Gambling and gambling problems in Sweden 2008–2010

SWEDISH LONGITUDINAL GAMBLING STUDY, SWELOGS FINDINGS FROM WAVE ONE AND WAVE TWO
Gambling and gambling problems in Sweden 2008–2010

Swedish Longitudinal Gambling Study, Swelogs
Findings from wave one and wave two
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Since 1999, the Public Health Agency of Sweden has been assigned the task of counteracting gambling problems and their social consequences in Sweden. In order to develop comprehensive preventive methods, we require knowledge on the scope of gambling, who is most affected, and what factors cause gambling problems.

The Swedish Longitudinal Gambling Study, Swelogs, was launched in 2008 with the purpose of acquiring up-to-date knowledge on gambling in Sweden. This report presents the results from the first and the second waves in the epidemiological study carried out in 2008–2010. Results from wave one, the prevalence study, give a detailed account of gambling prevalence, the gambling situation in different subgroups, problem gambling, and the relationship between gambling problems and health. Findings from wave two, the incidence study, describes changes with regard to gambling problems in the population over a one-year period and how this co-varies with changes in health.

Since Swelogs is one of the largest longitudinal gambling studies conducted so far, it is well known and widely followed by the international research community within the field of gambling. This report is a translation into English of two previously published reports from 2010 and 2012. We hope it can be useful for policy makers and researchers working with prevention of problem gambling outside Sweden.

The report has been compiled and processed by Jyotsna Chulki and Sylvia Olofsson and the final version was completed in cooperation with Ulla Romild and Marie Risbeck, all employed by the Public Health Agency of Sweden.

Anna Bessö
Head of department
Public Health Agency of Sweden
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<tr>
<td>AUDIT</td>
<td>Alcohol Use Disorders Identification Test</td>
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<td>CBT</td>
<td>Cognitive behavioural therapy</td>
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<td>CI</td>
<td>Confidence Interval</td>
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<td>DSM-IV</td>
<td>Diagnostic and Statistical Manual of Mental Disorders IV</td>
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<td>EP1</td>
<td>Wave one of the epidemiological track</td>
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<td>EP2</td>
<td>Wave two of the epidemiological track</td>
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<td>JAS</td>
<td>Jonsson-Abbott Scale is a measurement instrument which focuses on measuring the early risk factors for developing a gambling problem.</td>
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<td>M SEK</td>
<td>Million Swedish kronor</td>
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<td>MI</td>
<td>Motivational Interviewing</td>
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<td>MONA</td>
<td>Micro data Online Access System</td>
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<td>NGO</td>
<td>non-governmental organizations</td>
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<td>OR</td>
<td>Odds ratio</td>
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<td>PGSI</td>
<td>Problem gambling severity index</td>
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<td>Pk</td>
<td>Risk for becoming a problem gambler</td>
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<td>RTB</td>
<td>Register of the total population</td>
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<td>SCB</td>
<td>Statistics Sweden</td>
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<tr>
<td>SEK</td>
<td>Swedish kronor</td>
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<tr>
<td>SOGS-R</td>
<td>The South Oaks Gambling Screen – Revised; is a measurement instrument for problem gambling</td>
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<td>SSYK</td>
<td>Standard for Swedish professional classification</td>
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<td>SWEGS</td>
<td>Swedish gambling study; the first Swedish population study conducted in 1997/98</td>
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<td>Swelogs</td>
<td>Swedish longitudinal gambling study</td>
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Summary

Since the end of the 1990s, prevalence studies have become increasingly common when investigating what proportion of a population gambles and what proportion has gambling problems at a certain point in time. In recent years, growing attention has been paid to the need for epidemiological studies with repeated measurements where changes and possible explanations for increases or decreases in gambling problems can be studied. Swelogs, the Swedish Longitudinal Gambling Study, is one of the world’s first and the largest longitudinal epidemiological studies of gambling and health.

Swelogs is a research programme conducted and financed by the Public Health Agency of Sweden. The overarching goal of the project is to develop knowledge and methods that can prevent gambling problems. The study comprises an epidemiological study path and an in-depth study path with several measurement points in each and also a follow-up study where people from a previous study eleven years earlier are re-interviewed.

This report presents the results from the first two waves of the epidemiological study path. Results from wave one come from the cross-sectional study (prevalence study) and give a detailed account of gambling prevalence, the gambling situation in different subgroups, problem gambling, and the relationship between gambling problems and health. Findings from wave two, the incidence study, describes changes with regard to gambling problems in the population over a one-year period and how this co-varies with changes in health.

Main findings

Wave one

The proportion of problem gamblers in the population is around 2%, and 5% of the population run a risk of developing gambling problems. Gambling problems exist throughout the population, but there are significant differences in the proportions of gamblers among different segments of the population. For example, almost 1 in 10 men aged 18–24 but fewer than 1 in 100 women aged 45–64 are problem gamblers. In comparison with a
previous study the proportion of the Swedish population who gamble has gone from 88% to 70% over the last decade.

Gambling among minors is found in all forms of gambling despite the fact that the gambling market has a minimum age requirement of 18 for all gambling except buying lottery tickets. The proportion of problem gamblers among girls aged 16–17 is 2%, and among boys aged 16–17 it is 5%.

Gambling problems among the population have been redistributed. The proportion of problem gamblers remains at the same level for the population as a whole over the last decade, with increases in certain groups and decreases in others. The proportion of problem gamblers has doubled among men aged 18–24 and among women aged 45 or more. At the same time, gambling problems have decreased among boys aged 16–17, which was the group with the biggest gambling problems ten years ago. The proportion of problem gamblers has also decreased among men aged 45–64 and among women aged 18–44.

There are social differences between problem gamblers and people who do not have problems with their gambling. The proportion of problem gamblers is highest among those with the lowest level of education, the lowest income, and low socioeconomic status. There is a large proportion of problem gamblers among people who receive social allowance or unemployment benefits or have problems with their household economy. A comparison with the previous epidemiological study into gambling and gambling addiction from 1997/98 revealed that the connections between gambling problems and social differences had become stronger for men in the 2008 study.

There are connections between gambling problems, health and other factors. Poor mental health is six times more common among problem gamblers than among non-gamblers and gamblers without gambling problems. There are also connections between problem gambling and poor general health, risky alcohol consumption, daily smoking, subject to physical violence and financial problems.

Schools, workplaces and gambling venues/sites are important arenas for prevention. Almost 3% of the respondents had gambled in their workplace or in school instead of working or studying. The largest proportion was found among men 16-24 years old where more than 8% had gambled in their workplace or at school instead of working or studying. Among women
in the age bracket of 45–64 years, the corresponding figure was 2%. Problem gamblers and people at low risk of developing gambling problems account for a disproportionate share of both the time and money spent on gambling. If we add up the problem gamblers and people at moderate risk of gambling problems, these account for more than half of the money spent on gambling in Sweden. The more serious the gambling problems, the larger the proportion of stakes.

**Many relatives are affected.** In 2008 around 260,000 people in Sweden lived with someone who was a problem gambler and 76,000 of these were children. There was a higher proportion of problem gamblers among families with children compared to couples without children.

**Wave two**

**Many people go into and out of problem gambling over the course of a year.** The proportion of problem gamblers was unchanged, but three-fourths of the previous problem gamblers were replaced with new problem gamblers. Some of the new problem gamblers were individuals who had previously had gambling problems while others were completely new problem gamblers. A large turnover among problem gamblers indicates that the proportion of persons who have had gambling problems during their lives is larger than the approximately 2% who have had gambling problems at a single point in time.

**Almost half of the new problem gamblers were women.** In total, approximately 100,000 people in the Swedish population between the ages of 16 and 84 years became problem gamblers in one year between wave one (2008/09) and wave two (2009/10), i.e. those who went from no problems or low risk to problem gambling. Almost half of these were women. The highest incidence was among adolescent men and older women.

**85% of continued problem gamblers were men.** Just over 40,000 people were continued problem gamblers between the two waves of measurement, and nearly half of them had a serious gambling problem. Men accounted for approximately 85% of those who were continued problem gamblers.

**Risky alcohol consumption and poor mental health are important risk factors.** There was a connection between poor mental health and higher incidence of problem gambling specifically for men. We also noted a connection between developing risky drinking habits during the year and increasing gambling
problems. Risky alcohol behaviours, divorce or separation, and increased arguments with a close relative reduced the likelihood of recovering from a gambling problem.

There are connections between problem gambling and life events. In terms of life events, we found the strongest connection between incidence and the death of a close relative. Likewise, there was a connection between incidence and a higher number of arguments with a close relative, but these arguments might also have been a consequence of more gambling problems. Severely worsened finances co-varied with an increased risk of gambling problems, but there was also a connection between markedly improved finances and an increased risk of gambling problems. In the same way, there were connections between problem gambling and both positive and negative changes in employment circumstances.

Casino games, gambling machines and many forms of internet gambling have a high risk potential. Around 5% of the Swedish population gambles on games with a high risk potential every month. Those who gambled on games with the highest risk potential every month in one year between wave one and wave two had the highest incidence of problem gambling. The degree of risk potential was determined through combinations of various different factors such as the speed of the game, the opportunity to play multiple games, light and sound effects, and the speed with which the winnings were paid out for each gambling type. We found that casino games, gambling machines, and many forms of gambling on the internet have a high risk potential.

Future analyses from Swelogs will increase the knowledge on causes and consequences. The continued work in Swelogs will lead to better knowledge with regard to risk and protective factors for gambling problems, the actual scope of the problem, group level and structural level factors that influence gambling problems, distinguishing characteristics of people in the risk zone, and mobility between different degrees of gambling problems. The aim is that this knowledge will lead to the development of more effective preventive measures.
Background

Swelogs – a study of gambling and health

The Swedish Longitudinal Gambling Study (Swelogs) is a research project managed and funded by the Public Health Agency of Sweden. The overarching goal of the project is to develop knowledge and methods that can prevent gambling problems.

Swelogs is composed of three distinct paths of data collection;

- **An epidemiological path (the longitudinal study), called the EP-track**, in which we followed over 8,000 people on four different measurement occasions from 2008 to 2014. This report presents results from the first two data collections in the EP track.

- **An in-depth path called the ID track** in which approximately 2,000 participants from the population study has been interviewed at two more occasions during the study.

- **A follow-up study** from 2008, in which about 500 people who participated in the population study on gambling and health in 1997/98 were re-interviewed.

The longitudinal study is being conducted by the Public Health Agency of Sweden and the in-depth study by the Center for Psychiatric Research of the Karolinska Institute under commission from the Public Health Agency of Sweden. The final wave of the ID track will be a qualitative study carried out by Stockholm University under commission from the Public Health Agency.

The epidemiological study has ten purposes, including measuring the incidence of gambling problems in Sweden and to examining how gambling problems co-vary with gambling patterns and social, health, and economic situations. The study also intends to describe the gambling situation in the general population as a whole as well as in different groups and to compare these results with the results from earlier Swedish and international studies.

The layout of the study design and its contents were established in 2007, and components of the questionnaire were tested at the Statistics Sweden (SCB) measurement laboratory. In the spring of 2008, an ethical application and a pilot study were approved by the Ethical Review Board in Umeå. The measurement points from the epidemiological track are called EP1, EP2,
and so on. The first wave of data collection of the study population (EP1) was carried out between November 2008 and August 2009. Data collection for wave two, the one-year follow-up study (EP2), began in December 2009. Results from both of these measurements have been published in 2010 and 2012, respectively, as two different reports in Swedish.

Swelogs is one of the largest longitudinal gambling studies, it is well known and is widely followed by the research community within gambling studies across the world and has a considerable impact on knowledge and policy making internationally. With the intent to reach out to the larger international research community, we present the findings from the first two waves, EP1 and EP2, in detail in English in this current work.

**DEFINITION OF GAMBLING**

There are several ways to define gambling. Below is the definition that covers the forms of gambling we present in this report (Collins, 2003).

- Two or more parties pledge something of value (stake).
- There is the hope of winning something of a higher value (winnings).
- Who wins and who loses depends on the outcome of events that are unknown to the participants when they make their bet (result).

Sometimes chance is included in the definition of gambling because this is a common way of fulfilling the last point in the above definition.

**Below is the definition of gambling in accordance with the Swedish Lotteries Act (SFS 1994:100): Section 3:**

An activity in which one or more participants, with or without stake, can receive winnings (rewards) of a higher value than what each and every one of the other participants can receive. [...] When assessing whether or not a given activity is a lottery, the general character of the activity shall be taken into consideration, not just the greater or lesser degree of chance that exists in the individual case.
The Swedish gambling market

The modern history of gambling in Sweden began in 1896, when a group of private individuals were given permission to organise “Lotteriexpressen” (later “Penninglotteriet”) – a lottery with the purpose of financing the Stockholm Exhibition and other cultural activities. Totalisator betting on horses was introduced in 1923, and in 1935 betting was permitted in connection with football matches and the gambling company Tipstjänst AB was formed (AB Trav och Galopp, 2010; Svenska Spel AB, 2010).

The restaurant casino was introduced in the 1950s and gambling machines became more common in bars and other entertainment venues. Bingo spread among volunteer organisations across Sweden by the late 1960s (Sveriges Bingoarrangörers Centralorganisation, 2010). The gambling company for horse betting, AB trav och Galopp (ATG), was formed in mid 1970s and the possibility to gamble on horses from post offices was introduced. Gambling machines were banned in 1979. In the 1980s, gambling became increasingly commercialised. Gambling organisers began investing more money in marketing and in a number of new gambling forms such as Lotto, Måltips (football pools), Joker (number game), Oddset (sports and entertainment betting), Triss (scratch card), and Keno. The 1990s saw the introduction of the likes of Bingolotto backed by a number of NGO’s (Folkspel, 2010). The Government permitted gambling via gambling machines once again and Vegas has since then become the single biggest game on the Swedish gambling market.

The increase in marketing and the expansion of the Swedish gambling market continued into the 2000s. Casino Cosmopol (a wholly owned subsidiary to Svenska Spel AB) was permitted to open four international casinos in Sundsvall, Malmö, Gothenburg, and Stockholm. ATG launched live betting amongst its offerings, and Svenska Spel started online poker games. Several new national lotteries such as Miljönlotteriet, Postkodlotteriet, and Sverigelotten were founded, as well as the possibility of playing bingo online via the websites of Svenska Spel, Folkspel, and Miljönlotteriet. A number of gambling companies who did not have a permit to conduct business in Sweden also established themselves on the Swedish gambling market by offering gambling online. Already in 2009, the advertisements of such companies were found in all forms of the Swedish media, and there has been a drawn-out legal proceeding attempting to come to a decision on whether such marketing should be allowed or not.
The so called regulated gambling market is constituted by the actors who have a permit to conduct business in Sweden in accordance with the Lotteries Act (1994:1000), the Casinos Act (1999:355), or the Act Concerning Certain Forms of Gaming Machines (1982:636). Permission is currently granted to a limited number of actors:

- Svenska Spel AB
- AB Trav och Galopp (ATG)
- Folkspel
- Sveriges Bingoarrangörers Centralorganisation
- Sveriges Hotell- och Restaurangföretagare
- National lotteries such as Miljonlotteriet and Postkodlotteriet
- Associations that organize local lotteries.

The smaller, local, association-run lotteries and the aforementioned gambling actors operate under the fundamental principle that surplus from the gambling activities shall be invested in public or non-profit interests. This does not apply to companies that run restaurant casinos.

The so called unregulated gambling market is constituted by actors who provide online gambling to Swedish clients but lack a permit to conduct business in Sweden.

Illegal gambling includes gambling on gambling machines that do not belong to Svenska Spel, or commercial poker tournaments for profit that are run outside of one of the four state-owned casinos run by Svenska Spel (Casino Cosmopol).
Problem gambling

In this report, we define problem gambling as follows.

**Problem gambling** means that there have been negative consequences of a person’s gambling. Here, we refer to social, financial, and health-related consequences. Gambling becomes a problem when it

- affects work, school or other activities
- leads to mental or physical health problems
- leads to financial problems
- has negative consequences for family or others close to the individual.

**A public health perspective on problem gambling:** A public health problem is one that:

- occurs frequently
- has serious consequences (e.g., for health, economy, and social life)
- is unevenly distributed among the population
- is preventable.

Problem gambling fulfils all of these criteria and can therefore be seen as a public health problem. In Sweden, “överdrivet spelande” (excessive gambling) has been a subsection of public health policy since 1999 (the Government Offices, 1999; SOU 2000:91) together with tobacco, alcohol, narcotics, and doping (Regeringen, 2002, 2008; the Public Health Agency of Sweden, 2009).

**Figure 1.** Division of problem gambling among different segments of the population. Source: Ontario Problem Gambling Research Center
The above figure presents the division of problem gambling among the population based on various risk groups. People with gambling problems can be found in all sectors of the population, but the proportion is greater among those in high-risk groups than those in low-risk groups. Only individuals who do not gamble at all are entirely without risk. According to the model, the risk of problem gambling depends partly on how a person gambles (e.g., how often, what forms of gambling, and for how much money) and partly on other risk factors in a person’s life (e.g., psychological and socioeconomic conditions). The model also includes the idea that individuals can shift from one risk category to another and go from having gambling problems to not having problems.

Research project Swelogs

There were several reasons for why a national epidemiological study on gambling that stretches over a long period of time was required in Sweden. For example, existing data were limited (both geographically and in terms of the methods of measurement), and the gambling market had undergone dramatic changes over the past ten years. Furthermore, a good knowledge base was required by decision-makers on the local and national level. Finally, the initiatives for countering gambling problems needed to be expanded, including the development of treatment methods and preventive methods.

Purpose

The overall purposes of the Swelogs research project are to measure the prevalence of problem gambling and to obtain knowledge on risk factors and protective factors that can lead to the development of effective preventive initiatives.

Project structure

Ultimate responsibility for the study lies with the Director General of the Public Health Agency of Sweden. The international research team formed in connection with the conference “Best practice on prevalence studies in problem gambling 2007” now acts as the advisory group in scientific matters.

In 2007, the structure and content of the study was established, and parts of the questionnaire were tested in SCB’s (Statistics Sweden) measurement laboratory. In spring 2008, a pilot study was conducted and ethical approval
was given by the ethical review board in Umeå. Data collection for wave 1 began in late November 2008.

**Figure 2.** Swelogs’ plan for data collection.

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<tr>
<td>Epidemiological track</td>
<td>EP1* n = 15,000 16–84 years</td>
<td>EP2 n = 8,165 17–85 years</td>
<td>EP3 n = 7,000 19–87 years</td>
<td>EP4 n ~ 6,000 21–89 years</td>
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<td>In-depth track</td>
<td></td>
<td>ID1** n = 2,400 18–86 years</td>
<td>ID2 n ~ 2,000 20–89 years</td>
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<td>Follow-up track</td>
<td>n = 578 23–83 years</td>
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* EP = Epidemiologic study
** ID = In-depth study: A part of the panel followed up with in-depth interviews focusing on risk and protective factors.
*** A qualitative follow-up study is being planned to start in 2015 instead of the ID3 study that was planned earlier.

**Purpose**

The overall objectives of Swelogs are to measure the prevalence of problem gambling and to obtain knowledge on risk and protective factors that can lead to the development of effective preventive initiatives. Through the epidemiological study, we can follow gambling and problem gambling in Sweden over time. Follow-up on risk and protective factors via the in-depth path will use participants who were previously interviewed in the epidemiological study.

The **Swelogs epidemiological study on gambling and health** has the following purposes:

1. To measure the incidence of problem gambling in Sweden, both on a general population level and among various demographic groups and in relation to the form of gambling.

2. To investigate how gambling problems correlate with gambling patterns and social, economic, and health-related factors. This applies on both a general population level and in different demographic groups with the purpose of identifying vulnerable groups in society.
3. To compare our results with measurements from other countries and the previous Swedish epidemiological study on gambling and gambling problems from 1997/98.

4. To investigate how video and computer gaming correlate with gambling problems and economic, social, and health-related factors.

5. To measure the proportion of the population that is aware of existing initiatives for advice, support, and treatment for gambling problems.

6. To measure the number of relatives, including children, who are affected by gambling problems in the population at large and in different population segments.

7. To describe the starting point for upcoming follow-ups on a population level that are designed to encompass both prevalence and incidence measurements (occurrence and change).

8. To develop a base for the recruitment for the in-depth review panel, which shall include at least 1,750 people with different degrees of gambling problems.

9. To construct a knowledge base for developing improved measurement instruments for problem gambling.

10. To validate the measurement instrument for problem gambling (FORS) developed for use in the national public health surveys that are conducted annually by the Public health agency of Sweden.

In this report, we primarily discuss points 1, 2, 3, 5, and 6.
Method (EP1 and EP2)

Information on participation and confidentiality
Participants were informed that their participation was voluntary and that they were able to refrain from the questions they did not want to answer or even to withdraw their participation at any time. Written information was sent to all the participants about the data extracted from the registers that would complement the collected answers. The results were presented in such a way that no individual opinion or circumstances were disclosed.

Data access
All collected data were stored and analysed on SCB’s Microdata On-line Access (MONA), where both response data and register data were accessible via a remote desktop solution. For reasons of confidentiality, we processed and analysed the data while logged in to MONA. Those with authorisation to handle this data had a special security token that was used to log in to the system. Only summary results files can be downloaded from MONA.

Design of the questionnaire
The interview questions covered gambling patterns, relation to gambling via various standard forms, other gambling-related issues, and matters of health and socioeconomic background. The interview was concluded with an open question in order to obtain any other viewpoints, along with a question regarding consent to a follow-up interview. The questionnaire was tested in SCB’s measurement laboratory before the respective data collection process began. The interviews were conducted in several different languages with the aid of interpreters.

Data collection
Primary data collection for both EP1 (2008/09) and EP2 (2009/10) was conducted by SCB via telephone interviews. The participants received a letter with information on the survey prior to each interview. Participants
who could not be reached via telephone received a postal survey that was followed up with a reminder. The postal survey was somewhat shorter and differently designed, primarily in terms of introductory questions on gambling and different gambling forms.

Pilot Study
A pilot study was conducted with a stratified sample of 2,000 individuals from the Register of the total population (RTB). The strategy behind the stratified sample was to attempt to include as many problem gamblers as possible in the sample. The population was stratified according to age and place of residence, and larger proportions were selected from a younger age group (16–34 years) and from those living in metropolitan areas with a high proportion of rental properties. SCB conducted the data collection via telephone interviews during April and early May 2008. Over a quarter could not be reached by telephone. These people received a postal survey followed by a reminder. At the end of data collection in mid-June, data from 1,015 interviews and 95 postal questionnaires were collected.

Conclusions in the lead up to the next step (EP1)
The results from the pilot study were used to evaluate the questionnaire and as a basis for developing a final selection strategy and sample size. One of the largest changes where the questionnaire was concerned was the change of measurement instrument so as to facilitate comparisons with SWEGS, a study on gambling and gambling problems commissioned by the Swedish National Institute of Public Health in 1997/98. The measurement instrument for problem gambling that was used in the pilot study, DSM-IV, was replaced by SOGS-R.

Questionnaire design (EP2)
The main purpose with EP2 in 2009/10 was to measure the changes in gambling, risk for problem gambling, socioeconomic factors, and health after one year from the baseline measurements. Therefore, the questionnaires in EP2 were designed in the same way as for EP1 in 2008/09, but the questions on factors that do not change in a short period were excluded. Questions on gambling, problem gambling, video games, health, and household economy
were repeated and a set of questions on important life events within the past year was added. Interviews were conducted in many different languages, and interpreters were used when required.

Online gambling

In wave one, a direct question about gambling on the internet was used in the telephone interviews. This question was also used as a filter variable so that only those who answered yes to the question received follow-up questions about gambling on the internet in different game types. In the postal questionnaires, supplementary questions on various game types on the internet were asked to all those who gambled in each respective gambling form. We then created a variable for online gambling from those answers from the questions concerning gambling on the internet.

The findings from wave one showed that 9% of the population aged 16–84 had gambled online in the past year. In retrospect, we could conclude that this was probably an underestimation. On comparing both data collection methods, the results revealed that the weighted share of online gamblers according to the telephone interviews was 8% while the corresponding proportion with the postal questionnaires was 13%. The difference was statistically significant even when we controlled for gender, age, education, and living in metropolitan cities, which were all factors that correlated with online gambling.

For wave two, we removed the filter variable for online gambling in the telephone interviews. The proportion gambling online was instead calculated based on the answers to the follow-up questions on gambling in different forms pertaining to different game types on the Internet. Findings from wave two showed that the overall percentage of online gamblers was 13%. This time, the difference in the proportion between those who responded via telephone interview and those who completed the postal questionnaire was purely random.

The results on online gambling from postal questionnaires between wave one and wave two did not differ significantly. There was a significant increase, however, based solely on the results from the telephone interviews, indicating that the increase was an effect of the change in the measurement method rather than a real increase from wave one to wave two. It is possible that some people who answered “no” to the filter question in wave one had forgotten having gambled on some sorts of gambling or did not con-
sider buying Bingo Lotto or Harry Boy on the Internet as gambling online. Because they were asked about each individual game type in wave two, the chances of recall error were much lower.

Sample wave one (EP1)
The sample for the study consisted of a stratified sample of 15,000 persons aged 16–84 years from the Register of total population (RTB). The population was divided into 24 different strata based on age, gender, and risk of gambling problems ($P_k$) in accordance with Table 1 below.

The calculation of risk for becoming a problem gambler ($P_k$) was done in accordance with a model that was estimated using data from the pilot study conducted by the Swedish National Institute of Public Health in the spring of 2008. Factors that give an increased $P_k$ value in the calculation were

- being male
- having a low income
- having been unemployed for a minimum of 100 days
- having received unemployment compensation for 5 months or more
- someone in the family having received social welfare allowance.

<table>
<thead>
<tr>
<th>Calculated risk of problem gambling ($P_k$)</th>
<th>Gender</th>
<th>Age groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>16–24</td>
<td>25–34</td>
</tr>
<tr>
<td>$P_k \leq 0.03$</td>
<td>Men</td>
<td>2,757</td>
<td>89,754</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>375,622</td>
<td>516,388</td>
</tr>
<tr>
<td>$0.03 &lt; P_k \leq 0.1$</td>
<td>Men</td>
<td>342,966</td>
<td>400,130</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>141,629</td>
<td>38,339</td>
</tr>
<tr>
<td>$0.1 &lt; P_k$</td>
<td>Men</td>
<td>200,786</td>
<td>92,634</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>1,323</td>
<td>2,638</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,065,083</td>
<td>1,139,883</td>
</tr>
</tbody>
</table>

Being born in the Nordic countries, being married or having a registered partnership, and having been sick for one month or more all reduced the $P_k$ value. The sample was then selected with a greater sample inclusion probability for younger age groups and for persons at greater risk of developing gambling problems but with an even distribution of women and men (Table 2).
Table 2. Allocating the sample to strata.

<table>
<thead>
<tr>
<th>Calculated risk of problem gambling ($P_k$)</th>
<th>Gender</th>
<th>Age groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>16–24</td>
<td>25–34</td>
</tr>
<tr>
<td>$P_k \leq 0.03$</td>
<td>Men</td>
<td>307</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>347</td>
<td>444</td>
</tr>
<tr>
<td>$0.03 &lt; P_k \leq 0.1$</td>
<td>Men</td>
<td>582</td>
<td>632</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>1,477</td>
<td>243</td>
</tr>
<tr>
<td>$0.1 &lt; P_k$</td>
<td>Men</td>
<td>2,184</td>
<td>938</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>1,029</td>
<td>1,230</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5,926</td>
<td>3,690</td>
</tr>
</tbody>
</table>

Field work
The data collection was divided into three phases:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Period</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>21/10/2008–19/01/2009</td>
<td>8,000</td>
</tr>
<tr>
<td>II</td>
<td>12/01/2009–11/03/2009</td>
<td>4,001</td>
</tr>
<tr>
<td>III</td>
<td>02/03/2009–26/04/2009</td>
<td>2,999</td>
</tr>
</tbody>
</table>

The interviewers for the telephone interviews were specially informed about gambling by the personnel from the Swedish National Institute of Public Health. The information letter was translated into 16 languages, 5 of which were national minority languages. The interview guide was translated into English, and 42 interviews were conducted with the help of interpreters.

Roughly a quarter of the persons in the sample could not be reached via telephone. After the conclusion of each round of interviews, postal questionnaires were sent to those who could not be reached via telephone. A reminder was sent after eight days to all those who had not yet responded, and after a further nine days a new survey was sent as a reminder. The survey phase continued until August 2009.

RESPONSE FREQUENCY

<table>
<thead>
<tr>
<th>Sample</th>
<th>Original sample</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevented from participating</td>
<td>591</td>
<td></td>
</tr>
<tr>
<td>Overlap</td>
<td>153</td>
<td></td>
</tr>
<tr>
<td>Net sample</td>
<td>14,256</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Responded</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone interview</td>
<td>7,504 (52.6%)</td>
</tr>
<tr>
<td>Postal survey</td>
<td>675 (4.7%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No response</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not wish to participate</td>
<td>2,510 (17.6%)</td>
</tr>
<tr>
<td>Not reached/did not respond to the postal survey</td>
<td>3,567 (25.0%)</td>
</tr>
</tbody>
</table>
A common pattern in epidemiological studies is that there is a higher non-response rate among younger age groups, especially among young men. In our study, however, the highest proportion of respondents were the youngest, where 61% of the sample responded. The largest non-response rate was instead in the age group 25–34, where the proportion of respondents was a total 48%, and next was the 35–64 year olds, of which exactly half responded.

Another pattern that is often repeated in epidemiological studies is that socioeconomically vulnerable groups have lower response frequencies. When calculating $P_k$ values, there were a number of variables used to measure socioeconomic vulnerability. These included low income, unemployment, and the receipt of social welfare allowances. In total, the proportion with the lowest response rate in the group were those with more than 10% risk of problem gambling ($P_k > 0.1$), and this was in accordance with previously observed patterns. A total of 52% of men and 39% of women in
this category responded. Here, the youngest men were an interesting exception. Of the young men with a calculated high risk of problem gambling, 63% responded to the study.

The groups with the largest proportion of respondents were those at low risk of gambling problems in the age groups 25–34 and 35–64, as well as 16–24 year olds with a somewhat heightened risk of problem gambling.

Sending out postal surveys raised the response frequency by around 5 percentage points and was thereby an important supplementary measure to the telephone interviews, not least because the proportion that responded to the postal survey also had the highest proportion of responders with higher $P_k$ values. Half of those that responded via postal survey had a $P_k$ value greater than 0.1.

**Sample wave two (EP2)**

The 8,165 people who participated in the study in 2008/09 (EP1) constituted the sample for the follow-up survey carried out a year later in 2009/10 (EP2).

Telephone interviews were conducted between December 2009 and May 2010, and additional measurements with postal questionnaires were completed in August 2010.

**Table 4.** Respondents in EP2 distributed over strata. The numbers in parentheses are the percentages of respondents in EP2 based on participants in EP1.

<table>
<thead>
<tr>
<th>Risk of Gambling problems ($P_k$ value)</th>
<th>Gender</th>
<th>Age Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>16–24</td>
<td>25–34</td>
</tr>
<tr>
<td><strong>Low risk</strong> $P_k \leq 0.03$</td>
<td>men</td>
<td>94 (68%)</td>
<td>112 (83%)</td>
</tr>
<tr>
<td></td>
<td>women</td>
<td>159 (72%)</td>
<td>228 (78%)</td>
</tr>
<tr>
<td><strong>Moderate risk</strong> $0.03 \leq P_k \leq 0.10$</td>
<td>men</td>
<td>269 (70%)</td>
<td>299 (76%)</td>
</tr>
<tr>
<td></td>
<td>women</td>
<td>791 (76%)</td>
<td>75 (64%)</td>
</tr>
<tr>
<td><strong>High risk</strong> $P_k &gt; 0.10$</td>
<td>men</td>
<td>998 (73%)</td>
<td>226 (65%)</td>
</tr>
<tr>
<td></td>
<td>women</td>
<td>286 (65%)</td>
<td>304 (62%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>2,597 (72%)</td>
<td>1,244 (70%)</td>
</tr>
</tbody>
</table>
A total of 74% of those who participated in wave one took part in wave two. The highest participation was seen among the oldest population (65–84 years) with nearly 80% taking part in wave two. With a few exceptions, the proportion of men was higher than the proportion of women in all sub-categories based on the combined risk of gambling problems \((P_k)\) and age. People belonging to the age group of 35–64 years with low risk for gambling problems from wave one were most likely to continue participating in the study, and 86% of the women and 84% of the men in this group took part in wave two.

Of the original sample of 15,000 participants in EP1, 40% took part in wave two. The percentages varied widely between different groups. A total of 50% of those with low risk for gambling problems \((P_k \leq 0.03)\) took part in wave two, including equal proportions of men and women. 46% of the men and 47% of the women from the category where the risk was calculated to be between 3% and 10% participated in wave two. The highest drop-out rates were among those with the highest risk of gambling problems, and only 37% of the men and 25% of the women from the group with highest calculated risk participated in wave two. Higher participation among men is due to the youngest (16–24 years) where 46% participated in both wave one and wave two.

Comparison of those who participated in both EP1 and EP2 and the drop-outs

From the analysis of the sample groups, we found that among those who dropped out, women rather than men and people under the age of 35 years were over represented between wave one and wave two.

In wave one, the youngest age group (16–17 years) did not show higher dropout rates as seen in other age groups below the age of 35 years. Consistently significant socio-demographic differences were seen between those who continued their participation and those who dropped out. Among those who dropped out, a greater proportion of them were

- Single with or without children
- People born outside Sweden
- Inhabitants from one of the three largest cities in Sweden (Stockholm, Gothenburg and Malmö)
• People with high-school education as their maximum attained education
• People with economic problems
• People with low socioeconomic status
• People with mental health problems
• Smokers
• People with risky alcohol behaviour

Thus in many of the variables we used to categorise the population before the initial sampling, there were differences between those who remained in the sample and those who dropped out. This could have resulted in serious consequences for the study if we had not adjusted the sample so that we got more people from the groups with risk for gambling problems.

There were also differences in gambling habits among those who participated in EP2 and those who dropped out between EP1 and EP2. Attrition was high among those who did not gamble at all in EP1 and those at risk of gambling problems or who had a gambling problem. This means that gamblers without gambling problems were more likely to continue participating, especially those who gamble regularly, i.e. at least every month in one or more forms of gambling. There was a higher proportion of those who gambled on horses, number games, and lotteries among those who participated in EP2. There were no significant differences in participation for other types of games between the participants and the drop-outs in EP2.

One consequence of attrition is that it can be harder to look at results in subgroups, such as those living in metropolitan areas. Attrition was 30% among those who lived in Stockholm, Gothenburg or Malmö, while it was 25% among those living in the other parts of the country. At the same time, the proportion that had dropped out was greatest among those who were classified as problem gamblers in EP1 and was greater among those with gambling problems in Stockholm, Gothenburg, and Malmö (67%) compared to those with gambling problems in the rest of the country (50%). Consequently gambling problems in metropolitan areas are not reported separately for EP2.

We could still calculate reliable estimates for the proportion of problem gamblers in the population because we used calibration weights for such calculations. The same applied for the calculation of the percentage of new problem gamblers (see the section on calibration weights in the later sections).
Weighting and comparability between the two waves

To ensure that our results will provide a better picture of the population, we used calibration weights developed by SCB. The weights reduce the errors in the survey produced by sampling errors, i.e., that only a subset of the population has been studied. The weights also reduce the non-response errors that arise due to the non-respondents differing from the respondents in terms of what the study is about. The weighting was done with consideration for the following variables in 2008:

- gender
- age
- country of birth
- income
- type of place of residence (urban area or not)
- civil status
- employment situation
- family type (with or without children)
- level of education
- professional category
- social welfare allowance
- sickness benefits received
- unemployment
- employment sector

All variables correlated with the tendency to respond and with important target variables. The weighting also helped to correct the distortions in relation to the population caused by stratification of the sample.

When comparing estimates between wave one and wave two, we used respective sets of calibration weights to obtain estimates of the population at wave one and wave two. The other alternative would have been to calculate new estimates from wave one only for those 6,000 people who participated during both waves, but we wanted to avoid this for two reasons:

1. Not to create confusion by having slightly different results from wave one in our various publications.
2. So that the best estimates were made with the greatest possible amount of information, meaning estimations with over 8,000 responses and thus a lower degree of attrition.

To further assure that we had comparable results, we re-estimated values from wave one for the wave two respondents using only wave two calibration weights and compared them to the values estimated with all respondents in wave one and weighted using wave one calibration weights. With few exceptions, the results were identical. The largest difference was less than one percentage point and on an average the differences were half a per mille unit.

The weights were used in all analyses for the report both for EP1 and EP2. For the multivariate analyses, we compared the results with and without calibration weights and could show that the differences were very small.

When the weights were used, the calculated response frequency was 63% in EP1. It was higher for women than men, lowest among the oldest age group (65–84), and higher among those born in the Nordic countries than in other countries. The response frequency increased in line with income and education level and was higher among those who were married than those who were not.

With weighting, the calculated response rates became 80% in EP2, which was considerably higher compared with the weighted 63% response rate in wave one. An initial response rate of about 60% and a follow-up response rate of about 80% is considered normal in population studies.

Measurement instruments and index
In wave one (2008/09) the questionnaires for the telephone interviews and postal surveys differed in terms of the level of detail for gambling frequency. The questions in the postal survey differed somewhat so as to work well in a questionnaire. This report presents combined responses from the two different data collection methods wherever applicable.

The main purpose with EP2 in 2009/10 was to measure the changes in gambling, risk for problem gambling, socioeconomic factors, and health after one year from the baseline measurements. Therefore, the questionnaires in EP2 were designed in the same way as for EP1 in 2008/09, but the questions on factors that do not change in a short period were excluded. Questions on gambling, problem gambling, video games, health, and house-
hold economy were repeated and a set of questions on important life events within the past year was added. Interviews were conducted in many different languages, and interpreters were used when required.

Questions in both EP1 and EP2 were essentially similar. The only major change was with regards to how often one gambles in different game types, and we added an extra option in the telephone interviews and made changes so that we would get more detailed information from the postal questionnaires than before.

**Forms of gambling and game types**
The questions in the interviews and survey concerned nine different forms of gambling. The forms of gambling were in turn divided into different game types depending on where and how the respondents gamble. The table below shows the different forms of gambling with examples of different game types.

<table>
<thead>
<tr>
<th>Form of gambling</th>
<th>Different game types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lotteries</td>
<td>Bingo, lotteries with a draw once per week or less often, scratch cards or other instant lotteries, or other lotteries such as those run by associations and where the tickets are purchased from a shop/agent, online, etc. (EP1 5 different types; EP2 7 different types)</td>
</tr>
<tr>
<td>Number games</td>
<td>Lotto, Keno, and Joker bought from a shop/agent or online (3 different types)</td>
</tr>
<tr>
<td>Sports betting</td>
<td>Pools, sports betting, and other forms of betting with shops/agents or online (4 different types)</td>
</tr>
<tr>
<td>Horse racing</td>
<td>Gambling on trotting tracks or racecourses, Harry Boy, and other horse betting with shops/agents or online (6 different types)</td>
</tr>
<tr>
<td>Poker games</td>
<td>Poker (live) or online poker (6 different types)</td>
</tr>
<tr>
<td>Casino games</td>
<td>Roulette, black jack, or dice games in a casino or restaurant, on a boat, at a club, abroad, or online (4 different types)</td>
</tr>
<tr>
<td>Gambling machines</td>
<td>Gambling at Casino Cosmopol, restaurants, clubs, etc., or online (5 different types)</td>
</tr>
<tr>
<td>Live TV competitions</td>
<td>Competitions where money can be won by phoning in an answer to different word games, rebuses, and questions on live TV</td>
</tr>
<tr>
<td>Bingo</td>
<td>Bingo halls, online bingo, or other bingo games such as drive-in bingo (EP1 7 different types; EP2 5 different types)</td>
</tr>
</tbody>
</table>
In the telephone interviews, gambling frequency was measured for the past year for different types of games within each form of gambling. The lowest observed frequency was 6–11 times in the past year. In the introduction to the interview, two filter questions were used for each form of gambling. The italicised words were successively interchanged for each form of gambling:

**A) Have you ever put money on the horses?**
Follow-up questions for those who responded “yes”:

**B) Have you done this in the past 12 months?**
Those who responded “yes” to question B for the given form of gambling were then asked detailed questions about gambling in this specific form:

**How often have you put money on Harry Boy, purchased from a shop/agent, in the past 12 months?**
Response alternatives in EP1:
1. Daily/ almost daily
2. A few times per week
3. Once per week
4. A few times per month
5. Once per month
6. 6–11 times per year
7. More seldom/never

For the various forms of gambling, there were 1–7 detailed questions on game types.

In the postal survey, the introductory question for each game type in EP1 related to gambling frequency. Questions relating to different game types concerned solely whether or not the respondent had gambled with this game type.

**How often have you put money on horses in the past 12 months?**
Response alternatives:
1. Daily/almost daily
2. A few times per week
3. Once per week
4. A few times per month
5. Once per month
6. 6–11 times in the past 12 months
7. 1–5 times in the past 12 months
8. Never
Those who answered using one of alternatives 1–7 received the follow-up question:

**In what way have you put money on horses in the past 12 months?**

This question was followed by a list of between 3 and 7 different game types for the respective form of gambling. The respondents were able to mark one or more game types, but stated only whether or not they had gambled on a certain type of game, not how often.

From the postal surveys, we acquired the frequencies for the different forms of gambling. In order to obtain comparable measurements from the telephone interviews, we used the value of the highest stated playing frequency for any game type within each gambling form.

For specific game types, we show for EP1 whether the respondent has gambled at least 6 times in the past 12 months because this is the lowest level that can be discerned in the telephone interviews for various game types.

In EP2 the screening questions about gambling were only about gambling the past 12 months, and the same introductory question was used in the interviews and in the questionnaire:

**Have you put money on horses in the past 12 months?**

The response alternatives for how often people had gambled in the different types of games, such as Harry Boy, purchased from a shop/agent, had 8 different alternatives in the telephone interviews:

1. Daily/almost daily
2. A few times per week
3. Once per week
4. A few times per month
5. Once per month
6. 6–11 times in the past 12 months
7. 1–5 times in the past 12 months
8. Never

Only 4 different alternatives were used in the questionnaires:

1. Every week (alternatives 1–3 in the interviews)
2. Every month (alternatives 4–5 in the interviews)
3. One or a few times in the past 12 months (alternatives 6–7 in the interviews)
4. Never (alternative 8 in the interviews)
Gambling frequency (EP1)
For each and every one of the nine different forms of gambling, we defined variables for gambling frequency by dividing the responses into five different levels:

- 0 = Has not gambled in the last year
- 1 = Has gambled at some point in the past year, but less than once per month
- 2 = Has gambled once per month
- 3 = Has gambled several times per month
- 4 = Has gambled every week

The values for the nine variables were totalled to a gambling frequency index in which each person received a value between 0 and 36. Thereafter, the individuals were divided into four categories based on the gambling frequency index:

- **No gambling (0):** People who have not gambled in the past 12 months.
- **Low frequency gambling (1–3):** People who have gambled at some point but in not more than three different types of gambling and at the most monthly in one single gambling form.
- **Moderately frequency gambling (4–7):** People gambling in several different forms of gambling but at most weekly in not more than one gambling form.
- **High-frequency gambling (8 or more):** People gambling often in many forms of gambling and frequently in several different forms.

Gambling frequency (EP2)
For each and every one of the nine different forms of gambling, we defined variables for gambling frequency by taking the highest frequency in any type of gambling in each form and dividing the responses into four different levels:

- 0 = Has not gambled in the last year
- 1 = Has gambled at some point in the past year, but less than once per month
- 2 = Has gambled once per month or more frequently but less than once per week
- 3 = Has every week
The values for the nine variables were totalled to a gambling frequency index in which each person received a value between 0 and 27. Thereafter, the individuals were divided into four categories based on the gambling frequency index:

- **No gambling (0):** People who have not gambled in the past 12 months.
- **Low frequency gambling (1–3):** People who have gambled in a maximum of three different forms of gambling and weekly only in one gambling form.
- **Moderately frequency gambling (4–6):** People gambling in many different forms of gambling but weekly in a maximum of two gambling forms.
- **High-frequency gambling (7 or more):** People gambling in many forms of gambling and often (at least weekly) in many different forms.

**Risk potential (EP2)**

Different game types have different risk potential, which means that there seems to be a higher risk of developing a gambling problem if one gambles on certain types of games compared to others.

We have assessed all game types in the study according to seven criteria and formed a weighted index for the risk potential. The criteria and weights are taken from a measurement instrument for risk potential developed by a German research team. Their instrument is meant for specific games and consists of ten criteria, three of which were not applicable to the categories of games we used here (Meyer, Fiebig et al. 2011).
Table 5. Different parts of the measurement instrument for risk potential.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
<th>Definition</th>
<th>Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time for each gambling session</td>
<td>3.0</td>
<td>Time between the outcome of one bet and the ability to bet again on the same game</td>
<td>0 = More than 6 days; 1 = More than 24 hours and up to 6 days; 1.5 = More than 4 hours and up to 24 hours; 2 = More than 30 minutes and up to 4 hours; 2.5 = More than 3 minutes and up to 30 minutes; 3 = More than 1 minute and up to 3 minutes; 3.5 = 15 seconds up to 1 minute</td>
</tr>
<tr>
<td>Multiple gambling</td>
<td>2.0</td>
<td>Possibility for multiple bets together or to be active in multiple games at the same time</td>
<td>2 = One game and one betting; 3 = One game but many possible bettings; 4 = multiple games and possibility of multiple bettings</td>
</tr>
<tr>
<td>Light and sound effects</td>
<td>1.5</td>
<td>Light and sound effects during the game and/or in relation to the presentation of the game</td>
<td>0 = Neither sound or light; 2 = Either sound or light effects; 3 = Both sound and light effects</td>
</tr>
<tr>
<td>Varying betting amounts</td>
<td>1.4</td>
<td>Possibility for the gambler to decide on the amount of money one wants to gamble for</td>
<td>2 = Fixed amount; 3 = Varying but limited amount; 4 = Unlimited amount</td>
</tr>
<tr>
<td>Accessibility</td>
<td>1.3</td>
<td>How easily the game can be accessed</td>
<td>1 = Places specially reserved for the game; 2 = Accessible in special environments; 3 = Accessible in everyday public environments; 4 = Accessible at home or at the workplace</td>
</tr>
<tr>
<td>Payment of winnings</td>
<td>1.3</td>
<td>How long it takes from results to payment of winnings and the availability of new betting</td>
<td>1 = Payment after the results are published or made available; 2 = Immediately upon request, but not in the location where the result was decided; 3 = Immediately upon request and in the same location where the result was decided; 4 = Immediately and automatically after every game</td>
</tr>
<tr>
<td>Continuity of the game</td>
<td>1.0</td>
<td>The extent to which a gambling session can continue without interruption or can be extended by another type of game (need not be in the same form of gambling)</td>
<td>0 = 0–5 minutes of continuous gambling; 1 = More than 5 minutes and up to 14 minutes of continuous gambling; 2 = More than 15 minutes and up to 30 minutes of continuous gambling; 3 = More than 30 minutes and up to 1 hour of continuous gambling; 3.5 = More than 1 hour and up to 3 hours of continuous gambling; 4 = More than 3 hours of continuous gambling</td>
</tr>
</tbody>
</table>
For each game, the weight is multiplied by the coding such that one type of game can have a score of at least 9 and at the most 45 depending on the combination of different characteristics. The original instrument divided the games into five different levels. However, we have divided them into low, moderate, and high risk levels:

- 9–24: Low risk potential
- 25–31: Moderate risk
- 32–45: High risk

**Problem gambling and risk of problem gambling**

**MEASUREMENT INSTRUMENT SOUTH OAKS GAMBLING SCREEN – REVISED**

The South Oaks Gambling Screen–Revised (SOGS-R) is a measurement instrument for problem gambling that consists of 20 questions with two different time perspectives. The questions concern both a person’s entire lifetime and the past year. Those responding Sometimes/Often/Always to questions 1A–10A and Yes to questions 11A–20A are asked this follow-up question regarding the past year.

SOGS-R was used in the epidemiological study on gambling and gambling problems carried out in 1997/98 and was also used in Swelogs to enable us to compare the degree of problems between the two investigations.
<table>
<thead>
<tr>
<th>SOGS Lifetime</th>
<th>SOGS Past year</th>
<th>Response alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A. If you have lost at gambling, have you at any point returned another day to attempt to win back what you lost?</td>
<td>1B. How often has this happened in the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>2A. Have you ever had others believe that you won money on gambling, despite having lost in reality?</td>
<td>2B. How often has this happened in the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>3A. Have you ever gambled for more money than you actually intended to?</td>
<td>3B. How often has this happened in the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>4A. Have you ever been criticised for gambling?</td>
<td>4B. Has this happened during the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>5A. Have you ever had feelings of guilt due to your gambling habits?</td>
<td>5B. Have you ever felt this way in the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>6A. Have you ever felt as though you would like to stop gambling but didn’t believe you could do it?</td>
<td>6B. Have you ever felt this way in the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>7A. Have you ever hid lottery tickets, gambling money, gambling receipts, coupons, or other signs of gambling from your spouse/partner, children or other important people in your life?</td>
<td>7B. Have you done this at all during the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>8. Have there ever been heated discussions at home concerning how you handle money?</td>
<td>Question 8 is used only as a filter for question 8A.</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>8A. Have the discussions ever been about your gambling?</td>
<td>8B. Have you had such discussions in the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>9A. Have you ever gambled instead of going to work or when you were supposed to be studying?</td>
<td>9B. Have you done this at all during the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>10A. Have you ever borrowed money from someone for gambling, without paying them back?</td>
<td>10B. Have you done this during the past year?</td>
<td>Never/Sometimes/Often/Always</td>
</tr>
<tr>
<td>11A. Have you ever borrowed money from the household budget in order to gamble or pay off gambling debts?</td>
<td>11B. Have you done this during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>12A. Have you ever borrowed money from your spouse/partner in order to gamble or pay off gambling debts?</td>
<td>12B. Have you done this during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>13A. Have you ever borrowed money from relatives or acquaintances in order to gamble or pay off gambling debts?</td>
<td>13B. Have you done this during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>14A. Have you ever borrowed money from banks, financing companies or lending institutions in order to gamble or pay off gambling debts?</td>
<td>14B. Have you done this at all during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Question (A)</td>
<td>Question (B)</td>
<td>Yes/No</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>15A. Have you ever withdrawn cash using a credit card or charged to a credit account in order to gamble or pay off gambling debts?</td>
<td>15B. Have you done this at all during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>16A. Have you ever taken high interest rate loan from e.g., a private lender or “loan shark” in order to gamble or pay off gambling debts?</td>
<td>16B. Have you done this at all during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>17A. Have you ever sold shares, bonds, premium bonds, or other securities in order to gamble or pay off gambling debts?</td>
<td>17B. Have you done this at all during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>18A. Have you ever sold personal property in order to gamble or pay off gambling debts?</td>
<td>18B. Have you done this at all during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>19A. Have you ever written cheques that bounced or become overdrawn in your bank account in order to gamble or pay off gambling debts?</td>
<td>19B. Have you done this at all during the past year?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>20A. Have you ever experienced problems due to your gambling habits?</td>
<td>20B. Have you done this at all during the past year?</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

Each positive answer, i.e., Sometimes/Often/Always to any of questions 1–10 and each Yes to any of questions 11–20, adds 1 point to the score. The points are totalled separately for the person’s lifetime and for the past year. The maximum number of points for each total is 20. The following categories are used:

- 0–2 = No problem
- 3–4 = Problem gambling
- 5 or more = Probable pathological gambling
The Problem Gambling Severity Index (PGSI) is a measurement instrument for gambling problems that consists of nine questions, all with the response alternatives Never/Sometimes/Often/Always. The PGSI was developed in Canada and is now one of the most-used measurement instruments for problem gambling.

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often have you gambled for more than you can actually afford to lose in the past 12 months?</td>
<td></td>
</tr>
<tr>
<td>2. How often have you needed to increase the amount you gamble with in order to get the same feeling of excitement in the past 12 months?</td>
<td></td>
</tr>
<tr>
<td>3. How often have you returned another day to attempt to win back what you lost in the past 12 months?</td>
<td></td>
</tr>
<tr>
<td>4. How often have you borrowed money or sold something in order to have gambling money in the past 12 months?</td>
<td></td>
</tr>
<tr>
<td>5. How often have you experienced problems due to your gambling in the past 12 months?</td>
<td></td>
</tr>
<tr>
<td>6. How often has gambling caused you problems with your health, including stress and anxiety, in the past 12 months?</td>
<td></td>
</tr>
<tr>
<td>7. How often has someone criticised your gambling or said that you have problems with gambling in the past 12 months, irrespective of whether or not you felt this was true?</td>
<td></td>
</tr>
<tr>
<td>8. How often has your gambling caused financial problems for you or your household in the past 12 months?</td>
<td></td>
</tr>
<tr>
<td>9. How often have you had feelings of guilt over gambling, or what happens when you gamble, in the past 12 months?</td>
<td></td>
</tr>
</tbody>
</table>

The responses to the questions were coded as follows:

- 0 = Never
- 1 = Sometimes
- 2 = Often
- 3 = Always

The answers were summed, and the total score that one could get was 27. The following criteria were used:

- 0 = No gambling problems
- 1–2 = Low risk
- 3–7 = Moderate risk
- 8 or more = Gambling problem
Because we found very few respondents in the most serious category, which makes it difficult to make good estimates of how large the proportions are in the different subgroups, it is common to combine the categories “Moderate risk” and “Gambling problem”. We have, therefore, mainly used the above mentioned alternatives in three different categories,

- 0 = No gambling problems
- 1–2 = Low risk
- 3 or more = Problem gambling

Question 3 for the PGSI overlaps with question 1B for SOGS-R, and this question was asked just once in connection with the questions for SOGS-R.

CORRECTIONS FOR NON-RESPONSES AND SKIPPED QUESTIONS (EP1)
Responses were corrected to some extent to cover non-responses. This was especially true for the blocks of questions included in the measurement instruments for gambling problems in which non-responses were coded with “No/Never”. This means that the level of gambling problems might be somewhat underestimated.

Question 5 in the PGSI overlaps with question 20B in the SOGS-R, but the response alternatives are different. The plan was to ask a follow-up question with the extra response alternatives, but due to a skip erroneously programmed into the interview guide, neither question 20B nor the follow-up question were posed to anyone in the telephone interviews. The postal survey included the question from SOGS-R, but not the follow-up question for PGSI.

The SOGS-R consists of 20 questions. We established that the classification of the degree of gambling problems did not change when only 19 questions were used as in other studies. Thus our index for SOGS-R was calculated based on 19 questions instead of 20 so as to make our study more comparable to previous studies.

The PGSI consists of 9 questions, and in this case we had to estimate the value of the missing responses. We imputed answers for those who responded that they had at some point experienced problems due to their gambling problems using their answer to PGSI 8: “How often has your gambling caused financial problems for you or your household in the past 12 months?” Other responses were set to “Never”. This was the question for which the answers most strongly correlated to answers to PGSI question 5 in accordance with British and Canadian gambling studies.
INTERNAL ATTRITION AND IMPUTATION (EP2)

In the telephone interviews, there was always a possibility to choose not to answer individual questions by stating that one did not know or did not want to answer. Non-response rates were below 1% for the majority of questions with two exceptions, one of which concerned the biggest gambling winnings over the past year (1.6% non-response) and the other a question on “how important gambling is among friends” (4.6% non-response). Less than 1% of the participants terminated the interview before it was over. Non-response rates were slightly higher with postal questionnaires.

Attrition with individual questions is a problem, especially when merging the answers from several questions to get a more comprehensive picture. In order to still be able to use the collected responses, the missing data can be replaced with a substitute value through imputation. We have used this technique in two cases. The first was with non-responses to questions that were included in any of the measurement instruments for gambling problems. Here, we substituted the response “never” for unanswered questions.

The second case concerned the answers to question “How much money have you gambled in various forms of gambling in the past 30 days?” Non-responses for respondents who answered that they have gambled but did not specify the sum gambled were substituted with a value that corresponded to the average for all the gamblers who had gambled for the same length of time in the respective gambling form.

MENTAL HEALTH – KESSLER 6

The Kessler 6 (K6) instrument consists of six questions on poor mental health. The response alternatives are all the time/Most of the time/Some of the time/Rarely/Never.

1. Roughly how often in the past 30 days have you felt nervous?
2. Roughly how often in the past 30 days have you felt despair?
3. Roughly how often in the past 30 days have you felt restless or anxious?
4. Roughly how often in the past 30 days have you felt so depressed that nothing could motivate you?
5. Roughly how often in the past 30 days have you felt that everything is an effort?
6. Roughly how often in the past 30 days have you felt worthless?
The responses were coded as follows:

- 4 = All the time
- 3 = Most of the time
- 2 = Some of the time
- 1 = Rarely
- 0 = Never

The maximum number of points one could score was 24. The borderline for serious psychological disorder was 13. We did not strictly adhere to this, and instead used a value of 9, which is the borderline for poor mental health.

**HIGH-RISK ALCOHOL CONSUMPTION – AUDIT**

High-risk alcohol consumption was measured – as in the annual public health survey conducted by the Swedish National Institute of Public Health – with three questions obtained from the instrument AUDIT (Alcohol Use Disorders Identification Test). In the questionnaire we used, there were eight response alternatives for question 1 and six for question 2, but in the analysis they were merged in accordance with the following:

<table>
<thead>
<tr>
<th>Question</th>
<th>Responses</th>
</tr>
</thead>
</table>
| 1. How often have you drunk alcohol in the past 12 months?               | 4 = Daily/almost daily  
|                                                                          | 3 = A few times per week  
|                                                                          | 2 = Once per week or a few times per month  
|                                                                          | 1 = Once per month or 6–11 times or more seldom  
|                                                                          | 0 = Never                                                                 |
| 2. How many “glasses” have you drunk on a typical day on which you have drunk alcohol, in the past 12 months? | 4 = 10 glasses or more  
|                                                                          | 3 = 7–9 glasses  
|                                                                          | 2 = 5–6 glasses  
|                                                                          | 1 = 3–4 glasses  
|                                                                          | 0 = 1–2 glasses                                                                 |
| 3. How often have you drunk six “glasses” or more on the same occasion, in the past 12 months? | 4 = Daily/almost daily  
|                                                                          | 3 = Every week  
|                                                                          | 2 = Every month  
|                                                                          | 1 = 6–10 times or more seldom  
|                                                                          | 0 = Never                                                                 |

A “glass” is 50 cl of medium-strength beer, 33 cl of strong beer, 10–15 cl of wine, 5–8 cl of fortified wine, or 4 cl of spirits.

The answers were totalled and the maximum number of points was 12. The borderline for high-risk consumption was 8 points for men and 6 points for women.
Register variables (EP1 and EP2)
Response data from interviews and surveys were supplemented with the following details

- gender
- age
- civil status
- municipality
- citizenship
- country of birth
- parents’ country of birth
- number of children living at home
- marriage and divorce dates
- move of house within the country
- immigration and emigration
- date of a spouse or partner’s death
- highest level of education attained
- grades, study path, and home language tuition
- job and profession
- income
- private means
- debts
The following information from the register variables was used for the analyses in EP1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Year concerning the information</th>
<th>Chosen level for merging categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of education, highest</td>
<td>2006</td>
<td>3 levels: lower-secondary school, upper-secondary school, college or university</td>
</tr>
<tr>
<td>Profession in accordance with the Swedish Standard Classification of Occupations (SSYK)</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Level of qualification in accordance with SSYK</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Prevalence of unemployment benefits</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Prevalence of sickness benefits</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Prevalence of social welfare allowance</td>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>Disposable income</td>
<td>2006</td>
<td>The subcomponent in four classes that are the same size in terms of numbers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The family's disposable income in four classes that are of the same size in terms of numbers</td>
</tr>
<tr>
<td>Local authority</td>
<td>2008</td>
<td>Settled in Stockholm, Gothenburg, or Malmö or in the rest of Sweden</td>
</tr>
<tr>
<td>Country of birth</td>
<td></td>
<td>Sweden, elsewhere in Europe, or the rest of the world</td>
</tr>
</tbody>
</table>
The variable for socioeconomic status was subdivided according to profession (as per SSYK) and disposable income:

<table>
<thead>
<tr>
<th>Professional category</th>
<th>Disposable income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower quartile</td>
</tr>
<tr>
<td>Management work</td>
<td>High</td>
</tr>
<tr>
<td>Military work</td>
<td>High</td>
</tr>
<tr>
<td>Work that requires theoretical specialist competence</td>
<td>Medium</td>
</tr>
<tr>
<td>Work that requires shorter university education</td>
<td>Medium</td>
</tr>
<tr>
<td>Craftsmanship in construction and manufacturing</td>
<td>Medium</td>
</tr>
<tr>
<td>Process and machine operator work, transportation, etc.</td>
<td>Low</td>
</tr>
<tr>
<td>Office and customer service work</td>
<td>Low</td>
</tr>
<tr>
<td>Service, social care, and sales work</td>
<td>Low</td>
</tr>
<tr>
<td>Work in agriculture, horticulture, forestry, and fishing</td>
<td>Low</td>
</tr>
<tr>
<td>Work without the requirement for specific vocational training</td>
<td>Low</td>
</tr>
</tbody>
</table>

REGISTER VARIABLES EP2

Data such as gender, age, marital status, and place of residence were collected from the total population register from the year 2009. Remaining data from other registers were from the year 2007 or earlier.

In wave two, we have used information from the following register variables:

- Highest attained education
- Disposable income
- Qualification level according to SSYK (Standard for Swedish professional classification)
- Place of residence/municipality
- Country of birth
Prevalence, incidence, and transitions between risk types

**Prevalence** describes the proportion of a population who have a certain disease or are in a certain state of health at a particular time.

**Incidence** describes the number of events in a given population during a defined period of time. It is often used to describe the incidence of a disease, but it can also be used to refer to other symptoms or events.

In this report, prevalence relates to the proportion of problem gamblers according to the PGSI in the population in wave one (2008/09) and wave two (2009/10), i.e. those who had elevated risk of a problem or had an actual gambling problem at the respective wave.

Incidence describes the percentage of new problem gamblers in the population according to the PGSI for the year between EP1 (2008/09) and EP2 (2009/10). That is, those who transitioned from no problems or low risk to moderate risk or problem gambling. The incident cases were further divided into **real incidence**, i.e. problem gambling for the first time in life, and **relapse** where a previous gambling problem was defined as having a score of at least 3 on the SOGS-R lifetime scale, i.e. problem gambling or probable pathological gambling according to SOGS-R lifetime in wave one. Also included in the incident cases were the group of new risk gamblers that consisted of all those who transitioned from no problem to low risk or more, that is, from having PGSI = 0 to a PGSI = 1 or more.

We also studied those with reduced degrees of gambling problems. Here we had a few previous problem gamblers who had either moderate risk or were problem gamblers in wave one but transitioned to low risk or to no gambling problems in wave two. They were a part of the second transition category that consisted of people who displayed lesser degrees of gambling problems. People in this category were those who reduced their risk by at least one level in the PGSI scale, i.e. from having a gambling problem to a moderate risk, from moderate risk to low risk, or from low risk to no gambling problem.
Statistical analysis (EP1)

All prevalence, including gambling in different forms and problem gambling, were calculated as totals, but also divided by gender in different age groups.

For bivariate analyses of relationships between problem gambling and other variables, we treated problem gambling as the dependent variable. However, we were careful to not in any way attempt to substantiate causal connections that cannot be shown using cross-sectional data. All bivariate analyses were performed both as a total and divided by gender. To test bivariate correlations, we used Pearson’s chi-squared test for independence.

We also conducted a two-step cluster analysis with the frequency of gambling in the nine different forms in five different categories:

- has not gambled in the past year
- has gambled in the past year but less than once per month
- has gambled once per month
- has gambled several times per month
- has gambled every week.

In the analysis, individuals were grouped according to gambling patterns in six different clusters.

Multivariate analysis (i.e., analysis of the correlation between more than two variables) was performed with logistic regression with problem gambling in accordance with the PGSI as a dependent variable in two different types of models.

In the first type of model, only gambling in different types of gambling forms was an independent variable. Gambling patterns have a very obvious link to problem gambling, but it is not always simple to separate the problem itself from the gambling pattern because one affects the other. It might also be the case that the gambling pattern is an intermediate factor that is in turn affected by the other variables. We therefore chose to show a separate model in which only gambling patterns were used as independent variables in relation to problem gambling.

In the second type of model, we used the following variables for which we found connections with gambling problems:

- age
- gender
• born in Sweden, elsewhere in Europe, or other parts of the world
• family situation
• socioeconomic status
• the individual’s disposable income
• education
• full-time work for women, part-time work for men
• old-age pension
• parental allowance
• household economy
• money and time invested
• video and computer games
• general health
• mental health
• smoking
• high-risk alcohol consumption
• someone to share the most intimate emotions with
• subject to physical violence.

The model was reduced so as to only contain significant main effects. We then tested the interaction effects between the different main effects and age and gender separately. The final model contained main effects and interaction effects with gender. The estimations were made with the entire data material, but the results were largely the same when we excluded those who had not gambled in the past year.

The level of significance was set at 0.05 for all analyses. The statistical analyses were performed with PASW Statistics 17.0.

Statistical analyses (EP2)

We used the calibration weights when we conducted analyses with one variable or for bivariate analysis. The percentages we report are therefore, estimates concerning the whole population at each wave. The estimates for wave one were calculated for 8,165 respondents and weighted by the calibration weights for that measurement point. The estimates for wave two and estimates for changes between wave one and wave two were calculated
for the 6,021 respondents that participated also in wave two and weighted by the calibration weights for wave two.

The results are presented mainly concerning problem gambling or changes within the level of problem gambling as the dependent variable. For comparisons of prevalence rates for EP1 and EP2, we have calculated 95% confidence intervals. There is a significant difference in cases where these intervals do not overlap. Bivariate relationships were tested with Pearson’s chi-square test of independence. In subgroups with skewed distributions, we instead used Fisher’s exact test. Regarding the relationship between prevalence and incidence of problem gambling and potential causal variables, we have tested both the total population and the population divided into groups based on gender.

We studied various types of transitions for risk and problem gambling, and we used the following dependent variables and subgroups for the analysis. The groups partially overlap each other. For example, an individual might both be a new at-risk gambler and an incident case.

Table 6. Different types of transitions for risk and problem gambling from EP1 to EP2.

<table>
<thead>
<tr>
<th>Transition categories EP2</th>
<th>Studied subgroups</th>
<th>PGSI wave 1</th>
<th>No. of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>New risk gamblers (PGSI 1+)</td>
<td>Previous non-gamblers and gamblers without problems</td>
<td>0</td>
<td>5,331</td>
</tr>
<tr>
<td>Incidence (PGSI 3+)</td>
<td>Total except those who were problem gamblers in wave 1</td>
<td>&lt; 3</td>
<td>5,829</td>
</tr>
<tr>
<td>Gamblers with reduced degree of gambling problem (by at least by one PGSI category than before)</td>
<td>Previous gamblers with low risk, moderate risk, or gambling problem</td>
<td>≥ 1</td>
<td>690</td>
</tr>
<tr>
<td>Previous problem gamblers</td>
<td>Problem gamblers in wave 1</td>
<td>&gt; = 3</td>
<td>192</td>
</tr>
</tbody>
</table>

All analyses for the transitions between different groups were conducted with unweighted data. The schematic in Figure 3 shows various subgroups and each transition category. A white background indicates the PGSI category from EP1 included in the subgroup that was used as a base to calculate the respective transition category. A grey background indicates the PGSI category that was not included.

Subgroups of increased or decreased risk for incidence and previous problem gambling are represented separately in the figure to show how the larger and smaller categories co-vary.
According to EP1 problem gambling is obviously different in different age groups and for men and women, thus we first estimated logistic regression models for each dependent variable including age and gender as independent variables. The following variables were tested one at a time in models in which age and gender were included (the models for the new risk groups also included a variable for having had gambled in EP1):

- Household economy
- Gambled on TV or computer games in EP1
- Started playing the TV or computer games during the year
- General health, EP1
- Poor general health
- Mental Health, EP1
- Poor mental health
- Risky drinking habits, EP1
- Have acquired risky drinking habits during the year
- Smoking, EP1
- New smoker/started smoking during the year
• Lives in Stockholm, Gothenburg, or Malmö, EP1
• Moved to Stockholm, Gothenburg, or Malmö during the year
• Education, EP1
• Birth (Sweden or otherwise)
• Description according to JAS (Jonsson–Abbott Scale), which contains statements and views on gambling, EP1
• The opportunity to get help and support, EP1
• Someone to share their innermost feelings with, EP1
• Gambled at work or school, EP1
• Started gambling at work or school
• Life events observed in EP2.

For each of the four dependent variables, we then estimated multivariate models with the variables found to be significant in the previous step with the following steps:

1. Start with the model with independent variables from EP1 and remove variables with non-significant coefficients.
2. Test the interactions with age and gender.
3. Supplement the respective models with transitional variables and life events.
4. In the end, adjust the models by taking away the variables with non-significant coefficients.

Causality and risk

Using statistical methods, we can assess the relationship between two variables and determine if the relationship is random or statistically significant. The latter means that the relationship most likely applies not only to the sample studied but also to the whole population.

Causality implies a causal relationship. To study the cause and effect, we need to make repeated measurements in time. In clinical studies, one can isolate other possible factors and then add an agent that can produce a certain effect. When studying societal phenomenon such as gambling problems, this is not possible, but we can at least determine which factors precede a particular condition.
A risk factor is a trait, a state, or a habit that carries an increased risk of getting a particular disease or equivalent. The purpose of epidemiological studies is usually to identify and describe the relationship between, for example, diseases and risk factors. In this report, by risk we mean a relationship between a supposed risk factor and becoming a problem gambler.

One way to describe a possible risk is to calculate an odds ratio (OR), which describes the ratio of the odds of getting a disease in two groups such as men compared with women or people with lower education compared to those with higher education. One group is designated as the reference category with an OR = 1. When the OR for the comparative category is close to 1, the odds or the risk are about equal in both groups. An odds ratio significantly above 1 indicates an increased risk for the comparative category, but it can also be significantly below 1 indicating a significantly lower risk.

We used ORs to describe the relationship between possible risk factors and the incidence of problem gambling and other transitions that include significantly altered levels of problem gambling. Using multivariate analysis, we adjusted the relationship between a risk factor and the respective transition. The OR between a risk factor and a transition into or out of a more severe degree of gambling problem describes the overall effect, i.e. the increase in overall risk in the presence of a particular factor. In a multivariate model where background variables and other risk factors are adjusted for, the respective OR is more likely to be a direct effect of a particular risk factor. When background variables and other risk factors are interrelated, it might be difficult to accurately calculate the OR for each respective factor.

In theory, all influencing factors must be included in the model, which is not possible in complex situations like the one studied here. Model estimates should, therefore, be regarded as approximate and simplified descriptions that still show important features of the relationship between the incidence and the risk factors but without any ambition to describe cause and effect.
Results: Wave One (EP1)

Gambling – EP1

Our findings are reported in terms of the gambling situation in Sweden in 2008. We look at how many people gambled and what forms of gambling they participated in along with information on the time and money people spend gambling. We include gambling arranged by actors who had a permit to conduct business in Sweden, so called regulated actors, as well as gambling arranged by actors who did not have such a permit, so called unregulated actors. Finally, we show how different gambling categories are created based on the frequency of gambling and the forms of gambling people participate in.

Proportion of the population that gambled

A total of 92% of Swedes aged 16–84 have gambled at some point. The proportion that had gambled at some point in the previous year was 70%, and 44% gambled at least once per month. A third of those who had gambled over the previous year had only participated in one form of gambling. The most common forms of gambling are lotteries, number games (Lotto, Keno, and Joker), and horse betting.

In Sweden, gambling is generally more common among older generations. In our study, participation in gambling was highest among those aged 25–64 and was somewhat lower in the oldest age group. Men gambled more than women, and 74% of men and 67% of women aged 16–84 had gambled in the past year.

In the report, we have divided gambling into nine different forms. The details can be found under the section measurement instruments and index.
Those who were married or cohabiting gambled more than single people. The proportion of people that gambled was highest among those with upper-secondary school as the highest level of education and lowest among those with a university education. We also saw connections with the income of both the individual and the household. Participation in gambling increased in line with income, only to decline among the quarter that earns the most.

When did people start gambling, and what did they gamble on?

Of the respondents at EP1, 30% said they had gambled before they were 18 years old, and 11% stated that they were no older than 12 when they first gambled. There were also many who could not remember when they first gambled, so these data must be interpreted with care.

Lotteries, Bingolotto and sports betting were the most common début forms of gambling. Among women, lotteries and Bingolotto were the most common forms. Among men, the most common form was sports betting.
Who gambled instead of working or studying?

Almost 3% had at some point in the previous year spent their time gambling instead of working or studying. This proportion was largest among men (4%), and primarily among younger men. The proportion was 8%–9% among men aged 16–24 and then decreased in older men. Among women, the total proportion was around 1.5% and was highest among the youngest, i.e., the 16-17 year olds, where it was around 3%. Among women aged 45–64, 2% had gambled when they should have been working or studying.

According to socioeconomic status, gambling instead of working or studying was most common among the middle class, but it was only among women that there was a significant difference between different socioeconomic categories. Among men, the proportion fell as the socioeconomic status rose, but the difference was not as large as among women.

DIFFERENT FORMS OF GAMBLING

Lotteries were the most common form of gambling, and over half of the respondents had participated in lotteries in the previous year. More than a fifth had also gambled on number games or bet on horses or sports. Poker, casino games, gambling machines, live TV competitions, and bingo were forms of gambling that were each gambled on by less than 10% of the respondents. Many gambled on more than one form of gambling. Online gambling is reported separately in Figure 6, but it is also nested into other forms of gambling.
WHAT IS THE GAMBLING SITUATION IN DIFFERENT GROUPS?

Gender

**Figure 5.** The proportion of men and women who participated in at least one of the various forms of gambling at some point in the previous year.

Over half of both men and women purchased some form of lottery ticket in the previous year. This was also one of few forms of gambling in which women’s participation was higher than that of men. Other forms of gambling in which women had a somewhat higher degree of participation were competitions in live TV programmes and bingo.

A total of 32% of men and 24% of women had gambled on number games in the previous year. Where betting on horses was concerned, 27% of men and 20% of women had participated at some point and in some form in the previous year. Buying Harry Boy from shops or agents was the single most common type of horse betting.

Sports betting was about as common as betting on horses among men, and 28% of men had gambled via some form of sports betting in the past year. Among women, a considerably lower proportion (9%) gambled via sports betting. On the other hand, considerably more women bet on horses (20%).

Almost all forms of gambling had an online variant, and 13% of men and 4% of women had gambled online in the previous year.
Age
In terms of form of gambling, 45–64 year olds were the group that gambled the most on lotteries, number games, and horses. Other forms of gambling (sports betting, poker, casino games, gambling machines, TV competitions, and bingo) were most common among 18–24 year olds. The greatest difference between the age categories was found in number games, which were played by 36.5% of 45–64 year olds but only 3% of 16–17 year olds. Even without the minors, the difference was still greatest for number games.

Education
The respondents with upper-secondary school as the highest level of education gambled the most. This group had the most participants in all forms of gambling apart from poker, gambling machines, and bingo, where those with lower-secondary school as the highest level of education were at the top. The largest deviation in gambling participation was found in lotteries. Those with lower-secondary education purchased lottery tickets to a much lesser extent than other categories. In all other forms of gambling, those with university education gambled the least.

Country of birth
Compared to those born in the rest of Europe and other parts of the world, those born in Sweden gambled the most. While roughly 75% of all people born in Sweden had gambled in the previous year, the same statistic for those born in the rest of Europe was 56%, and this was only 44% for those born in the rest of the world. It was also more common among those born in Sweden to participate in several forms of gambling. Exceptions included gambling machines and bingo – where people from other parts of the world gambled the most – and TV competitions, where participation was roughly at the same level for all countries of birth.

Major cities
When we separated people living in Stockholm, Gothenburg, and Malmö from the rest of the country and drew comparisons, we found that those living in these metropolitan municipalities generally gambled less. Those living in the metropolitan municipalities, however, gambled more on casino games and gambling machines than the rest of the population. For number
games and poker, there were no major differences between those living in metropolitan municipalities and those living in rural municipalities.

Family situation
We compared four different family situations:

- Single – with and without children under the age of 18 living at home
- Married or cohabiting – with and without children under the age of 18 living at home.

Here, it was those married or cohabiting who had children living at home who gambled the most overall, and in particular on lotteries, number games, sports betting, betting on horses, and live TV competitions. Single people without children played the most poker, casino games, and gambling machines. For bingo, we saw no major differences between different family situations in terms of gambling. The largest difference in form of gambling was found in lotteries. There, over 60% of those who were married or cohabiting who had children living at home had gambled on lotteries, while 47% of single people without children had done the same in the previous year.

Socioeconomic status
There were few differences in participation in gambling between the various levels of socioeconomic status. Here, we only included those who had a profession and taxed income in 2006, which was the most recent information at the time of the analysis.

Participation in gambling overall, including lotteries, was largely the same across the board in all socioeconomic categories. For other forms of gambling, it was those with a medium-high status who gambled most, apart from live TV competitions and bingo where those with the lowest socioeconomic status gambled the most. The group with the highest socioeconomic status gambled the least on poker, gambling machines, live TV competitions, and bingo.

WHO GAMBELED ONLINE?
Online gambling was most common among those aged 18–44 years and was more than twice as common among men as women irrespective of age group.
Figure 6. Online gambling by gender and age.

Figure 6 shows the proportion of men and women in different age groups who gambled online in the previous twelve months. Among the men, 21% of the age groups 18–24 and 25–44 gambled online in the previous year. This was considerably more than in other age groups. Among women, the proportion who gambled online was highest among those aged 25–44, but the proportion was just a little lower among those aged 18–24. The proportion was by far the lowest among the youngest and eldest women.

UNREGULATED GAMBLING IN SWEDEN

In our study, “unregulated gambling” refers to online gambling using any services other than those offered by Svenska Spel, ATG, or other regulated operators.

A total of 2.7% of the respondents gambled on the unregulated gambling sites at least six times in the previous twelve months.

Men participated in unregulated gambling to a significantly greater extent than women. The proportion of men was around 5%, while the proportion of women was 0.4%. The highest proportion was among men aged 18–24 where 11% had participated in one or more of these forms of gambling on a regular basis. This was also relatively common among men aged 25–44, where 8% had participated in unregulated forms of gambling. Unregulated gambling was found among 2% of boys aged 16–17, but not among girls. Among women, the highest proportion was among those aged 18–24 (just over 1%) and was somewhat lower (0.8%) in those aged 25–44.
Single people participated in unregulated forms of gambling to a greater extent than those who were married or cohabiting, but in both categories there was a somewhat higher incidence of unregulated gambling among those with children.

Unregulated gambling was most common among those with upper-secondary school as the highest level of education, but the differences in educational background were not statistically significant. There was, however, a significant difference in socioeconomic status, and those with medium-high status gambled most in unregulated forms. Similarly, there was a difference when filtering by country of birth. People born outside of Europe engaged in unregulated gambling least (1.4%), and among the European-born respondents the proportion was lower among those born in Sweden (2.6%) than those born in the rest of Europe (3.7%).

ILLEGAL GAMBLING IN SWEDEN
The illegal forms of gambling we asked about in Swelogs were gambling on illegal gambling machines in restaurants, clubs, or similar. We also (with some hesitance) included live poker in clubs, which can be illegal but is not always so.

Around 1% of the respondents participated in illegal gambling at least six times in the previous year. They also gambled more than the rest of the population overall. Over half of those who participated in illegal gambling gambled every week for the previous twelve months. Among others who gambled in the previous year, a third had gambled every week. Those who participated in illegal gambling gambled more than others on casino games, poker, gambling machines, and bingo. They also gambled considerably more online.

Illegal gambling was found to exist among both men and women and in all age groups. The highest proportion of illegal gambling was found among men aged 18–24, where 5% took part in illegal gambling.

Illegal gambling was more common among single people, and it was less common among people with low socioeconomic status. The proportion was highest among those with a low level of education and lowest among those with a university education. Those born in Sweden or outside of Europe participated more in illegal gambling than those born elsewhere in Europe. In the latter group, the proportion was around 0.5%.
GAMBLING AMONG MINORS

When the data collection was carried out, there was no age limit for purchasing lottery tickets. A minimum age of 18 applied for other forms of gambling, but we found that gambling among minors occurred in all forms of gambling (Figure 7). Lotteries, poker, sports betting, and gambling machines were the most common among them. Boys were more active gamblers than girls. The proportion of boys was highest in all forms of gambling apart from calling in to live TV competitions, which was more common among girls.

Figure 7. Gambling in different forms among minors (16–17 years) in the previous year.

Scope of gambling measured in frequency, time, and money

In order to measure the scope of gambling, we chose to first look at how often people gambled and in how many different forms. We refer to these measurements jointly as “gambling frequency”. We then move on to take a look at how much time and money is spent.

Gambling frequency: We calculated a combined measurement for how often people gambled and how many different forms they participated in and formed four categories based on this.
Gambling frequency Description
No gambling Has not gambled in the past 12 months.
Low frequency Has participated in a maximum of three different types of gambling and at the most participated monthly in one gambling form.
Moderate frequency Several different forms of gambling, but at most weekly in one single gambling form.
High frequency Many forms of gambling and frequent gambling in several different forms.

How often do people gamble—what is the gambling frequency?
The proportion of the respondents that did not gamble at all was 30%. A third were low-frequency gamblers, a quarter participated in moderate-frequency gambling, and roughly a seventh gambled to the extent we refer to here as “high frequency”.

Figure 8. Gambling frequency for men and women.

Men gambled more often and in more forms of gambling than women. Over half of the men did not gamble at all or participated in low-frequency gambling. The corresponding proportion among women was around 70%. The proportion of moderate frequency gambling was roughly the same among women and men, but the proportion of high-frequency gambling was considerably higher among men.
What was the gambling frequency like between different groups and in different forms of gambling?

Men gambled to a greater extent and more frequently than women, and as for overall participation in gambling, the frequency increased with age up to pensionable age, after which it declined somewhat. For men in the age bracket 45–64, the proportion of high-frequency gambling was 19%, and for women in the same bracket 10%. High-frequency gambling was least common among single people with children (6%) and most common among married people or people cohabiting with no children (14%).

In terms of socioeconomic status, the proportion of high-frequency gambling was lowest among those with the lowest status (11%). It was somewhat higher among those with high status (13%) and highest in the mid-category (18%). If we instead look at the length of education, the proportion of high-frequency gambling was lowest among those with the highest level of education (7%) followed by those with lower-secondary education only. High-frequency gambling was most common among people with a medium-high level of education (17%), i.e., upper-secondary school being the highest level.

In terms of country of birth, the proportion of high-frequency gambling was largest among those born in Sweden (13%), somewhat lower among those born in the rest of Europe (11%), and lowest among those born in other parts of the world (4%).

The form of gambling with the highest proportion of high-frequency gamblers was sports betting (43%) followed by bingo, casino games, and lotto where 35%–40% were high-frequency gamblers. Lotteries had the lowest proportion of high-frequency gamblers.
How much time do we spend on gambling?
When we asked how much time has been spent on a form of gambling in the past month, 11% of the respondents estimated that they had spent three hours or more. Here, there was a clear difference between men and women. Among men, 15% gambled three hours or more in the previous month, while 6% of women gambled as much. This also varied greatly from one form of gambling to the next.

What was the scope of intensive gambling?
Gambling for an unusually large sum of money or for an unusually long consecutive period of time on one or more occasions is called intensive gambling. “Unusually” large sums or long periods must be compared with how much time and money a person normally spends on gambling. Among our respondents, 10% of those who had gambled in the previous year said they had gambled for unusually large sums or for an unusually long consecutive period at some point in the previous year. It is these people we refer to as intensive gamblers in Figure 10.
The difference between the proportion of male and female intensive gamblers was significant, but not as large as the difference between male and female participation in gambling in general. A total of 12% of men and 9% of women who had gambled in the previous year did so intensively at some point. Among men, the proportion of intensive gamblers was somewhat higher among younger gamblers and somewhat lower from the age of 25 and up, but the difference was not significant. For women, on the other hand, the proportion was significantly lower among the 45–64 year olds and higher among 65–84 year olds than among other categories. Among those who gambled, it was the 45–64 age bracket that felt to the lowest extent that they had participated in intensive gambling in the past year.

**How large were the sums staked in the various forms of gambling?**

To be able to roughly assess the magnitude of the sums staked in the various forms of gambling, we asked those interviewed to estimate how much money they had invested in each and every one of the nine different forms of gambling in the past month.

Around 20% stated that they gambled for more than SEK 320 (~35 EUR) in the previous month. The tenth that gambled the most gambled for more than SEK 600 (~65 EUR) in the previous month.

Men gambled with larger stakes than women on average. The stakes increased with age, but then declined in the 65–84 age group. People who were married or cohabiting gambled higher sums than single people, and single people with children spent the least on average per month.
As with gambling frequency on average it was those with medium-high socioeconomic status who gambled for the most money. Those with the lowest status gambled the least amount of money overall. In terms of education, those with upper-secondary school education as the highest level gambled for the highest sums and those with a university education gambled for the least. On average, people born in Sweden gambled for the most money. Those born in the rest of Europe gambled for smaller amounts, and those born in other parts of the world gambled for the smallest amounts. Online gamblers gambled for considerably larger sums than others.

**How well do our figures reflect the actual gambling consumption?**

It is always difficult to measure consumption retrospectively, but the most effective method is to ask people to keep a cash book (cash record). In retrospective calculations of how much money has been spent on gambling, there are two common types of error. The amount that a person gambles on games that they normally gamble on every week can be overestimated due to forgotten breaks from gambling. In the same way, sums gambled on games in which it is difficult to precisely follow series of staked amounts through losses and winnings are often under-reported. If a person who has gambled SEK 100 wins SEK 50 and also stakes this, he or she can see this as having gambled for SEK 150. In official statistics however, this would count as SEK 150 for the majority of gambling forms. There might also be systematic errors due to certain types of gamblers choosing not to participate in the survey or not answering these specific questions.

According to our results the Swedish public spent around SEK 32.3 billion on gambling in 2008. This money was distributed as shown in Figure 11.
Poker has by far the highest proportion of money gambled, which can be partially explained by the fact that we requested the total sums of money staked. Normally, only the “rake” is given for poker (a fee of 2.5% that the gamblers pay to the organiser).

The Swedish Gambling Authority reports the annual turnover from gambling within the regulated gambling market in Sweden. Because we requested statistics for all gambling, we should theoretically have received higher values.

Our estimated values were most in line with the Swedish Gambling Authority’s data on number games, sports betting, and casino games. For these games, the deviation was at most a 20% overestimation for number games and a similar underestimation for sports betting and casino games. The fact that we had a somewhat higher value for sports betting might be partly explained by the fact that gambling with foreign-based gambling companies and unregulated forms of gambling were reported in our study. For casino games, foreign-based gambling might also be included in our figures, although the difference might also be due to the official figures from the Swedish Gambling Authority being “after winnings”, while we requested total sums of money staked.

For lotteries, horse betting, and poker, our calculated sums were roughly half those given by the Swedish Gambling Authority. For lotteries and horse betting, many of the deviations can likely be explained by the fact that it is difficult to calculate exact amounts gambled if people also gamble with winnings. A large portion of the poker market is unregulated or illegal, and it
would therefore not be surprising if our values resulted in an overestimation. The fact that we still receive a low value might come down to those who are aware of how the turnover for poker is reported providing the rake instead of the actual sum of money gambled. Over and above this, there are the usual problems with calculating total amounts gambled.

Our calculated sums for gambling machines and bingo were almost exactly a third of the official figures. Both types of game are normally played with small but repeated stakes, which makes it difficult to estimate the total staked sums retrospectively if they consist partially of winnings from the game. A relatively small portion of the respondents gambled via gambling machines and bingo. The lack of such gamblers in the study might have had a significant effect on the calculated values. One comparison we can use is that when alcohol consumption is measured in Sweden via epidemiological studies, we tend to get a total amount corresponding to 40%–60% of the amount sold domestically.

**Figure 12.** Relative deviation between sums according to Swelogs and the Swedish Gambling Authority.

What were the relationships between money staked, time, and gambling frequency?

Of the tenth who gambled *for the most money* in the previous month, more than half were high-frequency gamblers. Similarly, over half of the tenth that spent the *most time* gambling in the previous month were high-frequency gamblers.
The proportion of intensive gamblers also increased in line with gambling frequency whether we looked at the total amount of gambling in different forms or how much time and money a person spent on gambling in the previous month. Of the tenth that gambled for the most money in the previous month, 19% also engaged in intensive gambling at some point in the previous year.

DIFFERENT GAMBLER CATEGORIES
To better understand the gambling situation among Swedes, we have identified six different categories based on how often people gamble and in what forms. This is going one step further than grouping by gambling frequency because we are now also including which specific forms of gambling each individual participates in to a large or small extent.

Non-gamblers
“Non-gamblers” are those who have not gambled in the previous 12 months.

The proportion of women among non-gamblers was somewhat higher than their proportion of the entire sample. The average age was the same as for all participants in the study, but there was a slightly higher proportion of younger and more elderly people. The proportion of those born outside of Sweden was relatively high, and a relatively large proportion had studied at university. Compared to other groups, somewhat fewer had children living at home.

Their average income was the same as that of the overall population, but the spread was greater. So this group included both those with high incomes and those with low incomes. Non-gamblers consisted of three groups of almost exactly the same size when dividing them by socioeconomic status.

Seldom Gamblers
Seldom gamblers did not gamble especially often. They purchased lottery tickets and occasionally gambled on horses. A few played bingo or phoned in to TV competitions. Only 2% of this group had gambled online in the previous year. Nine out of ten had spent a maximum of one hour gambling in the previous month, and the majority only gambled for small sums.

Women were a clear majority among seldom gamblers. Here, we found fewer among the younger respondents and more among the older. A rather small proportion were born abroad. Almost a third studied at the university, which was more than the total proportion. The proportion with children
living at home was somewhat larger than the total proportion, and this was mostly true for single people with children. However, there was also a rather large proportion of people cohabiting without children.

The income of the seldom gamblers was average, and there was relatively little variation. The proportion with a low socioeconomic status was large, but there was also a large group with a high socioeconomic status and thus only a rather small group in the middle.

**Habitual gamblers**

Habitual gamblers gambled quite often in general and in different forms of gambling. Half of these were frequent gamblers and a quarter were high-frequency gamblers. They participated in all forms of gambling, but quite few gambled on poker or casino games or used gambling machines. They gambled mostly on horses and number games compared to the other groups. A total of 10% of habitual gamblers gambled online. Habitual gamblers also staked relatively high sums in their gambling.

Less than half of the habitual gamblers were women. They had a higher average age than in other categories and a rather small age range. Few were under 25 years of age. The proportion of those born abroad was somewhat lower than the total. The habitual gamblers’ average income was higher than for other groups, and the variation was also somewhat less. The proportion with children living at home was somewhat greater than among the study sample as a whole, but here we also found the largest proportion of those cohabiting without children. Compared with both non-gamblers and infrequent gamblers, there were more in the middle category of socioeconomic status in this group. A large proportion had upper-secondary school as their highest level of education.

**Occasional gamblers**

Many of the occasional gamblers did not gamble a great deal, but they gambled in all different forms of gambling except for poker. They did not gamble to a large degree on casino games or bingo, but a relatively large proportion gambled on gambling machines, even though they did not do so very often. Quite a lot had called in to live TV competitions at some point or did so every month. A total of 5% had gambled online. At least half of the gamblers only gambled for small sums.
A little over half of occasional gamblers were women. Their average age was lower than the total average, and occasional gamblers were primarily found among those aged 44 and under. It was less common for this group to have children living at home. The proportion of people in this group born abroad was the same as that for the entire sample. A lower proportion had studied at university level, which might be connected with the low average age. This group had a lower average income with a relatively limited range. The proportion who had a high socioeconomic status, however, was relatively high.

Social gamblers
More than half of social gamblers were low-frequency gamblers. Everyone in this group gambled on poker, and this was the category that gambled on poker most frequently in clubs or in private contexts. Social gamblers were also found among all other forms of gambling, and in comparison to other categories they gambled more on casino games. While a few of the social gamblers gambled on bingo or number games, they were not especially active in calling in to TV competitions. A fifth gambled online. Compared with other categories, many of them felt they gained friends via their gambling. They were also the group with the largest proportion who not only had one but several people they could confide in. In the previous month, a quarter of social gamblers had spent three hours or more on gambling, which makes them the second-most active group in the previous month. Only the heavy gamblers had spent more hours than this gambling. Half said that they had gambled a maximum of SEK 40 in the previous month.

The social gamblers were the youngest group. Here we found quite a lot of people below the age of 25, and there were few in the group who were 45 and older. The proportion of women was low (20%). A small proportion were born abroad, and the proportion with children living at home was relatively small. Single people without children were the predominant category here. The average income was quite low, with quite a small variation, but there was still a relatively large group with a high socioeconomic status. The level of education was quite low for the group as a whole.
Heavy Gamblers

The group of heavy gamblers was dominated by those who gambled the most. The heavy gamblers participated in all forms of gambling, and here we found the highest proportion of weekly gamblers in all forms of gambling apart from number games. A third played online. They spent the most time gambling and had the highest average staked sums.

After the social gamblers, the heavy gamblers were the group with the lowest proportion of women (24%). Many were aged 25–44 years, and only a few were found in the youngest and the oldest age groups. The average age was, therefore, lower than that for the whole sample, and there was less age variation. A somewhat lower proportion than that of the entire sample group were born outside of Sweden, and rather few lived together with minors. There was, however, a relatively high proportion of single people with children. A very high proportion had upper-secondary school as their highest level of education. They were spread across three different socioeconomic categories with a slight predominance in the middle category. Their average income was the same as for the entire population but with less variation.

Figure 13. Gambler categories.
Problem Gambling – EP1

In this section, we look at the prevalence of problem gambling among the population in 2008. We begin with a general description of the scope of the problem and then look at the prevalence in different groups. After this, we report on connections between gambling problems and health and the individual’s attitude toward gambling. We continue by looking at the prevalence of problem gambling in different forms of gambling both individually and overall. We then look at how health variables, as well as demographic and socioeconomic variables, correlated with problem gambling. Finally, we discuss the connection between problem gambling and the time and money spent, and how problem gambling differed for the various gambler categories that we defined in the previous section.

People with gambling problems in Sweden

In order to describe the scope of gambling problems, we must briefly describe our measurement instrument; the Problem Gambling Severity Index (PGSI – see also the methods section). The PGSI consists of nine questions on gambling habits in the past twelve months. The sum of the answers then provides a result indicating one of four categories: no gambling problems, gamblers at low risk, gamblers at moderate risk, and gamblers with gambling problems. When we report different degrees of gambling problems, we normally merge the “moderate risk” and “gambling problems” and call these problem gamblers, as is usually the case in international contexts.
PGSI POINT SCALE AND CATEGORIES

0 points: No gambling problems. This group encompasses those who have not gambled at all in the past 12 months, as well as those who gamble but respond “never” to all nine questions. People in this group have had no negative consequences from their gambling in the past year.

1–2 points: Gamblers at low risk. Those who respond “never” to the majority of the questions but “sometimes” to one or a few might be on their way towards more serious gambling problems. People in this group likely experience no negative consequences of their gambling.

3–7 points: Gamblers at moderate risk. Those who respond “sometimes” to three or more questions, or “always” to one or a few questions, are more obviously on their way towards more serious gambling problems. People in this group almost always have negative consequences from their gambling.

8 points or more: Gamblers with gambling problems. People classed as gamblers with gambling problems are those who are affected most negatively by their gambling. At this stage, they may have lost control of their gambling.

The categories of “moderate risk” and “gambling problems” are often merged into one category; problem gamblers.

According to our study, 2.2% of Sweden’s population aged 16–84 were problem gamblers; i.e., gamblers who are either at moderate risk of gambling problems or who already have these problems. This was almost 165,000 people. Gambling problems in the population were distributed in as shown in Table 7.

Table 7. Gambling problems of different degrees in the population.

<table>
<thead>
<tr>
<th>Type of gambler</th>
<th>Proportion of the sample</th>
<th>Estimated proportion of the population aged 16–84 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>No gambling problems (0 points)</td>
<td>92.4%</td>
<td>6,742,900</td>
</tr>
<tr>
<td>Low risk (1–2 points)</td>
<td>5.4%</td>
<td>393,700</td>
</tr>
<tr>
<td>Moderate risk (3–7 points)</td>
<td>1.9%</td>
<td>140,100</td>
</tr>
<tr>
<td>Gambling problems (8 points or more)</td>
<td>0.3%</td>
<td>23,700</td>
</tr>
</tbody>
</table>
How many relatives were affected?
A fifth of the people with gambling problems and a third of those with moderate risk of gambling problems lived in a household with children. We estimated that more than 76,000 children lived in households with problem gamblers. The results showed that there were over 260,000 people living with problem gamblers in the total population at that point in time.

Table 8. Number of relatives that live with problem gamblers.

<table>
<thead>
<tr>
<th>Relatives</th>
<th>Gambling problem</th>
<th>Moderate risk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children (0–18 years old)</td>
<td>6,500</td>
<td>70,000</td>
<td>76,500</td>
</tr>
<tr>
<td>Other relatives</td>
<td>26,000</td>
<td>160,000</td>
<td>186,000</td>
</tr>
<tr>
<td>Total</td>
<td>32,500</td>
<td>230,000</td>
<td>262,500</td>
</tr>
</tbody>
</table>

Eighteen per cent also stated that they had at least one or more people close to them who at that particular time or previously had gambling problems of their own. Here, there was also a connection with this 18%’s own gambling. Among problem gamblers, a third said there was someone close to them with gambling problems.

Proportion seeking help for gambling problems
Less than 1% of the respondents stated that they had sought help for their own gambling problems. Calculated on a population level, this corresponds to around 2,800 people who sought help once and 7,600 people who sought help several times. A larger proportion of those who said they had sought help could be found among the problem gamblers, but this was still only 5% of the problem gamblers who stated that they had sought help. There were no women among those who had sought help for themselves.

Around 2% had sought help or information on gambling problems on behalf of someone else. Roughly half of these had done this more than once. Here, the proportion was roughly the same among women and men.

THE PREVALENCE OF GAMBLING PROBLEMS IN DIFFERENT SEGMENTS OF THE POPULATION

Gender
Gambling problems were generally higher among men, of whom 3.2% were problem gamblers at moderate risk of gambling problems or already had these problems. The problems were greatest among 18–24 year olds, where
almost one in ten men were problem gamblers. For men, the proportion of problem gambling decreased with age.

Among women, the proportion of problem gamblers was lower overall, and only 1.3% were at moderate risk and very few had gambling problems. For women, problem gambling was most common among the youngest, and the proportion decreased with age to then increase after 65 years. The overall number of gambling problems was thus somewhat greater among women than men in the eldest group.

Figure 14. Various degrees of gambling problems by gender and age.
Major cities
There was a difference between those living in the municipalities of Stockholm, Gothenburg, and Malmö and those outside of these areas. In these metropolitan areas, the proportion of problem gamblers was roughly 1% higher than in the rest of the country. This difference was found both overall and among women and men separately.

Country of birth
Being a problem gambler was more common among those born abroad than among those born in Sweden. The proportion of problem gamblers was 2% among those born in Sweden, 3% among those born elsewhere in Europe, and almost 5% among those born in the rest of the world. It was primarily among men that there was a difference depending on the country of birth.

The degrees of gambling problems among young men (16–24 years of age) were roughly the same irrespective of the country of birth. Among men aged 25–64 years, the proportion of problem gamblers was around 2% among those born in Sweden, but higher among those born abroad. The greatest difference was found in the age group 25–44 years where the proportion was 10% among those born elsewhere in Europe and 11% among those born in the rest of the world. The proportion among men aged 45–64 years born outside of Sweden was 3% among those born elsewhere in Europe and 6% among those born in the rest of the world. Among the eldest men there were no clear differences between those born in Sweden and those born in other countries due to a small number of respondents in this category.
Figure 15. Gambling problems by gender and country of birth (16–84 years of age).

**Men**

- **Sweden**: 20% problem gamblers, 40% low risk
- **Rest of Europe**: 15% problem gamblers, 50% low risk
- **Rest of the world**: 10% problem gamblers, 60% low risk

**Women**

- **Sweden**: 10% problem gamblers, 30% low risk
- **Rest of Europe**: 10% problem gamblers, 35% low risk
- **Rest of the world**: 10% problem gamblers, 30% low risk
Family situation

Table 9. Proportion of problem gamblers according to family situation

<table>
<thead>
<tr>
<th>Proportion of problem gamblers</th>
<th>Single</th>
<th>Married/cohabiting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Without children</td>
<td>4.9%</td>
<td>1.5%</td>
</tr>
<tr>
<td>With children</td>
<td>4.5%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Where the connection between family situation and gambling problems was concerned, there was a difference between men and women. Among men, the proportion of problem gamblers was higher among single people (around 5%), irrespective of whether or not they had children, and lowest among those who were married or cohabiting and who did not have children (1.8%).

Among women, the proportion of problem gamblers was around 1.5% for single people with no children, as well as for those who were married or cohabiting who had children, but under 1% for other groups.

Education

There were connections between education and gambling problems. Broadly speaking, gambling problems seemed to decrease as the level of education increased, but the pattern was not entirely clear. The proportion of those with gambling problems was generally just as high among those with high-school education as among those with only basic education.

Income

There was no connection between the family income and the individual’s gambling problems, but we saw a connection when we looked at the individual’s own income and gambling problems. Both the highest proportion of problem gamblers and the largest proportion of people at low risk of gambling problems were found in the quarter with the lowest income followed by the quarter with the next higher level of income. This observation was particularly true in men. In women we saw only a slight increase in gambling problems with an increase in income. There were nearly no problem gamblers and a very few with low risk of gambling problems among women in the highest quarter of income.
Figure 16. Proportion with gambling problems by gender and disposable income (tkr = thousand Swedish kronor)

Source of income

The prevalence of problem gamblers among women with full-time work was lower than among other women. Whereas the prevalence of problem gamblers among men with part-time work was higher than among other men, but we did not find such a connection in women with part-time work.

According to our findings, winnings were stated as a source of income by around 5% of men and 1.5% of women. There was a high proportion of problem gamblers among those who stated winnings as a source of income.

Among those who stayed at home with small children and received parental benefits, we found a lower proportion of problem gamblers among men, but a higher proportion of problem gamblers among women receiving
parental benefits. This should, however, be interpreted with caution since there only a very few who received parental benefits in the previous year.

The proportion of problem gamblers among women who received old-age pension and among young people was largely the same. However, among men with an old-age pension there was a lower proportion of problem gamblers compared with younger men and with women who received old-age pension.

The prevalence of a higher degree of gambling problems had a connection with receiving social welfare allowance as well as unemployment benefits, but the latter was primarily connected with a higher proportion of people with low risk of gambling problems. Among women who received unemployment benefits, the proportion of problem gamblers was considerably lower than among other women. The proportion at low risk, on the other hand, was considerably higher.

**Household economy**

People with control over their household economy had considerably fewer problems with their gambling than others. Around 80% of our respondents felt that they had no difficulties paying bills on time. The proportion of problem gamblers in this group was lower than it was in the total population. There was a smaller group of around 3% who managed their payments but always struggled to do so. Among these, the proportion of problem gamblers was only slightly higher than in the total population. The group of around 15% of people who managed their payments but struggled occasionally and around 2% of people with apparent financial difficulties were the ones with obvious gambling problems. The proportion of problem gamblers was 5% in the former and around 6% in the latter.

We saw a difference between men and women here. Among men, the highest proportion of problem gamblers was among those who fell behind with payments, while the highest proportion of women problem gamblers was found among those who occasionally struggled to make their payments. However, the proportion of problem gamblers among women was lower than the proportion of men in all subcategories.

**Socioeconomic status**

Gambling problems varied with socioeconomic status. We created three different categories based on the type of profession and income as low, middle, and high status.
The lowest proportion (1%) of problem gamblers was found among those with the highest socioeconomic status, and this was about half of the other two categories.

The proportion of people with low risk of gambling problem according to the PGSI was 6% among people with low socioeconomic status and 4% among people with high socioeconomic status.

Women with low socioeconomic status were a distinct group that differed from the rest with roughly twice as high levels of both people at low risk of gambling problems and problem gamblers.

Results of multivariate analysis with problem gambling as the dependent variable
As we previously established, we believe that around 2% of the respondents were what we refer to as problem gamblers, which covers moderate risk and problem gambling in accordance with the PGSI. We have now seen that a number of different factors correlate with problem gambling. Many of these also have a mutual connection.

Gambling patterns and problem gambling
One example of these connections was that between gambling patterns and problem gambling. In Table 10, we report odds ratios for the forms of gambling that have solid statistical connections with problem gambling. Here, those who did not participate in a certain form of gambling are the reference category for each form of gambling. Odds ratios greater than 1 show a connection between participating in a certain form of gambling and being a problem gambler.

The model was calculated for all forms of gambling at once, which means that the effect of participating in several different forms of gambling can be seen as multiplicative. This means that a person who only plays bingo has an odds ratio of 2.4, while a person who plays bingo and gambles online has an odds ratio of $2.4 \times 3.0 = 7.2$. 
Table 10. Odds ratios for direct links between form of gambling and problem gambling.

<table>
<thead>
<tr>
<th>Form of gambling</th>
<th>Odds ratio (OR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online gambling (all forms)</td>
<td>3.0</td>
</tr>
<tr>
<td>Gambling machines</td>
<td>2.5</td>
</tr>
<tr>
<td>Bingo</td>
<td>2.4</td>
</tr>
<tr>
<td>Live TV competitions</td>
<td>2.2</td>
</tr>
<tr>
<td>Poker</td>
<td>2.1</td>
</tr>
<tr>
<td>Casino games</td>
<td>1.6</td>
</tr>
<tr>
<td>Sports bettings</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Relationship between problem gambling and lifestyle factors, demographic factors, and socioeconomic factors

We found that the following factors had the strongest direct covariance with problem gambling: age, household economy, playing video or computer games, general and mental health, high-risk drinking habits, and residing in one of the municipalities of Stockholm, Gothenburg, or Malmö. There was no direct link with gender, but we found various strong links for men and women for some of the factors.

Odds ratios for the factors with the strongest direct covariance with problem gambling are presented in Table 11. An odds ratio higher than 1 clearly indicates a heightened risk while an odds ratio lower than 1 represents a reduced risk.

Table 11. Odds ratios for problem gambling in accordance with logistic, multivariate regression.

<table>
<thead>
<tr>
<th>Lifestyle factors</th>
<th>Odds ratio (OR)</th>
<th>OR, women</th>
<th>OR, men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 25</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Born outside Sweden</td>
<td>0.77 (n.s.)</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Can pay all the bills but struggles occasionally</td>
<td>2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plays video or computer games</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good health</td>
<td>0.30</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>Reduced mental health</td>
<td>0.89 (n.s.)</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>High-risk drinking habits</td>
<td>0.43 (n.s.)</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Resides in Stockholm, Gothenburg, or Malmö</td>
<td>2.9</td>
<td>1.0 (n.s.)</td>
<td></td>
</tr>
</tbody>
</table>

* n.s. = not statistically significant
This means that regardless of gender, the odds for problem gambling were roughly twice as large for the under-25s and for those who played video or computer games. The odds are multiplicative, which means that the odds for those under 25 who played video or computer games were around four times as high as someone over the age of 25 who did not play video or computer games.

The odds were also 2.6 times higher among those with strained finances, i.e., those who could pay all of their bills but occasionally struggled, compared with those who had no financial difficulties. What is interesting here is that those who were in an even worse situation, i.e., those who always struggled to pay their bills and those who were behind with bills or instalments, did not run a significantly higher risk of developing gambling problems. The fact that we gain this effect is likely a result of connections between financial difficulties and other variables in the model such as a high-risk alcohol consumption and poor mental health.

Being born abroad, having poor mental health, or having high-risk drinking habits were not clearly linked with gambling problems among women. For men, on the other hand, we found higher odds among those with poor mental health and/or high-risk drinking habits. Men born abroad also had higher odds.

Residing in one of the municipalities of Stockholm, Gothenburg, or Malmö correlated with a higher degree of problem gambling among women, but here we found no direct effect among men.

Finally, we could establish that good health correlated with a lower degree of problem gambling. For women, this was clearer than for men.
The relationship between gambling problems and health

We look first at the relationship between general health and gambling problems. Of those who stated that they had poor or very poor health, there was a larger proportion of gamblers at low risk of gambling problems and problem gamblers than among those who stated they had good or very good health.

Figure 17. Gambling problems in relation to general health.
There were also considerably more gamblers at low risk for gambling problems and problem gamblers among those with poor mental health.

**Figure 18.** Gambling problems and mental health

We could also reverse the perspective and look at the state of health based on the degree of gambling problems.

Among non-gamblers and gamblers with no problems, a little over 80% stated that they were in good general health and around 70% said they had good mental health. Even if there was a difference between genders, the proportion with good general and mental health decreased when we compared the groups by degrees of gambling problems. For those (men) with the most serious gambling problems, only 30% stated that they had good general health and around 12% said they had good mental health.
Figure 19. Health in relation to different degrees of gambling problems.

We also asked whether the respondents had someone to share their innermost feelings with and confide in. It was difficult to see any direct connections between gambling problems and the answers to this question. Here, we compared those who had no-one to turn to, those who had someone, and those who had several people they could confide in. Among women, the proportion of problem gamblers was lower among those with one or more persons to confide in. For the men, the lowest proportion of problem gamblers was found among those who had exactly one person to confide in compared with those who had none or several people to confide in.
What were the relationships between gambling problems and alcohol consumption, smoking, and being subjected to violence?

We could see that there was a connection between alcohol consumption and gambling problems. The proportion of gamblers at low risk of gambling problems and problem gamblers was higher in the group that had high-risk drinking habits than in the group without. This was true for both men and women.

**Figure 20.** High-risk alcohol consumption and gambling problems.

![Figure 20](image-url)
Among men, the proportion of problem gamblers was largest among those who smoked on a daily basis. Among those who smoked, there was above all a large proportion of gamblers with low risk of gambling problems. For women, we saw no clear connection between smoking habits and gambling problems.

**Figure 21.** Smoking and gambling problems.
Among men who had been subjected to physical violence, there was a larger proportion of problem gamblers than among other men. This applied to men who had been subject to violence in the previous year in particular. The proportion of problem gamblers among them was four times higher compared to men who were not exposed to any sort of violence. The proportion of men with gambling problems was twice as large among those subjected to physical violence earlier in life compared with the rest. Among women, however, we found no clear connection between having been subjected to physical violence and having gambling problems.

Figure 22. Gambling problems and physical violence.
The relationship between gambling problems and forms of gambling

Figure 23. Degree of gambling problems in relation to the PGSI.

<table>
<thead>
<tr>
<th>Percent</th>
<th>Number games</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Problem gamblers</td>
</tr>
<tr>
<td>50</td>
<td>Did not gamble in this form</td>
</tr>
<tr>
<td>40</td>
<td>Gambled occasionally in this form in the past year</td>
</tr>
<tr>
<td>30</td>
<td>Gambled every month or more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percent</th>
<th>Lotteries</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Did not gamble in this form</td>
</tr>
<tr>
<td>40</td>
<td>Gambled occasionally in this form in the past year</td>
</tr>
<tr>
<td>30</td>
<td>Gambled every month or more</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percent</th>
<th>Horse bettings</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Did not gamble in this form</td>
</tr>
<tr>
<td>40</td>
<td>Gambled occasionally in this form in the past year</td>
</tr>
<tr>
<td>30</td>
<td>Gambled every month or more</td>
</tr>
</tbody>
</table>
Gambling machines

Did not gamble in this form
Gambled occasionally in this form in the past year
Gambled every month or more

Percent

Bingo

Did not gamble in this form
Gambled occasionally in this form in the past year
Gambled every month or more

Percent

Problem gamblers
Low risk

Casino games

Did not gamble in this form
Gambled occasionally in this form in the past year
Gambled every month or more

Percent

Problem gamblers
Low risk

Gambling machines

Did not gamble in this form
Gambled occasionally in this form in the past year
Gambled every month or more

Percent

Problem gamblers
Low risk
Many who gamble do so in more than one form of gambling. It can therefore be difficult to determine whether there is any one form of gambling that causes gambling problems more than the others. One way of studying the connection between the form of gambling and gambling problems is shown in Figure 23, where we divided up those who gambled in the past year by how often they participated in each form of gambling. The category “Did not gamble in this form” therefore covers those who have participated in some form of gambling in the past year but not in this particular form. Note that the some individuals might be represented several times in different graphs. The forms of gambling were organised by the proportion of problem gamblers among those who gambled most in each form of gambling, i.e., at least once per month.

Among those who gambled on **number games**, there was no significant difference in the degree of gambling problems based on whether or how often a person gambled.

**Lotteries** differed from other forms of gambling in that the proportion of people with gambling problems was lowest among those who had gambled at some point in the previous year. It was even lower than among those who had not participated in this form of gambling. Among those who had not gambled on lotteries, the proportion who were at low risk of gambling problems, above all, was higher.

A similar pattern could be seen where **horse betting** is concerned. Among those who had gambled at some point but less frequently than once per month, the proportion at low risk was considerably lower compared both with those who gambled more frequently and those who did not gamble on horses at all.

For **live TV competitions**, we saw that the proportion of problem gamblers increased based on whether people participated in this form of gambling and how often. The proportion at low risk of gambling problems, on the other hand, was by far the lowest among those who had gambled at least once per month.

For other forms of gambling, i.e., **sports betting, poker, casino games, bingo, and gambling machines**, the proportion at low risk and the proportion of problem gamblers increased when we compared those who had not gambled in this form with those who had gambled at some point and with those who had gambled at least once per month.
What was the relationship between gambling problems and game type?

We could also go down to a more detailed game type, but then we were looking at those who had gambled on a certain game type at least six times in the previous year. Here, too, there was a great deal of overlap between the different groups because most had gambled on more than one game type. It is therefore not possible to say whether a certain game type leads to gambling problems. We can only establish connections between game type and the proportion of problem gamblers.

The various game types varied greatly in terms of importance. Some had only been played regularly by around ten people in our study, while the responses for other types were based on responses from 2,000 gamblers who had gambled six times or more in the previous year. All the results presented below are about regular gamblers, i.e., gamblers who gambled at least six times in the previous twelve months.

Among those who gambled on number games via the Internet, both with Svenska Spel and other organisers, there was a higher proportion of problem gamblers compared with the population as a whole. Among those who gambled in betting shops or with agents, the proportion of problem gamblers was significantly lower than among those who gambled online.

For lotteries, it was only among those who purchased scratch cards or Pick’n Click online via Svenska Spel that we found a higher proportion of problem gamblers than in the population as a whole. Where horse betting was concerned, it is only gambling with agents and in betting shops (not Harry Boy) that was associated with a higher proportion of problem gamblers compared with the population as a whole.

Where bingo was concerned, there was a higher proportion of problem gamblers among those who played in bingo halls or played online bingo, irrespective of organiser, compared with the population as a whole. Among those who played other types of bingo such as drive-in bingo, there was no significant difference.

All sports betting included in the study had a higher proportion of problem gamblers than the population as a whole, but here we could observe a difference between the various types. Less than 10% among those that gambled through agents or in betting shops were problem gamblers, while 12% or more of those who participated in sports betting with organisers other than Svenska Spel online or participated in other forms of betting were problem gamblers. Gamblers who participated in sports betting online with
Svenska Spel fell in between these and did not differ significantly from any of the groups.

Of the four different types of casino games that we asked about, there was a higher proportion of problem gamblers among those who gambled at restaurant casinos or played casino games online, but not among those who gambled at Casino Cosmopol or abroad.

For poker and gambling machines, there was a higher proportion of problem gamblers in all different types of gambling that we asked about compared with the population as a whole.

Among the ten game types associated with the highest proportions of problem gamblers (24% and up), seven game types were online in both regulated and unregulated forms. Here, we also found poker (live) at clubs, bingo halls, and Vegas slot machines in bingo halls or restaurants.

Can a person have gambling problems when they only participate in one form of gambling?

Roughly a third of those who gambled participated in only one form of gambling. Those who had participated in only one form of gambling were compared with those who had kept to the same form and at least one other form.

For those who participated in one or more forms of gambling, we found the highest proportions of problem gamblers among those who played on gambling machines and who played bingo, casino games, and poker.

Among those who only gambled via horse betting, live TV competitions, casino games, or bingo, there were no problem gamblers in our study. Where at least the three latter forms of gambling are concerned, there were also few people overall who participated in these particular forms.

For other forms of gambling, 1%–5% of the participants were problem gamblers. The highest proportion was for poker, and it was also only among poker players that we found people with gambling problems among those who only participated in one form of gambling. Among those in our study who had only gambled via lotteries, sports betting, gambling machines, or number games, there were gamblers at moderate risk of gambling problems but none who actually had gambling problems.
Figure 24. Proportion of problem gamblers among those participating in only one form of gambling or in a particular form along with at least one more form.

Relationship between gambling problems and computer gaming
Roughly half of all men and over a third of all women had gambled on video or computer games in the previous year. Around 20% played every week. In the age brackets 18–24 and 25–44, we saw a clear connection between a higher degree of gambling problems and video and computer gaming. Overall, there was also a connection between more frequent computer gaming and a higher degree of gambling problems.

The relationship between gambling, invested time and money
Seen in terms of how much money people spent on gambling in the previous month, the proportion of problem gamblers was around 0.5% among those who had gambled a maximum of SEK 40, around 2% among those who had gambled SEK 41–600, and 13% among those who had gambled for more than SEK 600. The difference between men and women was not especially large where gambling problems in these categories are concerned. On the other hand, the proportion at low risk of gambling problems varied.
There were different ways of studying the connection between the degree of gambling problems and the amount of time and money spent on gambling. In Table 12, we see how the total sum of money spent in the previous 30 days was spread across the four different groups with varying degrees of gambling problems.
Table 12. Money and time spent in the previous 30 days by groups with different degrees of gambling problems.

<table>
<thead>
<tr>
<th>Degree of gambling problem</th>
<th>Percentage, who gamble</th>
<th>Percentage of money spent</th>
<th>Proportion of money in relation to proportion of the population (100 = equal proportions)</th>
<th>Percentage of invested time</th>
<th>Proportion of time in relation to proportion of the population (100 = equal proportions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No gambling problems</td>
<td>89.3%</td>
<td>46.4%</td>
<td>52</td>
<td>46.8%</td>
<td>52</td>
</tr>
<tr>
<td>Low risk</td>
<td>7.5%</td>
<td>27.2%</td>
<td>362</td>
<td>25.8%</td>
<td>344</td>
</tr>
<tr>
<td>Moderate risk</td>
<td>2.7%</td>
<td>20.0%</td>
<td>741</td>
<td>12.7%</td>
<td>470</td>
</tr>
<tr>
<td>Gambling problems</td>
<td>0.5%</td>
<td>6.4%</td>
<td>1,280</td>
<td>14.7%</td>
<td>2,940</td>
</tr>
</tbody>
</table>

We saw that the close to 90% who gambled without having any risk of developing gambling problems stood for less than half of the invested sum of money wagered. The groups “at low risk” and “at moderate risk” accounted for around a quarter and a fifth of the staked sum, respectively, but constituted 7.5% and less than 3%, respectively, of those who gambled. Finally, the 0.5% that we estimated to have gambling problems accounted for around 6% of the money spent. The relationship between the proportion of the staked sum and the proportion of gamblers is also presented in Table 12.

The index figures in the table show, for example, that gamblers at low risk played for roughly 3.5 times as much money as would be expected based on their numbers (index = 362). Those at moderate risk accounted for over seven times as large a proportion of money in relation to their numbers (index = 741). Finally, those with gambling problems as a group played for 13 times as much money as what would be expected based on their numbers (index = 1,280).

The division of the number of hours was equal. However, we saw an offset between gamblers at moderate risk and those with gambling problems in that both groups accounted for roughly the same size proportions of the total gambling time, despite the group with gambling problems containing considerably fewer people. The relative time expenditure was roughly 0.5 times greater for the group of gamblers compared with those at low risk of developing gambling problems. The group that gambled by far the most was gamblers with gambling problems who accounted for almost 30 times more of the total gambling time compared with their proportion of the total population.
The relationship between the individual’s attitude to gambling and gambling problems

Those who had gambled for money in the previous 12 months were asked to indicate their reaction to 14 statements on gambling by stating the extent to which they agreed or disagreed. They did this by means of giving a number between 1 and 7, where 1 meant that they completely disagreed and 7 meant that they completely agreed.

In figure 26, the average value for each statement is given for the subcategories according to the PGSI scale. The statements are organised by the mean value for gamblers with gambling problems.

First we have the statement “I gamble because it's exciting”, where all categories have their highest mean value. Gamblers with gambling problems have an average value above 6, which means that almost everyone agreed with the statement. Among gamblers at low or moderate risk, the mean values were closer to 5 and those who gambled without experiencing any problems had a mean value just over 3. The connection between the responses here and the degree of gambling problems was not so strong.

The four statements focused on in the following are:

- I gamble more money than I intend to.
- I gamble for longer than I intend to.
- I see myself as a gambler.
- I gamble when in reality I have more important things to attend to.

For these four statements, we saw the strongest connections between responses and the degree of gambling problems. The average values of responses to the statements were above 5 for those with gambling problems, 2–3 for those at moderate risk, and less than 2 for those at low risk. One exception for those at low risk was the statement “I see myself as a gambler”, where the value was just above 2. Very few of those without gambling problems agreed to some extent with this statement.

An additional statement to the above that has a strong connection with the degree of gambling problems is “I find it difficult to stop gambling”. For this statement, the average response among those with gambling problems was just above 5 and the responses in the other groups were around 2 or lower.
Overall, there was a rather large difference between the group with gambling problems and others. The groups at moderate and low risk had similar answers. There was often a somewhat higher mean value for the responses among those at moderate risk. Exceptions to this include “I win a game depending on my skills” and “I gamble because it’s exciting”.

People who did not have gambling problems were quite consistent in their intervals between the various statements. The biggest exception was “I gamble because it’s exciting”, but the statements “I prefer gambling alone” and “Gambling is one of the most fun things to do” were also partial exceptions.

**Figure 26.** Average responses to statements on gambling.
The relationship between gambling problems and category of gamblers

People with gambling problems (PGSI 8+) were found only among occasional gamblers, social gamblers, and heavy gamblers and primarily among the latter.

People with moderate risk for gambling were found in all of the categories. The proportions at moderate risk of gambling problems were

- less than 1% among seldom gamblers
- around 2% among habitual gamblers and occasional gamblers
- 4% among social gamblers
- 8% among heavy gamblers.

As for low risk, the proportion was around 20% among social gamblers and heavy gamblers and considerably lower in the other categories.

<table>
<thead>
<tr>
<th>Category</th>
<th>Gambling pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-gamblers</td>
<td>Do not gamble at all.</td>
</tr>
<tr>
<td>Seldom gamblers</td>
<td>More than 80% are low-frequency gamblers. Gamblers in this group buy lotto, but not very often, and some also gamble on bingo or call on live TV competitions. They gamble to a small extent.</td>
</tr>
<tr>
<td>Occasional</td>
<td>Nearly half of the occasional gamblers are frequent gamblers and nearly 25% of them are high-frequency gamblers. They gamble in all forms. A few gamble on poker, casino games, or on gambling machines, but most of them gamble on horse betting and number games.</td>
</tr>
<tr>
<td>Habitual gamblers</td>
<td>Two thirds of the habitual gamblers are low-frequency gamblers. They gamble on all forms of gambling except for poker. While only a few gamble on casino games and bingo, a large proportion gambles on gambling machines but not regularly. Quite many have called on TV competitions either occasionally or on a monthly basis.</td>
</tr>
<tr>
<td>Social gamers</td>
<td>More than half of the social gamblers are low-frequency gamblers. All gamble on poker and in addition gamble on all other forms of gambling, but very few gamble on bingo and number games and nearly none calls on TV competitions more than once a year.</td>
</tr>
<tr>
<td>Heavy Gamblers</td>
<td>Nearly half of the heavy gamblers are high-frequency gamblers. They participate in all forms of gambling and gamble the most in all forms of gambling except for number games. It is gamblers in this category who gamble the most on horses along with habitual gamblers.</td>
</tr>
</tbody>
</table>
For women, the proportion of problem gamblers was highest among social gamblers. The proportion of problem gamblers was, in fact, greater among female social gamblers than male.

**Figure 27.** Gambling problems in categories of gambler by gender.
Problem gamblers were dominated by heavy gamblers, but there was also a reasonable proportion of habitual gamblers among these. It is also important to remember that relatively low proportions of problem gamblers in a sub-category that contains many individuals still leads to quite a large number of people in the end.

**Figure 28.** Problem gamblers by category of gambler.

Comparisons

**Swedish epidemiological studies**

The first large-scale study on gambling in Sweden was conducted in 1994 (Kühlhorn et al., 1995). However, the researchers looked only at people who played for a minimum SEK 50,000 in the previous year, which makes their results very difficult to compare.

An epidemiological study on gambling in Sweden was conducted in 1997/98 by a team of researchers associated with Professor Sten Rönnberg with funding from the Ministry of Health and Social Affairs (Rönnberg et al., 2000). This study, known as SWEGS (Swedish Gambling Study), was conducted mainly through telephone interviews among a random sample of the population. A follow-up study with personal interviews was also carried out on a smaller selection of those who participated in SWEGS (Jonsson et al., 2003).

From 2004, the Swedish National Institute of Public health has carried out an annual national public health survey to follow the development of public health in Sweden. The study looks at a random samples of the population and for different years additional samples have been selected in different regions. In this survey, questions are asked about high-risk gambling habits as one of the deciding factors for health.
**Sweden in 2008/09 and 10 years ago - a comparison**

In this part of the report, we compare the data from the SWEGS 1997/98 study with the data from Swelogs. The measurement instrument SOGS-R was used in both studies to measure gambling problems.

**SOGS-R Point Scale and Categories**

SOGS-R consists of 20 questions, some concerning general gambling habits, some concerning gambling within the past year. Those responding Sometimes/Often/Always to questions 1A–10A and Yes to questions 11A–20A are asked a follow-up question regarding the past year.

Each positive answer, i.e., Sometimes/Often/Always to any of questions 1–10 and each Yes to any of questions 11–20 adds 1 point. The points are totalled separately for the person’s lifetime and for the past year. The maximum number of points for each total is 20. The following limitations are used:

- 0–2: No problems
- 3–4: Problem gambler
- 5 or more: Probable pathological gambling

**Proportion of the population that gambled**

The most important and dramatic difference is that participation in gambling decreased considerably between 1997/98 and 2008. In 1997/98, 88% of the population over 15 had gambled in the previous year, and this had declined to 70% in 2008/09 among the population aged 16–84 who had gambled on some game type in the previous year. The reduction took place in all age groups and in both women and men. Gambling primarily decreased in the age bracket 16–17, i.e., among minors.

**Table 13. Changes in the number of respondents who gambled in the previous year.**

<table>
<thead>
<tr>
<th>Have gambled in the past year</th>
<th>1997/98</th>
<th>2008/09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>88%</td>
<td>70%</td>
</tr>
<tr>
<td>Male</td>
<td>90%</td>
<td>74%</td>
</tr>
<tr>
<td>Female</td>
<td>86%</td>
<td>67%</td>
</tr>
</tbody>
</table>
Table 14. Gambling by gender and age.

<table>
<thead>
<tr>
<th>Age</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>16–17</td>
<td>61%</td>
<td>87%</td>
</tr>
<tr>
<td>18–24</td>
<td>75%</td>
<td>92%</td>
</tr>
<tr>
<td>25–44</td>
<td>76%</td>
<td>91%</td>
</tr>
<tr>
<td>45–64</td>
<td>76%</td>
<td>89%</td>
</tr>
<tr>
<td>65–74</td>
<td>73%</td>
<td>86%</td>
</tr>
</tbody>
</table>

Who gambled the most?
Both the surveys found that men gambled for higher amounts than women. Unlike in EP1 where the average stake generally increased with age, people in the age range of 18–64 years gambled with nearly the same betting sum in SWEGS. People belonging to the age group 65 years and above bet lower amounts in both of the surveys. The group with high school as their highest level of education gambled the most in both the surveys. Unlike in 1997/98, in EP1 people born in Sweden were found to gamble with significantly higher stakes than people born outside Sweden.

Different forms of gambling
In general, participation in gambling decreased for all forms of gambling apart from poker and other card games, where participation increased by 2%-units. The decrease in various forms of gambling was a general trend for both men and women with the following exceptions:

- In EP1, women gambled just as much (in fact slightly more) on horse betting as in 1997/98.
- Gambling on poker increased among men, but not among women.
- Gambling on casino games decreased more for women than for men.

The gambling categories with decreased participation were sports betting, gambling machines, and lotteries. Despite this, lotteries were still the most common form of gambling.
Table 15. Changes in gambling participation according to different forms of gambling from 1997/98 to 2008/09 shown as percentages.

<table>
<thead>
<tr>
<th>Participation in gambling for men, women, and in total for the age group 16–74</th>
<th>2008/09</th>
<th>1997/98</th>
<th>Total 2008/09</th>
<th>Total 1997/98</th>
<th>Change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>Horse racing</td>
<td>27</td>
<td>20</td>
<td>33</td>
<td>19</td>
<td>23</td>
</tr>
<tr>
<td>Bingo</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Lotteries</td>
<td>53</td>
<td>56</td>
<td>83</td>
<td>83</td>
<td>54</td>
</tr>
<tr>
<td>Sports pools and betting</td>
<td>28</td>
<td>9</td>
<td>52</td>
<td>25</td>
<td>19</td>
</tr>
<tr>
<td>Gambling machines</td>
<td>12</td>
<td>7</td>
<td>22</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Poker and other card games</td>
<td>17</td>
<td>4</td>
<td>12</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Casino games</td>
<td>13</td>
<td>3</td>
<td>19</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

The proportion of the population with gambling problems in Sweden remained unchanged at around 2%. It would be easy to believe that nothing has changed, but upon closer inspection we see that this is not the case:

- The proportion of gamblers with no gambling problems in the previous year declined from 87% to 68%, i.e. a decrease of 19 % units.
- The proportion of gamblers who exhibited probable pathological gambling, both at some point in their life and during the previous year, increased by over half and by a third, respectively.

Table 16. Categorisation of the population according to SOGS-R 1997/98 and 2008/09 presented in percentage (%).

<table>
<thead>
<tr>
<th>Categories according to SOGS-R</th>
<th>At some point in their life</th>
<th>Past 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-gamblers</td>
<td>4.7</td>
<td>8.6</td>
</tr>
<tr>
<td>Gamblers without gambling problems</td>
<td>91.4</td>
<td>87.2</td>
</tr>
<tr>
<td>Problem gamblers</td>
<td>2.7</td>
<td>2.4</td>
</tr>
<tr>
<td>Probable pathological gamblers</td>
<td>1.2</td>
<td>1.9</td>
</tr>
<tr>
<td>Everyone with gambling problems</td>
<td>3.9</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Prevalence of gambling problems in different groups

Many of the connections discovered in 1997/98 remained in 2008/09. Men had more gambling problems than women, and the problems tended to be more serious among men, especially among the age groups 18–24 years and 25–44 years. Among men aged 25–44, the proportion of people with serious
gambling problems doubled. There were also changes among women, and gambling problems increased among women aged 45 years and older. Both studies found minors to be at a higher risk even when gambling problems have decreased among minors.

Table 17. Gambling problems in percentage of the total (and pathological gamblers) by gender and age.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16–17</td>
<td>7 (3)</td>
<td>10 (3)</td>
<td>3 (0.7)</td>
<td>3 (1)</td>
</tr>
<tr>
<td>18–24</td>
<td>9 (3)</td>
<td>5 (2)</td>
<td>2 (0.5)</td>
<td>3 (0.7)</td>
</tr>
<tr>
<td>25–44</td>
<td>5 (2)</td>
<td>5 (1)</td>
<td>0.4 (0.3)</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>45–64</td>
<td>2 (0.6)</td>
<td>2 (0.7)</td>
<td>0.6 (0)</td>
<td>0.4 (0.1)</td>
</tr>
<tr>
<td>65–74</td>
<td>1 (0.5)</td>
<td>1 (0)</td>
<td>0.5 (0)</td>
<td>0</td>
</tr>
</tbody>
</table>

We looked at the change in the relationship between gambling problems and the level of education and living in the major cities of Gothenburg, Stockholm, or Malmö. There was no relationship between the level of education or place of residence and gambling problems in the past year in the 1997/98 study. However, there was an association with the lifetime prevalence among people who only had basic or high school education and who lived in major cities. In EP1, this connection was also found for the actual incidence of gambling problems.

Being born abroad was still associated with a higher risk of gambling problems, and the connection was stronger in 2008 than it was in 1997/98. Living alone or together with a partner and having children under the age of 18 living at home affected one’s living situation and health in general. Gambling problems were more common among single people with children than among people who lived together with a partner. Being single without children also had a stronger connection with gambling problems. The connections appeared to have become somewhat weaker over the ten years because gambling problems seemed to decrease among single people with and without children and to increase among those who were married or cohabiting. However, it is difficult to compare the studies here because the 1997/98 study differentiated between married and unmarried people while we chose to distinguish between cohabiting and single people in EP1.
Relationship between gambling problems, health, and the individual’s attitude to gambling
We found that differences remained between gamblers with and without gambling problems. In both studies, gamblers with gambling problems had a more positive attitude towards gambling and gambled to a greater extent than others. They also disregarded other’s opinions, gambled for more money, and spent more time gambling. As in the 1997/98 study, people with gambling problems had worse health status in EP1.

Multivariate analysis
In order to gain a better picture on the associations, we performed multivariate regression analyses on the data from SWEGS and Swelogs. We noticed the following two differences when we compared these two studies:
• Life time prevalence of gambling problems among men was higher in 2008/09 than it was in 1997/98.
• Gambling problems in the previous year for people with only basic education were higher in 2008/09 than in 1997/98.

Conclusions from wave one
• Fewer people are gambling for more and more money.
• Gambling among minors is found in all forms of gambling
• The prevalence of problem gambling in the population has been stable over a ten year period but at the same time redistributed between population groups.
• Gambling problems are unevenly distributed in the population with regard to age, sex and socioeconomic status.
• There are connections between problem gambling and poor mental health, risky alcohol consumption, daily smoking, subject to physical violence and financial problems.
• Important arenas for prevention are schools, workplaces and gambling venues/sites.
• Many relatives, including children, are affected.
Gambling and problem gambling are prevalent in the population

The proportion of problem gamblers in the population is around 2%, and 5% of the population run a risk of developing gambling problems. Gambling problems exist throughout the population, but there are significant differences in the proportions of gamblers among different segments of the population. For example, almost 1 in 10 men aged 18–24 but fewer than 1 in 100 women aged 45–64 are problem gamblers. In comparison with a previous study the proportion of the Swedish population who gamble has gone from 88% to 70% over the last decade.

Gambling among minors is found in all forms of gambling despite the fact that almost the entire gambling market has a minimum age requirement of 18. The proportion of problem gamblers among girls aged 16–17 is 2%, and among boys aged 16–17 it is 5%.

Problem gambling is unevenly distributed

Gambling problems among the population have been redistributed. The proportion of problem gamblers remains at the same level for the population as a whole, with increases in certain groups and decreases in others. The proportion of problem gamblers has doubled among men aged 18–24 and among women aged 45 or more. At the same time, gambling problems have decreased among boys aged 16–17, which was the group with the biggest gambling problems ten years ago. The proportion of problem gamblers has also decreased among men aged 45–64 and among women aged 18–44.

There are social differences between problem gamblers and people who do not have problems with their gambling. The proportion of problem gamblers is highest among those with the lowest level of education, the lowest income, and low socioeconomic status. There is a large proportion of problem gamblers among people who receive social allowance or unemployment benefits or have problems with their household economy. A comparison with the previous epidemiological study into gambling and gambling problems from 1997/98 revealed that the connections between gambling problems and social differences had become stronger for men in the 2008 study.
Problem gambling is connected to health and other factors

Poor mental health was six times more common among problem gamblers than among non-gamblers and gamblers without gambling problems. These findings were consistent with those of international studies that showed connections between poor mental health and gambling problems.

Risky alcohol consumption and daily smoking showed connections with having gambling problems among men.

Violence was associated with gambling, and 13% of men subjected to physical violence in the previous year were found to be problem gamblers. Among men with low risk of gambling problems, 20% had been subjected to violence in the past year. There was no similar connection in women.

Financial problems were found among problem gamblers to a greater extent than people without gambling problems.

Important arenas for prevention

Schools and workplaces are important arenas for prevention. Almost 3% of the respondents had gambled in their workplace or in school instead of working or studying. The largest proportion was found among men 16-24 years old where more than 8% had gambled in their workplace or at school instead of working or studying. Among women in the age bracket of 45–64 years, the corresponding figure was 2%.

Many relatives are also affected. In 2008 around 260,000 people in Sweden lived with someone who was a problem gambler and 76,000 of these were children. There was a higher proportion of problem gamblers among families with children compared to couples without children.

A large proportion of gambling revenues is attributable to problem gamblers. Problem gamblers and people at risk of developing gambling problems account for a disproportionate share of both the time and money spent on gambling. If we add up the problem gamblers and people at moderate risk of gambling problems, these account for more than half of the money spent on gambling in Sweden. The more serious the gambling problems, the larger the proportion of stakes. These figures should be interpreted with care because they are based on self-reported information, but they correspond well with international studies that show that problem gamblers account for
30%–50% of the stakes and thus account for a disproportionate share of the gambling companies’ profits.
Results: wave two (EP2)

Incidence is an epidemiological term that indicates the number of events in a given population during a defined period of time. In epidemiology, events often refer to people being diagnosed with a particular disease. The proportion of those who fall ill (incidence) is then calculated in relation to those who were previously healthy. For diseases or conditions that are chronic, the number of people at risk gradually declines when one particular population is followed for a long period of time.

Prevalence describes the proportion of a population that has a particular disease or a particular condition at a given point in time. While the prevalence gives us an idea of how widespread the disease is, the incidence shows the rate at which new cases occur.

Here we use incidence measures to describe the percentage of new problem gamblers over a period of one year. The overall incidence is the proportion of problem gamblers in wave two coming from those who were not problem gamblers during wave one. We distinguish between entirely new problem gamblers and those who relapsed, i.e. those problem gamblers who are new in the second measurement but who had a gambling problem earlier in life, but we report our results mainly for the overall incidence. The exact definitions we use are reported in the methods section.

Objectives

- The purpose of wave two in the Swelogs population study was to get a picture of the changes over the course of one year. This applied to the overall image of gambling, problem gambling, and health, and especially changes on an individual level. Following the same individuals over time, i.e. at wave one and wave two, allowed us to study the changes in their situation in a way that is not possible with new samples each time.

- The key findings in this section are concerned with the incidence, i.e. the emergence of new problem gamblers within a year, and the connections that we find between the changes in risk for gambling problems and other factors such as alcohol use, health, and major life events within that year. We also describe changes in gambling participation.
Changes in gambling

In this section, we present our results on how gambling in Sweden changed over the course of one year from 2008/09 (EP1) to 2009/10 (EP2). The results of EP1 apply essentially to gambling in 2008 and the results of EP2 apply to gambling in 2009 since we asked about gambling in the past 12 months on both occasions. In this section, one can learn about the changes in different forms of gambling, changes in time and money people spend on gambling, and increases or decreases in unregulated and illegal gambling.

Proportion of the population that gambled

GAMBLING AT EP1 AND EP2

The percentage of the population that gambled in the previous year increased somewhat from EP1 to EP2. According to wave one, 70% gambled in the previous year and a year later in wave two, this had risen to 73%.

Figure 29. Percentage who gambled in the previous year in EP1 and EP2.
The percentage of respondents who gambled in various forms of gambling remained relatively similar between EP1 and EP2. There was a significant decrease in sports betting from 19% to 16% and for live television contests from 9% to 7%. Sports betting was also the form of gambling that decreased the most in comparison with the findings from EP1 and the findings from the population survey from 1997/98. In the year between the two waves, there was a significant increase in the number of people who gambled in number games from 28% to 32% and those who gambled online on the Internet from 9% to 13%. The increase in online gambling might be attributed to the measurement method for Internet gambling that was changed in the telephone interviews, which was the primary method of data collection (more info in the Methods section). The number of Internet gamblers among those who responded through the postal questionnaires remained roughly the same in both waves.

**Overall changes in gambling habits from EP1 to EP2**

Of the total population in the relevant age groups, more than 60% of the respondents reported that they had gambled in both the measurement periods. Men still gambled more than women. Our results show that 67% of men gambled at some point during both the first and the second measurement period, and 57% of women did the same. The proportion of new gamblers who had not gambled in the first measurement period but who had gambled in the second measurement period was slightly higher among women. Meanwhile, a marginally higher percentage of women reported having stopped gambling from the first to the second measurement, suggesting that men are more stable with their gambling habits. Just under a fifth had not gambled at all during both measurement periods.

**Figure 30.** Did not gamble or gambled at one or both measurement periods according to gender.
When we divide the data according to age and sex, we see that the percentage who gambled during both measurement periods was highest in the age groups 25–44 and 45–64 years. Among men, the percentage of new gamblers was highest among those who were 16–17 years at wave one. Among women, the proportion of new gamblers was higher than average among the age groups aged 16–17 years and 18–24 years in wave one, and it was also slightly higher among those who were 65 years and older. The proportion who gambled rose in almost all subgroups. One of the few groups where gambling decreased was among those born outside Europe. There were no changes among single people without children, and the proportion that had started gambling and that had stopped was approximately equal in the same group.

DIFFERENCES BETWEEN THE NEW GAMBLERS AND THOSE WHO GAMBALED DURING BOTH WAVES

The new gamblers in general were gambling less than those who gambled during both measurement periods. The percentage who gambled on lotteries at some point in the past year was about the same for both the new gamblers and the former gamblers, even if the new gamblers did not gamble as often (i.e. monthly or more) as the former gamblers.

As for other forms of gambling, a slightly higher percentage of former gamblers gambled on slot machines, poker, and bingo when compared to the new gamblers. The proportion who gambled on number games, sports, casino games, TV competitions, and horses was more than twice as great among the former gamblers as among the new gamblers, and the percentage of former gamblers who gambled on horses was four times higher. Taken together, this shows that the new gamblers were relatively slightly more likely to gamble on lotteries, poker, slot machines, and bingo than on other forms of gambling.
**Figure 31.** Those who gambled in the respective form of gambling, including via the Internet, at some point during the past 12 months presented in percentages.

<table>
<thead>
<tr>
<th>Gambling frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No gambling</td>
<td>Has not gambled in the past 12 months</td>
</tr>
<tr>
<td>Low-frequency gambling</td>
<td>Has gambled in a maximum of three different forms of gambling and weekly only in one gambling form</td>
</tr>
<tr>
<td>Frequent gambling</td>
<td>Has gambled in many different forms of gambling but mostly weekly in a maximum of two gambling forms</td>
</tr>
<tr>
<td>High-frequency gambling</td>
<td>Has gambled in many different forms of gambling and gambles often (at least weekly) in many different gambling forms</td>
</tr>
</tbody>
</table>

The proportion who gambled at some point in the previous 12 months increased by 3 percent units between the two waves, and it was primarily the low-frequency gambling that increased.
The changes in the proportion of moderate and high-frequency gambling is only marginal. However, it was a partially different group of people who engaged in high-frequency gambling at different waves. About one third of the category was replaced from the first to the second wave.

Men generally gambled more than women, and they accounted for 77% of those who gambled with high frequency during both the measurements. In relative terms, there were slightly more women among those who started and stopped gambling at high frequency, suggesting that women’s high frequency gambling varies more than that of men.

While there were a lot of younger adults (18–24 years in EP1) who decreased their gambling from high frequency to low frequency, relatively more minors (16–17 years in EP1) and older people (65–84 years in EP1) started to engage in high-frequency gambling.

The proportion with the lowest level of education were highest among those who started gambling at high frequency and lowest among those who decreased their gambling from high frequency to low frequency. In addition there was a fairly large group with only lower secondary education among those who continued to engage in high-frequency gambling. The share of gamblers with university education was highest among those who no longer engaged in high-frequency gambling. This might mean that those with lower education are less able to reduce their gambling once they start gambling at high frequencies.
People born in Europe outside Sweden were not very common among those who engage in high-frequency gambling. Here we mainly found people born in Sweden and a slightly higher proportion of people born outside of Europe when compared with the proportion of those who quit or continued gambling at high frequency.

**Gambling with different risk potential (Degree of risk)**

Most of the gambling types can cause gambling problems for the one who gambles on them, but the degree of risk varies. We used seven criteria (see the Methods section) with varying weights to assess the extent to which different gambling types affect the risk of developing gambling problems. This resulted in three groups of low, moderate, and high risk potential.

<table>
<thead>
<tr>
<th>Risk potential</th>
<th>Gambling types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>In games with long gaps between betting and outcome, gambling with short overall time per session, and gambling and few variations, e.g. lottery purchased through agents and Harry Boy.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Gambling with short duration from betting to outcome, possibility to extend the total gambling time with many rounds of gambling, e.g. most gambling forms, sports betting, gambling on horses, and live poker.</td>
</tr>
<tr>
<td>High</td>
<td>Gambling with a short gap between betting and outcome, fast payments of winnings, possibility of long sessions, and special effects with sound and lights. For example, many gambling forms available through the Internet and gambling on slot machines and casino games.</td>
</tr>
</tbody>
</table>

We investigated how common it is to gamble every month with low, moderate, or high risk potential. Those who gambled on several different games each month were in the group that corresponded to the highest risk potential for any of the gambling forms. Those who gambled less frequently than monthly and non-gamblers together formed the category of less than monthly gamblers.

The proportion who gambled at least monthly on any gambling form with high risk potential was 4%–5% in both 2009/10 and 2008/09. The proportion who did not gamble each month on a specific game type was unchanged at 56% between measurements. However, there was a slight shift between the monthly gamblers on game types with low and moderate risk potential. The percentage of moderate level decreased while the percentage of people gambling on game types with low risk potential increased.
A lot of changes were noted simultaneously in terms of who gambled on which game types. Figure 34 shows possible risky gambling on a monthly basis and the degree of risk in EP2 for the respective category of possible risky gambling on a monthly basis in EP1.

**Figure 34.** Changes in monthly gambling in games with different risk potential. The percentage of people remaining in the same risk category are marked with the orange colour for the respective category.
In EP2, the proportion remaining in the same risk category as in EP1 was greatest among those who did not gamble every month, where 82% of them did not gamble every month in any game type. For other categories, the proportion of unchanged risk level was between 54% and 59%, and 54% of those who gambled on games with high risk potential in EP1 continued doing so in EP2. This corresponds to about 180,000 people in the population who gambled at least monthly on any game with high risk potential during both the waves. Almost as many, about 140,000 people, began gambling every month on any of the games in the high risk category between EP1 and EP2. Of those, 50,000 did not gamble on a monthly basis at all in EP1. They were 1% of those who did not gamble monthly in EP1, but because this is the largest group in the population it still represents a large number of people.

**Changes in gambling sums**

![Figure 35](image.png)

We saw no significant changes in the total money invested on the basis of self-reported values in the survey. The median sum increased slightly, while the average value decreased. The average reduction was primarily due to fewer extremely high totals.

In terms of gambling forms, on average the amount gambled for in the past 30 days increased slightly for those who gambled on number games and on horse betting but decreased in other forms of gambling.

The self-reported values resulted in an overall underestimation of gambling in Sweden. We present the similarities and differences between the
self-reported values and the official totals reported by the Swedish Gambling Authority at page 67 where the results from wave one are reported. Figures from the Swedish Gambling Authority did not show any major changes between 2008 and 2009, and the increase in horse betting and number games was confirmed.

**Changes in gambling and gambling problems**

In this section, we describe how gambling and problem gambling in the population changed over the course of one year.

We describe the overall changes along with changes at the individual level. Because we interviewed the same people on two occasions, we could see changes at the individual level and thereby describe movement in and out of different degrees of problem gambling. We complemented the picture with movement in and out of gambling, and this led to eight categories of changed and unchanged conditions.

We used the measurement instrument PGSI to measure the extent of problem gambling. The PGSI consists of nine questions on gambling in the past twelve months. The sum of the responses then allows individuals to be classified into one of the following four categories: no gambling, low-risk gamblers, gamblers with moderate risk, and gamblers with gambling problems. In our report, we have combined the two groups of gamblers with moderate risk and gamblers with gambling problems into a single group of problem gamblers, as is usually done in the international context.

**PGSI POINT SCALE AND CATEGORIES**

- 0 points: No gambling problems.
  
  No gambling reported in the past 12 months.
- 1–2 points: Low-risk gambler.
- 3–7 points: Moderate-risk gambler.
- Score of 8 or higher: Gamblers with gambling problems.

The proportion of problem gamblers did not increase significantly during the one year between wave one and wave two and remained at about 2% of the population. However, the proportion who gambled without problems increased by about 4% units as the proportion of those who gambled in general increased slightly from 70% to 73% and the proportion with low risk of problem gambling dropped from 5% to 4%.
No change in the proportion of problem gamblers does not mean that no changes occurred between the two waves. Although the levels remained the same, a lot of people moved between and within the categories. The percentage of new problem gamblers (incidence) was 0.18% over the course of one year. The incidence of problem gamblers in the entire population was 1.4%, and the incidence of problem gamblers among those who had already gambled in wave one was 1.7%.

A total of about 100,000 people in Sweden in the age groups between 16 and 84 years became new problem gamblers between wave one in 2008/09 and wave two in 2009/10. Just over half were men, and more than a quarter were under 25 years of age. Meanwhile, more than 40,000 people continued to be problem gamblers in both waves, and almost half of them had serious gambling problems.

We found the largest changes among gamblers with low risk and among problem gamblers. In both of these categories, nearly 25% had remained within the same respective categories when compared between wave one and wave two. Among the previous problem gamblers, a similarly large proportion now had moderate risk, while the rest of them either gambled without any problems or had completely stopped gambling.

Among gamblers with low risk in EP1, nearly every 13th person (8%) became a problem gambler, but the majority of low-risk gamblers had reduced their degree of gambling problems or had completely stopped gam-
bling. Those who gambled without any signs of gambling problems was the group that changed the least. A total of 83% of them continued in the same category, 3% had an increased risk for gambling problems, and 1% became problem gamblers in wave two. Nearly 13% stopped gambling. The proportion of those who gambled without any signs of obvious gambling problems accounted for 92% of all those who gambled in the previous 12 months.

Of the previous non-gamblers in wave one, nearly 60% continued to be non-gamblers. Approximately 40% of this group began gambling, a little more than 1% moved on to become gamblers with low risk, and less than 1% became problem gamblers in wave two.

According to these changes, three quarters of the previous problem gamblers were replaced by new ones, where some of them had a gambling problem earlier in life and had relapsed in wave two while others were completely new problem gamblers.
### Table 18. Continued and new problem gamblers from EP1 to EP2 by age and gender.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Men</th>
<th>Women</th>
<th>16–24 years 2008</th>
<th>25–44 years 2008</th>
<th>45–64 years 2008</th>
<th>65–84 years 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Percentage of continued problem</td>
<td>26%</td>
<td>31.5%</td>
<td>12.8%</td>
<td>41.4%</td>
<td>111%</td>
<td>213%</td>
<td>5.9%</td>
</tr>
<tr>
<td>gamblers from EP1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of individuals</td>
<td>41,700</td>
<td>35,900</td>
<td>5,800</td>
<td>14,900</td>
<td>1,200</td>
<td>10,000</td>
<td>900</td>
</tr>
<tr>
<td>Of these, the number of individuals</td>
<td>45.7%</td>
<td>41.4%</td>
<td>60.0%</td>
<td>23.1%</td>
<td>–</td>
<td>50.0%</td>
<td>–</td>
</tr>
<tr>
<td>with a gambling problem in EP2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Incidence:</strong> new problem gamblers</td>
<td>1.0%</td>
<td>1.0%</td>
<td>11%</td>
<td>2.9%</td>
<td>1.0%</td>
<td>0.5%</td>
<td>0.9%</td>
</tr>
<tr>
<td>from previous non-problem gamblers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of individuals</td>
<td>78,300</td>
<td>36,900</td>
<td>41,400</td>
<td>16,400</td>
<td>5,300</td>
<td>6,600</td>
<td>11,000</td>
</tr>
<tr>
<td>Of these, individuals with a gambling</td>
<td>4.9%</td>
<td>71%</td>
<td>3.0%</td>
<td>7.7%</td>
<td>–</td>
<td>–</td>
<td>11.1%</td>
</tr>
<tr>
<td>problem in EP2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relapse:</strong> Problem gamblers at EP2</td>
<td>11.3%</td>
<td>12.1%</td>
<td>2.4%</td>
<td>14.1%</td>
<td>31%</td>
<td>15.3%</td>
<td>11%</td>
</tr>
<tr>
<td>no problems at EP1 but with problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earlier in life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of individuals</td>
<td>20,500</td>
<td>20,200</td>
<td>400</td>
<td>6,100</td>
<td>300</td>
<td>14,100</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Of these, individuals with a gambling</td>
<td>4.3%</td>
<td>4.3%</td>
<td>2.5%</td>
<td>4.9%</td>
<td>–</td>
<td>4.0%</td>
<td>–</td>
</tr>
<tr>
<td>problem in EP2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total incidence (including relapse):</td>
<td>1.4%</td>
<td>1.6%</td>
<td>11%</td>
<td>4.3%</td>
<td>1.3%</td>
<td>1.8%</td>
<td>0.9%</td>
</tr>
<tr>
<td>problem gamblers at EP2, but not EP1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of individuals</td>
<td>98,800</td>
<td>57,000</td>
<td>42,000</td>
<td>22,500</td>
<td>5,700</td>
<td>20,700</td>
<td>11,000</td>
</tr>
<tr>
<td>Of these, individuals with a gambling</td>
<td>6.1%</td>
<td>8.5%</td>
<td>2.9%</td>
<td>10.5%</td>
<td>–</td>
<td>5.9%</td>
<td>11.1%</td>
</tr>
<tr>
<td>problem EP2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Changes from EP1 to EP2

We divided the population into eight categories based on gambling, problem gambling, and changes in gaming habits.

Table 19. Status and changes regarding gambling and gambling problems at EP1 and EP2.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Non-gamblers at both measurements</td>
<td>17.6%</td>
<td>17.6%</td>
</tr>
<tr>
<td>2. Non-gamblers EP2, gamblers without problems EP1</td>
<td>8.9%</td>
<td>26.5%</td>
</tr>
<tr>
<td>3. Non-gamblers EP1, new gamblers without problems EP2</td>
<td>10.7%</td>
<td>37.2%</td>
</tr>
<tr>
<td>4. Gamblers without problems EP1 and EP2</td>
<td>59.2%</td>
<td>96.4%</td>
</tr>
<tr>
<td>5. Problem gamblers EP1, gamblers without problems or non-gamblers EP2</td>
<td>1.6%</td>
<td>98.0%</td>
</tr>
<tr>
<td>6. New problem gamblers EP2 (incidence), gamblers without problems or non-gamblers EP1</td>
<td>1.1%</td>
<td>99.1%</td>
</tr>
<tr>
<td>7. New problem gamblers EP2 with gambling problems earlier in life (relapse), gamblers without problems or non-gamblers EP1</td>
<td>0.3%</td>
<td>99.4%</td>
</tr>
<tr>
<td>8. Problem gamblers at both measurements</td>
<td>0.6%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Just under a fifth of the population in the relevant age groups did not gamble at all during in either wave one or wave two (Category 1). Two groups, those who gambled without any problems during wave one and new gamblers without any problems in wave two (categories 2 and 3, respectively), constituted around one-fifth of the total population.

Category 4 consisted of those who gambled without gambling problems during both waves. They made up nearly 60% of the population and along with categories 1 to 3 summed up to 96% of those who did not have gambling problems during both waves. The remaining 4% were problem gamblers either in one or in both the waves.

Category 5 represented about three-quarters of those who were problem gamblers in wave one but with lesser gambling problems in wave two or those who had completely stopped gambling in wave two. This group had since been replaced by a similar number of new problems gamblers, of whom about one-fifth were those who had a gambling problem earlier in life but did not have it in wave one. These new problem gamblers in categories 6 and 7 gambled without problems or did not gamble at all in wave one. Approximately 0.5% of the population were problem gamblers during both wave one and wave two.

Figure 38. Gambling and problem gambling in EP1 and EP2.

The overall picture of unchanged levels of problem gamblers but a greater recomposition within the group of problem gamblers showed that a significantly larger proportion of the population was at risk than the perceived 2% of the population that seemed to have had gambling problems at a particular time frame. The consequences of problems, such as financial problems and
relationship problems, were such that they might have remained even after the acute phase.

Age was one factor that clearly affected any eventual problem gambling. At either of the waves, 3% of the population in the age group 25–84 years were problem gamblers. The proportion of problem gamblers among the 17–24 year olds was 7%.

Persons in the age group 25–64 years were most likely to continue gambling without any gambling problems (over 60%), and this meant that the risk of developing a gambling problem was mainly found among adolescents and young adults, but also among those who were 65 and older.

There were also clear differences between men and women. For example, there were almost only men who relapsed into problem gambling from EP1 to EP2, i.e. those who were not problem gamblers in EP1 but had gambling problems earlier in life. There were similar differences depending on education, and the share of problem gambling decreased gradually with increasing levels of education. No person with a college or university level education was found among the problem gamblers who relapsed to problem gambling from EP1 to EP2.

CHANGES IN DIFFERENT CATEGORIES OF GAMBLING

In connection with data analyses for wave 1, six gambling categories were defined based on how often one gambled in different forms of gambling (refer section on Different gambling categories in EP1 results for details).

Except for non-gamblers, problem gamblers were found in all categories in wave one, but the highest proportion was among heavy gamblers. Among heavy gamblers, we found the highest proportion of both gamblers who were no longer problem gamblers (~ 6%) and those who continued to be problem gamblers (~ 5%) in wave two. About 3% of the heavy gamblers were new problem gamblers and just over half of them had a gambling problem earlier in life. Thus, the highest proportion of problem gamblers still remained among the heavy gamblers. About 5% of the heavy gamblers had stopped gambling.

There were around 2% new problem gamblers among the social gamblers and the seldom gamblers. The difference between these categories was that about one in ten new problem gamblers among the social gamblers had gambling problems earlier in life. Among the seldom gamblers there were no new problems gamblers with past problems.
The incidence among occasional gamblers, habitual gamblers, and non-gamblers in EP1 was around 1%. This again indicated that gambling problems could occur in all groups. Lower percentages from large groups, such as seldom gamblers and non-gamblers, summed up to more people than the higher percentages from smaller groups, e.g. social gamblers. The new problem gamblers from previous non-gamblers and seldom gamblers accounted for nearly half of all new problem gamblers.
PROBLEM GAMBLERS AT ONE OR BOTH OCCASIONS
Our results from the second wave in 2009/10 refer to the Swedish population between the ages 17 and 85 years. Among them, approximately 42,000 persons (0.6%) were problem gamblers at both the waves. A total of 78,000 people (1.1%) were new problem gamblers in wave two who did not have any gambling problems earlier, and approximately 21,000 were people (0.3%) who had a gambling problem earlier in life and who relapsed. Meanwhile, around 118,000 people (1.6%) reduced their gambling problems and were no longer problem gamblers in wave two.

WHAT WERE THE SIMILARITIES AND DIFFERENCES BETWEEN THESE GROUPS?
HOW DID THEY LOOK IN RELATION TO THE REST OF THE POPULATION?
Approximately 50% of the population were women. Among the new problem gamblers, about half of them were also women (53%), while virtually no women had relapsed to having gambling problems. Women constituted a smaller proportion of those who continued to be problem gamblers (14%) and just over a third (36%) of those who were no longer included in the category of problem gamblers, which was expected because women constituted 28% of the problems gamblers in wave one. In total, this showed a slight increase in problem gambling among women.
In wave 2, a total of 13.5% were under the age of 25 years. In wave 1, we found an alarmingly high percentage of youth and young adults who were problem gamblers. They constituted nearly 40% of those who continued to be problem gamblers and nearly a quarter of those who no longer belonged to that category in wave two. Among those who relapsed, the proportion of the population under 25 years was around 30%, and among the new problem gamblers this was just over 25%. Problem gambling was thus still a serious problem among young people. There were new problem gamblers of all ages, but those who had relapsed were almost exclusively under the age of 45 years.

Differences between the new problem gamblers and those who had gambling problems earlier in life and had relapsed into similar problems again in addition to gender, age, and education were those who gambled on horses, slot machines, poker, and casino games to a higher degree. They also indulged in unregulated gambling to a higher degree. However, there were no apparent differences connected to serious life events or general or mental health within the past year. Because they constituted fairly small groups, we combined the new problem gamblers and those who had relapsed into one group in rest of this report.
New problem gamblers
In this section, we continue to describe those who were non-problem gamblers in EP1 but became problem gamblers in EP2. Because we interviewed the same people at both measurements, we could monitor changes and show how habits and relationships at a point in time can be a predictor of forthcoming problems.

We also studied possible connections between other changes during the year and changes in levels of problem gambling. For such connections, we can only conclude that they occurred at the same time that problem gambling was changing, and we cannot conclude what was the cause or the effect.

Figure 42. Percentage of new problem gamblers from EP1 to EP2 by age and gender.

A total of 1.4% of the population aged 16–84 years in 2008 became problem gamblers in the following year. This ranged from 4% among boys 16–17 years old to a low of nearly 0% among men 45–64 years. The difference between men and women was significant in all age groups except for those who were 25–44 years in 2008/09.

Among men, there was a continued high proportion of new problem gamblers also among 18–24 year olds. This dropped to just under 2% among men 25–44 years old. It was virtually non-existent among men 45–64 years old but again closer to 2% among men 65 years and older. Among men, the percentage of new problem gamblers was higher among previous 16–17 year olds and 18–24 year olds than in other age groups and was significantly lower among former 45–64 year olds.
Among women, the percentage of new problem gamblers was significantly lower in the oldest age group compared with the previous 16–17 year olds and 45–64 year olds, but otherwise there were no clear differences between age groups.

**Figure 43.** Percentage of new problem gamblers by highest level of education and age.

There were roughly similar proportions of new problem gamblers (1.7%–1.8%) among men with compulsory school and high school as their highest education. The share of new problem gamblers among men with a university education was just over 1%. There was no significant difference between different educational groups for men.

For women, the pattern varied more between groups with different levels of education and the differences were significant ($p < 0.001$). The largest percentage of new problem gamblers (2.5%) was found among women with primary education as the highest attained education, and the lowest rate of problem gamblers (0.5%) was found among the women who had high school as their highest education. For women with a university education, the percentage of new problem gamblers was similar to that of men with a university education at around 1%. Age might be a confounding factor, but when we controlled for age we found no significant relationship between education and incidence.
CHANGING GAMBLING HABITS

There was a clear link between gambling regularly and problem gambling. The connection was clearer between gambling regularly with increasing degree of risk potential and problem gambling.

Figure 44. New problem gamblers in EP2 corresponding to monthly gambling in EP1.

The percentage of new problem gamblers was highest (7%) among those who gambled on games with a high risk potential followed by those who gambled on games with medium risk potential. Among those who did not gamble at all, and among those who gambled every month but only on game types with low risk potential, there were less than 1% new problem gamblers at EP2 with a slightly higher proportion among those who gambled less frequently than monthly. The question of who became a problem gambler primarily depended on the gambling habits in the year that elapsed between the waves. Irrespective of gambling habits in EP1, the risks were higher for those who gambled on games with high risk potential every month during the year between EP1 and EP2.

Of those who went from not gambling at all to gambling every month on games with high risk potential, 20% became problem gamblers. Among those who went from gambling less frequently than monthly to gambling every month on games with high risk potential, and among those who continued to gamble every month on games with high risk potential, nearly 10% became problem gamblers.
However, we did not see a high percentage of new problem gamblers in the group that gambled on a monthly basis previously on games with medium risk potential and low risk potential and later began gambling on games with high risk potential. A total of 5% of those who gambled previously on the games with moderate risk potential, and 3% of those who gambled previously on the games with low risk potential, became problem gamblers from EP1 to EP2.

**Figure 45.** Percentage of new problem gamblers among gamblers with high risk potential in EP2 after gambling in EP1.

<table>
<thead>
<tr>
<th>Percent</th>
<th>Non-gambler</th>
<th>Not gambling every month</th>
<th>Low risk potential</th>
<th>Medium risk potential</th>
<th>High risk potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>15</td>
<td></td>
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<td>10</td>
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<tr>
<td>5</td>
<td></td>
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</tr>
</tbody>
</table>

**LIFE EVENTS IN THE PAST YEAR**

Life events can bring major changes that can sometimes have consequences in the form of increased problems with different types of dependences, including gambling problems. In wave two, we asked about 13 different types of life events.

The life events that were associated with men becoming problem gamblers included death of a near relative, getting married or entering a new relationship, worsening economic problems, and increased arguments with a near relative. For women, legal difficulties and improved working conditions were associated with becoming problem gamblers.

Note that these relationships were valid under the same past 12 months within which a gambling problem developed, and some events such as increased arguments with a near relative might also be a consequence of gambling.
Results from wave one showed that gambling problems were more common among both women and men who had poor general health. For men, we also found a higher proportion of problem gamblers among those with poor mental health, among daily smokers, and among those with risky alcohol behaviours.

Only risky alcohol behaviour had an apparent connection with future gambling problems for men, and 3% of the men who had risky alcohol habits in EP1 became new problem gamblers in EP2.

Among men who did not belong in the group with risky drinking habits but ended up there from EP1 to EP2, almost 5% became problem gamblers. A similar relationship was seen to be emerging among women, but it was not statistically significant. In EP2 in particular, there was an increased proportion of new problem gamblers among women with risky alcohol habits. Current alcohol habits seemed to be related to problem gambling more than past alcohol behaviours.

The inverse relationship also held true, and those who were or would become problem gamblers in the following year had significantly higher risk of acquiring risky alcohol behaviours.

When it comes to poor mental health, there was an association with problem gambling among men. Nearly 3% of men with poor mental health became new problem gamblers in EP2.
Very few problem gamblers were seen among women with poor general health, and there were very few new problem gamblers among women with poorer general health in the previous year. Among men, we did not find any significant association between general health and becoming problem gamblers.

HOW DOES ONE LOOK AT ONE'S OWN GAMBLING

A scale with statements about gambling (Jonsson-Abbott Scale, JAS) were included in the questionnaire in EP1. The respondents had to enter a number from 1 to 7, where 1 meant that they did not agree with the statement and 7 meant they strongly agreed. The questions concerned gambling in the past year and therefore only those who gambled at some point during the past 12 months were given the questions.

We grouped the responses by combining responses 1–3 as corresponding to disagreeing and responses 4–7 as corresponding to agreeing in whole or in part. Figure 47 shows the percentage of new problem gamblers among those fully or partly agreeing with each statement.

The percentage of new problem gamblers was highest among those who at least partially agreed with the statements “I gamble for more money than I planned to”, “I gambled longer than I expected”, and “I see myself as a gambler.” The assessment of the statements shows clear correlation, and this means that many people might have agreed with several statements.
Figure 47. The proportion of new problem gamblers among those who agreed completely or partially with the statements in wave one. The questions were posed to those who gambled sometime in the past year. Among these, the incidence was 1.7%

<table>
<thead>
<tr>
<th>Statement</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>I gamble for more money than I had intended</td>
<td>15%</td>
</tr>
<tr>
<td>I gamble for more time than I had intended</td>
<td>10%</td>
</tr>
<tr>
<td>I consider myself a gambler</td>
<td>10%</td>
</tr>
<tr>
<td>If I gamble just enough it will be profitable</td>
<td>5%</td>
</tr>
<tr>
<td>My gambling helps me make friends</td>
<td>0%</td>
</tr>
<tr>
<td>I find it difficult to stop gambling</td>
<td>0%</td>
</tr>
<tr>
<td>My gambling is a way for me to earn money</td>
<td>0%</td>
</tr>
<tr>
<td>Gambling is the most enjoyable activity available</td>
<td>0%</td>
</tr>
<tr>
<td>Gambling helps me forget about everything else for sometime</td>
<td>0%</td>
</tr>
<tr>
<td>I win a game depending on my skills</td>
<td>0%</td>
</tr>
<tr>
<td>I gamble because it is exiting</td>
<td>0%</td>
</tr>
<tr>
<td>I gamble when in reality I should have been doing something else</td>
<td>0%</td>
</tr>
<tr>
<td>I have strategies that help me not to gamble excessively</td>
<td>0%</td>
</tr>
<tr>
<td>I prefer gambling alone</td>
<td>0%</td>
</tr>
</tbody>
</table>

Analysis of contributing factors

To go within a year from not gambling at all or gambling without any problems to having problems with gambling (incidence) is one of the major changes we have studied. Among the new problem gamblers, there was a combination of people who were completely problem free and those who already were at risk for gambling problems.

Another type of change of interest to us is when someone goes from not gambling at all or gambling without any signs of risk to having some degree of gambling problems (at least 1 point according to the PGSI). Some of the background factors were the same as for the new problem gamblers, but there were also differences. We describe this group who go from not having any problem of any degree as new at-risk gamblers.
We also show that many people experienced reduced degrees of problems over the course of the year. Here we distinguish between the overall reduction of the problem (gamblers with lower level of problem) defined by moving from one category on the PGSI classification to any lower category – e.g. from elevated risk to some risk – and going from being a problem gambler in EP1 (increased risk or problem gambling) to no longer being a problem gambler at EP2 (former problem gamblers).

Table 20. Types of transitions for risk and problem gambling from wave one to wave two.

<table>
<thead>
<tr>
<th>Studied subgroups</th>
<th>PGSI 2008/2009</th>
<th>Number of individuals</th>
<th>Transition category 2009/2010</th>
<th>Weighted percentage of the subgroup studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earlier non-gamblers and gamblers without problems</td>
<td>0</td>
<td>5 331</td>
<td>New risk gamblers (PGSI 1+)</td>
<td>3.4%</td>
</tr>
<tr>
<td>All, with an exception of problem gamblers 2008/2009</td>
<td>Less than 3</td>
<td>5 829</td>
<td>Incidence (PGSI 3+)</td>
<td>1.4%</td>
</tr>
<tr>
<td>Previous gamblers with low risk, moderate risk or gambling problems</td>
<td>1 or more</td>
<td>690</td>
<td>Gamblers with reduced degree of gambling problem (at least by one PGSI-category than earlier)</td>
<td>69.1%</td>
</tr>
<tr>
<td>Problem gamblers 2008/2009</td>
<td>3 or more</td>
<td>192</td>
<td>Previous problem gamblers (&lt;PGSI 3)</td>
<td>73.9%</td>
</tr>
</tbody>
</table>

The new problem gamblers were previously non-gamblers, gamblers without a gambling problem, or gamblers with some risk of gambling problems. Gamblers with a reduced degree of gambling problems were those who previously had low risk, moderate risk, or gambling problems and previous problem gamblers; those who had moderate risk at EP1 but had low risk at EP2 and those who had a gambling problem at EP1 but had a moderate risk or lower at EP2.

In this section, we describe which factors correlate most clearly with increased or decreased levels of gambling problems. The results are based on a multivariate analysis that was used in order to determine the effect of each and every independent variable. ORs were used to describe the results, and significant ORs indicate an increased risk in relation to changing degree of gambling problem. Some factors varied with the degree of gambling prob-
lem, but such factors had a less clear direct effect due to their correlation with other factors that also varied with the degree of gambling problems. We looked especially at the wave 1 measurement but also for changes over the course of one year. Results for an increasing degree of gambling problems were clearer than for lowering degrees of gambling problems due to considerably larger groups.

**Sociodemographic factors**

Gender and age were significantly associated with altered levels of gambling problems. Young men under the age of 25 years were at greatest risk when it came to new at-risk gamblers, but there was also a generally higher risk for men of all ages and for women under the age of 25 years. Even for the new problem gamblers, there was a similar pattern but with a slightly weaker connection when we took other factors into account. We consistently controlled for gender and age and for all of the other background variables in order to look for direct associations between the changes and the degree of gambling problems.

The risk of being an at-risk gambler or a problem gambler was twofold higher for people born outside Sweden. However, we found no significant association between living in one of the three metropolitan municipalities and an increased rate of problem gambling.

Much to our surprise, education did not show any associations with altered levels of problem gambling even though it is considered to be one of the variables that usually indicates a connection with gambling problems. There are several studies that show a clear link between rising levels of education and lowering levels of problem gambling, and this was confirmed in EP1.

Having problems with paying bills and falling short on meeting household needs could to some extent be a sign of risk at present or in the future for risky or problem gambling, but there was no clear, direct statistical correlation in our data. The relationship between problems with household economy and increased levels of problem gambling might have their origins in common underlying factors. To have someone who can help with practical things or illness or to have someone to share their innermost feelings with was associated with lower risk of becoming a problem gambler or an at-risk gambler. However, the connection was not as clear when we took into account more factors, and this suggests that social support is rather indirectly linked with problem gambling and is thus not a clear protective factor.
Gambling and computer games – changes during the year
People who had gambled at any time had twofold higher risk of having an increased degree of gambling problem a year later, irrespective of whether it was becoming an at-risk risk gambler or a problem gambler.

Gambling at work or school hours very clearly indicated increased risk for gambling problems. In EP1 we found that those who gambled instead of working or engaging in schoolwork had a higher risk of becoming at-risk gamblers. We found that those who did not engage in any such gambling practices previously but had started in the year between EP1 and EP2 had a twofold higher risk of becoming an at-risk gambler and more than double the risk of becoming a problem gambler.

We also found a clear increased risk of becoming problem gamblers for those who gambled on video or computer games in EP1. This relationship was maintained even when we controlled for gender and age. Although the risk of becoming an at-risk gambler was higher among those who gambled on video or computer games in EP1, this risk disappeared when we took more factors into account.

Health indicators – state at EP1 and changes during the year
Good general health had a strong statistical association with reduced risk of becoming a problem gambler, and those who had good general health had half the odds of becoming problem gamblers. There was also some correlation between poor general health and becoming an at-risk gambler, but this effect disappeared when other interacting factors were included.

There was a certain relationship between poor mental health at EP1 and future increased risk of becoming an at-risk gambler or a problem gambler. Above all, it was poor mental health during the year between the measurements that correlated with increased risk for both risky and problem gambling and with not being able to reduce their gambling problem.

Heavy alcohol consumption was clearly correlated with all sorts of changes in the level of problem gambling. It increased the risk for risky gambling and problem gambling and reduced the probability of moving to a lower rate of problem gambling or going from being a problem gambler to not being a problem gambler. It was the only factor that uniquely correlated with all the changes that we analysed with multivariate models.

Those who acquired risky alcohol habits during the year between measurements had an especially increased risk for problem gambling. The odds
were higher for those who acquired risky alcohol habits over the year than for those who already had risky alcohol habits at EP1, especially for becoming an at-risk gambler or a problem gambler.

Smoking had no direct statistical correlation with either increased or decreased levels of problem gambling in our study, but there were some associations with increased risk when we only adjusted for age and gender.

**Life events in the past year**

Momentous events, so-called "life events", might affect gambling habits. With regards to the relationship between life events and changing degree of gambling problems, we found associations but not causality because both events occurred during the same time period.

A near relative's death was associated with increased risk of becoming a problem gambler, even when we took other factors into account. Divorce or separation was associated with a lower chance for a problem gambler to reduce his or her gambling problem even when other factors were taken into account, and we also found an association with an increased risk of becoming an at-risk gambler or a problem gambler. Similarly, marriage or being in a new relationship was associated with an increased risk of becoming a problem gambler.

An increased number of arguments with a near relative was associated with increased risk of gambling and problem gambling and an overall decreased likelihood of lowering levels of problem gambling. To some extent, it was also associated with reduced chance for a problem gambler to move to a lower level of problem.

Seriously impaired economy clearly correlated with the risk of going from no gambling problems to becoming an at-risk gambler, but there was also some correlation between markedly improved economy and increased risk of either becoming an at-risk gambler or even a problem gambler. For those who took out a loan or sold a major investment, there was also a link with increased risk of problem gambling, but this disappeared when we took other factors into account.

Markedly improved self-reported working conditions were significantly associated with increased risk of becoming at-risk gamblers. Worsening of working conditions also led to some increased risk of becoming an at-risk gambler, but the relationship disappeared when more factors were considered in the models. Problems with work or with one's boss or other superiors were also associated with increased risk of becoming an at-risk gambler,
but the risk was reduced in a model with more explanatory variables. This, along with the fact that gambling during working hours also correlated with increased risk of becoming an at-risk gambler, shows that working conditions and changing working conditions highly correlated with the risk of developing a gambling problem. On the contrary, we found no association between retirements and increased or decreased levels of problem gambling.

Possible effects of legal difficulties, serious injury or illness of oneself or of a family member, pregnancy, or additions to the family as well as major changes in housing conditions were not so strong that any correlation persisted when we controlled for other factors.

Conclusions from wave two

- Many people go into and out of problem gambling over the course of a year. Three quarters of the former problem gamblers were replaced with new problem gamblers.
- Half of the new problem gamblers were women and 85% of continued problem gamblers were men.
- Risky alcohol consumption and poor mental health are important risk factors for problem gambling.
- There are connections between problem gambling and life events.
- Casino games, gambling machines and many forms of internet gambling have a high risk potential.
- Important arenas for prevention are schools, work places and some gambling venues/sites.

High incidence of problem gambling

Many people go into and out of problem gambling over the course of a year. The proportion of problem gamblers was unchanged, but three-fourths of the previous problem gamblers were replaced with new problem gamblers. Some of the new problem gamblers were individuals who had previously had gambling problems while others were completely new problem gamblers. A large turnover among problem gamblers indicates that the proportion of persons who have had gambling problems during their lives is larger than the approximately 2% who have had gambling problems at a single point in time.
Large differences between continued and new problem gamblers

Almost half of the new problem gamblers were women. In total, approximately 100,000 people in the Swedish population between the ages of 16 and 84 years became problem gamblers in one year between wave one (2008/09) and wave two (2009/10), i.e. those who went from no problems or low risk to problem gambling. Almost half of these were women. The new problem gamblers were present in all age groups, but particularly among adolescents and young adults (up to 25 years) and among those who were 65 years and older. The highest incidence was among adolescent men and older women. About a quarter of all the new problem gamblers were under the age of 25.

85% of continued problem gamblers were men. Just over 40,000 people were continued problem gamblers between the two waves of measurement, and nearly half of them had a serious gambling problem. Men accounted for approximately 85% of those who were continued problem gamblers.

Problem gambling is connected to health and other factors

Risky alcohol consumption and poor mental health important risk factors. There was a connection between poor mental health and higher incidence of problem gambling specifically for men. We also noted a connection between developing risky drinking habits during the year and increasing gambling problems. Risky alcohol behaviours, divorce or separation, and increased arguments with a close relative reduced the likelihood of recovering from a gambling problem.

There are connections between problem gambling and life events. In terms of life events, we found the strongest connection between incidence and the death of a close relative. Likewise, there was a clear connection between incidence and a higher number of arguments with a close relative, but these arguments might also have been a consequence of more gambling problems. Severely worsened finances co-varied with an increased risk of gambling problems, but there was also a connection between markedly improved finances and an increased risk of gambling problems. In the same way, there were connections between problem gambling and both positive and negative changes in employment circumstances.
Important arenas for prevention

Schools and work places are important arenas for prevention. Both better and worse self-reported working conditions might increase the risk of problem gambling. Gambling at work or school was clearly correlated with increased levels of problem gambling. Prevention in the workplace primarily by limiting the opportunities to gamble at work can thus be important for helping to prevent people from becoming problem gamblers. There was also a correlation between problems at the workplace and problems with managers and superiors and an increased rate of problem gambling.

Casino games, gambling machines and many forms of internet gambling have a high risk potential. Around 5% of the Swedish population gambles on games with a high risk potential every month. Those who gambled on games with the highest risk potential every month in one year between wave one and wave two had the highest incidence of problem gambling. The degree of risk potential was determined through combinations of various different factors such as the speed of the game, the opportunity to play multiple games, light and sound effects, and the speed with which the winnings were paid out for each gambling type. We found that casino games, gambling machines, and many forms of gambling on the internet have a high risk potential.
Overall conclusion

Problem gambling is a public health problem

Based on the results of this report, we conclude that gambling problems in Sweden are a public health problem. A public health problem is one that

- occurs frequently
- has serious negative consequences
- is unevenly distributed among the population
- is preventable.

OCCEURS FREQUENTLY

In wave 1, gambling among minors was found in all forms of gambling despite the fact that almost the entire gambling market had a minimum age limit of 18 years. In wave 2, we still found underage gambling among 17 year olds. The percentage of new problem gamblers among 17-year-old boys was 2.1%, corresponding figures for 17-year-old girls was below 0.1%.

The proportion of problem gamblers in the population was 2%, but three-quarters of the problem gamblers were replaced with new problem gamblers over the course of one year. A fifth of the new problem gamblers had gambling problems earlier in life. In addition, 4%–5% of the population had some risk of gambling problems and they were at a higher risk of becoming problem gamblers. Taken together, this showed that gambling problems affect a much larger proportion of the population than just those with problems at a particular time.

SERIOUS NEGATIVE CONSEQUENCES

In wave one, the negative consequences that were associated with problem gambling included poor mental health, risky alcohol and smoking habits, violence and financial problems. Risky drinking behaviour in particular was a clear indicator of future problem gambling and for poor mental health. We found that separation or divorce made it less likely for gambling problems to be reduced.
UNEQUAL DISTRIBUTION IN THE POPULATION
Gambling problems are found throughout the population, but there are major differences between different population groups. The percentage of new problem gamblers was 1.4% in the general population and 4% among men aged 18–24 years and under 0.5% among men aged 45–64 years and women aged 65–84 years. Men had previously been in the clear majority among the problems gamblers, but women made up nearly half of the new problem gamblers. The results also show social differences between problem gamblers and people who do not have problems with their gambling. The proportion of problem gamblers is highest among those with the lowest level of education, the lowest income, and low socioeconomic status. There is a large proportion of problem gamblers among people who receive social allowance or unemployment benefits or have problems with their household economy. A comparison with the previous epidemiological study into gambling and gambling problems from 1997/98 revealed that the connections between gambling problems and social differences had become stronger for men in the 2008 study.

PREVENTABLE
Our results show that it is common for people to move in and out of gambling problems even before the problem becomes chronic or a progressive disease. Although our study cannot conclude on the effectiveness of any preventive measures, we interpret the results that problem gambling is characterized by fluidity as an indication that problem gambling is preventable. We therefore find an urgent need that preventive measures are developed, evaluated and implemented. Both wave one and wave two show that important groups for prevention are minors and the socially disadvantaged and important arenas are schools, work places and some gambling venues/sites. However, there is also a need for more general measures because gambling problems are distributed throughout the population and with all forms of gambling.
Knowledge gaps for future research

An important part of Swelogs is to identify the causes for the occurrence and continuation of gambling problems. During the period 2011-2015 we have conducted two further data collections in the epidemiological track and one in the in-depth track. Continuing work with Swelogs will lead to improved knowledge on:

- risk and protective factors,
- the extent of the problem,
- important factors at the group level and at the structural level for problem gambling,
- characteristics of people at risk, and
- mobility between different levels of problem gambling.
References


Presentation of the Swelogs Advisory Board

**Max Abbott** is Pro Vice-Chancellor and Dean of the Faculty of Health and Environmental Sciences at Auckland University of Technology, New Zealand, where he is also Professor of Psychology and Public Health, Co-director of the National Institute for Public Health and Mental Health Research, and Director of the Gambling and Addictions Research Centre. Max Abbott was a member of the research group conducting SWEGS 1996-2003.

**Rachel A. Volberg**, Ph.D., has been involved in research on gambling and problem gambling since 1985 and is widely regarded as the most experienced problem gambling epidemiologist in the world. Dr. Volberg has directed or consulted on numerous studies throughout the world, including national prevalence surveys in the United States, Australia, New Zealand, Great Britain, and Sweden. Rachel Volberg was a member of the research group conducting SWEGS 1996-2003.

**Per Binde** is an associate professor in social anthropology at the University of Gothenburg, Sweden and has been in the research field of gambling since 2001. His interest in gambling is broad, with a focus on the cultural roots of gambling, its social contexts, and its regulation.

**Jakob Jonsson** is a clinical psychologist with experience from problem gambling and responsible gambling since 1992. He was a member of the SWEGS research team from 1996 to 2003 and was responsible for writing the phase two SWEGS reports. Jakob works at Sustainable Interaction, a private company specializing in problem gambling and responsible gambling where he works with treatment, research, and responsible gambling. He is also a PhD student at Stockholm University.

**Anders Tengström** has been active in the research area of gambling addictions since 2004 and was one of the appointed experts in the governmental gambling evaluation of 2007-08.
Anders Stymne was from February 2001 until May 2008 project manager in the Swedish Institute of Public Health and responsible for the efforts of the Institute concerning problem gambling. Anders has been a part of the secretariat in three governmental inquiries on drug issues and was an expert for the inquiry on gambling.
The Swedish Longitudinal Gambling Study, Swelogs, was launched in 2008 with the purpose of acquiring up-to-date knowledge on gambling in Sweden. In this report, results from the first and the second epidemiological studies carried out during November 2008 to August 2009 and December 2009 to May 2010 are presented.

The report is primarily intended for researchers, experts, and politicians interested in the area, but it might also be of interest to those who come across people with gambling problems within their families or at their workplaces, as well as to other concerned parties.

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