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## Gambling Disorder and Minority Populations: Prevalence and Risk Factors

Mayumi Okuda<sup>1</sup>, Weiwei Liu<sup>2</sup>, Jodi A. Cisewski<sup>3</sup>, Luis Segura<sup>3</sup>, Carla L. Storr<sup>4</sup>, and Silvia S. Martins<sup>3</sup>

<sup>1</sup>Department of Psychiatry, Columbia University, 710 West 168th Street, 12 Floor, New York, NY 10032, USA

<sup>2</sup>NORC at the University of Chicago, 4350 East-west Highway, Bethesda, MD 20814, USA

<sup>3</sup>Department of Epidemiology, Columbia University Mailman School of Public Health, 722 West 168th Street, New York, NY 10032, USA

<sup>4</sup>Center for Health Outcomes Research, University of Maryland School of Nursing, 655 West Lombard Street, Baltimore, MD 21201, USA

### Abstract

**Purpose of review**—Previous studies demonstrate disparities in health and health services including gambling disorders (GD) among ethnic and racial minority groups. In this review, we summarize studies examining the prevalence of GD across different ethnic and racial minorities.

**Recent findings**—We describe the sociodemographic subgroup variations at heightened risk for GD and factors associated with GD in racial and ethnic minority groups including gambling availability, comorbid substance use, psychiatric conditions, stress, acculturation, and differences in cultural values and cognitions. We found that research of GD among minority groups is scant, and the prevalence of GD among these groups is at a magnitude of concern.

**Summary**—Racial and ethnic minority status in it of itself is not a risk factor for GD but may be a proxy for underlying potential risk factors. The need for prevention and treatment programs for different cultural group remains unmet.

### Keywords

Gambling disorder; Racial minorities; Ethnic minorities; Risk factors

### Introduction

A hallmark of most countries across the world today is the diversity in the ethnic and racial composition of the population. Often considered minorities, there are more than 370 million

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indigenous people living in 90 countries worldwide. In addition, more people than ever are living outside their country of origin. In 2015, the number of international migrants worldwide reached 244 million, an increase of 71 million or 41 %, compared to 2000 [1]. In the USA, racial and ethnic minorities constitute approximately a third of the population and are expected to become the majority by 2050 [2, 3]. Overwhelming evidence has documented that members of racial and ethnic minority groups are more likely to experience disparities in health and health services [4]. This paradigm appears to hold true when it comes to Gambling Disorders (GD). In the present review, the term “Gambling Disorders” (GD) will be used to denote both problem and pathological gambling, we do not simply refer to GD as defined in DSM-5 [5–7].

High prevalence rates of GD have been found among racial and ethnic minorities across the world [8], as well as lower rates of treatment-seeking among certain minority groups [9]. Extensive research has documented sociodemographic subgroup variation and a number of risk factors for GD in the general population, such as comorbid psychiatric disorders and gambling availability [10]. This review will first summarize prevalence studies across different ethnic and racial minority groups at heightened risk for GD. This will be followed by a discussion of specific risk factors as they pertain to racial and ethnic minority groups. Finally, we will describe future directions for research on GD in racial and ethnic minority populations.

## Prevalence

Several studies have reported the prevalence of GD in ethnic and racial minority groups. These studies are summarized in Table 1. Overall, gambling activities appear to be frequent among ethnic and minority populations with rates ranging between 12.9 and 87 %. Prevalence of GD have been reported as low as 0.3 % in Hispanics and as high as 58 % in South East Asian refugees.

## Risk Factors Associated with Gambling Disorders

**Sociodemographic Characteristics**—A significant association between GD and several sociodemographic characteristics, including gender, age, marital status, education, and place of residence, has been reported among the general population [10–12]. Evidence is accumulating that the association between sociodemographic characteristics and GD may differ by racial and ethnic minority groups [8, 13, 14•, 15•]. For example, findings from a large epidemiological study conducted in the USA in the early 2000’s [8] found that among individuals with a GD, significantly more non-Hispanic Blacks than non-Hispanic Whites were women, and significantly fewer Hispanic than non-Hispanic Whites were widowed, separated, or divorced. The study also showed that more Hispanics than non-Hispanic Whites with GD had less than high school, and non-Hispanic Blacks were more likely to fall into the lowest income category than non-Hispanic Whites. A similar finding was reported among callers to a gambling helpline where the majority of Black callers were women and less likely to have a post-high school education as compared to Whites [13]. Furthermore, a study comparing Native Americans living on or near a U.S. reservation to non-Native Americans living in similar areas found a similar elevated risk of developing GD among

Native American males and females and that economic status and unemployment both contributed to the greater rates of GD among the Native Americans [16].

Other studies have also found social economic status and place of residence to be associated with GD. For example, a large representative cross sectional study conducted among the Greenland Inuit, a large indigenous population that constitutes the majority of their country, found significant associations between lifetime GD and social transition, measured as place of residence and a combination of residence, education, and occupation [17••]. The findings suggested that the Greenland Inuit caught between tradition and modern ways of life may be more vulnerable to GD. The same study also found that lifetime GD was associated with adverse childhood experiences including alcohol-related problems in childhood home and sexual abuse (the latter only for women). A study conducted in the USA found that living in neighborhoods with higher disadvantage was associated with gambling frequency and problems among young adult gamblers of minority groups [18••].

### **Comorbid Substance Use and Psychiatric Conditions**

Data from one study using a selected sample consisting of predominantly ethnic and racial minority groups and low income populations reported that impulsivity, depression, and aggressive behavior in early childhood or early adolescence are all significantly associated with lifetime GD [19•, 20•, 21]. For Native Americans, historical trauma and post-traumatic stress disorder (PTSD) have also been found to be associated with greater likelihood of developing GD [16, 22••]. Findings from a large epidemiologic study conducted in the USA suggest a stronger relationship between a range of psychiatric disorders (e.g., mood and anxiety disorders) and GD among non-Hispanic Blacks and Hispanics than among non-Hispanic Whites [23, 24].

Studies conducted with minorities in the USA [16, 25], Asians in Hong Kong [26•], and Greenland Inuit [27•] have reported a strong relationship between GD and substance use, including heavy use of alcohol, tobacco, and marijuana, even after controlling for socioeconomic characteristics. Studies that compare this relationship among ethnic and racial minority groups reported a stronger association between GD and smoking cigarettes among Asian adolescents [28•] and a lower likelihood of alcohol use disorders compared to non-Hispanic Whites [29]. In Native American populations, increased alcohol use has also been associated with a greater likelihood of having GD [16, 22••]. On the contrary, a large epidemiologic study conducted in the USA found that non-Hispanic Blacks with GD were significantly less likely than non-Hispanic Whites to have a lifetime alcohol use disorder. In addition, non-Hispanic Blacks and Hispanics with GD were less likely than Whites to have lifetime nicotine dependence [8].

Studies in the general population have found that GDs are associated with personality disorders such as antisocial behavior [30], ADHD combined (inattention and hyperactivity-impulsivity) [31, 32, 33•], conduct disorder [34]. However, no studies have reported whether the consistency of such relationships in minorities, or whether the presence of other psychiatric conditions, like depression [35], modifies the relationship between personality disorders and gambling among minorities still remains unclear.

## Gambling Availability

Availability of gambling activities has also been reported to increase gambling participation and the risk of developing a GD [9, 36]. An environment where gambling is both legal and readily available may lead to increased gambling participation among ethnic and racial minorities. There may be minimal cultural and linguistic barriers associated with certain gambling activities for immigrants (e.g., slot machines) [37, 38]. In addition, one study reported that gambling availability in residence after migration (i.e., wide-open gambling in California and restrictive gambling in Hawaii) contributed to variation in Asian American's gambling behaviors [39].

Further, self-reported convenience to gambling venues or activities is strongly associated with GD among Native American groups [40••]. It was found that the establishment of casino gambling on several reservations through the 1988 Federal Indian Gaming Regulatory Act Disparity led to an increased exposure to gambling activities in Native American groups, which may partly explain the high rate of GD in this population [8]. Currently, more than 240 of the 562 Native American tribes in the USA engage in gambling operations with more than 400 casinos and bingo halls throughout 28 states.

## Culture

Gambling is a ubiquitous activity encountered in almost all cultures. Cultural values and beliefs are the moral principles and standards accepted by individuals and groups, and they can impact decision making around taking risks. As we begin to form a more global understanding of gambling behaviors, disparities in the acceptance of gambling, type of gambling activity, and rates of GD point to possible cultural variations in values and beliefs regarding fate, illusions of control, and particular superstitious thinking [41].

For cultures following collectivist values, GD may be thought as undercutting civic virtues and social responsibilities with the quick accumulation of wealth encouraging greed and destructive impulsivity and the accumulation of losses contributing to detrimental consequences including financial debt, strained relationships, and work and health issues. For instance, as something attained through no effort, gambling is considered a sin in the Qur'an and thus condemned and viewed as unholy in Muslim cultures. Contrariwise, gambling is a central feature in Chinese social events and festivals and it is thought that the long history and popularity of dice and card games contributes to the attraction of Chinese to casino tables [42]. Furthermore, some studies report that perceived skill and experience in gambling activities may be seen as a virtue in some Chinese and Indian groups [43•]. In Malaysia, gambling activities may be viewed as an attractive leisure option as well as a contributor to economic growth in the country [43•]. Using a small predominately African American sample, one study found that acceptance of gambling as a normalized behavior among parents and friends was positively correlated with GD in high school students [44]. Thus, for some cultures, social norms and history may portray gambling as an acceptable way of living [41, 45].

Cognitive factors may also underlie cultural differences in GD. Some authors have hypothesized that the acceptance of magical thinking among Native Americans may

generalize to gambling via a belief in luck [16]. Chinese, on the other hand, tend to believe in nonlinear or cyclical change—what goes up must come down [46] with research showing that Asians are more prone to believing that something positive will happen after a run of bad luck, also known as gambler’s fallacy [47]. In contrast, individuals with an European heritage tend to believe change is relatively linear—that there is no change and streaks will continue (hot hand fallacy—a winning streak is likely to continue or cold hand fallacy—losing likely to continue) [47].

### **Stress**

Difficulties related to immigration stress and post-immigration adjustment, which may affect more strongly racial and ethnic minority groups, have been associated with GD. Members of racial and ethnic minority groups often face additional stressors including unemployment, language barriers, loss of status, and social isolation when they migrate to a new country. For immigrants who have lost their social supports, gambling may serve as a venue to socialize and rebuild their networks [39, 48]. Though limited by a very small sample size, one study reported a 59 % lifetime prevalence of GD in South East Asian refugees to the USA, a rate that is 25 times higher than that of the general population [49]. Studies have suggested that compared to those living in more privileged conditions, individuals living in disadvantaged backgrounds may be more prone to a cognitive bias (“prospect theory”) that leads to placing a higher value on winning or seeing losses as less of an adverse consequence [50]. In the context of fewer financial resources and higher expectations of better living in the host culture, gambling may be perceived as a relatively easy way to achieve these goals [37].

It has also been hypothesized that individuals that cannot exercise actual control over a stressful situation might attempt to compensate for by engaging in behaviors that seem to heighten a generalized, subjective illusory perception of controllability. Consistent with this hypothesis, one study found that highly stressed individuals preferred gambling forms that instilled an illusion of control [51]. Other authors have hypothesized that given that individuals tend to have negative perceptions of high arousal states that accompany stress, engaging in high arousal activities such as gambling provides a positive interpretation of the stress-related arousal in the form of excitement [52]. Whether these hypotheses explain the links between immigration, post-immigration adjustment, and GD remains to be clarified.

### **Discrimination**

Discrimination has also been associated with GD. A study conducted in Canada documented high levels of GDs in Urban Aboriginal adults living in a mid-sized city and an association between racial discrimination, gambling activities, and GD [22••]. A positive association was found between 12-month racial discrimination and current PTSD symptoms (related to racial discrimination) and suggested that PTSD avoidance/numbing symptoms mediated the association between racial discrimination and the increased use of gambling to escape negative affect [22••].

## Acculturation

Acculturation may have different effects on gambling and GD. Some studies have suggested that it may lead to increased gambling through the successful adaptation to gambling behaviors in the host culture where gambling is more accessible, socially acceptable, or that it may serve as a way to cope throughout a challenging acculturation process [41]. In this regard, GD appears to follow the “immigrant paradox” a phenomenon described in which first-generation immigrants have better health outcomes than non-immigrants and immigrants of subsequent generations [8]. For instance, it has been reported that Hispanic immigrants living in the USA are an exception to the pattern of higher prevalence of GD among racial and ethnic minority groups. Despite social adversity and high prevalence of risk factors for GD among Hispanics, a large study conducted in the general population in the USA showed that GDs were not significantly more prevalent in Hispanics when compared to non-Hispanic Whites and to other minority groups [8]. Nonetheless, the “protective effects” of Hispanic ethnicity appear to dissipate in future generations. Findings from a separate study conducted using the same epidemiologic sample but with a focus on immigrants (independent of minority status) revealed that first-generation immigrants engage less frequently in gambling and have lower rates of GD than non-immigrants and second and third-generation immigrants [15•]. Compared to first-generation immigrants, immigrants of subsequent generations and non-immigrants were significantly more likely to report involvement in all problem gambling behaviors. The study also showed that age and duration in the USA played a role; as immigrating prior to age 12 increased the likelihood of gambling compared to those who arrived as adolescents or adults.

Though not examined for GD, other studies on the immigrant paradox as it relates to substance use disorders have pointed to a protective role of foreign nativity which may be related to greater social controls against problematic behaviors in their countries of origin [53]. In the case of substance use disorders, assimilation to the host culture, or living for longer periods of time in countries with high rates of substance use, appears to accelerate the rates of substance use disorders for immigrant groups from countries with lower rates. However, greater availability of substances alone cannot fully explain these observations given that some countries with wide availability of substances have also shown consistent low rates of substance use disorders. Several mechanisms have been hypothesized to be protective including traditional family values of affiliation, a sustained sense of belonging that can buffer adversity, and arriving at an older age which may result in lower exposure to cultures different from their own, probably reducing the likelihood of stress related to discrimination. However, the extent to which these hypotheses relate to the development of GD in racial and ethnic minorities remains unknown.

On the other hand, a survey conducted on a diverse sample of Native Americans living in the USA reported that higher levels of Native American culture/identity (measured as Native identity, exposure to reservation life, living more by “Native way,” participation in Native American activities, speaking a tribal language and having a Native American name) increased the odds of GD [40••]. Furthermore, the study found that living by the “White way of life” was associated with significantly lower odds of GD.

## Future Directions

Very few studies have focused on treatment of GD in minority populations [11] despite the fact that several studies have shown high rates GD in ethnic minorities [11, 24, 54–57]. One of the few large epidemiologic studies conducted in the USA reported that while individuals in some minority groups (non-Hispanic Blacks and Native/Asian Americans) had a higher prevalence of GD as compared to non-Hispanic Whites, individuals with GD had similar clinical course and all individuals with GD had low treatment-seeking patterns regardless of their race or ethnicity [8]. Overall, only 9.3 % of individuals with GD from all racial or ethnic minority groups sought treatment for GD, so, in this study, there was no difference in treatment-seeking for GD between minorities and non-Hispanic Whites. Data on differences on the severity of the disorder among racial and ethnic minorities remains mixed. The same large epidemiologic study did not find differences between racial and ethnic minorities regarding the number of criteria endorsed [8], while smaller selected samples report greater severity of GD among certain ethnic and racial minority groups. For instance, a study focusing on differences between minority and non-minority callers to gambling disorder helplines [13, 29] reported that compared to non-Hispanic Whites, non-Hispanic Black callers have a longer duration of gambling problems, a higher prevalence of depression and of daily tobacco use, a higher prevalence of treatment-seeking for mental health problems. Furthermore, another study reported that Asian Americans were more likely than non-Hispanic Whites to report suicide attempts related to gambling problems [29].

Treatment-seeking involves a myriad of factors related to the disorder and its severity, pre-existing beliefs about the cause of the disorder, the availability, perceived efficacy and quality of interventions, and a wide range of environmental factors affecting individuals with the disorder. Cultural values likely influence treatment-seeking behaviors for GD. For cultures with highly permissive beliefs towards gambling, it might be difficult to view signs of GD as problematic, which can become a significant barrier for the recognition of the disorder [58]. Future studies are needed to elucidate specific factors that influence treatment-seeking patterns for ethnic and racial minority groups. Racial and ethnic minorities are more likely to report prior discrimination by mental health providers, negative beliefs about mental health including discomfort in discussing personal matters, social stigma related to being identified as having a mental health problem, and distrust of formalized mental health providers as barriers to accessing care [57, 59]. Lack of insurance, long waiting lists, and lack of services in clients' preferred language are common barriers for care [60]. Particularly for undocumented immigrants, help seeking may be associated with fear of the possibility of deportation, and a perceived lack of available, appropriate, culturally-congruent services in their communities. Thus, cultural adaptations in GD treatments and increased access to services may improve barriers to care [57, 61]. We do not yet have ways to identify in individual patients dysfunction in specific neural systems that explains GD symptoms and that could lead to specific treatment recommendations. Ongoing work on the various brain mechanisms that lead to the constellation of symptoms of GD may offer the basis for novel, personalized therapeutic alternatives [62, 63]. In sum, there is a need for more fine-grained research in the area of GD and racial and ethnic minorities in the USA and in other countries.

## Conclusions

Our review highlighted prevalence of GD among ethnic and racial minority groups is at a magnitude of concern. Evidence, although scant and often laden with limitations, is accruing that suggests certain minority groups are more vulnerable to develop GD. Being a member of a racial or ethnic minority in of itself is not merely a risk factor for GD, and research must do a better job at elucidating the real risk factors within these high risk populations. Racial and ethnic minority status may simply be a proxy for underlying potential risk factors such as social economic disadvantage, gambling availability, stress and acculturation processes, as well as cultural variations in values and cognitions. The contribution of these different factors in the development of GD is still an area under research. The need for prevention and treatment programs for different cultural group remains unmet.

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### Compliance with Ethical Standards

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**Table 1**

Prevalence of gambling and GD across studies examining ethnic and racial minorities

Minority group	Citation	Location and time period	Sample	Time point	Prevalence
ADOLESCENTS (underage 18)					
58 % African American; 36.1 % Caucasian; 5.9 % Other	Goldstein et al. 2009	Flint, Michigan—September 2006 through August 2007	Adolescent emergency department patients who completed a brief self-administered computerized screening questionnaire as part of a RCT on alcohol and violence intervention.	Past year	23 % gambled in the past year 18 % non-African American gambled in the past year 27 % African American gambled in the past year
African American	Martins et al. 2013a; Martins et al. 2008b; Martins et al. 2015c; Storr et al. 2012; Lee et al. 2012	Baltimore, Maryland—1993 to 2005	Urban first-grade students from 27 classrooms in nine elementary schools who participated in the Preventative Intervention Research Center (PIRC) Second Generation Intervention Trial, a randomized prevention trial, and followed to age 18.	Past year	Martins et al. 2013a (from grade 6–10): 67 % gambled in the past year 21 % at-risk or problem gamblers Martins et al. 2008b (from age 16–18): Among 17-year old African American adolescents ( $n = 452$ ): 47.4 % past-year gamblers With gambling problems: 32 % males; 6.6 % females Martins et al. 2015c (from age 16–18): Among African American Gamblers (216/427–50.6 %): 72.7 % any gambling problem (males) 27.4 % any gambling problem (females) Storr et al. 2012 (at grade 11): 87 % past year gambling (minority) 199 % African American; 1 % Hispanic; 13.4 % past year gambling (non-minority) Lee et al. 2012 (from age 11–20): 43.3 % social gamblers [85.4 % African American; 14.6 % Caucasian] 11.6 % problem gamblers [88.9 % African American; 11.1 % Caucasian]
White: 86 % (1992) and 86.6 % (1995); Asian American: 2.3 % (1992) and 3.3 % (1995); African American: 1.4 % (1992) and 2.5 % (1995); American Indian: 1.3 % (1992) and 2.4 % (1995); Mexican or Latin American: 1.1 % (1992) and 2.0% (1995); Other/ mixed: 3.3 % (1992) and 2.0 % (1995); Missing or unknown race 4.6 %	Stinchfield et al. 1997	Minnesota—1992 and 1995	Public school students in the 6th, 9th and 12th grades	Past year	Asian American: 11 % weekly/daily gambling (1992) 9.9 % weekly/daily gambling (1995) White: 14 % weekly/daily gambling (1992) 12.3 % weekly/daily gambling (1995) American Indian: 20.6 % weekly/daily gambling (1992) 17.4 % weekly/daily gambling (1995) Mexican/Latin American: 21.2 % weekly/daily gambling (1992) 21.6 % weekly/daily gambling (1995) African American: 21.8 % weekly/daily gambling 18.3 % weekly/daily gambling

Minority group	Citation	Location and time period	Sample	Time point	Prevalence
(1992) and 1.2 % (1995)					
85.7 % White 3.0 % Black 1.2 % Chinese 5.4 % Other Asian 4.7 % Ethnicity Unknown	Forrest et al. 2012	Great Britain—2008–2009	Random sample of 8958 British adolescents (11–15) surveyed in 201 schools	Past year	1.9 % Gambling Problem; 3.0 % Asians
121 Asian American; 1659 Caucasian	Kong et al. 2013	Connecticut, USA—2011?	Convenience sample of 1780 adolescents (enrolled in grades 9 to 12) from 10 public high schools	Past year	Classification by Potenza et al. (2011): Not Gamblers: 24.79 % Asian Americans and 16.4 % Caucasians Gambling but not meeting criteria for pathological gambling: 44.63 % Asian Americans and 57.13 % Caucasians At-risk/problem gambling: 30.58 % Asian Americans and 26.40 % Caucasians Classification by DSM-IV: Not Gamblers: 24.79 % Asian Americans and 16.40 % Caucasians. Pathological Gambling: 13.22 % Asian Americans and 3.74 % Caucasians. Low risk: 44.63 % Asian Americans and 57.60 Caucasians At-risk gambling: 13.22 % Asian Americans and 17.96 % Caucasians
Chinese	Cheung. 2014	Hong Kong, China—2007–2010	A stratified, random sample of 4734 Chinese adolescents aged 12–23	Past year	28 % past-year gambling 2.4 % at-risk gamblers 1.1 % probable pathological gamblers 2.5 % gambled once a week or more often
American Indian 70.7 %; Non-Indian 29.3 %	Peacock et al. 1999	USA—Great Lakes Indian Reservation—year not specified	Students in grades 7–12 enrolled in either a tribal or public school	Past year Lifetime	81.2 % gambled at least once in life 75 % gambled within the last 12 months
87 % African American; 3 % Asian American; 1.3 % Caucasian; 1 % Hispanic; 4.7 % Other	Wickwire et al. 2007	USA—year not specified	Students were recruited from nine randomly selected sophomore English classes in two urban high schools	Past year Lifetime	60 % gambled in the past year 80 % gambled at least once in their lives
ADULTS (18 years and older)					
Chinese Canadian	Lai 2006	Canada 2001–2002	Random sample of 2257 Chinese last names from phonebooks in Victoria, Greater Vancouver, Calgary, Edmonton, Winnipeg, Greater Toronto, and Greater Montreal. Participants aged 55 or older were included	Current	26.6 % current gamblers
76.6 % First Nation/ Aboriginal; 22.6 % Metis/mixed ancestry;	Currie et al. 2013	Edmonton, Canada—May to December 2010	Urban Aboriginal adults recruited using posters and ads throughout the community	Past year	33.5 % 12-month problem gambling (First Nation/aboriginal) 31.3 % 12-month problem gambling (Métis/mixed ancestry)

Minority group	Citation	Location and time period	Sample	Time point	Prevalence
0.3 % Inuit					0 % 12-month problem gambling (Inuit)
92.2 % Aboriginal; 3.8 % Torres Strait Island; 4.0 % Both	Hing et al. 2014	Australia—2011	Self-selected Indigenous adults surveyed at three Indigenous festivals, online and in several Indigenous communities.	Past year	19.5 % problem gamblers (all respondents) 25.4 % problem gamblers (completed the PGSI)
Filipino Americans	Kim et al. 2012	San Francisco and Honolulu—1998 to 1999	Participants came from the Filipino American Community Epidemiological Study (FACES)	Past year	12.9 % regular gambling
Indigenous populations	Stevens et al. 2009	Northern Territory of Australia—2002	Non-institutionalized, indigenous and general population, in the Northern Territory of Australia in remote areas (NATSISS) and non-remote areas (NATSISS and GSS).	Past year	Reported Gambling Problems: 14.6 % (NATSISS) & 3.5 (GSS).
Maori (25.1 %); Pacific (13.5 %); Asian (17 %); and Euro/other (44.4 %)	Walker et al. 2009	New Zealand—2006–2007	In-home, nationwide survey captured data from a multi-stage, random probability sample of 1774 adults and 199 15–17 year olds. Maori (New Zealand's indigenous people), Pacific and Asian peoples, and people in areas of deprivation were oversampled.	Past year	Maori: 12.3 % (8.4–16.2 %) non-gamblers, 58.9 % (53.7–64.1 %) infrequent gamblers, 20.4 % (16.1–24.7 %) frequent non-continuous gamblers, 8.4 % (5.6–11.2 %) frequent continuous gamblers. Pacific: 29 % (21.6–36.5 %) non-gamblers, 52.2 % (43.9–60.5 %) infrequent gamblers, 8.3 % (5.5–12.1 %) frequent non-continuous gamblers, 10.4 % (6.4–15.9 %) frequent continuous gamblers. Asian: 34 % (27.2–40.8 %) non-gamblers, 52.9 % (45.9–59.8 %) infrequent gamblers, 11.5 % (7.1–16 %) frequent non-continuous gamblers, 1.6 % (0.4–1.5 %) frequent continuous gamblers. Euro/other: 15.7 % (12.7–18.7 %) non-gamblers, 62.6 % (58.8–66.4 %) infrequent gamblers, 18.4 % (15.5–21.4 %) frequent non-continuous gamblers, 3.3 % (2.1–4.5 %) frequent continuous gamblers.
Aboriginal	Stevens et al. 2012	Northern Territory of Australia—2004–2005	Ten Aboriginal communities were selected for a study of housing improvement and child health. Information used was of 240 caregivers who were surveyed using the NLES to measure gambling problems.	Past year	40.4 % reported problem gambling.
Pacific Islanders	Perese et al. 2011	South Auckland, New Zealand—2000	Data collected as part of the Pacific Islands Families: First Two Years of Life study, which follows a cohort of PI infants and their mothers born at Middlemore Hospital in South Auckland between March to	Past year	30.1 % gamblers at 6 weeks, 30.7 % gamblers at 12 months and 29.4 % at 24 months.

Minority group	Citation	Location and time period	Sample	Time point	Prevalence
Indigenous populations	Hing et al. 2014a, b	Australia—2011	December 2000 ( $n = 1376$ ). A convenience sample of 1259 indigenous Australians recruited during 3 Aboriginal cultural and sports festivals. Additionally, an online survey was created and promoted among Aboriginal communities.	Past year	a: 80.3 % past-year gamblers. b: 23.4 % non-gamblers, 28 % non-problem gamblers. 12.5 % low risk gamblers, 16.6 % moderate risk gamblers, 19.5 % problem gamblers.
South East Asians	Petry et al. 2003	Connecticut, USA—2002	Convenience sample of 96 South East Asian refugees attending community service organizations for Laotian, Vietnamese, and Cambodian people	Past year	Overall: 28 % non-problem gamblers, 12 % problem gamblers, 58 % pathological gamblers. Non-problem gamblers: 41 % Laotian; 19 % Cambodian; 41 % Vietnamese. Problem gamblers: 27 % Laotian; 64 % Cambodian; 9 % Vietnamese. Pathological: 28 % Laotian; 31 % Cambodian; 41 % Vietnamese.
Inuit	Larsen et al. 2013a, b	Greenland—2006–2010	Adults from the Inuit Health in Greenland Survey population based general health survey who completed a self-administered questionnaire	Past year Lifetime	a: 4.1 % past year problem gambling (men) 15.8 % lifetime problem gambling (men) 2.8 % past year problem gambling (women) 9.9 % lifetime problem gambling (women) b: 12.7 % lifetime problem gambling (men and women)
African American, Hispanic and other	Barry et al. 2012a; Barry et al. 2011b; Pilver et al. 2014; Alegria et al. 2009	USA—2001–2002	Non-institutionalized, white and black adults from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) from Wave 1	Past year [Barry et al. 2012a; Barry et al. 2011b] Lifetime [Pilver et al. 2014; Alegria et al. 2009]	Barry et al. 2012a: 0.98 % problem or pathological gambling (African Americans) 0.45 % problem or pathological gambling (White) Barry et al. 2011b: 0.5 % problem or pathological gambling (White) 0.4 % problem or pathological gambling (Hispanic) Pilver et al. 2014: 2.8 % at-risk/problem/pathological gamblers [75.63 % White; 10.23 % African American/Black 9.63 % Other; 4.50 % Hispanic] Alegria et al. 2009: Disordered Gambling: 2.3 % (95%CI: 1.5–3.3 %) Native American/Asians. 2.2 % (1.8–2.6 %) Blacks. 1.0 % (95%CI: 0.8–1.4 %) Hispanics. Pathological gambling: 0.56 % (95%CI: 0.3–1.2 %) Native Americans. 0.9 % (95%CI: 0.6–1.1 %) Blacks. 0.3 % (95%CI: 0.1–0.5 %) Hispanics.



Minority group	Citation	Location and time period	Sample	Time point	Prevalence
40.6 % Caucasian; 38.2 % African American; 17.7 % Hispanic	Petry et al. 2011	USA—1999 to 2005	Adults recruited via direct screening efforts conducted at substance abuse treatment centers and ads and flyers placed at those locations. Participants had to score 3 or more on the SOGS, self-report of wagering on at least 4 days and spend at least \$ 100 in total in the past 2 months.	Past year Lifetime	70.1 % pathological gambler (lifetime) 55.1 % pathological gambler (past year)
41.5 % Hispanic American; 58.5 % Native American	Westmeyer et al. 2005	Southwest region, North Central region of the USA—year not specified	Community-based survey of rural and urban U.S. veterans.	Lifetime	10 % lifetime pathological gambling (Native American) 4 % lifetime pathological gambling (Hispanic)
56.1 % Asian Americans; 43.9 % non-Hispanic White	Chan et al. 2015	West Coast USA—2009 to 2010	College students (age 18–25) recruited from the psychology subject pool at a large university	Lifetime	Among those who have initiated gambling: 28.9 % problem gambling (Asian American) 16.8 % problem gambling (White American)
American Indian	Cozzetto et al. 1996	North Dakota—year not specified	Five samples of American Indian North Dakotan adults: North Dakota in general, Fort Totten, Belcourt, Turtle Mountain band of Chippewa, Sioux tribe	Lifetime	6 % compulsive gambler (General North Dakota population) 10 % compulsive gambler (General Chippewa population) 14 % compulsive gambler (General Sioux population)
American Indian	Westmeyer et al. 2008	North Central Area of the USA—1999–2001	Stratified community-based sample of 557 American Indian veterans living on or near 5 reservations, three urban areas, and attending pow-wows.	Lifetime	42 % gamblers. 17 % Non-problem gamblers and 25 % problem gamblers.
Chinese	Wu et al. 2012	China—2012	Convenience sample ( $n = 932$ ) of Hong Kong or Macao university students.	Lifetime	86 % ever gambled. 1.4 % Problem Gambling.
Black Africans	Peltzer et al. 2006	Thohoyandou, South Africa—year not specified	Black Africans chosen by a venue-based survey at a horse-race betting club.	Lifetime	31 % probable pathological gamblers 20 % potential gambling problems
Indigenous populations	Volberg et al. 1997	New Zealand 1991 and North Dakota 1992	New Zealand sample: nationwide survey by random digit dialing of residential dwellings, $n = 3933$ . Maori and Pacific Islanders were overrepresented. North Dakota sample: random sample of 1517 adults from a telephone list purchased from a survey company. Additionally, 400 people were interviewed from the four countries in	Lifetime and Current	Indigenous: 8.7 % lifetime problem gamblers; 5.9 % lifetime probable pathological gamblers; 4.6 % current problem gamblers; 2.2 % current probable gamblers (New Zealand). Caucasian: 3 % lifetime problem gamblers; 1.7 % lifetime probable pathological gamblers; 1.4 % current problem gamblers; 0.6 % current probable gamblers (New Zealand). Indigenous: 7.1 % lifetime problem gamblers; 7.1 % lifetime probable pathological gamblers; 5.8 % current problem gamblers; 6.6 %

Minority group	Citation	Location and time period	Sample	Time point	Prevalence
53.9 % Native American; 46.1 % non-Native American	Zitow 1996	Northern Plains of the USA—1990	North Dakota with the greatest proportion of Native American residents to minimize bias by low telephone ownership.		current probable gamblers (North Dakota), Caucasian: 2.5 % lifetime probable gamblers; 0.8 % lifetime probable pathological gamblers; 1.3 % current problem gamblers; 0.5 % current probable gamblers (North Dakota).
African American	Christensen et al. 2004	Boston, Massachusetts—year not specified	Aboriginal and non-aboriginal groups at gambling facilities	Not specified	9.1% problematic gamblers (Native American) 4.6 % problematic gamblers (Non-Native American) 2.8 % pathological/compulsive gamblers (Native American) 1.6 % pathological/compulsive gamblers (Non-Native American)
Chinese	Loo et al. 2008	The systematic review included studies from any country that examined gambling among Chinese.	A convenience sample of 67 African American community residents, ages 50 to 88  Systematic review using the following keywords: Chinese, ethnicity, culture, addiction (also addictive), and gambling (also gamble) of 25 articles obtained from: PsycINFO (1840–now), Web of Science Databases, Medline (1950–present), Sociological Abstracts (1963—in press), ProQuest Social Science Journals (1994–present), PAIS International (1972–current), and CSA Worldwide Political Science Abstracts (1975–current).	Not specified	4.4 % gambling disorders  26.6–92 % gamblers. 2.5–1 % problem gamblers. 1.78–2.9 % pathological gambling