

A Public Health Approach to Gambling:

A report prepared for Gambling Research Exchange Ontario (GREO)

Final Report

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BACKGROUND

Health agencies such as the World Health Organization (WHO) do not consider gambling a public health issue, and as a consequence there are no global public health frameworks for gambling (Adams et al., 2009). In contrast, in tobacco control for example, the WHO Framework Convention on Tobacco Control (FCTC) led to substantial increases in global evidence-based tobacco control policies and consequently had significant impacts on tobacco consumption, prevention, and harm reduction (such as exposure to second-hand smoke) (WHO, 2014).

The need for a public health approach to gambling is particularly critical as gambling enters a new era. No longer is gambling confined to designated spaces such as casinos or racetracks, but instead the availability of gambling is becoming easily accessible through internet gaming, mobile applications, access to free gambling practice sites, and increased promotion and advertising such as televised poker matches. It is unknown what impact the widespread availability of gambling opportunities will have on gambling participation, attitudes towards gambling, harms from gambling, and problem gambling. What is known is that, from a public health perspective, increasing opportunities for gambling participation is the opposite approach to regulation compared to how addictive substances such as alcohol and tobacco have been regulated. The purpose of this project was to attempt to inform the public health community about how gambling is a public health issue and how public health approaches can be used to address gambling and gambling harms.

A public health framework addressing the continuum of gambling risk is needed (Messerlian et al., 2005). Such a framework not only shifts the focus on problem gambling treatment to a broader consideration of primary and secondary problem gambling prevention strategies, but it also encourages attention to and prevention of gambling-related harms that do not reach the threshold of being considered “problem gambling” (Messerlian et al., 2005). This approach would incorporate a focus not only on risk to the gambler but also to families and communities impacted by gambling (Korn et al., 2003). There is existing literature examining how gambling harms warrant a multi-faceted, integrated public health approach across the continuum of gambling behavior. One component of the scoping review examines this literature and identifies frameworks for how public health can address gambling harms.

The WHO emphasizes the importance of the social determinants of health in their Commission on Social Determinants of Health in 2008. This document highlights the need to achieve health equity through action on the social determinants of health (WHO, 2008), which the WHO categorizes further into structural determinants and intermediary determinants. Structural determinants of health are those that “generate stratification and social class divisions in society and that define individual socioeconomic position...” Structural determinants have also been referred to as “the social determinants of health inequities” (WHO, 2010). The key structural determinants are: income, education, occupation, social class, gender, and race/ethnicity (Solar &

Irwin, 2010). Intermediary determinants of health shape health outcomes. The main intermediary determinants of health include: material circumstances (e.g., housing, neighbourhood quality), psychosocial circumstances (e.g., psychosocial stressors, social support, coping), behavioural and biological factors (e.g., nutrition, physical activity, tobacco consumption, genetic factors) (WHO, 2010).

Previous research on addictive substances has found that individuals who are from a more socially and/or economically disadvantaged group are more likely to use substances to deal with their life circumstances (WHO, 2003), and that use of these substances also leads to decreases in social and economic conditions (WHO, 2003). Thus addiction can both be a consequence of the social determinants of health and a contributor to the impact of social determinants on health. In the same way, we would hypothesize that gambling is both a contributor to the impact of the social determinants of health and gambling related harms are also a consequence of the social determinants of health. We would hypothesize that gambling can lead to changes in intermediary determinants of health such as material losses, poor psychosocial circumstances (e.g. stress), and unhealthy behaviours such as co-morbid use of addictive substances (e.g. tobacco). We would also hypothesize that gambling could lead to some changes in structural determinants of health such as lower socioeconomic status due to loss of employment or income. Moreover, we would hypothesize intermediary and structural determinants of health would lead to gambling harms. For example, those most likely to gamble may be lower SES individuals who are more likely to be exposed to parents gambling at a young age. Certain groups such as First Nations living on reserve may be more likely to be exposed to gambling and therefore more likely to participate in gambling (Breen & Gainsbury, 2013).

There are some jurisdictions that have recognized gambling as a public health issue such as New Zealand, where a 2003 Gambling Act formally recognized gambling as a public health issue (Adams et al., 2009), or efforts from the Victorian Responsible Gambling Foundation in Australia (Victorian Responsible Gambling Foundation, 2015). We will therefore incorporate the progress, successes, and lessons learned from other countries currently doing work in this area into our scoping review. The strategies identified by other jurisdictions will be highlighted in our white paper to provide the public health community with tangible approaches to address gambling and gambling harms

RESEARCH QUESTIONS

The purpose of this report is to provide a summary of the evidence demonstrating why gambling should be considered a public health issue and how public health can inform gambling strategies using evidence from other domains and jurisdictions. The study will consist of a scoping review of the literature on the social determinants of health and how they relate to gambling. The main objectives are to:

- (1) Examine from a public health perspective how the social determinants of health (intermediate and structural determinants) relate to gambling and gambling related harms.
- (2) Examine the comorbidities of gambling with other substance use (including tobacco, alcohol, and marijuana).
- (3) Identify other jurisdictions that have approached gambling as a public health issue, determine their rationale where applicable, and provide examples of their public health approaches including successes or lessons learned.
- (4) Identify approaches that have been adopted to address substance use that could perhaps be applied to gambling.

METHODOLOGY

We conducted a scoping review of the literature to examine gambling as a public health issue using the following databases: Pubmed, Medline, Proquest Health & Medicine, and PsychInfo. Separate searches were run in each of the databases using the following keywords: "gambling and": a) income b) education c) occupation d) social class e) socioeconomic status f) food insecurity g) gender h) race or ethnicity i) housing j) neighbourhood k) mental health l) stress m) physical activity n) obesity o) sedentary p) tobacco or cigarettes or smoking q) alcohol r) marijuana s) substance use. An additional search was also conducted for the keywords "gambling and public health". The abstracts of all the papers were assessed for relevance by a single reviewer. Studies that were identified as relevant were then reviewed completely.

RESULTS

Gambling and the Social Determinants of Health

Structural Determinants

Structural determinants have also been referred to as “the social determinants of health inequities” (WHO, 2010). The key structural determinants are: (1) income; (2) education; (3) occupation; (4) gender; (5) and race/ethnicity (Solar & Irwin, 2010). Solar & Irwin also include “social class” as a category but based on findings in the literature we categorized “social class” with “income,” “education,” or “occupation”.

(1) Income

Studies have generally demonstrated a positive correlation between gambling and income. Marshall (1998; 2000) examined cross-sectional data from a nationally representative sample of adults living in Canada, and reported that higher income was associated with a greater participation in recreational land-based gambling activities, such as playing the lottery and casino games. Increased income was also positively associated with greater overall gambling expenditures; higher-earning households reported spending greater overall sums gambling. These findings are in agreement with an earlier study by Kallick et al. (1979), who examined gambling tendencies among a nationally representative sample of adults in the United States. In this study, higher income was related to greater participation in recreational gambling and to greater overall gambling expenditures. Similar findings have further been reported in a study of a nationally representative sample of adults from New Zealand, where researchers observed that higher-income individuals were more likely to gamble (Gray, 2011). In explaining the reported findings, researchers have proposed that high-income households are in possession of more disposable income therefore allowing them to spend more money gambling (Macdonald et al., 2004; Marshall, 1998).

Similar studies of income in relation to overall gambling expenditure have also been carried out using adolescent samples, and the findings mirror those reported for adults. Darling et al. (2006) examined the spending habits of secondary-school students, aged 14 to 17 years, residing in six geographic regions of New Zealand. The adolescents in this cross-sectional sample obtained their income from part-time employment as well as from parents and family members. Results from the investigation revealed that higher adolescent income was associated with greater expenditure on gambling activities. These findings replicate an earlier study conducted by Ide-Smith and Lea (1988), in which the researchers also reported that higher income contributes significantly to the likelihood of gambling expenditure among a sample of adolescents, aged 13 to 14 years, in the United Kingdom.

Despite these broad findings reported across age groups, more nuanced results emerge when studies differentiate between types of spending and types of gambling in relation to income. For example, when measuring proportional expenditure rather than total expenditure on gambling, studies have noted that it is, in fact, lower-income households that spend proportionally more of their earnings on gambling activities relative to higher-income households (Marshall, 1998; 2000). Using a nationally representative sample of households in the United Kingdom, Grun and McKeigue (2000) observed that the proportion of individuals residing in low-income households who spent more than 10% of their income on gambling rose from 0.6% to 3.2% following the introduction and subsequent promotion of a national lottery. A similar five-fold increase in proportional spending on gambling was not observed among higher-income households. Consequently, it appears that individuals with low-income not only spend a greater percentage of their earnings on gambling, but they are also at a greater risk of increasing this proportional expenditure in response to policy change that facilitates access to gambling activities.

When differentiating between types of gambling activities, Gray (2011) reported that while gambling at lower rates overall, low-income individuals tend to be more likely to participate in high-risk gambling activities than individuals with a higher income. In this study, high-risk gambling activities were defined as those encouraging frequent and continuous participation by allowing for the immediate re-investment of winnings (e.g., gaming machines). The observed tendency of individuals with low-income to spend a greater proportion of their income on gambling, and to engage in more high-risk gambling activities, is in line with additional reports indicating that a low-income status is a risk factor for problem gambling (Currie et al., 2006; Derevensky et al., 2005; Ladouceur, 1996). For instance, in a cross-sectional study of Canadians aged 12 years and older, participants in the highest income category were the least likely to be problem gamblers, whereas individuals in lower income categories were more likely to engage in potentially harmful forms of gambling (Faregh and Derevensky, 2013). Similar findings have also been replicated in international studies including Hong Kong (Wong & So, 2003) and Spain (Beco, 1996). Theories pertaining to the buffering role of higher income against problem gambling have not yet been developed thoroughly, and therefore represent a limitation in the existing body of research.

In the context of online gambling specifically, existing research suggests there is a significant association between income and likelihood of gambling online. Specifically, in large-scale cross-sectional studies of adults in Canada, the United States, the United Kingdom, and Australia, higher incomes have been linked to a greater tendency to participate in online gambling (Gainsbury et al., 2012; Wardle et al., 2011; Wood & Williams, 2009; Woodruff & Gregory, 2005). In the United States, researchers found that the largest group of online gamblers assessed reported earning between \$50,000 USD and \$99,999 USD annually (Woodruff & Gregory, 2005). In Canada, the average annual income of Internet gamblers was found to be \$74,600 CAD, with 37.7% of internet gamblers reporting an annual household income exceeding \$100,000 CAD (Wood & Williams, 2009). In studies reporting these findings, researchers proposed that the overrepresentation of high income individuals among Internet gamblers may be attributable to ease of access. Specifically, individuals who earn a higher income are more likely to be able to afford computer equipment, credit cards, and technological services that would allow them to participate in online gambling (Wood & Williams, 2009). In contrast, the reduced access to the Internet experienced by lower-income individuals may preclude them from participating in online gambling as frequently as higher-income individuals. However, it should be noted that this study was conducted many years ago and Internet access has since become more widespread. Therefore, more recent data would be beneficial to determine whether the economic profile of online gamblers has changed over time.

Studies of online gambling have not yet differentiated between high-risk versus low-risk Internet games or between different types of expenditure on these games. As a result, it is currently unclear whether the general results available regarding online gambling are applicable to all types of gambling conducted over the Internet, or whether more complex findings pertinent to income will emerge when specific activities and spending are taken into account. A large-scale

study of adults in Canada has reported that, while high-income individuals are indeed more likely to participate in online gambling, individuals with lower income who gamble online are significantly more likely to be problem gamblers (Wood & Williams, 2009). These findings mirror results reported in assessments of land-based gambling. Given what is known about land-based gamblers, one hypothesis would therefore be that individuals with lower incomes may be more likely to seek out high-risk games online and may as a result spend a larger proportion of their overall earnings on these games. However, empirical research is needed to test this hypothesis.

(2) Education

Studies of problem and pathological gambling suggest that individuals with lower education may be more likely to develop gambling problems. A strong association was observed between level of education and problem gambling in a nationally representative sample of Danish adults (Ekholm et al., 2014). Specifically, researchers noted that individuals with lower levels of education were more likely to ever have experienced problem gambling and were also more likely to have experienced problem gambling in the past year. Similar findings for both problem and pathological gambling were found in a large sample of adults obtained from the Vietnam Era Twin Registry (Scherrer et al., 2007). The results of this study indicated that lower educational attainment was associated with a greater likelihood of experiencing problem and pathological gambling. In samples of Canadian adults, cross-sectional studies have also demonstrated that lower educational attainment, and particularly educational attainment below the post-secondary level, is associated with a greater likelihood of experiencing problem and pathological gambling (Ladouceur, 1996; McIntyre et al., 2007).

The pattern of association between gambling and education is consistent with education and pathological gambling. A nationally representative cross-sectional investigation of Canadian adults examined educational attainment in relation to gambling severity—a composite construct that accounted for gambling frequency, gambling expenditure, indicators of problem gambling, and adverse consequences stemming from participation in gambling (el-Guebaly et al, 2006). A differentiation was not made between types of gambling in this investigation. Results from this study demonstrated that the risk of moderate or high gambling severity was greater among adults with lower levels of education. Similarly, MacDonald et al. (2004) examined gambling behaviours using data from two cross-sectional surveys of Canadian households: the Survey of Family Expenditures and the Survey of Household Spending. Higher education was associated with reduced gambling prevalence and with less gambling expenditures. Researchers have suggested that a potential explanation for the association between gambling and education is that individuals with more education may have more decision-making skills and/or more accrued intelligence as a result educational experiences, which may buffer against gambling and problem gambling (MacDonald et al., 2004).

It should be noted, however, that the literature examining the association between educational attainment and gambling is inconsistent. Whereas the majority of the literature has demonstrated

that individuals with lower levels of educational attainment are more likely to gamble and suffer from gambling problems, some studies have found opposite effects. Some research has suggested a curvilinear relationship. Studies of Canadian adults and Greenland Inuit found the highest gambling frequency occurred among individuals possessing the lowest and highest levels of education (Larsen et al., 2013; MacDonald et al., 2004). It has been suggested that greater access to disposable income may account for the observation that particularly high levels of education may be linked to more prevalent gambling tendencies (Griffiths et al., 2009).

Academic performance and parental education level have also been linked to likelihood of gambling in youth (less than 18 years of age). Specifically, a meta-analysis of early risk and protective factors for problem gambling found that poor school performance was one of the strongest risk factors for subsequent gambling, though findings across studies included were quite variable (Dowling et al., 2017). Additionally, a study of Canadian youth found that lower parental education level was associated with youth gambling engagement (Jacobs, 2000), particularly among impulsive youth (Auger et al., 2010). Youth categorized as 'impulsive' who also had parents with less than a university education had a 70% higher likelihood of engaging in gambling compared to youth with at least one university-educated parent (Auger et al., 2010). It has been suggested that socioeconomic conditions stemming from lower levels of parental education may foster anti-social tendencies, which many in turn lead to reduced effort in school and a greater likelihood of engaging in high-risk activities such as gambling (Auger et al., 2010).

Although low educational attainment has been linked to increased likelihood of land-based gambling, these effects appear to be reversed in assessments of online gambling. Specifically, higher educational attainment is associated with a greater tendency to engage in online gambling. Using an international convenience sample of online gamblers primarily representing the United States, Canada, and the United Kingdom, McBride and Derevensky (2009) reported that individuals engaging in online gambling were more likely to be highly educated. In fact, 40.4% of online gamblers in the sample reported having an undergraduate degree, and an additional 16.5% reported having a graduate or post-doctoral degree. Similar findings were also found using convenience samples of online gamblers from the United States (Woodruff & Gregory, 2005) and Canada (Wood & Williams, 2009). In a large nationally representative study in the United Kingdom, Griffiths et al. (2009) also found that individuals with higher levels of education were more likely to gamble online.

Researchers have suggested that the link between higher levels of education and greater likelihood of gambling online may be attributable to environmental and experiential factors. Specifically, they have suggested that greater education leads to more substantial computer literacy which, in turn, promotes computer-based activities such as online gambling (Griffiths et al., 2009; McBride & Derevensky, 2009; Woodruff & Gregory, 2005). This suggestion is supported by findings that online gamblers are likely to endorse a comfort with technology as well as with online transactions (Wood et al., 2007). Additionally, it has been suggested that higher education results in higher income, and the subsequent ability to purchase computer

equipment and services that facilitate access to online gambling (Griffiths et al., 2009; McBride & Derevensky, 2009). In support of this latter suggestion are findings of a significant association between greater online gambling and higher income (Marshall, 2000; Welte et al., 2004), as well as reports showing that Internet gamblers typically have reliable and easy access to the Internet at work and/or at home (Woodruff & Gregory, 2005). These explanations, however, have not yet been empirically tested. Moreover, these differences in access to the technology for gambling online may no longer be relevant given the rapid availability of mobile phones and gambling apps. Current research is needed to determine whether there are still socioeconomic disparities in online gambling prevalence.

(3) Occupation

Studies of occupation and gambling behaviour, have typically noted that being unemployed or employed in a lower status occupation may be associated with greater likelihood of gambling participation. Orford et al. (2010) analyzed responses obtained through the British Gambling Prevalence Survey – a nationally representative survey of adults aged 16 years and over residing in private households in the United Kingdom. Findings from the study demonstrated that individuals living in households where earners work in managerial/professional jobs exhibited lower gambling prevalence and lower gambling frequency compared to occupational categories that reflected less stable or less skilled employment. Similarly, in a national sample of New Zealand adults, Volberg and Abbot (1994) reported that unemployed individuals were significantly more likely to engage in weekly lottery games, on-course betting, and gambling via gaming machines compared to individuals who were employed. This pattern of results was not replicated in a study of adults from Ontario, however, where researchers found that that a larger proportion of employed individuals reported having gambled in the past 12 months compared to unemployed respondents (Azmier, 2000).

Individuals in lower status occupations are also more likely to spend more money gambling. A national community-based study of New Zealand adults, (Abbot and Volberg, 2000) found that individuals employed in lower status occupations reported significantly greater total gambling expenditures compared to individuals employed in higher status occupations. Further, a study of households in the Australian state of New South Wales (Worthington, 2001) found that individuals on unemployment assistance spent more money on lotteries and on-course betting compared to individuals who were employed. Although empirical assessments of the causal mechanisms underlying these associations have not been conducted, researchers have suggested that individuals in lower status occupations earn less money and therefore are more likely to gamble to supplement their income (Lesieur & Heineman, 1988; Welte et al., 2004; 2011).

Research examining occupation and gambling among young people has demonstrated opposite findings. Youth with long-term or steady employment are more likely to gamble. A large representative sample of youth (14-21 years old) in the United States found that youth with full-time employment were more likely to have gambled in the past year compared to youth who were not employed (Welte et al., 2008). Further, Volberg (1998) obtained data from a random

sample of adolescents between the ages of 13 and 17 who were residing in the state of New York. Results demonstrated that adolescents who reported working for 10 hours or more per week were significantly more likely to gamble than adolescents who worked fewer hours. Therefore, among adolescents it may be the case that greater access to disposable income as a result of more steady employment may ultimately result in a greater likelihood to take part in gambling activities (Macdonald et al., 2004). Further research is needed to better understand these relationships. For example, it might be the case that youth who are employed 10 or more hours per week may be from a lower socioeconomic status family and therefore may be required to work to supplement their family income. Consequently, lower socioeconomic status may be a factor influencing these associations.

Studies examining the association between occupational status and problem gambling have yielded mixed results. In particular, while some investigations suggest that lower occupational status is predictive of greater likelihood of problem gambling, other studies indicate that no significant relationship exists between these variables. In a study of a nationally representative sample of adults residing in the United States, Welte et al. (2011) reported that the likelihood of problem-gambling increases with lower status occupation. Similarly, a cross-sectional study of adults from New Zealand, found that lower-status occupations may be predictive of problem gambling (Abbott & Volberg, 2000). Further, using a convenience sample of adults from Spain, Legarda et al. (1992) found that unemployed individuals are more likely to be problem gamblers. Conversely, a study of youth and adolescents in New Zealand found no significant association between pathological gambling and occupational status (Clark et al., 2006). A convenience sample of female adult gamblers from Victoria, Australia also found a non-significant relationship between employment status and impaired control over gambling (Scannell et al., 2000). Consequently, further investigations clarifying the link between pathological gambling and occupational status are needed.

Studies examining online gambling suggest that people in less stable occupations tend to be more likely to engage in land-based gambling whereas people in higher status occupations are more likely to engage in online gambling. In a cross-sectional study of adults in the UK, Griffiths et al. (2009) reported that, compared to land-based gamblers, those who reported gambling online were more likely to be in professional or managerial employment positions. In contrast, land-based gamblers were more likely to be employed in lower status occupations or to be temporarily employed. Similarly, McBride and Derevensky (2009) also reported online gamblers were more likely to be stably employed. Specifically, in a convenience sample of participants recruited online, primarily representing residents of the US, Canada, and the UK, 70% of respondents who indicated that they had gambled online in the past 12 months were employed full-time. Although additional studies are warranted to further replicate and understand these patterns of findings, preliminary explanations of the effects perhaps suggest that individuals with more stable employment tend to have the necessary income to purchase technological equipment, which provides easier access to online games (Wood & Williams, 2009). Further, individuals with higher status occupations tend to have better computer literacy, given that this skill is typically

required for their employment, which may translate to greater comfort gambling online (Wood & Williams, 2011).

(4) Gender

Investigations examining gender differences in land-based recreational gambling among adults have predominantly reported that males are more likely than females to participate in gambling activities. Using data collected through the Gambling Impact and Behavior Study—a national study of adults residing in the United States—Potenza and colleagues (2006) observed that males were more likely to report participating in gambling activities than females. Additionally, the researchers noted that a larger proportion of male versus female respondents indicated that they had started gambling in adolescence, that they tended to gamble on a weekly basis, and that their past-year wins or losses from gambling exceeded \$100 USD. Examining a sample of adults from the US, McDaniel and Zuckerman (2003) found that males took part in a wider variety of gambling activities compared to females and that males reported significantly greater interest in gambling relative to females. These findings are consistent with results reported in previous studies of gambling behaviour among adults in Australia and Canada (Chantal et al., 1995; Delfabbro, 2000; Smart & Ferris, 1996).

Studies of adolescent gambling have yielded results that are consistent with adult gambling studies. Specifically, gambling is more prevalent among males compared to females, with males dedicating more time and resources to gambling-related pursuits. A review of studies assessing gambling among youth in Canada and the United States reported that, across the studies examined, males showed a tendency to gamble more often and to spend more money on gambling compared to females (Jacobs, 2000). Among adolescent gamblers specifically, differences between preferences for gambling activities were noted between men and women. While males gravitated toward sports betting and games of personal skill, females more commonly participated in games of pure chance, such as lotteries or bingo. In a national household survey of adolescents in the US aged 16 to 17 years, Desai et al. (2005) reported that, compared to females, males were more likely to gamble on a weekly basis and to report a past-year gambling loss exceeding \$100 USD. Stinchfield (2000) also found that the rate of daily gambling among males was eight times greater than the rate observed for females in a sample of high-school students in the US (aged 14 to 20 years). Findings of greater gambling participation among adolescent males have also been reported in numerous earlier studies of recreational gambling conducted in various regions of the US and Canada (Gupta & Derevensky, 1998a; Stinchfield et al., 1997; Volberg, 1993; Wallisch, 1996; Winters et al., 1993).

One theoretical explanation for observed gender differences in gambling is that males are socialized through early play and modeling to engage in more competitive behaviour relative to females, which may manifest in a greater likelihood of engaging in gambling in later life (Delfabbro, 2000; Griffiths, 1995). Males also tend to have more positive attitudes toward gambling than females, including the perception that gambling is exciting and socially meaningful, which may encourage them to pursue gambling with greater frequency (Breen &

Zuckerman, 1999). Furthermore, males are more likely to engage in risky behaviour relative to females, and therefore gender differences may be attributable to differences in problem behaviour overall (Byrnes et al., 1999).

Males are also more likely to gamble online compared to females. Griffiths and Barnes (2008) examined a self-selected sample of adults from the United Kingdom and found that 85% of all respondents who had gambled on the Internet at some point in their lives were male, whereas the remaining proportion were female. Additionally, males who engaged in land-based gambling were more likely than female land-based gamblers to also seek out gambling activities online. These findings are consistent with results reported in general studies of gambling, which have indicated that males tend to prefer more variety in their gambling activities than females (McDaniel & Zuckerman, 2003). Despite these overall findings, a more recent study suggests that the gap in online gambling prevalence among male versus female adults in the UK be narrowing (Griffiths et al., 2009). Specifically, in their sample of UK adults, Griffiths and colleagues (2009) found that 74% of Internet gamblers were male while 26% were female. Even in the case of this slightly narrower gap, men were still three times more likely to Internet gamble than women.

In more recent studies of adolescent gambling in three provinces in Canada, males were significantly more likely than females to gamble online (Wijesingha et al., 2017); 15.3% of males reporting gambling online in the past 3 months compared to 3.7% of females (Elton-Marshall et al., 2016). Researchers have suggested that gender differences in online gambling may be due to males' tendency to adopt new technologies or technological formats more readily than females, leading to a perhaps increased willingness to shift into Internet-based games (Broos, 2005; Griffiths et al., 2009). Historically females have been thought to adopt technologies more slowly than males, but recent shifts toward more equal use of technology may help explain the narrowing of the gap between men and women's online gambling (Griffiths et al., 2009; Schumacher, & Morahan-Martin, 2001). Another potential explanation is that males are more likely to play video games compared to females, and a blurring of lines between video game play and online gambling may make online gambling more appealing for males (Greenberg et al., 2010; Lucas & Sherry, 2004; Griffiths, 1991).

Additional gender differences in types of gambling online have also been noted. Specifically, investigations of representative samples of adults from Canada, the UK, and Germany have reported that males tend to gravitate towards sports betting and casino games online, whereas females are more likely to prefer online bingo (Elton-Marshall et al., 2016; Griffiths & Barnes, 2008; Sassen et al., 2011; Wood & Williams, 2011). These results are consistent with studies examining land-based gambling (Jacobs, 2000).

Studies of pathological gambling have reported a more complex association between gender and gambling than studies of recreational gambling. In a meta-analysis of investigations assessing disordered gambling among college students, Blinn-Pike et al. (2007) found that the inclusion of a larger proportion of males in study samples was significantly associated a higher reported

prevalence of disordered gambling across studies. Furthermore, in a national prevalence study of gambling conducted among Canadian adolescents and young adults aged 15 to 24 years, Huang and Boyer (2007) observed that males were significantly more likely than females to report gambling problems. These same findings were observed in a study of adults residing in the UK, where 80.8% of the problem gamblers identified in the investigation were male (Griffiths & Barnes, 2008). In a closer examination of sex differences in the progression from recreational gambling to problem gambling however, studies have reported that females typically progress faster to pathological gambling, with the progression of gambling disorders occurring approximately two times faster in females than in males (Grant & Kim, 2002; Tavares et al., 2001). Despite this difference, males and females have been shown to be equally likely to file for bankruptcy as a result of gambling behaviours (Grant & Kim, 2002).

Investigations aimed at understanding the motivation behind problem-gambling behaviours have reported that males and females tend to differ in their rationale for engaging in pathological gambling. Gupta and Derevensky (1998b) observed that males tend to report engaging in detrimental gambling tendencies due to a desire to escape or to dissociate from current experiences, as well as to seek out excitement. As a result, the researchers suggested that males prone to problem gambling may have an abnormal physiological resting state that propels them to seek out stimulation externally. In contrast, the researchers noted that females typically engage in problematic gambling in reaction to states of emotional distress, such as depression. Consequently, they may take part in hazardous gambling activities as a way to cope with challenges or difficulties.

(5) Race/Ethnicity

There is limited research on gambling behaviour among racialized groups, mainly due to inadequate sample sizes that often do not allow for meaningful subgroup analyses to be performed (Barnes, Welte & Tidwell, 2017). However, some research has demonstrated important disparities in gambling-related harms for racialized minorities and Indigenous people. Overall, visible minority respondents report having more gambling problems compared to Caucasian respondents (Cookman & Weatherly, 2016). Barnes and colleagues (2015) found that while the number of people gambling is similar across racial and ethno-cultural groups, the frequency at which people gamble and the rates of problem gambling are higher among people who identify as Black compared to people who identify as White or Hispanic. In fact, Black-identifying respondents had over twice the odds of being a problem gambler compared to White-identifying respondents. Other studies have also demonstrated that Black-identifying respondents report higher problem gambling rates than White-identifying respondents (Barnes, Welte & Tidwell, 2017). In a study of youth gambling in the United States, heavy gambling was found to be higher among Black-identifying youth (24%) compared to White-identifying youth (15%) (Barnes et al., 2009). There is a lack of research examining the mechanisms for these ethno-cultural differences.

Gambling socially is popular in Chinese communities (Loo, Raylu, Oei, 2008), although research

suggests that overall gambling prevalence rates are lower among Chinese-identifying adults (Afifi et al., 2010) and older adults (Lai, 2006) compared to the general population. Some studies have also shown that respondents who identify as Asian gamble less but lose more money than respondents from other ethno-cultural groups (Venkataraman Rinker et al., 2016), and that Asian-identifying Americans display higher problem gambling rates than White-identifying Americans (Lesieur et al., 1991; Welte et al., 2001). Findings from a sample of Chinese American students in San Francisco found that Chinese American adolescents had higher problem gambling prevalence rates compared to the national rate (Chiu & Woo, 2012). Research has also indicated a rising trend in the prevalence of problem gambling among the Chinese population (Loo, Raylu, Oei, 2008). Gamblers who identify as Chinese are also less likely to admit that they have a gambling problem and less likely to seek professional help (Scull & Woolcock, 2005). The reluctance to admit and seek help has been attributed by researchers to cultural characteristics (Loo, Raylu, Oei, 2008) such as stigma around gambling problems in Chinese culture (Kim, 2012). Potential reasons for higher rates of problem gambling in Chinese communities may be attributable to factors such as early exposure to gambling (Chiu and Woo, 2012) and media (television and movies) that glorifies gambling (Chiu & Woo, 2012). Research has demonstrated considerable within-group differences in gambling behaviour among those who identify as Asian (Petry et al., 2003; Thomas and Yamine, 2000). Therefore, research aggregating different ethnic groups into one large sample under the term Asian is limited in interpretability given that this group is heterogeneous and comprises of individuals who differ in religion, language, culture, and geography (Kim, 2012). A public health approach to gambling should ensure that awareness and treatment services for problem gambling are culturally appropriate and should be developed in collaboration with the community (Radermacher et al., 2016). Service providers should understand the potential role of stigma as a barrier for seeking help particularly in Chinese and other Asian communities (Radermacher et al., 2016).

Research has also shown that Indigenous populations have higher problem gambling prevalence rates compared to the general population (Barnes, Welte & Tidwell, 2017; Breen & Gainsbury, 2013; Currie et al., 2013; Wardman, el-Guebaly & Hodgins, 2001). Indigenous populations are also significantly more likely to be internet gamblers (Wood & Williams, 2009). Research has suggested that gambling may provide a way to temporarily escape from the effects of historical trauma (Dion et al., 2015), childhood trauma (Dion et al., 2010; Dion et al., 2015), and social trauma (Hagen et al., 2013). Currie and colleagues (2013) also found that gambling is a coping mechanism used by urban Indigenous-identifying Canadians to deal with experiences of racism. They found that racial discrimination is a significant predictor of problem gambling. Efforts aimed at developing culturally tailored trauma informed approaches to problem gambling prevention are needed (Hagen et al., 2013). Moreover, a public health approach to gambling should employ community-driven gambling interventions (Breen & Gainsbury, 2013).

Summary of Structural Determinants

There was sufficient research literature in each of the categories to determine that gambling is

related to each of the structural determinants of health. There are important distinctions in how the social determinants relate to gambling along the continuum of gambling related harms. While overall gambling participation may vary according to advantaged vs. disadvantaged groups, the individuals most likely to experience problem and pathological gambling (and consequently gambling harms) are more disadvantaged groups (lower income, lower educated, lower status occupations, ethnic minorities).

The association between gambling and income is complex. Individuals with higher income are more likely to gamble and have a tendency to spend more money while gambling, likely because they have greater access to disposable income. Consequently, people with a higher income are less likely to suffer from problem gambling. It is therefore important that public health strategies of problem gambling do not focus solely on amount of money spent or frequency of gambling without taking into consideration peoples' income and ability to withstand financial losses. Whereas individuals with greater income may be more likely to gamble, they also have greater resources to recover from gambling losses and consequently their gambling attributable harms are lower. Similarly, there are mixed findings about the association of level of education with recreational and problem gambling. Like with income, these mixed findings may be rooted in the fact that a higher education is associated with higher earnings, which provides resources that facilitate gambling, but also create a buffering effect against the consequences of financial loss during play.

Evidence regarding occupation type and gambling is limited, but existing research suggests that those who are unemployed or those who hold lower status occupations may be more likely to engage in land-based recreational gambling. At the same time, higher status occupation is associated with online gambling, perhaps as a result of greater access to technological resources afforded through better occupations. Problem gambling is largely more characteristic of individuals with less stable work environments.

The overwhelming research evidence suggests that males are significantly more likely to engage in gambling and to suffer from gambling problems in comparison to females. However, females show a faster rate of progression from recreational gambling to problem gambling, and therefore they represent an important at-risk group in the gambling literature.

There are significant disparities in gambling and problem gambling by ethnicity, with marginalized populations being more likely to gamble and to suffer from problem gambling. Specifically, in Canada, Indigenous populations are significantly more likely to gamble and to experience problem gambling compared to the general population. Further, black people are found to be significantly more likely to gamble than individuals in other racial/ethnic groups, and the prevalence estimates of problem gambling among the Chinese population continues to grow, particularly among younger cohorts. This is a critical area of future research for prevention and treatment strategies, particularly to better understand the contextual reasons behind these ethno-cultural differences, and to develop effective treatment and prevention programming that is culturally appropriate.

Intermediary Determinants

Intermediary determinants of health shape health outcomes. The main intermediary determinants of health include: (1) material circumstances (housing, neighbourhood quality), (2) psychosocial circumstances (mental health), (3) behavioural factors such as nutrition, obesity/physical activity (4) behavioural factors such as tobacco consumption/other substance use, (5) age (WHO, 2010).

(1) Material Circumstances (Housing and Neighbourhood):

Research on gambling and neighborhood disadvantage is limited. However, the studies that do exist demonstrate that neighborhood disadvantage is significantly associated with problem gambling (Barnes et al., 2013; Welte et al., 2004; Welte et al., 2006), pathological gambling (Lesieur et al., 1991), and frequency of gambling (Barnes et al., 2011; Barnes et al., 2013; Welte et al., 2004). In a nationally representative U.S. study, Barnes and colleagues (2013) found that problem gambling is highest when neighbourhood disadvantage is high coupled with low Individual-level socioeconomic status. In examining frequency of lottery gambling, a nationally representative U.S. study found that neighbourhood disadvantage was a significant predictor of the number of days spent gambling on the lottery in the last 12 months (Barnes et al., 2011). Neighbourhood risk has also been associated with increased youth gambling problems among a Canadian sample (Lussier et al., 2014). A study examining the spatial distributions of Video Lottery Terminals (VLTs) in Montreal found that VLTs were more likely to be concentrated in disadvantaged neighbourhoods (Gilliland & Ross, 2005). Similar results regarding VLTs have been found in Australia (Marshall, & Baker, 2001). Other research has found that accessibility to sites (i.e. walking distance) that have a permit for VLTs are linked to vulnerable neighbourhoods (Robitaille & Herjean, 2008). When examining youth access to VLTs, Wilson and colleagues (2006) found that VLTs were more likely to be located near schools in low socioeconomic neighbourhoods. Thus, the disproportionate presence of VLTs in disadvantaged neighbourhoods exacerbates inequalities.

VLTs serve as a gateway for youth gambling addiction and have therefore been identified as a public health concern by some scholars (Doiron & Mazer, 2001). Moreover, VLTs (particularly due to their locations in bars and pubs) increase the availability and access to gambling, especially for vulnerable populations (Robitaille & Herjean, 2008). In addition to concerns about VLTs, research on gambling availability also indicates that having a casino located within 10 miles of a person's home is associated with increased problem gambling (Welte et al., 2004). A study of electronic gambling machine (EGM) losses in Australia, also found that the highest EGM losses occurred in the most disadvantaged neighbourhoods (Rintoul et al., 2013). Social disorganization theory has been positioned as a theoretical explanation for the link between neighbourhood disadvantage and gambling-related harms (Barnes et al., 2013). This theory argues that crime and delinquency is a result of social disorganization (i.e. lack of social control) which is the result of ecological factors such as poor economic conditions and high rates of residential mobility. Social disorganization theory has been linked to substance abuse which has been linked to problem gambling and therefore neighbourhood disadvantage might be an

explanatory factor for gambling behaviours (Barnes et al., 2013). Therefore, public health approaches to gambling must take into consideration the "spatial distortion of gambling opportunities" (Gilliland & Ross, 2005) and ensure that inequality is not being further exacerbated. More research is needed to determine whether the relationship between gambling-related harms and disadvantaged neighbourhoods is attributable to the fact that access to gambling opportunities in disadvantaged neighbourhoods is higher or because of other factors that promote gambling are present in disadvantaged neighbourhoods (Martins et al., 2012).

There is limited research on the relationship between gambling and homelessness or housing instability (Antonetti & Horn, 2001; Gattis & Cunningham-Williams, 2011; Matheson et al., 2014). Gambling problems are more likely to be present among those living in unstable housing conditions compared to those who live in stable housing (Gattis & Cunningham-Williams, 2011). Among those experiencing homelessness, problem gambling prevalence rates vary from 5% to 15% (Antonetti & Horn, 2001), a rate much higher than average. In a study examining problem gambling prevalence at a homeless shelter in Toronto, Matheson and colleagues (2014) reported pathological gambling rates of 25% among the sample. This was a rate that they described as "alarmingly high" (p. 537). Similarly high rates have been found among Canadian homeless youth (Dufour et al., 2014). Moreover, in a survey of problem gamblers in Australia, one-third of respondents reported that gambling led to a housing crisis which included eviction, being unable to pay rent, and having to sell or leave their home (Antonetti & Horn, 2001). Financial stress was the most common pathway from problem gambling to a housing crisis (Antonetti & Horn, 2001). Qualitative research examining the relationship between gambling and homelessness showed that homeless youth and adult men use gambling as a way to make money, escape emotional pain, and to relieve boredom and social isolation (Hamilton-Wright et al., 2016; Marsden, 2012). Electronic gaming machines were the preferred method of gambling among those individuals facing housing instability (Antonetti & Horn, 2001). Longitudinal research would be beneficial to determine the direction of the relationship between gambling and housing instability.

(2) Psychosocial Circumstances (Mental Health):

Given that gambling can be exhibited at pathological levels (American Psychiatric Association, 2013), and has been described as an addiction (Ladouceur, 2004), numerous studies have aimed to understand the link between gambling and mental-health indicators. These investigations have primarily focused on particularly detrimental gambling behaviours, including problem gambling and pathological gambling, although some results have been reported pertaining to overall gambling.

Studies of mental health indicators in the context of gambling are limited. However, the few investigations that do exist report a significant association between gambling behaviour and mental health. Specifically, reports suggest that gambling may have a detrimental effect on mental health. Mood disorders and anxiety disorders have consistently been found to be significant correlates of gambling. Desai et al. (2005) examined the association between gambling and numerous health-related variables using data obtained from a national survey of

adolescents between the ages of 16 and 17 years residing in the United States. The researchers observed that individuals who had gambled in the past year were significantly more likely to report a history of depression than non-gamblers. This association was particularly pronounced among females, as past-year female gamblers were four times more likely to report experiencing depression than female non-gamblers. Further, in an examination of gambling among a community sample of adolescent females from Baltimore, USA, Martins et al. (2007) found that past-year anxiety symptoms were significantly higher among participants who had gambled in the past year compared those who had not.

Similar findings regarding mental health and recreational gambling were reported in studies of adults from Canada and the United States. Among a representative sample of adults residing in the Canadian provinces of Ontario, Quebec, Saskatchewan, and New Brunswick, Humphreys et al. (2011) found that recreational gambling was significantly associated with mood and anxiety disorders. Specifically, participation in recreational gambling was predictive of a greater tendency to report having either one of these two types of disorders. Further, in their study of adults residing in the United States, Parhami and colleagues (2014) observed that recreational adult gamblers reported a greater prevalence of mood disorders than non-gamblers. As an extension of previously reported findings among adult samples, the researchers further noted that recreational gamblers were more likely than non-gamblers to experience dysthymia and manic episodes— both reflecting disordered mood. Lastly, in a study of noninstitutionalized older adults (aged 60 years and older) from the US, Pietrzak et al. (2007) found that compared to non-gamblers, individuals who reported gambling five or more times in a single year were more likely to report experiencing symptoms of mood disorders (mania), anxiety disorders (specific phobias), and personality disorders (antisocial personality disorder, obsessive compulsive personality disorder).

Studies of online gambling have further echoed the findings reported in studies of general recreational gambling activities. An investigation conducted by Petry and Weinstock (2007) examining Internet gambling among a convenience sample of university students in the United States reported that recreational online gambling was significantly associated with mental health indicators. In this analysis, mental health was assessed using the General Health Questionnaire (GHQ)—a screening device intended to identify symptoms of psychiatric disorders among community samples. Results revealed that as the frequency of Internet gambling increased, scores on the GHQ decreased, indicating diminishing mental health. Further, in a study that assessed a convenience sample of adults residing in Hartford, Connecticut, USA, Petry (2006) observed a significant relationship between Internet gambling and overall mental health, as measured using the Short Form Health Survey. Specifically, the researcher noted that individuals who gambled online with any frequency, even infrequently, exhibited significantly poorer mental health compared to individuals who reported never having gambled online. To date, assessments of recreational gambling in relation to specific mental health diagnoses, as opposed to measures of overall mental health, have yet to be conducted.

Investigations of problem or pathological gambling have consistently reported that problematic forms of gambling tend to be associated with numerous negative mental health outcomes. According to two systematic reviews and meta-analyses of studies assessing treatment-seeking gamblers, the Axis-I disorders of the DSM-IV that are most highly associated with problem gambling include mood disorders and anxiety disorders (Downling et al., 2015; Lorains et al., 2011). The most prevalence psychiatric disorder among problem gamblers in these studies was major depressive disorder. Consistent with these general patterns of findings, Pietrzak et al. (2007) assessed a sample of adults from the United States and found that problem gamblers were more likely than non-problem gamblers to report numerous specific mood and anxiety disorders including: major depressive disorder, dysthymic disorder, mania, generalized anxiety disorder, and phobias. Additionally, in assessing a convenience sample of gamblers seeking help through a telephone helpline operated by the Connecticut Council on Problem Gambling, Potenza et al. (2001) observed that approximately 80% of the problem gamblers reported experiencing depression and anxiety. Similarly, a second telephone counselling service operated by the Addiction Research Institute in Australia observed that 25% of callers identified stress reduction and 16.2% identified depression as motivating factors underlying their gambling tendencies (Addiction Research Institute, 1995).

Additional investigations of detrimental gambling habits and mental health have observed that problematic gambling may also be associated with antisocial personality disorder—a finding that echoes studies conducted among recreational gamblers (Pietrzak et al., 2007). Cunningham-Williams et al. (1998) assessed a large sample of adults residing in St. Louis, Missouri, USA, and reported that, compared to non-gamblers, individuals exhibiting detrimental patterns of gambling were more likely to meet the diagnostic criteria for antisocial personality disorder. Specifically, while 35% of problem and pathological gamblers met the criteria for a diagnosis of antisocial personality disorder, only 4.6% of non-gamblers exhibited symptoms of the same personality disorder. Similarly, in a study of adult pathological gamblers conducted in Edmonton, Alberta, Bland et al. (1993) reported that 40% of pathological gamblers had antisocial personality disorder, compared to only 3.1% of individuals who did not gamble. Similar rates of antisocial personality disorder among problem and pathological gamblers have also been reported in adult samples from Australia, Spain, and the United States, although a considerable portion of these studies have relied on limited sample sizes (Black & Moyer, 1998; Ibanez et al., 2003; Pietrzak & Petry, 2005; Steel & Blaszczynski, 1998).

When problem gambling has been assessed in the context of online gambling, the findings have primarily identified mood states as motivating factors in encouraging online play among problem gamblers. Using a voluntary student population of online poker players from the UK, Wood et al. (2007) examined the factors underlying pathological tendencies in online gambling. They noted that the strongest predictor of pathological gambling habits in their sample was mood states—specifically, the experience of negative mood states after play. In a later investigation of adult online pokers players recruited through poker networking sites and forums, Hopley and Nicki (2010) observed that dissociation was the strongest significant predictor of excessive online

poker playing, followed by impulsivity, negative mood states, and boredom proneness. In aiming to tease apart which negative mood states specifically may be influencing the development of problematic gambling habits among online poker players, Hopley et al. (2012) examined a self-selected sample of online adult poker players who reported playing 2 to 60 hours of online poker weekly. The researchers found that the only negative mood state predictive of problem gambling was stress. In aiming to explain the role of mood and stress in problematic online gambling, Hopley et al. (2012) suggested that individuals may gamble online in an effort to reduce or to avoid negative emotional or stressful situations—behavior that may ultimately result in even more pronounced feelings of negative mood and anxiety. In response, online gamblers may seek out additional gambling opportunities, perpetuating a cycle of gambling and emotional avoidance. This theory, however, has yet to be tested directly. Further, it should also be noted that the discussed findings have primarily been limited to one type of online gambling and would benefit from being extended to the assessment of other Internet-gambling formats.

To date, two major theories have been proposed in an effort to explain the link between gambling and diminished mental health. According to the general theory of addiction put forth by Jacobs (1986), there are two predisposing factors that put an individual at risk for developing an addiction such as habitual or problematic gambling. The first factor is biological, reflecting a physiological resting state that is either perpetually excited or perpetually depressed. These resting states yield feelings of stress and anxiety, to which individuals typically react by seeking out activities or outlets that promise to alleviate the negative feelings. In the context of gambling, this theory proposes that feelings of anxiety or stress in reaction to pre-existing depression or mania may motivate and fuel the pursuit of gambling activities (Blaszczynski et al., 1991; Gupta & Derevensky, 1998; Hopley et al., 2012). A second predisposing factor for addictive tendencies is environmental, such as an unsupportive family or social environment in which an individual is made to feel inadequate or inferior, particularly during critical years of development. In response to these environmental circumstances, individuals may indulge in addictive behaviours in an effort to dissociate from past experiences or to augment their sense of social importance. In support of this latter component of the theory, Hardoon et al. (2004) reported that poor perceived familial and peer support was associated with problem gambling among a sample of adolescents from Ontario.

A second theory applicable to the association between mental health and gambling is the stress-coping theory of addictive behaviours proposed by Willis and Shiffman (1985). According to this theory, stress may be a perpetuating factor in the development of addictive behaviours. This stress could stem from internal factors, such as anxiety or boredom, or from external factors, such as marital discord or familial difficulties (McCormick et al., 1987). In response to feelings of stress, an individual enacts coping efforts. Individuals who use effective coping skills are likely to navigate stressful situations successfully and achieve healthy outcomes. Those who use ineffective coping skills, however, may be liable to develop pathologies or detrimental mental-health outcomes (Willis & Shiffman, 1985). One possible ineffective coping strategy used by problem gamblers may be escape-avoidant coping, in which the individual engages in tasks not

relevant to the stressor in an effort to dissociate from the stress-inducing situation (Lightsey & Hulse, 2002). In this case, the core issue at the source of stress is not addressed or resolved, which perpetuates further avoidant or problem behaviours (Gupta & Derevensky, 1998).

The direction of the potential causal link between mental-health difficulties and gambling is not entirely clear. While it could be the case that individuals experiencing stress or poorer mental health may turn to gambling as a way of coping with the associated symptoms, it may also be that participation in gambling results in poorer mental-health outcomes indirectly through its associations with greater poverty, crime, substance abuse, and domestic violence (Coman et al., 1997; National Research Council, 1999).

(3) Behavioural Factors

Nutrition

There is virtually no research examining the relationship between nutrition and gambling. In one study, the intake of higher dietary fat and sugar was significantly associated with pathological gambling (Chamberlain et al., 2017). However, to our knowledge no other research exists in this area. Gambling environments such as casinos may promote this relationship by providing high calorie foods at low costs via buffets (Chamberlain et al., 2017). Therefore, educating gamblers about healthy diets may be beneficial. Additional research is needed to explore the mechanisms behind this association to determine if impulsivity mediates the relationship between high dietary fat and sugar and gambling or whether the association is attributable to other environmental factors. To further examine how gambling relates to nutrition, we searched for any research related to gambling and food insecurity, with the hypothesis that gambling could lead to food insecurity (gamblers may forgo food to gamble or because they have no money for food because of their gambling), or food insecurity could lead to gambling losses (if food insecurity affects cognitive impairment). To our knowledge, based on our literature search, there is no literature examining the relationship between food insecurity and gambling. This represents an important future research direction.

Obesity/Physical Activity

Research examining the link between gambling and obesity has largely demonstrated that gambling and obesity are significantly related, both at the clinical and at the sub-clinical level. Data obtained from a nationally representative sample of Danish citizens aged 16 years and older revealed that problem gamblers were more likely to be obese, as indicated by a higher Body Mass Index (BMI), compared to non-problem gamblers (Algren et al., 2015). Similar findings were reported in a study of pathological gambling. Black et al. (2013) compared a randomly selected community sample of adults to a convenience sample of pathological gamblers in the United States. These researchers found that pathological gamblers had a higher BMI and a greater likelihood of obesity compared to non-gamblers. In young adults, at-risk gambling was common among 10% of obese respondents and 24% of overweight respondents (Grant et al.,

2014). In studies of recreational gambling, researchers have also observed that recreational gamblers tend to have a higher BMI compared to non-gamblers in both youth and adult cohorts in the United States (Desai et al., 2007; Okunna et al., 2016). Although numerous studies have replicated the association between gambling and obesity, the causal link between the two constructs remains unclear. It has been proposed, however, that the neurological processes that aid in the inhibition of short-term rewards when long-term consequences are likely to be negative may be common to both decision-making in gambling and to eating behaviours (Clark, 2014; Davis et al., 2014). Specifically, it may be the case that individuals who have difficulty with the regulation of this inhibitory response may be more prone to both gambling and obesity. Further studies of this theory are warranted.

Gamblers are more likely to be sedentary with less than 7% of older adult gamblers reporting that they use walking as a means of transportation (Moore, 2001). A study examining gambling among those 65 years and older living in Alberta found that physical inactivity was significantly associated with money spent on bingo (O'Brien Cousins & Witcher, 2007). According to physical activity guidelines, children and youth should get at least 60 minutes of exercise daily and adults should spend approximately 150 minutes per week. Data on the physical activity of Canadian children and youth show that less than 7% meet the physical activity guidelines and this further decreases with age (Colley et al., 2011). Moreover, Canadian children and youth are spending 62% of their waking hours being sedentary, which includes activities such as sitting for long periods of time, watching TV, using a computer or tablet, and playing video games (Canadian Society for Exercise Physiology, 2011). With regards to Canadian adults, approximately one-fifth reached the recommended physical activity guidelines (Statistics Canada, 2015). To our knowledge there is no research examining the relationship between sedentary behaviour and gambling for adolescents and limited research on adults. With the legalization of online gambling occurring in numerous jurisdictions and the rise in the prevalence and availability of online gambling making gambling more accessible, research on the relationship between sedentary behaviour and gambling (especially online gambling) is needed now more than ever. Research on heavy internet use among university students has found that there is a significant association between sedentary lifestyle and obesity with heavy internet use (Peltzer, Pengpid & Apidechkul, 2014). Similar results have been found among adolescents (Durkee et al., 2016). Moreover, given that gambling is often a sedentary activity, it may provide individuals who are physically inactive and limited by obesity and other health problems with a reliable form of entertainment (Leppink et al., 2016). Therefore, more research in this area is required.

(4) Substance Use

Tobacco Use

Studies assessing the potential association between recreational gambling and tobacco use have yielded mixed findings. The studies that have found a significant association between gambling and tobacco use have reported that more pervasive gambling is related to greater tobacco use,

both among adolescents and among adults. In a study of a community sample of students attending public elementary schools in the Baltimore, Maryland, USA, Martins et al. (2007) reported that there was a significant association between past-year tobacco use and gambling. Specifically, 42% of individuals who gambled in the past year reported past-year tobacco use, whereas only 18% of non-gamblers reporting using tobacco in the preceding 12 months. Studies of gambling frequency have further replicated these findings. For instance, LaBrie et al. (2003) noted that greater gambling frequency was significantly associated with tobacco use, both in the past month and in the past year, when studying a large sample of college students from the United States. Similarly, Volberg (1993) observed that adolescents from the United States who reported gambling on a weekly basis were significantly more likely to use tobacco than were infrequent gamblers. Findings supporting the link between tobacco use and gambling have further been reported in a study of gambling expenditure carried out by Smart and Ferris (1996). Specifically, the researchers reported that heavier smoking was significantly related to higher gambling expenditures, as well as more pervasive gambling-related problems.

Although some studies of recreational gambling and tobacco use have identified a significant positive association between the variables, other studies have found no such significant link. In assessing the association between the number of cigarettes that adolescents reported smoking daily and the number of times they had gambled in the past year, Barnes et al. (1999) observed a significant positive correlation between the constructs, whereby heavier smokers reported a higher tendency to gamble. However, when these variables were included in a multivariate analysis, in which the researchers controlled for the effects of demographic and personality factors, the correlation between smoking and gambling was no longer significant. A non-significant association between tobacco use and smoking was also reported by Proimos et al. (1998) in their assessment of students in grades 8 to 12 enrolled in public and private schools in the state of Vermont, USA. Specifically, it was noted that there was no significant link observed between gambling in the past 12 months and the frequency of cigarette use in both bivariate and multivariate analyses. In studies assessing adults aged 65 years and older in the United States, Vander Bilt et al. (2004) and Pietrzak et al. (2005) also did not find a significant association between cigarette smoking and engaging in gambling activities.

Assessments of recreational online gambling and tobacco use are currently limited and are predominantly restricted to the comparison of online gamblers to exclusively land based gamblers (i.e., in casinos, in bingo halls). The results emerging from these studies do not reflect a consensus among researchers regarding the association between smoking and gambling. Griffiths et al. (2011) obtained a nationally representative sample of adult online gamblers from the UK, and compared them to a sample of gamblers who had not previously participated in online gambling. Online gamblers were significantly less likely to smoke compared to land-based gamblers. Specifically, 73% of land-based gamblers reported being current smokers, in contrast to 64% of online gamblers. Similarly, in a study of a random sample of adults residing in the UK, Wardle et al. (2011) found that 27.0% of land-based gamblers reported being current smokers, compared to 16.8% of online gamblers. These findings were reversed, however, in a

study carried out by Wood and Williams (2011), who examined gambling in relation to past-month tobacco use in a random sample of households in Canada. Based on the data obtained, the researchers concluded that individuals who gambled online were significantly more likely to use tobacco than individuals who did not gamble online, noting that 33.1% of land-based gamblers and 44.3% of online gamblers reported smoking in the past month. As a result of these contrasting findings, it is currently not clear whether greater tobacco use is associated with a greater likelihood of gambling online. However it is possible that the association between tobacco use and gambling may differ across countries, particularly given that the countries identified differ in both tobacco and gambling policies.

Although studies of recreational gambling have yielded inconsistent findings regarding the link between tobacco use and gambling, assessments of problem and pathological gamblers show more cohesive findings. Specifically, results from these studies indicate that disordered gambling and tobacco use are highly comorbid, with greater rates of one typically corresponding with greater rates of the other. Across numerous investigations, the rate of lifetime nicotine dependence has reliably been shown to be greater than 60% among pathological gamblers (Maccallum & Blaszczynski, 2002; Petry et al., 2005; Petry & Oncken, 2002; Stinchfield & Winters, 1996). Further, in a meta-analysis of population surveys examining the link between problematic gambling and numerous pathologies, Lorains et al. (2011) reported that pathological gambling was highly comorbid with nicotine dependence across investigations. In fact, nicotine dependence was found to have the highest mean prevalence among pathological gamblers out of all pathologies assessed. Additional studies of treatment-seeking gamblers have reported that regular use of tobacco is common among this population, and is typically associated with a more severe urge to gamble (Grant & Potenza, 2005; Petry & Oncken, 2002).

The link between tobacco use and disordered gambling that is identifiable in adult samples has been replicated in studies of adolescents and youth. In a random sample of individuals between the ages of 12 and 17 years residing in the Canadian province of Alberta, Wynne et al. (1996) noted that adolescent problem gamblers were twice as likely to report being daily smokers compared to adolescent recreational gamblers. Further, in assessing adolescents between the ages of 14 and 21 years from the US, Barnes et al. (2009) noted that past-year tobacco use was significantly associated with heavy gambling and with problem gambling. Further, in studying a large sample of adolescents between the ages of 13 and 15 years residing in Reykjavík, Iceland, Ólason et al. (2006) reported that respondents who were identified as problem gamblers were more likely to smoke on a daily basis compared to recreational gamblers or to non-gamblers. Consequently, the substantial link notable between problematic gambling tendencies and tobacco use appears to be robust across age groups.

Although there appears to be an association between tobacco use and gambling, particularly among clinical populations, the lack of longitudinal data pertaining to this association precludes researchers from specifying a clear causal link between the variables. It may be the case that individuals who tend to smoke are attracted to gambling as a form of recreational activity,

particularly given that many casinos typically allow individuals to smoke while gambling (Desai et al., 2007). In support of this suggestion, Corney and Davis (2010) reported that, following a smoking-law change in the United Kingdom that implemented regulations against smoking in bingo halls, bingo attendance decreased significantly nation-wide. In contrast, it may also be the case that gambling behaviours precede smoking, and that individuals initiate smoking after developing gambling habits. Evidence in support of this temporal pattern was reported by Westphal et al. (2000), who observed that the average age of onset for gambling activity was 11.3 years, while the average age of onset for tobacco use was 11.6 years among a sample of adolescents from the state of Louisiana, United States.

Additional investigations of tobacco use and gambling have further suggested that the two tendencies may emerge together, rather than one preceding the other, and that they may interact in their development (Desai et al., 2007). This notion is formalized in the generality of deviance perspective put forth by Hirschi and Gottfredson (1994), which proposes that deviant inclinations, including gambling and tobacco use, jointly emerge from a general lack of self-control or tendency toward impulsivity. Specifically, according to this perspective, deviant behaviours tend to be rooted in a tendency to seek immediate rewards at the risk of long-term consequences—a propensity that may be characteristic of both smokers and gamblers (Desai et al., 2007). In support of the generality of deviance perspective, studies have reliably shown that the two behavioural tendencies may share similar neurobiological, genetic and/or common environmental factors. Such findings suggest the importance of biological and unique environmental experiences in individual differences pertinent to both gambling and smoking-related behaviours (Mcgrath & Barrett, 2009).

The link between tobacco use and gambling may be particularly pertinent to health and wellbeing outcomes of gambling, given the finding that gamblers with a history of substance abuse exhibit greater psychiatric symptoms, more familial difficulties, greater occupational challenges, and a more substantial need for mental-health treatment relative to gamblers with no history of substance abuse (Ladd & Petry, 2003; Petry, 2007; Potenza et al., 2004).

Alcohol Use

The relationship between alcohol and gambling has been researched extensively. In a survey of British adults, alcohol consumption was significantly associated with problem gambling (Griffiths et al., 2010). Research on adolescents has found that compared to non-gamblers, gamblers are more likely to drink alcohol on a regular basis (Gupta & Derevensky, 1998). Pathological adolescent gamblers are also more likely to drink alcohol regularly, than adolescents who were not pathological gamblers (Derevensky & Gupta, 1998). In a study examining the relationship between gambling and alcohol consumption in New Mexico, Blankenship and colleagues (2007) found that problem gambling was more affected by the amount of alcohol consumed per occasion rather than the number of occasions where the respondent consumed alcohol. In a nationally representative U.S. study, 73% of pathological gamblers had an alcohol use disorder (Petry et al., 2005). The direction of the relationship

between alcohol and gambling can go both ways. Alcohol may lead to decreased inhibition resulting in increased risk taking during gambling, which could further result in more gambling problems. Alternatively, alcohol may be used as a coping mechanism for mental health problems caused by gambling problems (Stewart & Kushner, 2005). Another possible explanation is that a third variable mediates the relationship between gambling and alcohol use (Stewart & Kushner, 2005). Alcohol policies such as beverage taxes or restricting the availability of alcohol in gambling venues may be beneficial for minimizing gambling-related harms (French, Maclean & Ettner, (2008).

There is also research that demonstrates a significant relationship between online gambling and alcohol. Among adolescents, research in Canada found that online gamblers were more likely to be binge drinkers compared to adolescents who did not gamble (Wijesingha et al., 2017). Similarly, a British survey of adults found that internet gamblers were more likely to drink alcohol than non-internet gamblers (Griffiths et al., 2011). Griffiths and colleagues (2011) explain this phenomenon by asserting that internet gambling facilitates drinking at home, which is more cost effective than drinking alcohol at a gambling venue.

Research examining gambling while consuming alcohol is rather limited (Kyngdon & Dickerson, 1999; Welte et al., 2004) despite the fact that gambling venues provide individuals with opportunities to gamble and consume alcohol simultaneously and that the relationship between alcohol and gambling has been well established. Baron and Dickerson (1999) found that drinking continuously while gambling was a significant predictor of sustained and unintended gambling. Kyngdon and Dickerson (1999) found that EGM players who were given three standard alcoholic beverages before gambling continued to gamble even when they were losing incessantly, compared to EGM players who were given a placebo. In a survey of adults in the US, Welte and colleagues (2004) found that drinking while gambling results in a "more reckless gambler". In contrast, they found that individuals who did not drink while gambling displayed almost no pathological gambling. Research has also demonstrated that drinking while gambling online is a significant predictor of online problem gambling (McCormack, Shorter & Griffiths, 2013). More research in this area is critical with the legalization of online gambling and the introduction of mobile gambling applications that increase gambling accessibility.

Other Substance Use

Gambling has also been linked to substance abuse. According to Problem Behaviour Theory (Donovan & Jessor, 1985), problem behaviours reflect a single underlying common factor that influences multiple problem behaviours including gambling, substance use (cannabis, alcohol, cigarette smoking, other illicit drug use), and delinquent behavior (Barnes et al., 2015). Research demonstrates that problem gambling is associated with substance abuse including alcohol, tobacco, and marijuana use (Barnes et al., 2015).

Consistent with this theory, heavy gambling and gambling problems have been found to be associated with cannabis use across multiple studies (Barnes et al., 2009; Dowling et al., 2017;

Engwall, Hunter, & Steinberg, 2004). A large Canadian study found that problem gamblers are significantly more likely than non-problem gamblers to report being high or drunk while gambling (Martins et al., 2010). There is also research to suggest that co-morbid use of addictive substances could serve as triggers for problem gambling relapse (Nower et al., 2013). Little is known about the impact of cannabis on gambling behaviour while gambling. Some research has suggested that cannabis users may process wins and losses differently which may make them more vulnerable to pathological gambling (Cousijn et al., 2012). Another study found that tetrahydrocannabinol (THC) increased risk taking in a task with a risky or non-risky payoff (Lane et al., 2005). Data from our own research has also demonstrated that online gamblers are significantly more likely to use cannabis. Whereas 22.3% of non-gamblers used cannabis in the last year, 39.3% of adolescents who had gambled online used cannabis in the past year, and 35.9% of adolescents who gambled exclusively in land-based gambling used cannabis (Elton-Marshall, 2017). Online gamblers were also significantly more likely to be regular cannabis users: 20.6% of online gamblers used cannabis once a week or more compared to 13.2% of exclusively land-based gamblers and 7.2% of non-gamblers. There were also striking differences in the frequency of cannabis use according to gambling severity: 49.9% of “high problem” gamblers compared to 23.4% of “low problem” gamblers and 8.6% of “no problem gamblers” used cannabis once a week or more (Elton-Marshall, 2017).

(5) Age

Older Adults

Older adults represent the highest proportion of gamblers (Ontario Lottery and Gaming Corporation [OLG], 2012). In an examination of prevalence, it was found that 75% of adults over the age of 55 reported gambling in the past year (McCready, Mann, Zhao, & Eves, 2005). A concern with problem gambling among older adults is that their unique life circumstances make it more difficult to overcome gambling losses. Many older adults are transitioning out of the labour force or are retired and therefore have limited resources to recover from financial losses (Grant Stitt, Giacomassi, & Nicols, 2003; Ladd, Molina, Kerins, & Petry, 2003; McCready et al., 2005; Petry, 2002). As well, older adults also have more time for leisure activities such as gambling and are more likely to experience feelings of uselessness, boredom, and income inadequacy, which may motivate them to gamble (Kerber, Adelman-Mullally, Kim, & Schafer Astroth, 2015; Kim & Moen, 2002; Loroz, 2004; McNeilly & Burke, 2000; Parekh & Morano, 2009; Wiebe, 2002).

Adolescents

Young people may be particularly vulnerable to the problematic effects of gambling (Derevensky, 2012). Despite government legislation aimed at prohibiting adolescents from gambling, evidence suggests that adolescents participate in both regulated and unregulated forms of gambling (Derevensky, 2015) with Canadian estimates suggesting that 61% of youth and young adults gambled in the past year (Huang & Boyer, 2007). Moreover, over 9% of

adolescents in Canada had gambled online in the past three months alone (Elton-Marshall, Leatherdale & Turner, 2016). The rate at which adolescents gamble online was found to be even higher the rate among adults in Canada (Wood & Williams, 2009) and Australia (Gainsbury, 2015). The prevalence rates of pathological gambling for youth are higher than what has been found for adults (Derevensky et al., 2003). Given that early gambling initiation is associated with increased risk of gambling-related harms in the future (Jacobs, 2000), it is vital that a public health approach to gambling focuses on the prevention and treatment of gambling problems for adolescents.

Summary of Intermediary Determinants

Individuals living in disadvantaged neighbourhoods are significantly more likely to experience gambling problems. However, the directionality of this association is unclear. It might be the case that gambling opportunities are more likely to appear where individuals are more likely to use them, or it may be that individuals are more likely to use gambling opportunities if they are readily available. Further research evidence is needed to examine where gambling opportunities are located and the impact of the introduction of gambling opportunities by comparing rates of gambling and problem gambling pre-post introduction of a new opportunity.

There is overwhelming evidence that gambling and problem gambling are associated with a host of poor mental health outcomes. However, because the majority of the research is cross-sectional, the temporal association between gambling and mental health is unclear. It may be that individuals with poor mental health are more likely to gamble, or conversely it may be that gambling, particularly problem gambling, leads to poor mental health outcomes. Additionally, it may be that individuals with mental health issues such as depression are more likely to gamble, and that their gambling (particularly losses) exacerbate their mental health problems even further. Longitudinal research to better understand the temporality of these effects is needed.

There is no research examining how gambling relates to food insecurity, and this is therefore a priority area for further research. Gambling is, however, related to obesity, and individuals who gamble are more likely to be obese. Additional research is needed to better understand the mechanisms underlying this association and particularly the role of sedentary behaviour and gambling.

Gambling is strongly related to tobacco, alcohol, and cannabis use. These associations demonstrate the importance of tackling comorbid substance use and addictions rather than providing public health prevention campaigns that focus solely on one addiction. These findings also have important implications in the context of the current regulatory environment in Ontario. In January 2015, Ontario legalized online gambling and in July 2018, Canada will legalize cannabis. These changes have the potential to significantly impact substance use and comorbid addictions in Ontario. Given the strong associations between cannabis and online gambling and problem gambling, it will be critically important to examine whether there are impacts of the changes in both the legalization of online gambling and cannabis on gambling and cannabis use.

This is particularly critical as policy changes increase opportunities for comorbid use. Cannabis will become more accessible and online gambling will continue to bring gambling into the home, therefore creating even greater opportunity for gambling while under the influence of cannabis.

It is important to examine the impact of gambling across the lifespan. Adolescents in Canada are gambling despite restrictions. They are also vulnerable to future problem gambling related harms if sufficient prevention programming is not available. A particular concern for adolescents is the emergence of new gambling opportunities particularly online and mobile gambling. A high proportion of adolescents are gambling online and this is likely to lay the foundation for future gambling online as adolescents become older and able to legally access online gambling opportunities. Future research is needed to better understand how adolescents are responding to the new gambling environment (i.e. online gambling) as well as the merging of gambling and video gaming. On the other end of the spectrum, older adults may be particularly vulnerable to gambling related harms. In particular, these individuals may be more likely to suffer from negative consequences of gambling from which they cannot recover.

Social Determinants and Gambling Summary

Marginalized populations are more likely to suffer from the harms associated with gambling. Given the comorbidities between these social determinants of health and gambling-related harms, initiatives to address disparities in health equity should incorporate a public health approach to gambling. A public health framework for gambling would integrate strategies along the gambling continuum to focus not only on treatment for problem gamblers but also on prevention initiatives and harm reduction.

Towards a Framework for Gambling as a Public Health Issue

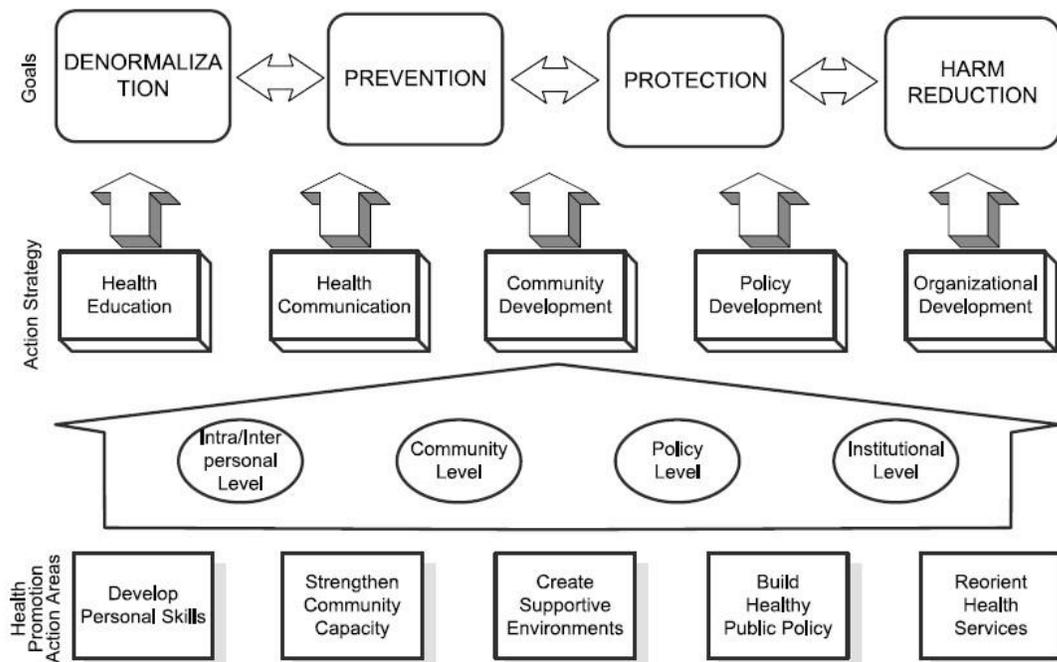
Problem or pathological gambling remain socially hidden problems (Messerlian et al., 2005). Further, media and advertising have been successful in legitimizing gambling and having a destigmatizing effect (Messerlian et al., 2005). The existing approaches taken towards gambling in Canada often ignore the social aspect of pathological gambling and gambling-related harms and instead focus on micro-level approaches that tend to blame the individual for their gambling problems (Barmaki, 2010). While addressing gambling-related harms via treatment options for problem gambling is important, there also needs to be increased attention paid to what determines that harm (Adams et al., 2009). A public health perspective would shift the focus from the individual to the physical, cultural, social and environmental context in which harmful consumption is taking place (Adams et al., 2009). A public health approach would address prevention as well as treatment and rehabilitation (Korn & Shaffer, 1999). Public health approaches to gambling recognize the need for a balance between the health, social, and economic costs and the benefits of gambling to individuals and communities (Korn, 2000).

Korn & Shaffer (1999) outlined a Public Health Action Plan with 3 goals: (1) Preventing gambling attributable problems through “public awareness, early identification of problems and

the provision of treatment services as tertiary prevention”; (2) Promoting “informed and balanced attitudes and behaviors towards gambling” at both individual and community levels; (3) Protecting vulnerable populations from gambling attributable harms. Messerlian, Derevensky and Gupta (2005) also identified three prevention objectives as part of a comprehensive public health approach to gambling for adolescents: (1) Primary prevention; (2) Secondary prevention; (3) Tertiary prevention. Primary prevention would be aimed at increasing knowledge and awareness of the risks and consequences of gambling. Strategies would include prevention related social marketing and mass media campaigns and regulating pro-gambling advertising and promotion. Secondary prevention would be aimed at early identification of youth at risk for problem gambling. This strategy would include “developing and implementing education and training programs for health care workers” (Messerlian et al., 2005). Finally, tertiary prevention would aim to “increase access and availability of treatment, services, and support” for gambling problems. More potentially effective strategies would include ensuring that youth would have access to free, youth oriented services that could ensure confidentiality (Messerlian et al., 2005).

Messerlian, Derevensky and Gupta (2005) also developed a structure to guide public health approaches for youth gambling (see figure below).

Public Health Policy Framework for Action
 Source: Messerlian, Derevensky & Gupta (2005)



There are four public health goals which are inter-related and address the underlying issues of gambling problems (Messerlian et al., 2005):

1. Denormalization - society begins to question and assess underage gambling. These include examining marketing strategies employed by the gambling industry, challenging myths and assumptions of gambling, and promoting accurate knowledge of the impact of gambling on youth.
2. Prevention - increase knowledge and awareness of the risks of gambling. Includes early identification and treatment of youth problem gambling.
3. Protection - governments, the industry, and the general public have a responsibility to protect children and adolescents from the harmfulness of gambling. These include protecting adolescents from the marketing of gambling products and venues.
4. Harm reduction - preventing the specific problem behaviour from developing. This should be aimed at all adolescents, not just those at-risk.

[Lessons Learned from Tobacco, Alcohol and Other Substance Use Applied to Gambling](#)

Strategies to address gambling-related harms can be incorporated into existing public health initiatives that focus on social determinants of health and other substance use such as alcohol, tobacco, or cannabis. Many of the measures that have been developed for addressing other substance use, tobacco in particular, could also be adapted to inform strategies pertaining to gambling. Guidelines from existing public health frameworks may be especially relevant.

One of the most significant advances in public health has been the development of the Framework Convention on Tobacco Control (FCTC), the first international treaty negotiated under the World Health Organization. The FCTC is an evidence-based treaty with many recommendations that could easily be adapted or incorporated into a strategic framework for adopting a public health approach to gambling. In fact, the need for an evidence-based framework for responsible gambling has previously been highlighted by leading gambling experts (Blaszczynski, Ladouceur, & Shaffer, 2004). Outlined below are relevant articles of the FCTC and their potential relevance for gambling policy and programming.

Price and Taxation

Article 6 of the FCTC relates to price and tax measures intended to reduce the demand for tobacco (WHO, 2003). Taxation has been found to be an effective way to discourage tobacco use (Chaloupka et al., 2012). Additionally, tobacco taxes can be a source of revenue to support tobacco control intervention and prevention initiatives (Chaloupka et al., 2012). It has similarly been suggested that gambling may also benefit from taxation and price regulation (Gainsbury et al., 2014). As noted by Gainsbury et al., (2014), gambling tax increases can be passed onto the consumer by the operator, therefore lowering the value of potential winnings and prizes. Presumably, these lowered winnings would decrease the appeal of gambling. A concern in the

modern gambling environment, however, is that with internet gambling a considerable portion of gambling websites are operated from jurisdictions with low tax rates. Consequently, any imposed taxation strategies run the risk of pushing individuals toward the illegal market (Gainsbury et al., 2014). Given that the illegal market typically does not offer responsible gambling tools and other harm reduction mechanisms, this could potentially have a negative impact on gambling behaviour and problem gambling over time. Therefore, caution using taxation strategies is warranted, particularly outside of land-based venues.

An alternative potential initiative is the use of pricing strategies to minimize harm, such as the implementation of a maximum bet allowance (Gainsbury et al., 2014). There has been some evidence to suggest that maximum bet allowances yield smaller losses and a reduction in gambling participation, while decreasing alcohol and tobacco consumption (Wardle et al., 2011).

Regulating Gambling Content

Article 9 of the FCTC proposes guidelines for testing and measuring the contents of tobacco products, and for the regulation of contents and emissions (WHO, 2003). There are many ways in which gambling products could be regulated so that they are designed in a way that is less harmful. A recent systematic review found that pop-up messages or similar messaging on electronic gaming machines (EGMs) can be an effective harm reduction strategies (Tanner et al., 2017). These messages can be used to deliver information such as: facts about slot machines and how they work, information about the risks associated with gambling, or reminders to gamblers about the time and money they have spent gambling (Tanner et al., 2017). Another effective strategy aimed at regulating gambling content is to set mandatory limits on maximum bet amounts (Tanner et al., 2017). Behaviour tracking technology would also be beneficial to enforce mandatory set loss limits, and to identify individuals for interventions where problematic game patterns are detected (Rintoul et al., 2017).

Changes to the structure of EGMs may also be effective harm minimization tools. For example, slot machines often have “reinforced small ‘wins’ in multiline games that are in fact monetary losses” which have been termed “losses disguised as wins” (Graydon et al., 2017). Losses disguised as wins are problematic because they are often misinterpreted by consumers and are further reinforced by accompanying audiovisual feedback (e.g. lights, sounds) associated with winning (Graydon et al., 2017). Therefore, one regulatory approach to ensure that gamblers are not being misled would be to regulate the use of this auditory feedback so that it does not appear as though someone had won when in fact they have lost money. Another strategy that has demonstrated some efficacy has been the use of a short animation about losses disguised as wins to reduce overestimation of wins (Graydon et al., 2017).

In addition to regulating the content of games, it would also be beneficial to regulate the gambling environment to ensure that gamblers are not encouraged to gamble further. Potential strategies include discouraging gambling venues from offering complimentary food and beverages (Rintoul et al., 2017). Reduced access to complimentary alcohol in particular may be

effective given that alcohol consumption is associated with a greater likelihood of problematic gambling (McCormack, Shorter & Griffiths, 2013; Welte et al., 2004).

Regulating Packaging and Labelling

Article 11 of the FCTC includes provisions for mandatory health warning labels on tobacco packaging. These warning labels should be rotated (to avoid wear out effects), “shall be large, clear, visible and legible”, “should be 50% or more of the principal display areas but no less than 30% of the principal display areas”, and may be in the form of pictures or pictograms (WHO, 2003). These recommendations are based on research evidence demonstrating how warning labels can be most effective.

Warnings for gambling have been introduced in some jurisdictions, beginning with educational efforts to inform gamblers of the risks of gambling and offering access to a toll-free hotline for problem gambling through signage at gambling venues (Ginley et al., 2017). More recently, there has been substantial interest in the development of effective warning messaging for gambling. A recent systematic review of warning messages for EGMs found support for the efficacy of warning messages for informing gamblers and reducing gambling harms (Ginley et al., 2017). In particular, warning messages were found to be optimally effective when they were brief, direct, easy to understand, and created an interruption in play that was difficult to ignore by gamblers (Ginley et al., 2017). Ginley et al., (2017) also noted that while the focus of warning labels for gambling has been on EGM’s, placement of warnings in other locations should also be tested, such as including warning labels on gambling advertising, similar to what has previously been regulated for tobacco and alcohol advertising.

Article 11 of the FCTC also restricts the use of: “misleading tobacco product packaging and labelling that promotes a tobacco product by any means that are false, misleading, deceptive or likely to create an erroneous impression about its characteristics, health effects, hazards or emissions...”. As previously noted, EGMs that disguise losses as wins are one way in which consumers are misled into underestimating their harms—in this case, losses (Graydon et al., 2017). Therefore, one recommendation would be to restrict audiovisual cues that promote losses as wins. Similarly, regulations on demo games would also be beneficial given that some internet casinos provide inflated payout rates for demo games to entice players to gamble for money assuming that they would be more likely to win (Sévigny et al., 2005).

Regulations on misleading advertising would also be another area for adoption. For example, in May 2015, the British Gambling Commission introduced the Licensed Conditions and Codes of Practice (LCCP). These codes of practice outlined requirements for licensed gambling operators to ensure consumer protection related to misleading promotions (Gerrard, 2017). Since the introduction of the LCCP, financial penalties have been issued to gambling operators for the use of misleading or vague advertisements, which, for instance, do not clarify the meaning of terms such as “free bets”, or what is needed to qualify (Gerrard, 2017). Overall, an effective public health strategy would be to restrict any misleading advertising or gaming components that

provide consumers with false perceptions about their game play. Emerging evidence may be useful in identifying gaming or advertising that provides misleading or erroneous perceptions and in developing responsive regulatory approaches.

Education, Communication, Training and Public Awareness

Article 12 of the FCTC addresses the need to “promote and strengthen public awareness of tobacco control issues” (WHO, 2003). This objective includes: “broad access to effective and comprehensive educational and public awareness programs on the health risks...effective and appropriate training or sensitization and awareness programmes on tobacco control addressed to persons such as health workers, community workers, social workers, media professionals, educators, decision-makers, administrators and other concerned persons” in addition to other provisions (WHO, 2003).

Gambling has been referred to as a “hidden addiction” (Campbell et al., 2011) particularly because individuals who suffer from gambling problems typically do not seek help, and the general public tends to view gambling as a harmless form of entertainment (Monaghan & Derevensky, 2008; Wood & Williams, 2009). This view of gambling as a benign recreational activity is often reinforced by positive and often glamorous portrayals of gambling in the media (Monaghan & Derevensky, 2008). Further, the general public is often poorly educated about the public health risks of gambling, including a lack of awareness that the consequences of gambling can be severe for those experiences gambling problems (Monaghan & Derevensky, 2008).

Previous research has demonstrated that teachers rank all other risky behaviours and academic problems as more serious than gambling (Derevensky et al., 2014). Canadian parents also do not believe that gambling is an important issue relative to other risky behaviours (Campbell et al., 2011). This underestimation of the risks associated with gambling is problematic, particularly in Ontario, where recent changes to the curriculum have included a mandate to teach about online gambling prevention. It is important that prevention efforts receive support from teachers to ensure appropriate delivery, and from parents given that they are potential gatekeepers to gambling activities and that they impart attitudes towards gambling on their children (Campbell et al., 2011). It is therefore clear that there is a need to provide better education about the potential harms of gambling and to ensure that health and community workers, educators, parents, and the general public are aware of the warning signs for gambling problems and the comorbidity between gambling and other substance use.

Advertising, Promotion and Sponsorship

Article 13 of the FCTC regulates tobacco-related advertising, promotion and sponsorship. The article stipulates several policies that should be adopted as a minimum including the prohibition of “all forms of tobacco advertising, promotion and sponsorship that promote a tobacco product by any means that are false, misleading or deceptive or likely to create an erroneous impression” (WHO, 2003). Additionally, warning messages are to accompany all tobacco advertising (and promotion/sponsorship where needed), and restrictions are suggested for direct or indirect

incentives that encourage tobacco product purchases, as well as tobacco sponsorship of events and activities (WHO, 2003).

As previously noted, it is important to restrict any advertising that provides false perceptions about the harms of gambling. Further, warning messages on advertising for gambling similar to tobacco control campaigns may also be warranted. Gambling prevention strategies could also include restrictions on direct or indirect incentives, such as the use of bonuses that encourage further game play. A particular concern with gambling advertising, promotion and sponsorship, is the potential to appeal to adolescents. Therefore, it would be reasonable to restrict gambling advertising, promotion, and sponsorship geared towards children and, in particular, adolescents. These restrictions would ideally extend to event sponsorship for events that appeal to minors, and to advertising in venues that are typically attended by minors.

Restriction on advertising, promotion and sponsorship has become more difficult in the current gambling environment, where advertisements for online gambling are prevalent online and during televised poker games. With sponsorship of gambling websites such as PokerStars becoming more sophisticated and including endorsements from celebrities that are popular with young people (e.g. Kevin Hart), it is important to develop effective counter-marketing strategies. An analysis of effective tobacco control campaigns targeting young people provides important lessons for what might be effective for youth gambling prevention campaigns. Byrne et al., (2005) recommend the following strategies based on youth tobacco control initiatives: (1) messaging highlighting the risks associated with gambling; (2) denormalization campaigns targeting the gambling industry that highlight manipulative messaging from the industry and the reliance on gambling losses to generate profits; (3) advertising using young people; (4) personal stories to highlight family members' suffering resulting from a loved one's gambling addiction; (5) messaging targeting at-risk demographic groups (based on gender and ethno-cultural background); (6) messaging targeting different age groups (e.g. focusing on delay of onset) and tailoring different messages for individuals who (a) have little or no experience gambling; (b) are gambling regularly; and (c) are at risk for pathological gambling (Byrne et al., 2005).

Demand Reduction Measures

Article 14 of the FCTC calls for the "...implementation of effective programmes aimed at promoting the cessation of tobacco use" (WHO, 2013). This implementation includes integrating diagnosis and treatment counselling as part of health and education programmes, establishing health care facilities and rehabilitation centre programmes for diagnosis, counselling, prevention and treatment.

A similar strategy for improving problem gambling treatment could also be implemented. For example, as mentioned previously, it is imperative that we increase knowledge among health care professionals, as well as among social and community workers to ensure that they are educated about the public health harms of gambling. It is important for these individuals to understand how to screen for gambling problems, how to recognize individuals at risk for

problem gambling, and where to send patients to get further assistance. Additionally, given the high comorbidity of gambling with other substance use, health care professionals could also be encouraged to screen for gambling disorders when a patient indicates that they are using other substances. Integration of problem gambling treatment services across different service sectors is also critical. The Department of Justice in Victoria has developed a program that requires collaborative partnerships for gambling health services between gambling, alcohol and other substance use; mental health; and other family service sectors (Martyres & Townshend, 2016).

Regulating Accessibility

Until recently in Ontario, alcohol purchases were limited to the Liquor Control Board of Ontario, and the purpose of this control was to restrict access to alcohol. Similarly, reducing operating hours for gambling venues rather than allowing venues to be open 24 hours has been shown to be an effective harm minimization tool (Tanner et al., 2017). However, a limitation of this strategy is that it is not feasible to restrict accessibility to online gambling websites to designated times, particularly those that are not government sanctioned. Consequently, for individuals with a particular drive to gamble, reduced access to illegal gambling sites would not prevent them from seeking out opportunities to gamble online. Another strategy to limit the accessibility of gambling is to remove Automated Teller Machines (ATMs) from gambling venues or to limit withdrawals from ATMs. This strategy has demonstrated efficacy in reducing expenditures, playing time, and problem gambling severity (Tanner et al., 2017). Such a strategy may be applied to limits on cash that can be transferred to online gambling websites. However, this would only be feasible in government-run online gambling websites.

Article 15 of the FCTC calls for measures to prohibit the sale of tobacco products to persons under the legal age limit (WHO, 2003). As noted by Gainsbury et al., (2014), having a minimum age for purchasing tobacco and alcohol is important for reducing consumption and minimizing harms by restricting access to minors. Given that early gambling initiation is associated with increased risk of harm in the future, regulating a minimum age for gambling also offers important public health benefits (Gainsbury et al., 2014; Gupta & Derevensky 1997; Wynne et al., 2006). However, it has also been noted that, a minimum age of 18 may not be sufficient to protect adolescents and young adults from gambling harms (Gainsbury et al., 2014). The minimum age could be raised to correspond to a later age during which gambling related losses may be less impactful. As gambling becomes more accessible through online avenues, the issue of establishing or revising a minimum age for gambling will become more urgent.

Even with the implementation of gambling regulations, there is a continued need for parental awareness and support for preventative gambling strategies. It is important for parents to enforce restrictions on gambling, particularly given that children are more likely to engage in risky gambling behaviour if their parents allow gambling prior to the legal age of majority.

Research, surveillance and exchange of information

Article 20 of the FCTC calls for parties to “develop and promote national research and to

coordinate research programmes at the regional and international levels in the field of tobacco control” (WHO, 2003). This includes research examining the determinants and consequences of tobacco consumption, and surveillance of the “magnitude, patterns, determinants and consequences of tobacco consumption...” including integration of surveillance programmes into national, regional, and global health surveillance programmes so that comparisons can be made across jurisdictions.

There is currently a lack of ongoing surveillance data available in Canada, which creates substantial challenges in developing estimates of the prevalence of gambling problems, and forms of gambling behaviour among high risk groups, such as adolescents. Dedicated funding to examine trends over time and to allow responses to problematic shifts in gambling patterns are critical, particularly with the rapid emergence of online gambling. Very little is known about online gambling among adolescents, and recent estimates suggest that rates are higher than previously estimated (Elton-Marshall et al., 2016). However, limited research currently exists regarding the manner in which adolescents are gambling and what prevention strategies are needed.

Moreover, there is a lack of coordinated surveillance efforts that would enable comparisons of gambling, and particularly online gambling between countries differing in their approaches to gambling and online gambling regulation. Such comparisons would be helpful to determine best practices in problem gambling prevention strategies. This aim would require ongoing dedicated funding and commitment from governments internationally, but would have the potential to lead to significant advances in developing an evidence based approach to emerging forms of gambling. Given that online gambling occurs across international jurisdictions, such a coordinated effort to understanding the issue is warranted.

Jurisdictions Approaching Gambling as a Public Health Issue

The Case of Australia

Beginning in the 1990s, Australia witnessed a substantial and rapid increase in commercial gambling (Productivity Commission, 2010). A prevalence study conducted in the country indicated that 64.3% of adults had gambled at least once (Gainsbury et al., 2015), and total annual gambling expenditures were estimated to be in excess of \$17.5 billion AUD in 2007 (Office of Economic and Statistical Research, 2007). Additionally, proportional expenditure on gambling, represented as the percentage of disposable household income being spent on gambling activities, increased from 1.5% from the 1980-1981 fiscal year to 3.0% in the 2005-2006 fiscal year (Office of Economic and Statistical Research, 2007). While traditional land-based gambling saw a decrease in 2012 in Australia, online and electronic gambling has been consistently growing in popularity, with approximately \$1.1 billion AUD being spent on gambling websites (Gainsbury et al., 2015; Lamont et al., 2011)

As a result of the considerable prevalence of gambling behaviours in Australia, there has been

growing concern regarding the detrimental effects that the gambling industry may have on the health and well-being of the country's residents. Specifically, the greater availability of gambling in Australia—a result of more relaxed gambling laws—has led to increased participation in gambling activities and, subsequently, a growing prevalence of problem gambling in the country (Storer et al., 2009). Further increases in problem gambling have also been attributable to the growing popularity of electronic and online games in Australia, which facilitate risky play in a poor social atmosphere (Gainsbury et al., 2012; 2014). In 2010, approximately one-third of gambling expenditures were attributable to individuals identified as problem gamblers (Productivity Commission, 2010), providing evidence that problem gambling appears to be both pervasive and financially taxing on affected individuals, in addition to conferring detrimental social, physical, and psychological impacts (Addiction Research Institute, 1995; Livingstone et al., 2017; Petry, 2006; Productivity Commission, 1999).

At the same time, Australia has seen numerous financial and economic benefits from the legalization of gambling within its borders. For instance, the revenue generated from the taxation of legal gambling activities accounts for a substantial portion of the country's tax revenue stream. In the 2002-2003 fiscal year, Australia's State government generated approximately \$5 billion AUD revenue from gambling, which accounted for 10% of the total taxation revenue collected by the government (Productivity Commission, 2010). Additionally, the legalization of gambling in Australia has resulted in the availability of more employment opportunities, with estimates showing that at least 145,000 individuals were employed in Australia's gambling industry in 2010 (Public Health Association of Australia, 2014). Furthermore, in the 2004-2005 fiscal year, 5,370 gambling businesses were in operation, many of which oversaw numerous gambling venues (Australian Bureau of Statistics, 2006). Due to these economic benefits, the notion of enforcing the complete prohibition of gambling activities in Australia was deemed an undesirable step in addressing the detrimental effects of gambling in the country.

In an effort to respond to growing concerns regarding gambling in Australia, while also maintaining the potential economic benefits that the gambling industry may provide, the country has opted to take a pro-active public health approach to gambling rather than an individual-centred treatment approach. The decision to avoid an approach that focuses on the rehabilitation of individuals exhibiting symptoms of gambling addiction was based in existing research, which suggests that the effects of problem gambling extend far beyond the afflicted individual. For instance, it has been noted that the habits of any given compulsive gambler will detrimentally affect approximately 5 to 10 other individuals within their surroundings or social circle (Public Health Association of Australia, 2014). Pathological forms of gambling further carry community-based effects, with growing numbers of problem gamblers increasing pressure on communities to provide more legal, social, and financial services (Public Health Association of Australia, 2014). Consequently, an approach to addressing gambling issues deemed effective by Australia was one with a focus on public health, which takes into account the interaction between the individual, the community, and the gambling environment, and further assumes preventative rather than reactive stance on addressing the proliferation of pathological forms of gambling

(Detels, 2009). First steps to developing this approach were taken in 2000, when the Council of Australian Governments tasked the Ministerial Council on Gambling to develop a National Framework on Problem Gambling (Parliamentary Joint Select Committee on Gambling Reform, 2012). This national framework was finalized in 2004, and it highlights four key areas of focus (Ministerial Council on Gambling, 2009):

(a) Public awareness, education and training- A central objective pertinent to this area is the need to effectively and transparently inform individuals and communities about available gambling products and activities (e.g., the odds of winning on a particular game), as well as about the potential harms associated with these products and activities. A second aim is to increase awareness of help and support resources available to individuals suffering from problematic gambling tendencies via explicit promotion of these resources in order to facilitate early diagnosis of problem gambling. In outlining these objectives, the framework stresses the need for jurisdictions to be aware of at-risk groups in the community, and to tailor their initiatives in such a way that ensures that these groups will benefit from the courses of action pursued.

(b) Responsible gambling environments- This area of focus highlights the need for jurisdictions to create gambling environments that ultimately minimize the likelihood that gamblers will develop problematic or pathological gambling behaviours. A recommendation central to this area is the need for all jurisdictions to consider and assess carefully the ramifications of introducing new gambling activities, venues, or opportunities to the surrounding community, ideally via formal social impact assessment strategies. Further, the framework recommends that codes of conduct be developed and promoted by all jurisdictions, which put forth information about responsible practices and informed decision-making to gambling operators and consumers.

(c) Intervention, counselling and support services- An objective central to this area of focus is the development of support, counseling, and treatment services that are accessible, effective, and sensitive to diversity. According to the framework, these services should be available and tailored to all residents of Australia, including those residing in remote areas as well as to Indigenous populations. The services should also be overseen by individuals who have sufficient education and training in areas appropriate to problem gambling. One specific initiative recommended for this area is the introduction and use of a national standardized assessment tool for the diagnosis of pathological gambling tendencies.

(d) National research and data collection- This area of focus outlines recommendations regarding initiatives that could be taken to ensure the effective implementation and further development of various public-health strategies pertaining to gambling. One major initiative put forth is the implementation of a National Gambling Research Program—a program aimed at increasing knowledge regarding problem gambling and associated intervention strategies, which would be jointly funded by all jurisdictions in Australia.

In addition to outlining the four areas of focus, outlined above, the National Framework on Problem Gambling further emphasized to the need for all jurisdictions in Australia to adopt a

harm minimization approach to problem gambling. Harm minimization is a public-health strategy, focused on prevention and control, which strives to reduce detrimental economic, social, and health consequences of addiction, without enforcing prohibition (Blaszczynski, 2001). To date, all jurisdictions in Australia have agreed to pursue harm minimization in their efforts to address problematic gambling behaviours within their population (Parliamentary Joint Select Committee on Gambling Reform, 2012). All jurisdictions have also signed the National Partnership Agreement on Preventative Health, through which they have shown their commitment to fostering healthy behaviours in their communities (Council of Australian Governments, 2009).

Following the dissemination of information regarding the National Framework on Problem Gambling, all jurisdictions were tasked with addressing the four focus areas outlined in the framework. A number of aims were addressed successfully across these jurisdictions between the years 2004 and 2008, as outlined in a progress report compiled by the Ministerial Council on Gambling (2009). Specifically, all Australian jurisdictions developed campaigns or community events intended to foster community awareness regarding problematic gambling habits. The jurisdictions further clarified policies pertaining to the professional training of gambling counsellors, as well as to the social impact assessment of new gambling opportunities entering local communities. Through a collaborative effort, the jurisdictions developed a single toll-free helpline intended to offer counselling services to individuals suffering from disordered gambling via telephone. Lastly, all jurisdictions provided funding to a National Gambling Research Program, later renamed to Gambling Research Australia, which supported research pertaining to the four focus areas outlined in the National Framework on Problem Gambling. This research program is no longer active in Australia.

In addition to undertaking joint efforts to address the objectives stipulated in the National Framework on Problem Gambling, some jurisdictions individually developed and pursued a comprehensive public health approach tailored to their specific region. For instance, the state of Queensland introduced the Responsible Gambling Strategy (Queensland Treasury, 2002), while the state of Victoria put forth the Taking Action on Problem Gambling strategy (Parliament of Victoria, 2006). The principles and initiatives guiding these strategies echoed those outlined in the National Framework on Problem Gambling, but the two strategies yielded different outcomes due to their implementation. Specifically, while an evaluation of Queensland's strategy found it to be effective in minimizing harms pertinent to gambling, Victoria's strategy faced criticism for its absence of clear and explicit benchmarks and targets tied to specific aims. This absence of targets prevented auditors from being able to assess the strategy effectively (Parliamentary Joint Select Committee on Gambling Reform, 2012).

The Case of New Zealand

Beginning in the 1990s New Zealand experienced a rise in gambling consumption for almost a decade, that resulted in an increase in the number of people seeking treatment and services for problem gambling (Adams et al., 2009). From 1993 to 2003, six casinos were opened and in

2003, there were approximately 22,000 non-casino gambling machines (one for every 180 people living in New Zealand) (Bunkle & Lepper, 2004). Efforts to distribute all resources into problem gambling treatment were deemed ineffective since they did not take a proactive stance and tackle the source of the problem (Adams et al., 2009).

New Zealand is a unique example because they have made concerted efforts to create a comprehensive public health approach to gambling with their 2003 Gambling Act where the government officially recognized gambling as a public health issue (Adams et al., 2009). In taking a public health approach to gambling, New Zealand has recognized three key areas of activity: harm minimization, health promotion and political determinants (Adams et al., 2009). Harm minimization involves making changes to the gambling environment that result in the decline of harmful gambling consumption (Adams et al., 2009). Adams, Raeburn and de Silva (2009) identify an example of a harm minimization strategy in Australia (Victoria) where the State identifies communities where EGM accessibility has demonstrated harm and restricts the number of EGMs present in that particular community. Health promotion involves emphasizing the importance of community action and is influenced by the Ottawa Charter for Health Promotion (Adams et al., 2009). Strategies include developing "community capacity, knowledge and resilience with regard to the attraction of gambling" to empower communities to deal with the future of gambling opportunities (Adams et al., 2009, p. 690). The health promotion strategy recognizes that regulation of gambling alone is not adequate considering that the new gambling environment involves online or mobile gambling (Adams et al., 2009), which makes regulation increasingly difficult. This strategy also recognizes that the community knows best and can inform the government how to most effectively deal with the harmful effects of gambling in their community. Political determinants involve altering the "conflicted relationships that form between gambling profits and government" (Adams et al., 2009, p. 690). Gambling profits bring in significant revenue to the government and in some places such as Canada this revenue surpasses those of tobacco and alcohol combined (Adams et al., 2009). Therefore the political determinants strategy involves three components: public health advocacy, mechanisms of surveillance and structural accountability (Adams et al., 2009). These three components serve to make the relationship between gambling profits and the government more transparent.

Adams & Rossen (2012) have examined the effectiveness of the 2003 Gambling Act a decade later and have pointed out four crucial mistakes that the New Zealand government made: (1) Allowing the gambling industry to have a significant input into key aspects of the problem gambling strategy. (2) Separation of the different arms of a broad public health approach into different government agencies. (3) The benefits for communities were seen only in terms of financial returns. (4) Lack of independent accountability to oversee the broader policy and regulatory environment.

CONCLUSION

Existing approaches to gambling in Canada have often focused on micro-level approaches to gambling that blame individuals while ignoring the physical, cultural, social, and environmental contexts which may contribute to problematic gambling and gambling related harms (Adams et al., 2009; Barmaki, 2010). The current study demonstrates that an approach to gambling that considers the social determinants of health is warranted. Given the comorbidity between gambling and other substance use (e.g., tobacco, alcohol, cannabis use), an efficient use of resources would be to adopt strategies that address multiple substance use and addictions including gambling. There have also been many advances in public health strategies addressing other substance use such as tobacco. Efforts to address prevention and treatment of gambling related harms could therefore adapt some of these successful strategies for gambling. Australia and New Zealand are examples of jurisdictions that have adopted a public health approach to gambling. Other jurisdictions can use the lessons learned from Australia and New Zealand to inform their own public health strategies.

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