plays within the experiences and related experiences within the environment. ☐ The role that gender plays within the experience is identified by varying individuals of varying gender identities. ☐ Clear identification of gender inequities within the environment ☐ Addresses gender -norms and -relations that influence the functioning of the environment ☐ Challenge gender -stereotypes and -biases, ensuring no usage of gender -stereotypes and -biases within the environment ☐ Promotion of gender inclusion is clear, focusing on exploration better to understand the role of gender within the environment
GIS Score and Evaluation

GIS Score	GIS Evaluation
1	Gender Injustice: *perpetuates gender -inequities, -inequalities, and -discrimination* ● Characterized by the failure of the work to include and consider the role of gender within the environment. ● The work exemplifies no consideration of gender equality, contributing to continued systemic gender discrimination. ● Rampant usage of gender -stereotypes and -based discrimination, not gender-sensitive.
2	Gender-Simple: *neglects to consider the role and impact of gender norms and relations* ● The work considers gender at a basic level, acknowledging the different experiences individuals of varying gender identities may have (commonly exclusively acknowledging male and female). ● The role that gender plays within the environment is not discussed. ● Some usage of gender -biases and -stereotypes.
3	Gender-Conscious: *acknowledges the role and impact of gender norms and relations, though fails to address the associated inequities individuals experience* ● The work promotes gender equality and inclusion, focusing on the role that gender plays within the environment. ● Fails to understand and address the associated gender inequities tied to the environment. ● Clear respect for gender, a basic understanding of gender inclusivity.
4	Gender-Trained: *supports and understands the role of gender norms and relations, examining the varied needs of individuals associated with gender* ● Characterized by the work's understanding of the role that gender plays within the environment, gender inclusion is integrated throughout the work. ● Explores some of the inequities associated with different gender identities, acknowledging the role gender plays in the experience. ● The work facilitates the inclusion and acknowledgement of gendered -experiences and -representations, with no usage of gender -stereotypes and -biases
5	Gender-Clear: *identifies gender inequities impacting individuals, further exploring and addressing areas to transform the harmful role and impact of gender norms and relations* ● Clear identification, exploration, and understanding of gender inequities individuals of all gender identities experience. ● The work contributes to the transformation of gender inclusion through the address of gender -norms and -relations, committed to advocating gender justice. ● Challenges gender -stereotypes and -biases, actively promoting the value of gender inclusion.

The research acknowledges the emphasis on the negative health risks and impacts associated with cannabis consumption. The research would like to acknowledge the health benefits of cannabis consumption. The CCSA has identified evidence that cannabis can be effective in treating symptoms related to some chronic conditions (nausea, vomiting, and pain; Canadian Centre on Substance Use and Addiction, 2020d). Cannabis cannabinoid THC is recognized to have a therapeutic effect, and cannabinoid CBD is recognized to relieve pain, anxiety, and other chronic conditions (under medical usage; Canadian Centre on Substance Use and Addiction, 2023).

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