

# Do youths gamble? You bet! A Swiss population-based study

Marie-Thérèse Luder, André Berchtold, Christina Akre, Pierre-André Michaud, Joan-Carles Suris

Research Group on Adolescent Health, Institute of Social and Preventive Medicine, Centre Hospitalier Universitaire Vaudois and University of Lausanne, Lausanne, Switzerland

## Correspondence:

JC Suris, MD, PhD

Unit head

Research group on Adolescent Health (GRSA) Institute of Social and Preventive Medicine (IUMSP) Bugnon, 17

CH-1005 Lausanne

Switzerland

E-Mail: [Joan-Carles.Suris@chuv.ch](mailto:Joan-Carles.Suris@chuv.ch)

## Summary

**Objectives:** To establish the gambling prevalence among Swiss resident youths, to estimate the associations between gambling frequency and substance use, poor mental health and social support and to determine the correlation between gambling pattern and gambling frequency.

**Methods:** Cross-sectional population-based survey conducted in 2007. From 1233 eligible participants aged 15–24 years, adequate information was available for 1116 (582 males), distributed into: non- (n = 577), occasional (n = 388) and frequent gamblers (n = 151).

**Outcome measures:** Substance use, social activities, presence of a reliable person among friends or family, psychological distress, major depression and gambling pattern.

**Results:** Overall, the 48.3% (n = 539) of youths who had gambled during the previous year; were older and more likely to be male than non-gamblers. 13.5% (n = 151) gambled at least weekly and could be differentiated from occasional gamblers on the basis of their gambling pattern. After controlling for gender, age and language area, occasional gamblers were significantly more likely to be occasional binge drinkers, whereas frequent gamblers were more likely to be daily smokers.

**Conclusion:** Almost half of Swiss resident youths are involved in gambling. Both occasional and frequent gambling are associated with further health compromising behaviour. Practitioners dealing with young people should be aware that gambling is a behaviour that might be part of a more global risky behaviour framework.

**Key words:** youth; gambling; substance use; social support; mental health

## Introduction

Due to the growing offer of gambling opportunities over the last decades and the persistent concern that a higher availability might increase gambling related pathology, research has largely focused on the prevalence of pathological gambling and its associations. Switzerland is no exception with regard to the increase in the availability of gambling opportunities. The explosion of internet use, a more liberal gambling law adopted in 1998, and the trendy poker playing are all examples of this phenomenon. As suggested by other studies among adults [1], an increased environmental offer increases the personal implication in gambling activities (at least at the beginning of increased availability). Moreover, as has been shown among an adolescent population [2], an increased gambling participation increases the risk of problem gambling.

A definition of gambling commonly used by other authors [3, 4] is “wagering of money or something of value on an event with an uncertain outcome with the primary intent of winning additional money and/or material goods”. Comparable to alcohol consumption, gambling is a socially well accepted behaviour as long as severe adverse outcomes do not emerge. Indeed, the addictive potential of gambling can lead to pathological gambling, defined as “a persistent and maladaptive gambling behaviour [as indicated by the presence of  $\geq 5$  criteria of the DSM-IV] and not better explained by a manic episode” [5]. Intermediate states have been defined such as “at risk” or “problem gambling” [6]. Moreover, disordered gambling among adolescents and young adults (including any degree of problematic gambling) has been associated with adverse outcomes such as alcohol use and abuse [4], illegal drug use [7], smoking [8] and depression [4]. However little research has focused on the level of gambling involvement and these same associations among adolescents. The few reports using participation criteria such as gambling frequency used a dichotomic measure, analysing only the high gambling frequency group without considering moderate gamblers [7, 9].

Therefore, gambling has often been considered as a spectrum spreading from recreational gambling to pathological gambling but always on the basis of the number

of gambling related problems rather than on the basis of gambling participation [10, 11]. As mentioned by Rodgers et al., measuring gambling participation (including gambling frequency) seems to be an important step in the analysis of gambling behaviour as a healthy gambling behaviour has never really been quantified [12]. For that matter, there is some longitudinal evidence showing a clear correlation between gambling frequency at age 16 and gambling problems one year later [13].

According to Blaszczynski and Nower's pathways model of problem and pathological gambling, disordered gambling is necessarily preceded by the establishment of a habitual gambling pattern [14]. On the other hand, Currie et al. reported that gambling frequency and the amount of money spent among a population aged 15 years and older, had a dose-related relation with harm generated by gambling [15]. Therefore, we can hypothesise that frequent gambling is probably a preliminary step of disordered gambling.

Adolescence being a period of experimentation and progressive identification with adult lifestyle, gambling could be an attractive activity for young people. It is an exciting experience which furthermore offers the illusion of easy money and the possibility of a better lifestyle. The attraction to gambling becomes evident when looking at the very high prevalence rates (about 60–80%) of last year gambling involvement among adolescents in North America [16, 17] and in some European countries [4, 8, 10]. Additionally, problem behaviour such as heavy alcohol use, illicit drug use, cigarette smoking, delinquency or risky sexual behaviour tend to be correlated among adolescents [18]. Thus, if frequent gambling is considered as a risky behaviour, adolescents are probably a particular at-risk group [19, 20].

In a study among adults in Switzerland, disordered gambling was associated with an onset before age 21 and with being younger than 29 years [19]. Given that, to our knowledge, no data exist in Switzerland on youth gambling, the assessment of this behaviour seems useful in order to establish baseline measures and the importance of the phenomenon.

Our study has three objectives: 1) to establish the prevalence of gambling among young people in Switzerland, 2) to assess a possible association between gambling frequency and substance use, poor mental health and social support as it has been described for problem gambling [4, 7, 8, 21], and 3) to determine the correlation between the number of different games in which youths are involved and gambling frequency.

## Methods

### Survey design and participants

Data were drawn from the 2007 Swiss Health Survey, a nationally representative (residents aged  $\geq 15$  years), cross-sectional population-based survey conducted every 5 years since 1992 by the Swiss Federal Statistical Office [22]. The study sample was chosen through a stratified random sampling of a database of all private Swiss households with a land-line telephone. Stratification was made by region,

canton and household. The number of households was proportional to the population of the canton. A total of 18,760 (response rate 66.3%) randomly selected Swiss-residents living in a private household with a telephone connection agreed to participate in an oral interview carried out in French, German or Italian (computer assisted telephone or face to face interview [if preferred for people aged  $\geq 75$  years], or a proxy interview if the target subject was not able to answer to the questions himself because of absence, medical or language reasons). Participants were then asked if they would agree to complete an additional written questionnaire (internet or paper and pencil). Out of the 17,511 (93.3%) questionnaires sent, 80.5% ( $n = 14432$ ) were completed.

For the present study, only data of subjects aged between 15 and 24 years who responded to the oral interview and to the written questionnaire ( $n = 1233$ ) were considered. Data on gambling behaviour were available for 1116 young people (see table 1 for sample characteristics). Non-respondents did not differ in terms of gender and age.

### Measures

#### *Gambling frequency*

Participants were asked how many times (5 categories ranging from " $\geq 2$ /week" to "not gambled") they gambled for money in the previous year in Switzerland on each of the eighteen gambling activities outlined in the questionnaire. Activities were divided in four categories, each divided in further sub-categories: (1) "betting at a casino" (tables, slot machines, poker/blackjack/others), (2) "betting and playing the lottery" (lottery, scratch cards, lotto/bingo, sporting events, electronic lotteries, other), (3) "other gambling activities outside casinos" (games of skill, gambling in a private setting, illegal gambling, other) and (4) "gambling on the internet" (casino, poker or black-jack tournaments, sporting events, lotteries, other). The maximal frequencies of the first three sub-categories (tables, slot machines, poker/blackjack/others) were summed in order to create a unique "casino gambling" variable, as one can go to a casino once and be involved in different types of activities. Consequently, participants could be involved in a maximum of 16 activities over the last year. As performed in other studies [2, 7], mid-point frequency values were transformed into continuous variables of number of times gambled last year at each activity. Then, all these variables were summed to derive the total number of times gambled during the previous year. At last, three groups were defined: (1) non-gamblers (no gambling in the past year), (2) occasional gamblers (gambled  $< 52$  times/year) and (3) frequent gamblers (gambled  $\geq 52$  times/year, as defined in previous studies [7]). This cut-off represents roughly an average of once a week and allows comparisons with previous research.

### Independent variables

#### *Socio-demographic characteristics*

Demographic variables included age, gender, nationality (Swiss/other), language area (Italian, German or French) and residence (rural/urban). As this questionnaire was not

originally designed for young people, usual data like parents' education level or income were not available to assess SES. We chose a dichotomic variable assessing whether participants had a personal income (which they could use to gamble) or not.

#### Gambling pattern

The gambling pattern refers to the number of different gambling activities reported. Participants indicated on a 5-point Likert scale ranging from "not involved in this activity" to "≥2 times/week" their frequency of participation in each activity over the past year. The 16 activities described under "gambling frequency" were dichotomized into "involved-" or "not involved in this activity" and summed to obtain the number of different games involved in during the previous year. Five categories of gambling participation were then created: 0, 1, 2, 3 and 4 or more activities.

#### Substance use

The different items tested included: daily smoking (at least one cigarette/day), current cannabis use ("do you currently use cannabis?"), current use of any other illegal drug (such as heroine, cocaine, ecstasy, LSD, etc), which was defined as the sum of all other drugs, each time headed by "do you currently use...?" and last year's binge drinking episodes (≥5 standard drinks for men and ≥4 for women) [23].

The latter was categorised in 3 groups: never, occasional (< once/month) and frequent (≥ once/month).

#### Mental health

Psychological distress was assessed by using a score built on the five mental health questions of the MOS SF-36 [24]. The final scores were dichotomized into "high psychological distress" (0–52) versus "other" (> 52) as done previously [25]. Major depressive disorder was assessed in a dichotomic way using the CIDI-SF 12-months version [26].

#### Social support

Two items were used to assess the social involvement and support of the participants: frequency of participation in social activities (group, association or political party), which was divided in three categories (weekly or more, monthly or more but not weekly, less than a few time per year) and presence of a person (in the family or among friends) to rely on for support or assistance in daily life, which was used in a dichotomic way.

#### Statistical analyses

We performed a bivariate analysis comparing firstly the three groups and secondly occasional gamblers (OG) versus frequent gamblers (FG), using chi-square tests for categorical data and t-test or ANOVA for continuous data. Results are given as prevalence or means with 95% confid-

**Table 1**  
Bivariate analysis comparing the three gambling frequency groups<sup>a</sup>.

	<b>NG</b> (n = 577)	<b>OG</b> (n = 388)	<b>FG</b> (n = 151)	<b>Total sample</b> (n = 1116) <sup>c</sup>
<i>Socio-demographic factors</i>				
Gender (male) <sup>b</sup>	41.84 (36.94–46.92)	58.65 (51.69–65.28)	75.15 (64.12–83.66)	52.19 (48.26–56.08)
Mean age (years) <sup>b</sup>	18.59 (18.32–18.86)	19.70 (19.33–20.08)	19.52 (18.90–20.13)	19.10 (18.89–13.31)
Nationality (Swiss)	84.86 (79.60–88.95)	77.06 (67.69–84.5)	75.49 (61.04–85.83)	80.88 (76.32–84.75)
<i>Language area<sup>b</sup></i>				
German	53.44 (48.48–58.32)	33.31 (28.66–38.29)	13.26 (10.10–17.21)	73.05 (69.82–76.05)
French	40.14 (33.61–47.05)	44.74 (37.80–51.89)	15.12 (10.75–20.85)	22.18 (19.41–25.24)
Italian	79.67 (66.83–88.40)	10.28 (4.96–20.10)	10.05 (3.97–23.26)	4.77 (3.69–6.14)
Residence (urban)	65.22 (60.30–69.83)	78.82 (66.72–78.18)	72.33 (61.83–80.83)	68.82 (65.25–72.18)
Personal income(yes) <sup>b</sup>	54.43 (49.37–59.41)	65.40 (58.24–71.93)	64.42 (53.32–74.17)	59.59 (55.7–63.37)
<i>Mental health</i>				
High psychological distress	2.69 (1.5–4.82)	2.88 (1.47–5.56)	3.57 (1.51–8.18)	2.88 (1.94–4.25)
Major depressive episode	5.26 (3.42–8.02)	5.53 (3.38–8.91)	7.78 (2.54–21.47)	5.7 (4.08–7.91)
<i>Substance use</i>				
Daily tobacco smoking <sup>b</sup>	12.58 (9.71–16.16)	20.08 (15.40–25.74)	34.04 (24.03–45.71)	18.09 (15.34–21.2)
Current cannabis use <sup>b</sup>	4.71 (3.21–6.87)	11.1 (7.71–15.71)	13.15 (7.73–21.49)	8.07 (6.36–10.18)
Current use of other illegal drugs	0.24 (0.05–1.1)	0.20 (0.03–1.44)	0.78 (0.19–3.09)	0.3 (0.12–0.76)
<i>Binge drinking<sup>b</sup></i>				
Never	68.67 (63.77–73.19)	52.30 (45.08–59.42)	57.54 (46.29–68.07)	61.47 (57.59–65.2)
Occasional	14.14 (10.98–18.02)	24.46 (19.20–30.62)	13.13 (7.89–21.07)	17.6 (14.94–20.61)
Frequent	17.19 (13.64–21.44)	23.24 (17.63–29.99)	29.33 (20.33–40.30)	20.94 (17.87–24.38)
<i>Social support</i>				
<i>Participation in social activities</i>				
Weekly or more	42.40 (37.50–47.46)	44.33 (37.44–51.46)	35.81 (25.85–47.18)	42.18 (38.39–46.07)
Monthly or more but not weekly	20.11 (16.31–24.53)	18.51 (14.22–23.47)	17.53 (10.48–27.87)	19.2 (16.44–22.32)
Less than a few times/year	37.49 (32.75–42.48)	37.15 (29.94–44.99)	46.65 (35.58–58.06)	38.61 (34.73–42.64)
No reliable person among friends or family	1.53 (0.71–3.26)	4.5 (1.20–15.52)	5.73 (1.97–15.51)	3.13 (1.49–6.43)

<sup>a</sup> Data are given as point prevalence (95% confidence interval).  
<sup>b</sup> Significant differences were found at the 95% level.  
<sup>c</sup> The sample size available for each analysis varies between 1110 and 1116 due to a small number of missing data.  
Variables retained in at least 60% of replications in the bootstrap analysis (10000 replications) are presented in boldface font.

ence interval (95% CI). After that, we conducted a multinomial stepwise logistic regression, using non-gamblers (NG) as the reference group and a binary stepwise logistic regression comparing OG and FG. Standard procedures for automatic variable selection in regressions being known to produce unstable and non-reproducible results [27], we selected explanatory variables using a bootstrap procedure. Ten thousand bootstrap samples were generated and a backward selection was applied on each of them. Variables retained in at least 60% of the replications were included in the final regression models [28]. It is interesting to note that some variables significant at the bivariate level were not retained for the multivariate analysis by the bootstrap procedure, which indicates that these variables are too closely related to the particularities of our sample and that generalising the results to the entire population does not make sense. Results are given as adjusted odds ratio. We used StataIC10 for bivariate and multivariate analysis, as it allows computing coefficient estimates and variances taking into account the sampling weights. MATLAB 7.1 was used for the bootstrap variable selection procedure.

## Results

### Study population and gambling characteristics

In our sample, 48.3% of youths ( $n = 539$ ) (95% CI, 44.3–52.3%) were involved in some gambling activity during the previous year; 34.8% (95% CI, 30.9–38.7%) were classified as OG and 13.5% (95% CI, 10.9–16.6%) as FG.

### NG vs OG vs FG

At the bivariate level, the three groups showed significant differences in terms of gender (the higher the frequency, the more likely to be male), age (OG being the oldest), personal income (the higher the frequency, the more likely to have a personal income) and language area (with French-speaking being the most likely to gamble). Regarding substance use, gambling frequency was associated with smoking, cannabis use and binge drinking. There were differences in daily smoking, current cannabis use and binge drinking between the three groups, with FG showing the highest prevalence rates. Although no statistically significant differences in the domain of social support and mental health were

found, there was a higher percentage of OG and FG compared to NG who did not have a reliable person among friends or family, participated in social activities only a few times per year, had high psychological distress and had suffered from a major depressive episode during the previous year (table 1).

At the multivariate level (using NG as the reference group), OG and FG were older, more likely to be male and living in the French language area (whereas OG were also more likely to live in the German area). Regarding substance use, OG showed a higher probability to have experimented binge drinking less than monthly during the past year, while FG had higher odds of being daily cigarette smokers (table 2).

### OG vs FG

Compared to OG, FG were more likely to be male (at the bivariate level) and to be involved in 3 (adjusted odd ratio [AOR] (95% confidence interval) 7.89 (2.84–21.93)) or  $\geq 4$  (AOR, 13.73 (5.12–36.83)) different gambling activities during the past twelve months even after controlling for gender and age. The correlation between gambling frequency and the number of games youths were involved in was high ( $r = 0.85$ ;  $p < 0.0001$ ).

## Discussion

We found that 48.3% of Swiss resident youths were involved in at least one gambling activity during the previous twelve months and 13.5% did so at least weekly. Our findings support previous studies comparing gamblers and abstainers reporting that males and older adolescents are more involved in gambling [16, 29–31]. Past year gamblers (OG+FG) were significantly more often males and older than NG.

Past year gambling prevalence was lower than the rates found in previous studies (more than 60% in North America and Scandinavia [2, 7, 32]). However, as we are not aware of gambling frequency data among adults in Switzerland (which we could compare to international studies), we cannot know if lower gambling participation is a general cultural trend in the country, or if it only applies to the adolescent population. The only certainty is that the

**Table 2**  
Multinomial logistic regression using NG as the reference category<sup>a</sup>.

Variable	OG		FG	
	Adjusted Odds Ratio (95% confidence interval)	P value	Adjusted Odds Ratio (95% confidence interval)	P value
<i>Socio-demographic factors</i>				
Gender (male)	2.02 (1.37–2.97)	<0.001	4.37 (2.40–7.96)	<0.001
Age	1.15 (1.07–1.23)	<0.001	1.12 (1.01–1.25)	0.03
Language area				
Italian	1 (reference)		1 (reference)	
German	5.14 (2.30–11.47)	<0.001	2.14 (0.71–6.44)	0.18
French	9.20 (4.01–21.11)	<0.001	3.29 (1.04–10.39)	<0.05
<i>Substance use</i>				
Daily tobacco smoking	1.20 (0.96–1.50)	0.12	1.70 (1.21–2.39)	0.002
Binge drinking				
Never	1 (reference)		1 (reference)	
Occasional	1.68 (1.05–2.69)	<0.05	0.65 (0.32–1.34)	0.24
Frequent	1.09 (0.69–1.74)	0.71	0.88 (0.45–1.73)	0.72

<sup>a</sup> The logistic regression uses explanatory factors selected from the bootstrap procedure.

rates of disordered gambling among adults (2.2% of lifetime problem gamblers and 1.1% of pathological gamblers [33]) are as prevalent in Switzerland as in other countries [34].

The involvement of FG in more different gambling activities than OG has an apparently obvious explanation: if one plays more, the probability to play different games is higher. However, if FG are involved in more different types of games, it could as well be because they attach more importance to the actual fact of gambling than to the type of gambling activity they choose. In other words, they need to gamble and the type of gambling would have little importance.

The differences noted between the three groups with regards to the linguistic area participants came from, need to be placed in the specific Swiss context. Indeed, the three major language areas differ in their respective cultural contexts but also regarding their risk factor profiles [35]. As we found frequent gambling (and casino gambling, data not shown) to be most prevalent in the French area, it is interesting to note that according to the Centre of Excessive Gambling (<http://www.jeu-excessif.ch/pages/B-01.htm>), the French part of Switzerland also has the highest casino density. This finding would support the fact that higher availability is associated with higher gambling frequency.

Consistent with other studies [16, 20, 29, 30, 36] we found alcohol misuse to be significantly associated with gambling at the bivariate level. However, at the multivariate level the association between FG and frequent binge drinking disappeared, whereas OG remained associated to occasional binge drinking. Although this result could probably be explained by the relative small number of observations, occasional gambling and binge drinking could also be part of adolescent exploratory behaviour among this group of youths.

The difference between OG and FG concerning the use of tobacco, cannabis and other illegal drugs is also interesting. At the bivariate level, there was a clear trend showing higher involvement of FG in all these behaviours, with the most marked differences for daily smoking. This finding is consistent with previous research, indicating that tobacco use is associated with gambling frequency [16]. As daily smoking is an important risk factor for nicotine dependency [37], its association with frequent gambling could suggest a higher tendency among these youths to have endorsed behaviours that have ceased to be merely exploratory.

The literature indicates that depression/dysphoria are associated with gambling among females [29] and that frequent internet gambling is associated with poor general mental health [38]. Although not reaching statistical significance, at the bivariate level our results agree with these findings, with a clear trend showing higher percentages of depression and high psychological distress among higher frequency gamblers. The prevalence of mental health issues among FG could be somewhat underestimated. Indeed, FG are more likely to be male and males are more likely to minimise their mental health problems, as demonstrated by their lower odds of seeking help when depressed [39].

Research regarding social support in the domain of problem gambling indicates that gambling problems are negatively related to the number of peer relations, positively related to the fact of being more active in clubs or associations [21] and that problem gamblers undertake more activities with others compared to non gamblers [40]. If we assume that frequent gambling is a preliminary step to pathological gambling, it could be hypothesised that FG should be similar to problem gamblers regarding their social support. Although our results revealed that FG seem to have less reliable support from family or friends, they also showed that social involvement in groups or associations decreases with increasing gambling frequency. This difference between problem gamblers and frequent gamblers could be due to the fact that pathological gamblers spend much more time in public institutions or social settings for gambling, and therefore consider themselves to be more active in groups or associations.

The main strength of this study is that it is based on a nationally representative sample of Swiss resident youths, permitting the analysis of young people coming from all socioeconomic backgrounds including those who dropped out of school. However, our study has some limitation. Firstly, the cross-sectional design of the survey does not allow any interpretation about causality. Secondly, as the survey relies on self-reported telephone and written data, a response bias cannot be excluded. However, the fact that confidentiality was assured should minimise this. Thirdly, questions on gambling behaviour were not specifically designed for a young people population and were embedded in a more general questionnaire covering many topics, which could decrease the accuracy of the answers.

Overall, our results indicate that half of Swiss youths aged 15–24 years are involved in some sort of gambling and that this behaviour is associated with other risk behaviours. These findings have some important implications. From a clinical point of view, health care practitioners should be aware that gambling is an issue to be considered in the psychosocial assessment of young people. Moreover, young gamblers (especially frequent ones) should be closely monitored in order to prevent the development of addictive patterns. From a public health point of view, prevention messages and interventions among youths seem to be needed.

## Funding / potential competing interests

Support/Funding: The Swiss Health Survey is funded by the Swiss Federal Statistical Office. This analysis received no additional funding.

Role of the funding organization: The funding bodies had no role in the design and conduct of the study; in the analysis and interpretation of the data; or in the preparation, review or approval of the manuscript.

## References

- 1 Welte JW, Wieczorek WF, Barnes GM, Tidwell MC, Hoffman JH. The relationship of ecological and geographic factors to gambling behavior and pathology. *J Gambli Stud.* 2004;20(4):405–23.

- 2 Hansen M, Rossow I. Adolescent gambling and problem gambling: Does the total consumption model apply? *J Gambl Stud.* 2008;24(2):135–49.
- 3 Messerlian C, Gillespie M, Derevensky JL. Beyond drugs and alcohol: Including gambling in a high-risk behavioural framework. *Paediatr Child Health.* 2007;12(3):199–204.
- 4 Molde H, Pallesen S, Bartone P, Hystad S, Johnsen BH. Prevalence and correlates of gambling among 16 to 19-year-old adolescents in Norway. *Scand J Psychol.* 2009;50(1):55–64.
- 5 American Psychiatric Association (APA). *Diagnostic and Statistical Manual of Mental Disorders.* 4th ed. Washington DC: 1994.
- 6 Gerstein DR, Toce MT, Johnson RA, Buie T, Chuchro L, Engelman L, et al. *Gambling Impact and Behavior Study. Report to the National Gambling Impact Study Commission.* <http://cloud9.norc.uchicago.edu/dlib/ngis.htm>. 1999. 11-5-2009. Ref Type: Online Source
- 7 Barnes GM, Welte JW, Hoffman JH, Tidwell MC. Gambling, alcohol, and other substance use among youth in the United States. *J Stud Alcohol Drugs.* 2009;70(1):134–42.
- 8 Skokauskas N, Satkeviciute R. Adolescent pathological gambling in Kaunas, Lithuania. *N J Psychiatry.* 2007;61(2):86–91.
- 9 Welte JW, Barnes GM, Hoffman JH. Gambling, substance use, and other problem behaviors among youth: A test of general deviance models. *Journal of Criminal Justice* 2004;32(4):297–306.
- 10 Fisher S. A prevalence study of gambling and problem gambling in British adolescents. *Addict Res.* 1999;7(6):509–38.
- 11 Shaffer HJ, Korn DA. Gambling and related mental disorders: a public health analysis. [Review] [200 refs]. *Ann Rev Public Health.* 2002;23:171–212.
- 12 Rodgers B, Caldwell T, Butterworth P. Measuring gambling participation. *Addiction.* 2009 Feb 10.
- 13 Vitaro F, Brendgen M, Ladouceur R, Tremblay RE. Gambling, delinquency, and drug use during adolescence: mutual influences and common risk factors. *J Gambl Stud.* 2001;17(3):171–90.
- 14 Blaszczynski A, Nower L. A pathways model of problem and pathological gambling. *Addiction.* 2002;97(5):487–99.
- 15 Currie SR, Hodgins DC, Wang J, el-Guebaly N, Wynne H, Chen S. Risk of harm among gamblers in the general population as a function of level of participation in gambling activities. *Addiction.* 2006;101(4):570–80.
- 16 Stinchfield R. Gambling and correlates of gambling among Minnesota public school students. *J Gambl Stud.* 2000;16(2-3):153–73.
- 17 Shaffer HJ, Hall MN, Vander Bilt J. Estimating the prevalence of disordered gambling behavior in the United States and Canada: A research synthesis. *Am J Public Health.* 1999;89(9):1369–76.
- 18 Guilamo-Ramos V, Litardo HA, Jaccard J. Prevention programs for reducing adolescent problem behaviors: Implications of the co-occurrence of problem behaviors in adolescence. *J Adolesc Health.* 2005;36(1):82–6.
- 19 Bondolfi G, Osiek C, Ferrero F. Prevalence estimates of pathological gambling in Switzerland. *Acta Psychiatrica Scandinavica.* 2000;101(6):473–5.
- 20 Lynch WJ, Maciejewski PK, Potenza MN. Psychiatric correlates of gambling in adolescents and young adults grouped by age at gambling onset. *Archi Gen Psychiatry.* 2004;61(11):1116–22.
- 21 Gerdner A, Svensson K. Predictors of gambling problems among male adolescents. *Intern J Soc Welfare.* 2003;12(3):182–92.
- 22 Calmonte R, Galati-Petrecchia M, Lieberherr R, Neuhaus M, Kahlmeier S. Santé et comportement vis-à-vis de la santé en Suisse 1992–2002. Neuchâtel, Switzerland; 2005.
- 23 Courtney KE, Polich J. Binge drinking in young adults: Data, definitions, and determinants. *Psychol Bull.* 2009;135(1):142–56.
- 24 Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care.* 1992;30(6):473–83.
- 25 The European Opinion Research Group (EORG). The Mental Health Status of the European Population. [http://ec.europa.eu/health/ph\\_determinants/life\\_style/mental\\_eurobaro.pdf](http://ec.europa.eu/health/ph_determinants/life_style/mental_eurobaro.pdf). 2003. Ref Type: Online Source
- 26 Kessler RC, Andrews G, Mroczek D, Ustun B, Wittchen H-U. The World Health Organization's Composite International Diagnostic Interview Short Form (CIDI-SF). *Intern J Methods Psych Res.* 1998;7(4):171–85.
- 27 Austin PC, Tu JV. Automated variable selection methods for logistic regression produced unstable models for predicting acute myocardial infarction mortality. *J Clin Epidemiol.* 2004;57(11):1138–46.
- 28 Austin PC, Tu JV. Bootstrap Methods for Developing Predictive Models. *The American Statistician.* 2004;58(2):131–7.
- 29 Desai RA, Maciejewski PK, Pantalon MV, Potenza MN. Gender differences in adolescent gambling. *Ann Clin Psychiatry.* 2005;17(4):249–58.
- 30 Goldstein AL, Walton MA, Cunningham RM, Resko SM, Duan L. Correlates of gambling among youth in an inner-city emergency department. *Psychol Addict Behav.* 2009;23(1):113–21.
- 31 Welte JW, Barnes GM, Tidwell MCO, Hoffman JH. The prevalence of problem gambling among US Adolescents and young adults: Results from a national survey. *J Gambl Stud.* 2008;24(2):119–33.
- 32 Huang JH, Boyer R. Epidemiology of youth gambling problems in Canada: A national prevalence study. *Can J Psychiatry. Rev Can Psychiatr.* 2007;52(10):657–65.
- 33 Bondolfi G, Jermann F, Ferrero F, Zullino D, Osiek CH. Prevalence of pathological gambling in Switzerland after the opening of casinos and the introduction of new preventive legislation. *Acta Psychiatr Scand* 2008;117(3):236–9.
- 34 Stucki S, Rihs-Middel M. Prevalence of Adult Problem and Pathological Gambling between 2000 and 2005: An Update. *J Gambl Stud.* 2007 Jan 11.
- 35 Faeh D, Minder C, Gutzwiller F, Bopp M. Culture, risk factors and mortality: Can Switzerland add missing pieces to the European puzzle? *J Epidemiol Community Health.* 2009 Apr 21.
- 36 Duhig AM, Maciejewski PK, Desai RA, Krishnan-Sarin S, Potenza MN. Characteristics of adolescent past-year gamblers and non-gamblers in relation to alcohol drinking. *Addict Behav.* 2007;32(1):80–9.
- 37 Patton GC, Coffey C, Carlin JB, Sawyer SM, Wakefield M. Teen smokers reach their mid twenties. *J Adolescent Health.* 2006;39(2):214–20.
- 38 Petry NM, Weinstock J. Internet gambling is common in college students and associated with poor mental health. *Am J Addict.* 2007;16(5).
- 39 Sen B. Adolescent propensity for depressed mood and help seeking: race and gender differences. *J Ment Health Policy Econ.* 2004;7(3):133–45.
- 40 Delfabbro P, Thrupp L. The social determinants of youth gambling in South Australian adolescents. *J Adolesc.* 2003;26(3):313–30.