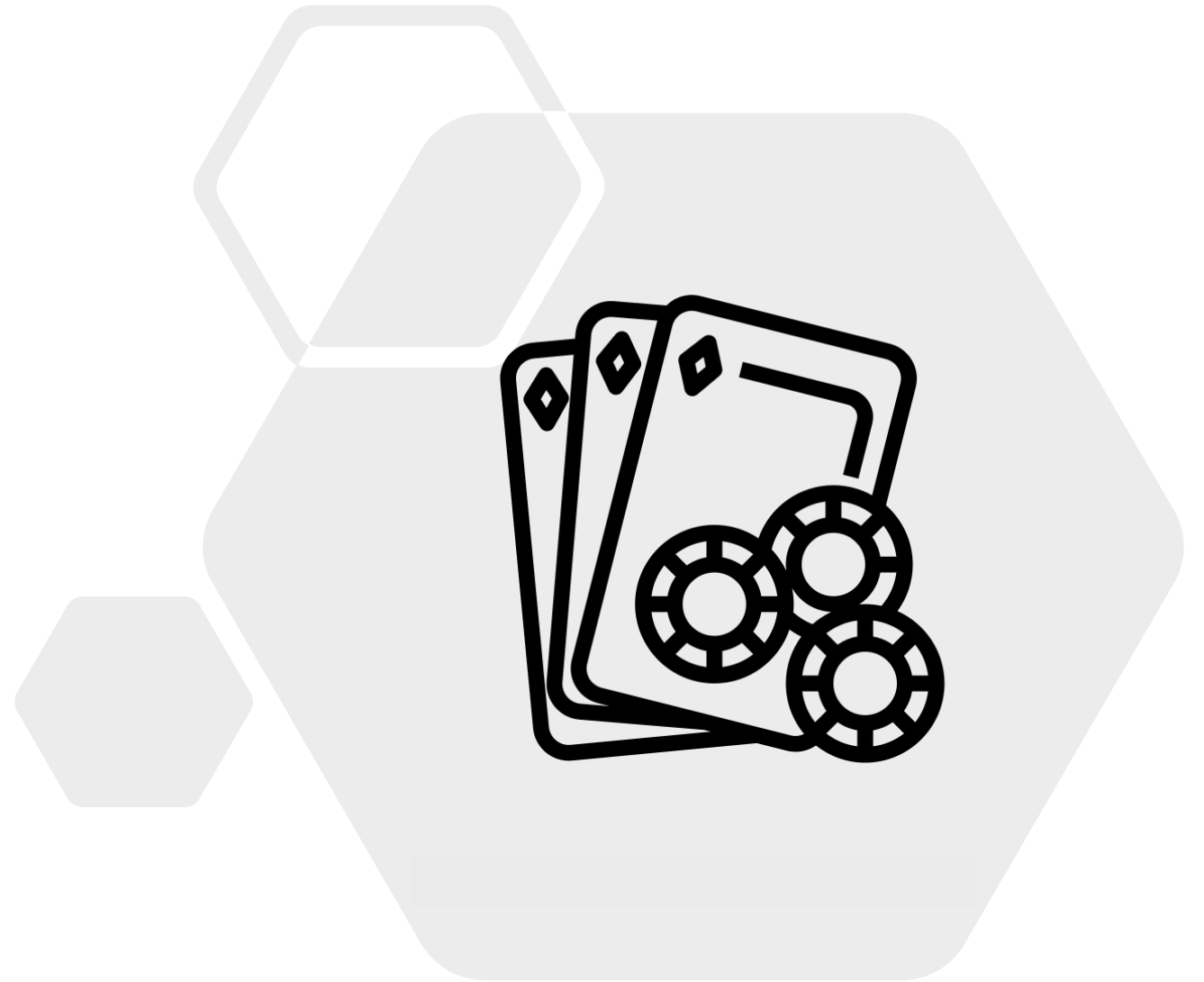# Sociodemographic risk factors for risky and disordered gambling – Investigations through registry data

André Syvertsen
University of Bergen, Norway
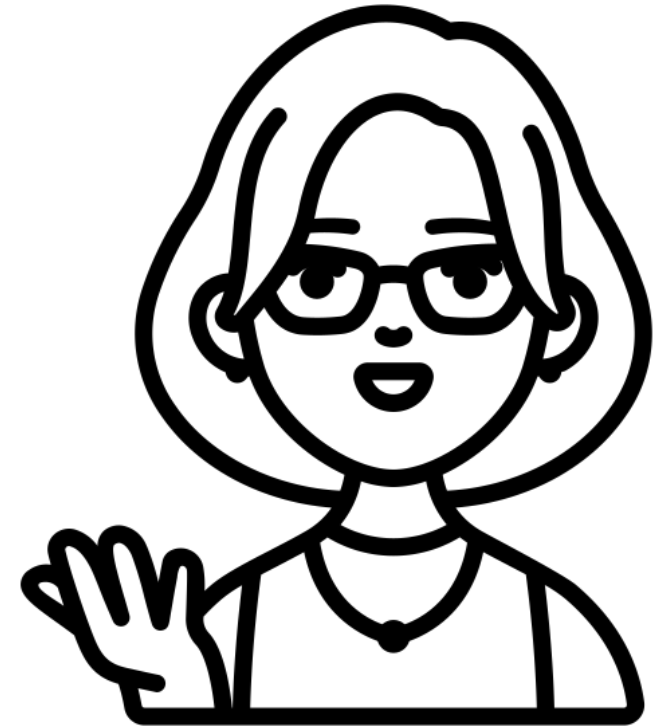National Competence Centre for Gambling and Gaming Research (SPILLFORSK)

Background

Gambling is regulated as a monopoly in Norway

Multix represents one of the only physical electronic gaming machines available

Study 1: How do annual trends in average gambling and high-intensity gambling vary by age and gender?

Overview of study 1

Sample:

Norsk Tipping's *Multix* Electronic Gaming Machine customers (n = 195,318 individuals (26.5% women)).

Age ranged from 18 to 103 years (M = 41, SD = 16).

Time period: March 2013 to December 2018, 70 months.

Indicator of gambling intensity: <u>Theoretical loss</u>

Analyses: Distribution of 90th percentile theoretical loss, quantile regressions on same measures.

Yearly trends: gambling participation

Yearly trends in EGM participation

Table 1.

Participants on Multix between 2013 and 2018 by gender.

Age Categories	2013[1] (N = 101,695)		2014 (N = 102,626)		2015 (N = 94,253)		2016 (N = 94,599)		2017 (N = 89,465)		2018 (N = 80,607)	
	Men N = 75,564	Women N = 26,131	Men N = 75,459	Women N = 27,167	Men N = 69,327	Women N = 24,926	Men N = 69,645	Women N = 24,954	Men N = 65,890	Women N = 23,585	Men N = 59,318	Women N = 21,289
18-29 years	23,333 (31%)	5,273 (20%)	21,484 (28%)	5,229 (19%)	1,207 (26%)	4,409 (18%)	17,641 (25%)	4,173 (17%)	15,600 (24%)	3,658 (16%)	12,605 (21%)	2,939 (14%)
30-39 years	15,070 (20%)	4,200 (16%)	15,092 (20%)	4,309 (16%)	13,480 (19%)	3,716 (15%)	13,877 (20%)	3,679 (15%)	13,125 (20%)	3,422 (15%)	11,826 (20%)	3,036 (14%)
40-49 years	15,284 (20%)	5,194 (20%)	15,093 (20%)	5,346 (20%)	13,640 (20%)	4,802 (19%)	13,220 (19%)	4,691 (19%)	12,126 (18%)	4,344 (18%)	10,729 (18%)	3,834 (18%)
50-59 years	11,476 (15%)	4877 (19%)	12,365 (16%)	5,088 (19%)	12,199 (18%)	4,823 (19%)	12,464 (18%)	4,880 (20%)	12,330 (19%)	4,730 (20%)	11,553 (19%)	4,381 (21%)
60-69 years	7,046 (9.3%)	3,887 (15%)	7,648 (10%)	4,172 (15%)	7,782 (11%)	4,150 (17%)	8,049 (12%)	4,260 (17%)	8,019 (12%)	4,080 (17%)	7,806 (13%)	3,784 (18%)
70+ years	3,355 (4.4%)	2,700 (10%)	3,777 (5.0%)	3,023 (11%)	4,019 (5.8%)	3,026 (12%)	4,394 (6.3%)	3,271 (13%)	4,690 (7.1%)	3,351 (14%)	4,799 (8.1%)	3,315 (16%)

Note. [1]From March to December. Column percentages.

Yearly trends in EGM participation

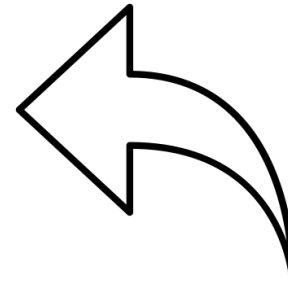| Age Categories	2013[1] (N = 101,695)	
	Men N = 75,564 (74%)	Women N = 26,131 (26%)
18-29 years	23,333 (31%)	5,273 (20%)
30-39 years	15,070 (20%)	4,200 (16%)
40-49 years	15,284 (20%)	5,194 (20%)
50-59 years	11,476 (15%)	4877 (19%)
60-69 years	7,046 (9.3%)	3,887 (15%)
70+ years	3,355 (4.4%)	2,700 (10%)

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Note. [1]From March to December. Column percentages.

Yearly trends in gambling intensity: most intense gamblers
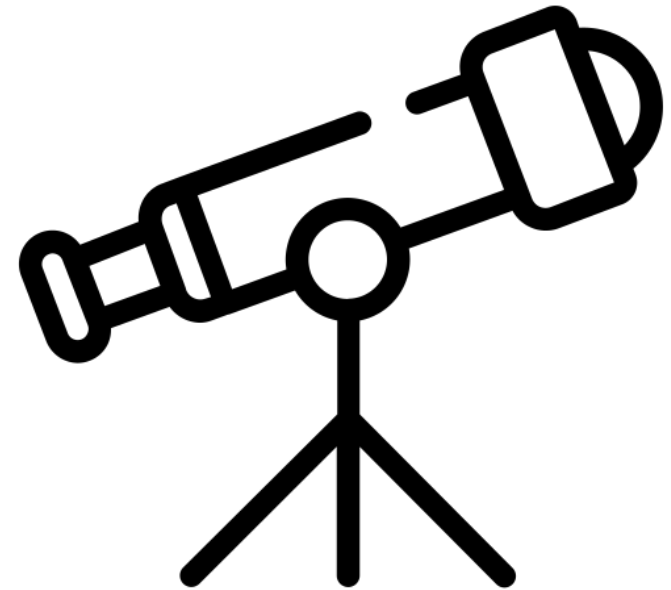
90th Percentile Theoretical Loss (NOK)

Men
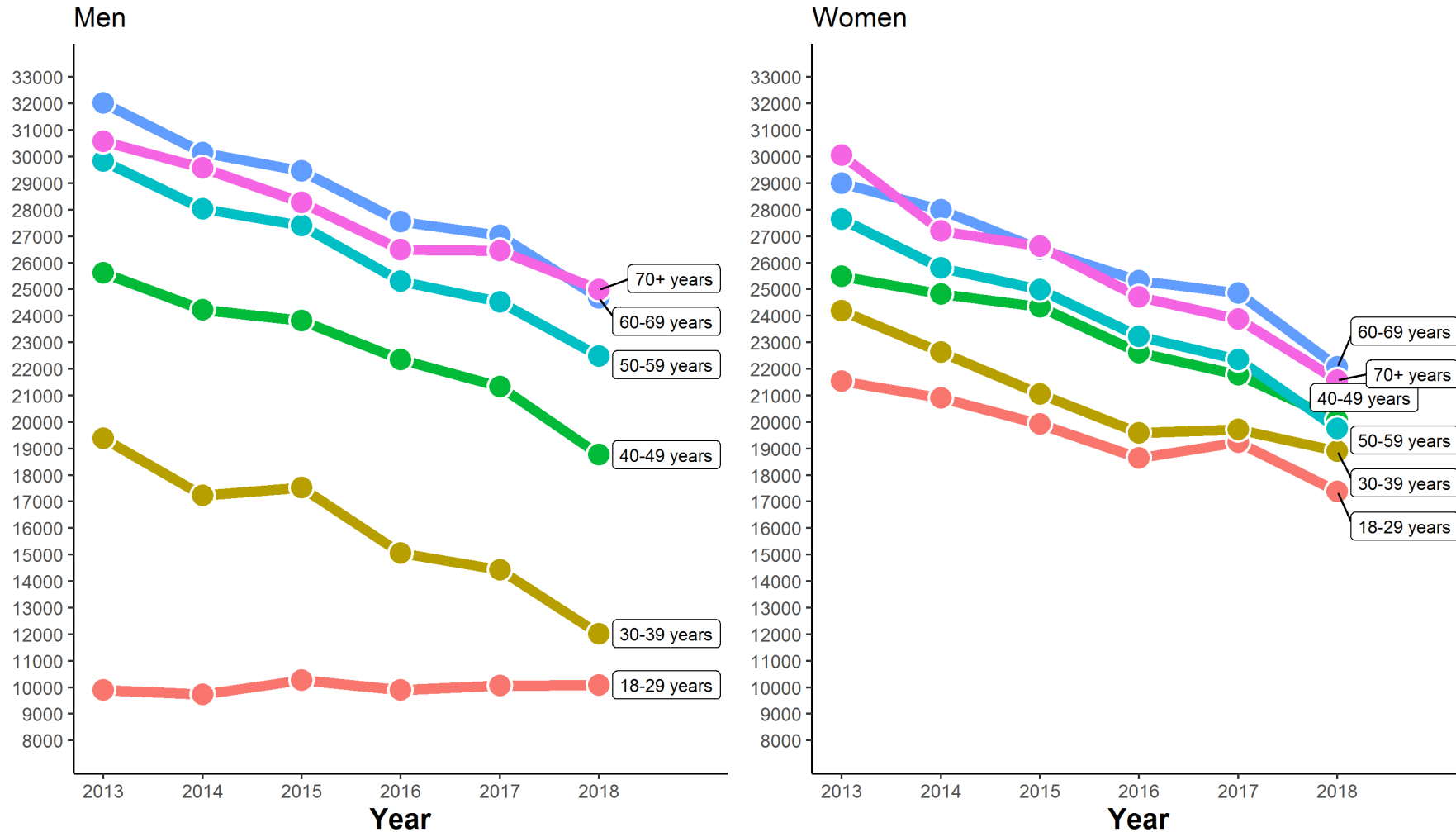
Women

Study 2: Do women develop risky gambling faster than men?

Telescoping:
"The accelerated progression from starting a potentially addictive behavior to reaching a disordered level of that behavior"

Overview of study 2

Sample:

Norsk Tipping's *Multix* Electronic Gaming Machine customers (*n* = 184,113 individuals (27.0% women)).

Age ranged from 18 to 103 years (*M* = 41, *SD* = 16).

Time period: March 2013 to December 2018, 70 months.

Indicator of risky gambling: Meeting monthly loss-limit

Analyses: *t* test for investigating age differences, survival analysis to examine time to risky gambling (Kaplan-Meier + Cox regression)

Were women older when starting gambling on Multix?

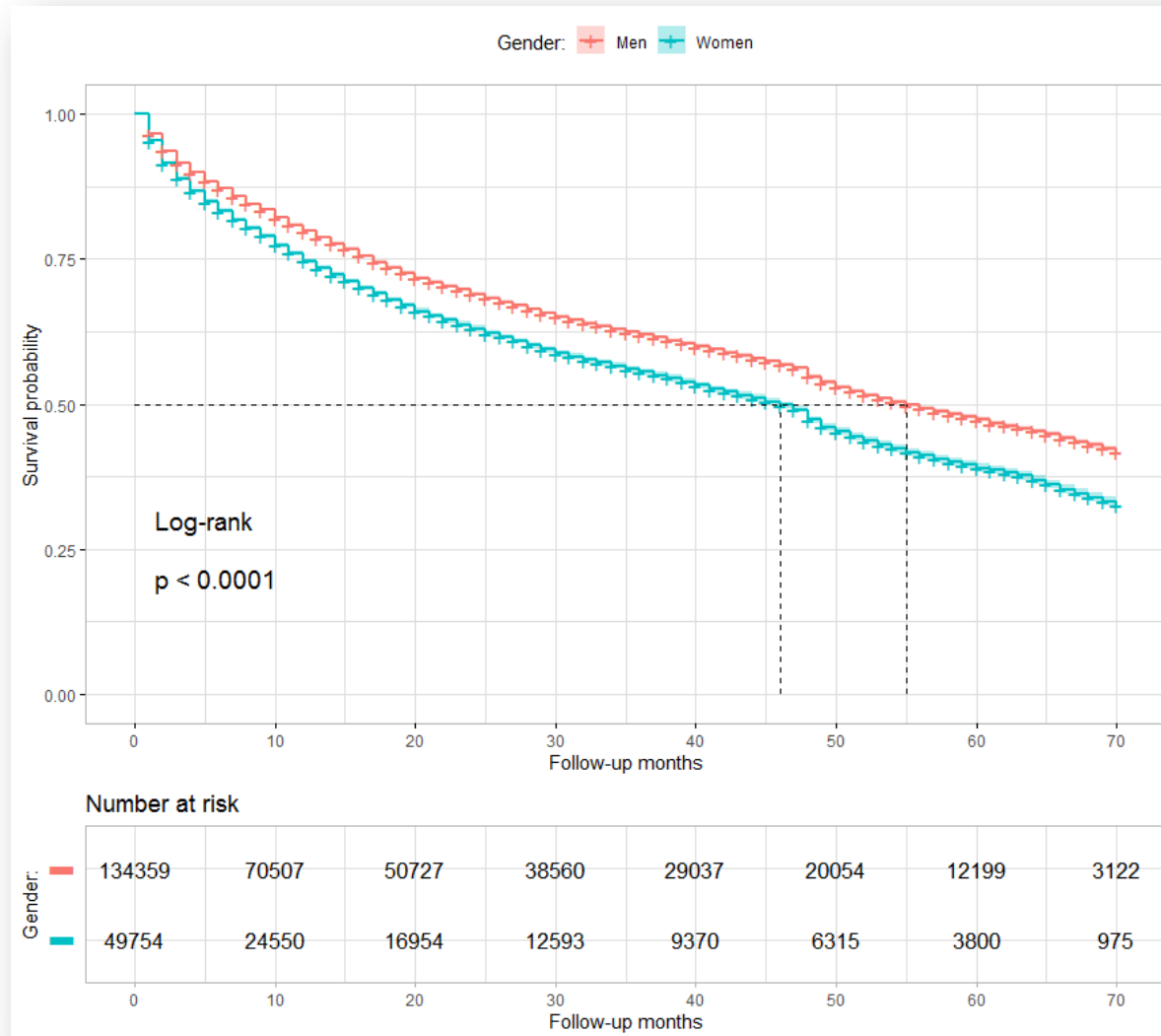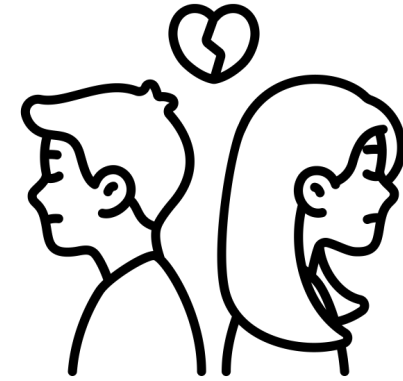| Age at start[2]				
Median (IQR)	37 (27, 50)	45 (31, 58)		
Mean (SD)	40 (15)	46 (17)	<0.001	-0.358

Do women develop risky gambling faster?

Study 3

Does divorce increase the odds for gambling disorder?

Does marriage reduce the odds for gambling disorder?

Overview of study 3

Samples (case-control design):
All adults receiving first GD diagnosis (*n* = 5,121) between 2008-2018.
Controls: general population (*n* = 26,685) and somatic/psychiatric controls
(*n* = 27,826). Controls matched on gender and age.

Time period: January 2008 to December 2018, 11 years.

Analyses: Unconditional logisitic regression

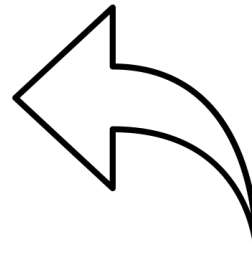# Marital status and risk for gambling disorder

Table 3.

Logistic regressions for marriage on odds for first gambling disorder diagnosis

	Against NPR illness control (n = 16,925)			Against FD-Trygd general control (n =15,940)		
Predictor	OR[1]	95% CI[1]	p-value	OR[1]	95% CI[1]	p-value
Age in 2008	1.01	[1.00, 1.01]	<0.001	1.01	[1.00, 1.01]	<0.001
Gender						
Men (reference)	1.00	—		1.00	—	
Women	1.10	[0.99, 1.22]	0.076	1.00	[0.90, 1.11]	0.976
Exposure						
Unmarried (reference)	1.00	—		1.00	—	
Marriage	0.62	[0.55, 0.70]	<0.001	0.57	[0.50, 0.64]	<0.001

Note. [1]OR = odds ratio, CI = confidence interval. GD cases= 3,610.

Table 2.

Logistic regressions for divorce on odds for first gambling disorde

	Against NPR illness control (n = 8,114)			Again
Predictor	OR[1]	95% CI[1]	p-value	OR[1]
Age in 2008	1.01	[1.00, 1.01]	0.13	1.00
Gender				
Men (reference)	1.00	—		1.00
Women	0.77	[0.66, 0.90]	0.001	0.75	[0.64, 0.87]	<0.001
Exposure				
Married (reference)	1.00	—		1.00
Divorce	2.45	[2.06, 2.92]	<0.001	2.41	[2.02, 2.87]	<0.001

Note. [1]OR = odds ratio, CI = confidence interval. GD cases = 1,076.

Marital status and risk for gambling disorder

Exposure

Married (reference)	1.00	—
Divorce	2.45	[2.06, 2.92]

Exposure

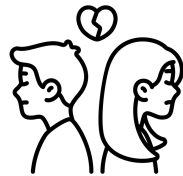|		
Unmarried (reference)	1.00	—
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Table 3.

Logistic regressions for marriage on odds for first gambling disorder diagnosis

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Predictor	OR[1]	95% CI[1]	p-value	OR[1]	95% CI[1]	p-value
Age in 2008	1.01	[1.00, 1.01]	<0.001	1.01	[1.00, 1.01]	<0.001
Gender						
Men (reference)	1.00	—		1.00	—	
Women	1.10	[0.99, 1.22]	0.076	1.00	[0.90, 1.11]	0.976
Exposure						
Unmarried (reference)	1.00	—		1.00	—	
Marriage	0.62	[0.55, 0.70]	<0.001	0.57	[0.50, 0.64]	<0.001

Note. [1]OR = odds ratio, CI = confidence interval. GD cases = 3,610.

Table 2.

Logistic regressions for divorce on odds for first gambling disorder diagnosis

	Against NPR illness control (n = 8,114)			Against FD-Trygd general control (n =10,116)		
Predictor	OR[1]	95% CI[1]	p-value	OR[1]	95% CI[1]	p-value
Age in 2008	1.01	[1.00, 1.01]	0.13	1.00	[0.99, 1.00]	0.573
Gender						
Men (reference)	1.00	—		1.00	—	
Women	0.77	[0.66, 0.90]	0.001	0.75	[0.64, 0.87]	<0.001
Exposure						
Married (reference)	1.00	—		1.00	—	
Divorce	2.45	[2.06, 2.92]	<0.001	2.41	[2.02, 2.87]	<0.001

Note. [1]OR = odds ratio, CI = confidence interval. GD cases = 1,076.

Objective gambling behavior data and health registry data can be utilized to add to our knowledge of risk factors for risky and disordered gambling
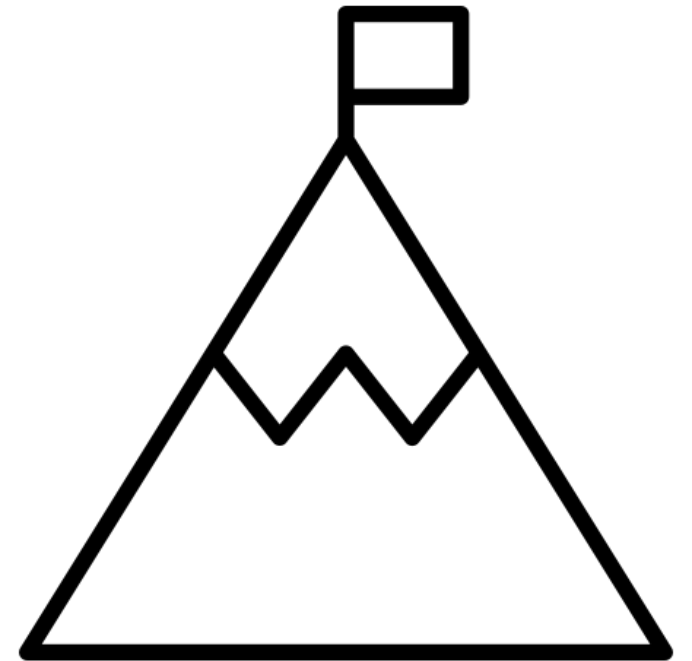
The individual studies

- <u>Study 1:</u> Syvertsen, A., Leino, T., Pallesen, S., Smith, O. R. F., Mentzoni, R. A., Griffiths, M. D., & Erevik, E. K. (2023). **Age and gender differences in gambling intensity in a Norwegian population of electronic gaming machine players**. *International Gambling Studies*, 1–21. https://doi.org/10.1080/14459795.2023.2199051

- <u>Study 2:</u> Syvertsen, A., Leino, T., Pallesen, S., Smith, O. R. F., Mentzoni, R. A., & Erevik, E. K. (2022). **Telescoping and gender differences in high-risk gambling: Loss limit behavior in a population of electronic gaming machine players.** *Psychology of Addictive Behaviors*. https://doi.org/10.1037/adb0000844

- <u>Study 3:</u> Syvertsen, A., Leino, T., Pallesen, S., Smith, O. R. F., Sivertsen, B., Griffiths, M. D., & Mentzoni, R. A. **Marital status and gambling disorder: A longitudinal study based on national registry data.** (2023). *BMC Psychiatry*, *23*(1), 199. https://doi.org/10.1186/s12888-023-04697-w