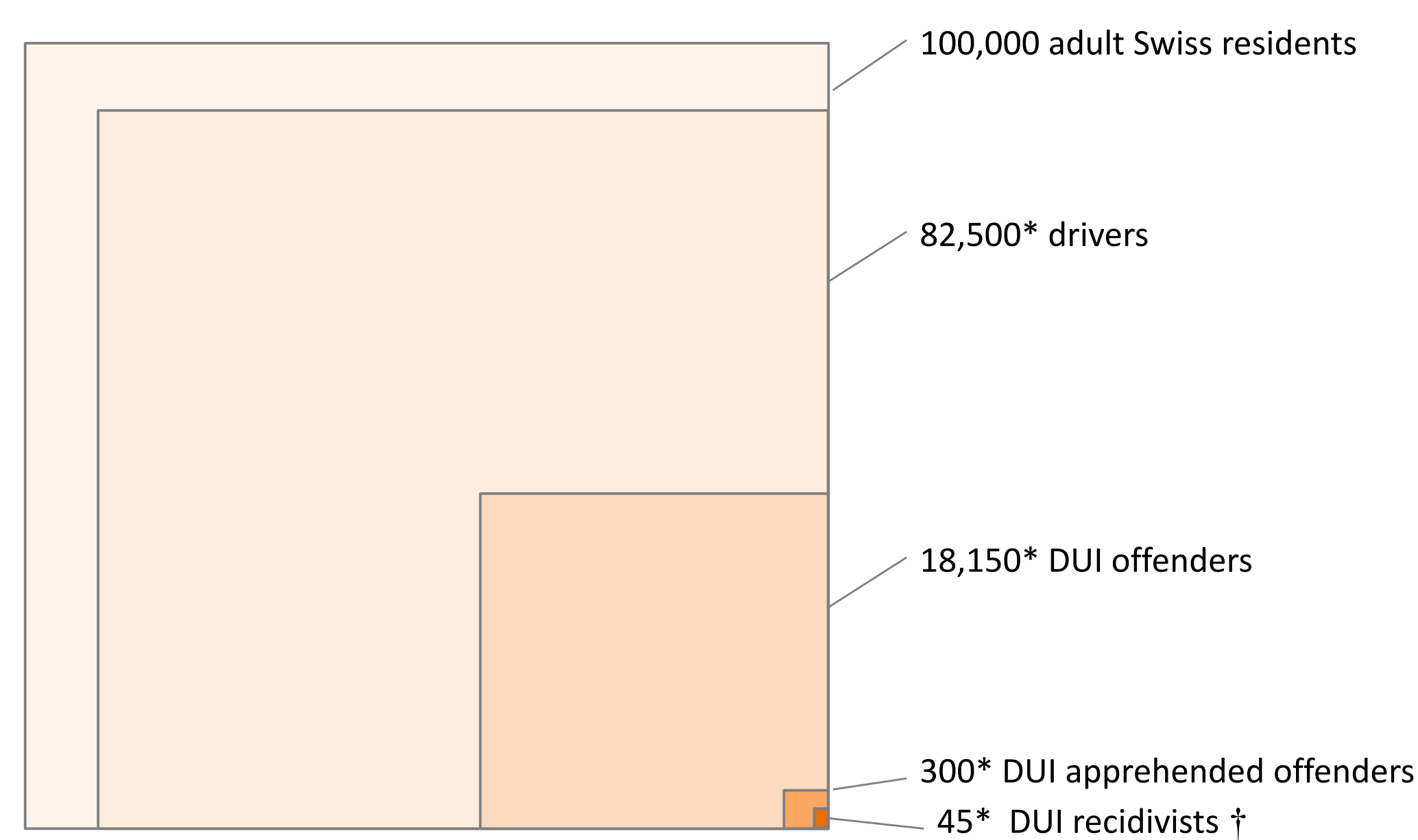


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#### BACKGROUND:

One unintentional accident out of four is due to alcohol which is also responsible of 3.8% of all deaths and is therefore one of the most important avoidable known risk factors affecting health.<sup>1</sup> Alcohol-related traffic fatality occurs every 31 minutes in the United States and represent 39% of total traffic fatalities.<sup>2</sup> Number of drivers self reporting having driven after having drunk too much varies considerably between countries with a year period prevalence of 2.9% in the US,<sup>3</sup> of 21.8% in Switzerland<sup>4</sup> and a six month period prevalence of 32.9% in Queensland, Australia.<sup>5</sup> In Switzerland,<sup>6</sup> four drivers out of one thousand who drive under the influence (DUI) will be caught and considered as offenders and one out of seven will repeat the same offense during the following five years (Figure 1).



**Figure 1:** Yearly prevalence estimate of events in relation to driving under the influence of alcohol in Switzerland.

DUI = driving under the influence of alcohol.

\* Estimated from data made available by the Swiss Federal office of Statistics from 2006 and 2007.

† A driver was considered as a recidivist if caught under the influence of alcohol while driving and having been condemned for the same offense during the previous five years.

#### RESULTS:

1,588 first-time alcohol offenders were included into the study. First time DUI offenders in Geneva were mainly represented by male drivers (89%), inexperienced (median = 12 yrs; range 0 – 56 yrs) or young drivers (median = 34.1 yrs; range 18 – 83 yrs), and drivers with lower BAC levels (median = 1.5; range 0.8 – 2.48).

Repeated offense of DUI at three years was 12.5% (n=199). Recidivism was more prevalent for DUI with a BAC of 2.0‰ g/kg at first offense (Figure 2). They were 1.7 times more likely to recidivate in the following three years. Other predictors of recidivism were male gender (OR=2.3), less than 5 years of experience as a driver (OR=2.8), and been under 30 yrs of age (OR=2.2). Analyzing time of first offense throughout the day, we observed recidivism to be more frequent for those who initially drove under the influence between 3 AM and 10 AM (OR = 1.8). (Table).

Factors	Recidivism		OR <sup>†</sup>	OR <sub>adj</sub> * [CI95%] <sup>††</sup>
	Yes; n(%)	No; n(%)		
<b>Gender</b>				
Female	11 (6.3%)	163 (93.7%)	1	1
Male	188 (13.3%)	1,226 (86.7%)	2.3 [1.2 to 4.3]	1.9 [0.99 to 3.6]
<b>Age</b>				
= 30 yrs	89 (9.1%)	890 (90.9%)	1	1
< 30 yrs	110 (18.1%)	499 (81.9%)	2.2 [1.6 to 3.0]	1.5 [1.1 to 2.2]
<b>BAC</b>				
0.8 to 1.99‰ g/kg	157 (11.6%)	1,200 (88.4%)	1	1
2 to 2.49‰ g/kg	42 (18.2%)	189 (81.8%)	1.7 [1.2 to 2.5]	2.2 [1.5 to 3.2]
<b>Experience as driver</b> (n=1,434)				
= 5 yrs	116 (9.5%)	1,105 (90.5%)	1	1
< 5 yrs	83 (22.6%)	284 (77.4%)	2.8 [2.0 to 3.8] <sup>‡</sup>	2.3 [1.6 to 3.3]
<b>Day of the week</b>				
Sat. and Sun.	103 (13.4%)	667 (86.6%)	1	1
Mon. to Fri.	96 (11.7%)	722 (88.3%)	0.9 [0.64 to 1.2]	0.9 [0.86 to 1.6]
<b>Time of the day</b>				
10 AM to 2:59 AM	88 (9.7%)	822 (90.3%)	1	1
3AM to 9:59 AM	111 (16.4%)	567 (83.6%)	1.8 [1.4 to 2.5]	1.5 [1.1 to 2.0]

**Table:** Odds of recidivism during the three years following recovery of driver's licence following first time DUI offense.

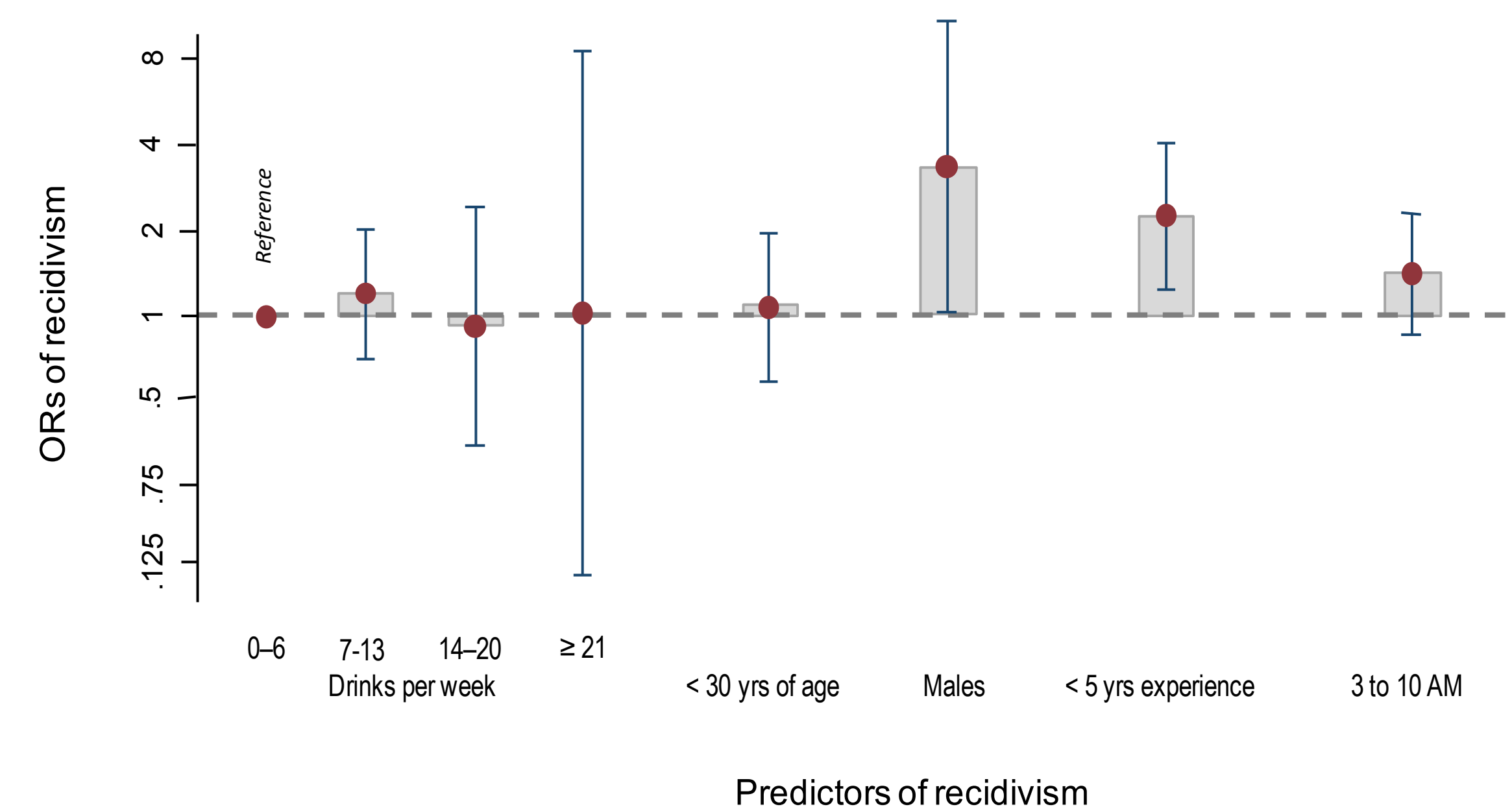
\* Adjusted for all factors in the model.

† Associations could be exaggerated by observation bias. DUI offenders are not all exposed to the same risk of been caught as police officers are trained to check those that are more likely to drink and drive.

‡ n=1434 as experience as driver was unavailable for 154 drivers.

Adjusted odds ratio shows that BAC  $\geq 2.0\text{‰ g/kg}$  was negatively confounded to all other significant factors (Table). Furthermore, gender, age, years of experience, and time of the day seemed to have been associated to recidivism only in the absence of elevated BAC values (interaction terms; OR  $\approx 0.5$ ).

We then looked more closely to relationships between BAC, reported alcohol consumption and recidivism using data from the 724 DUI who agreed to participate to the RCT. BAC at initial DUI offense was significantly associated to average daily alcohol consumption ( $p = 0.501$ ;  $p < 0.0001$ ) (Figure 3). However recidivists did not significantly report drinking more (+0.3 drinks per week;  $p = 0.537$ ) than other DUIs. Self-reported alcohol consumption was not predictive of recidivism (Figure 4). Our results therefore show that BAC was a much better predictor of recidivism than self-reported alcohol consumption.



**Figure 4:** Recidivism and self-reported consumption adjusted for other factors in model.

#### CONCLUSIONS:

BAC, driving experience, age, gender, and time of the first DUI predict recidivism of DUI offense. New existing stricter policies for inexperienced DUI drivers are supported by our data. When BAC of a first DUI offender is  $\geq 2.0\text{‰ g/kg}$ , the administrative authority should take measures to evaluate a possible alcohol problem before considering relicensing.

#### ACKNOWLEDGMENTS

This study would not have been possible without the logistic support from Geneva's "Office Cantonale des Automobiles et de la Navigation".

#### UNITS

Blood alcohol concentration (BAC) is given in ‰ g/kg; 1‰ g/kg is equivalent to 0.106 ‰ g/L

Number of drinks are given for standards metric glasses (WHO) which contain 12.5 mL of ethanol. 1 standard WHO drink is therefore equivalent to 0.7 US standard drinks.

#### OBJECTIVES:

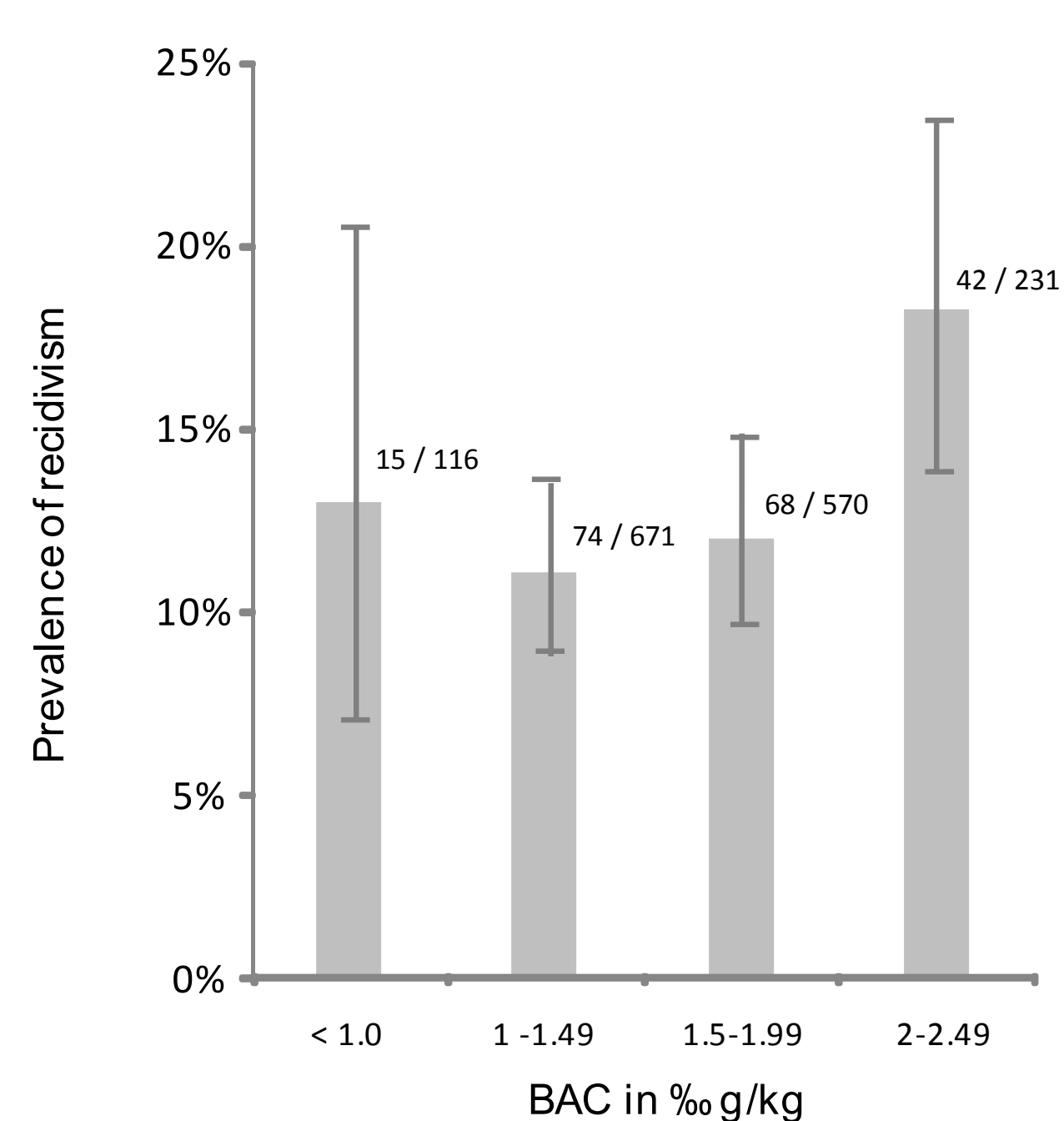
The goal of the study was to assess predictors of DUI recidivism at three years for first-time DUI alcohol offenders.

#### METHODS:

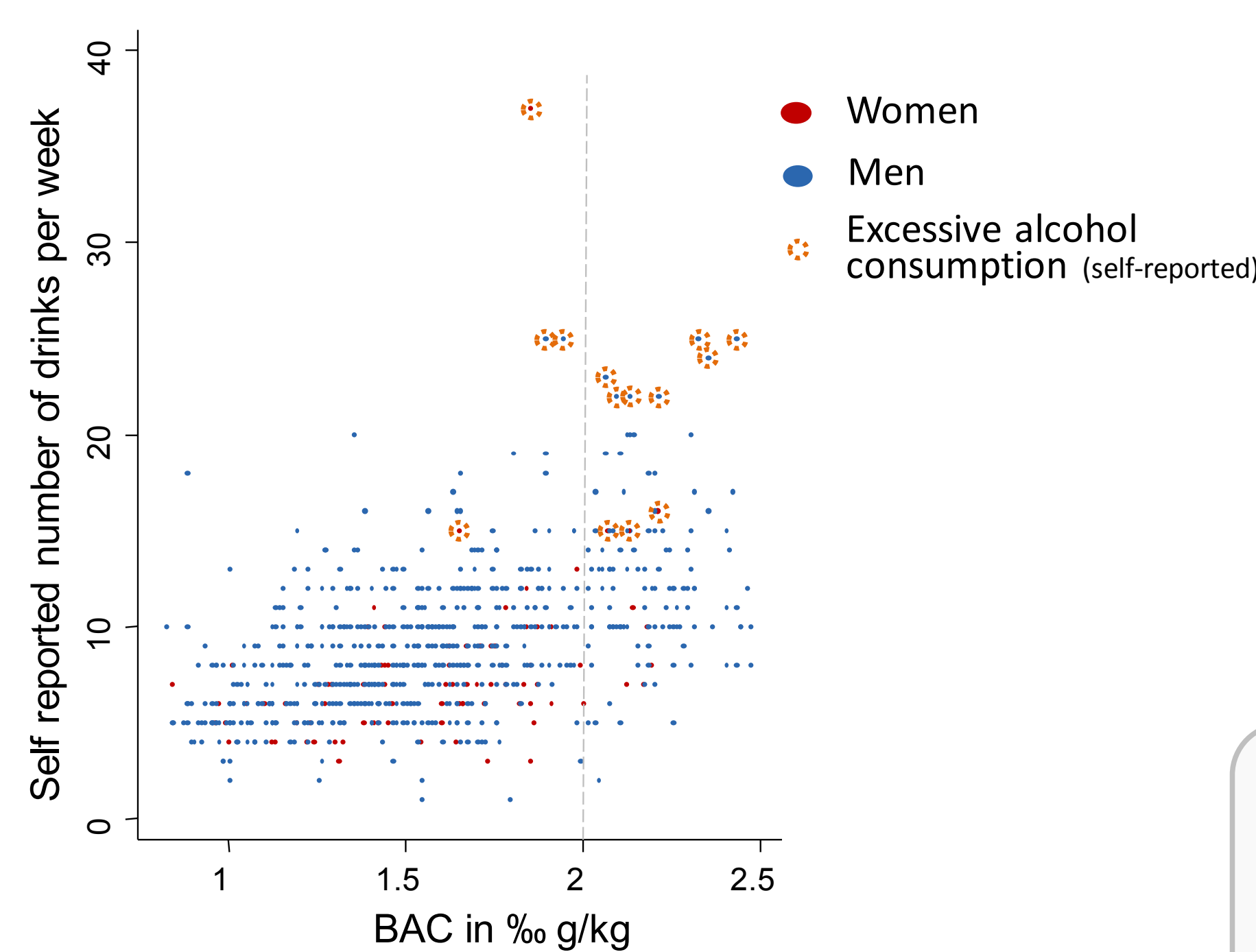
This cohort study was nested in a large randomized clinical trial (RCT); the PRECASIA study, which followed drivers convicted for a first-time DUI offence within the previous 5 last years with a blood alcohol concentration (BAC) between 0.80‰ and 2.49‰ g/kg for three years (2001-2007).

Each DUI offender between 2001 and 2004 from the Canton of Geneva was invited to participate to the RCT and was registered for monitoring. All DUI offenders were therefore followed-up for three years. Recidivists were identified through the national registry.

The predictive variables were: BAC, sex (male), age (< 30 yrs), driving experience (< 5 yrs), time of the offense, and day of the week (weekdays). Excessive alcohol consumption (WHO) was defined as  $\geq 3$  average daily drinks (10g of OH) for men and  $\geq 2$  average daily drinks for women.



**Figure 2:** Prevalence of recidivism for different BACs



**Figure 3:** Self reported alcohol consumption per week and BAC during first DUI offense.

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