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## The association of substance use with attaining employment among unemployed job seeking adults: Prospective findings from the French CONSTANCES cohort

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1 **The association of substance use with attaining employment among**  
2 **unemployed job seeking adults: Prospective findings from the French**  
3 **CONSTANCES cohort.**

4

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37

38 **Abstract**

39 This study aimed to examine the prospective association between tobacco, alcohol and  
40 cannabis use with attaining employment among unemployed job seekers. Data from the  
41 French population-based CONSTANCES cohort on 5,114 unemployed job seeking adults  
42 enrolled from 2012 to 2018 were analyzed. Binary logistic regressions were computed. Odds  
43 ratio (OR) and 95%CI of remaining unemployed at one-year of follow-up (versus attaining  
44 employment) according to substance use at baseline were obtained. The following  
45 independent variables were introduced into separate models: tobacco use (non-smoker, former  
46 smoker, light(<10cig/day), moderate(10-19cig/day) and heavy smoker(>19cig/day)), alcohol  
47 use according to the Alcohol Use Disorder Identification Test (non-users(0), low(<7),  
48 moderate(7-15) and high or very high-risk(>15)) and cannabis use (never used, no use in the  
49 previous 12 months, less than once a month, at least once a month but less than once per  
50 week, once per week or more). Analyses were adjusted for age, gender and education. At  
51 follow-up, 2,490 participants (49.7%) were still unemployed. Compared to non-smokers,  
52 moderate and heavy smokers were more likely to remain unemployed, with ORs (95%CI) of  
53 1.33 (1.08-1.64) and 1.42 (1.04-1.93), respectively. Compared to low-risk alcohol users, no  
54 alcohol users and high or very high-risk alcohol users were more likely to remain  
55 unemployed, with ORs (95% CI) of 1.40 (1.03-1.83) and 2.10 (1.53-2.87), respectively.  
56 Compared to participants who never used cannabis, participants who use cannabis once a  
57 week or more were more likely to remain unemployed, OR (95%CI) of 1.63 (1.33-2.01).  
58 Substance use may play an important role in difficulty attaining employment.

59 **Keywords:** Tobacco use; Alcohol use; Cannabis use; Employment.

60

61 **Introduction**

62 Substance use is one of the most important risk factors for adult mortality and morbidity in  
63 the world (1). Besides many adverse consequences on physical and mental health, substance  
64 use is also negatively linked to educational achievements and positively with poverty and  
65 social deprivation (2,3). From a public health perspective, these detrimental consequences are  
66 driven by the most frequently consumed substances: tobacco, alcohol and cannabis (1,4,5).  
67 France has one of the highest rates of tobacco and cannabis use among Western European  
68 countries, and in 2017, at least 23% of the French general population exceeded the  
69 recommended maximum amounts for alcohol consumption (6–8). On the other hand,

70 according to the International Labor Organization, unemployment is a worldwide crisis  
71 aggravated by the COVID-19 pandemic and its rate is expected to rise to 5.7% in 2022 (9). In  
72 France, unemployment rate was roughly stable in the 10 years prior to the Covid-19 global  
73 crisis, i.e., from 8.9% in 2010 to 7.8% in 2020 (10). Age, gender, and education remained  
74 among the top sociodemographic factors associated with employment. Specifically, an older  
75 age, being a woman and being less educated are frequently positively associated with an  
76 increased likelihood of unemployment (11–13). Unemployment has been associated with  
77 physical and mental health concerns and with an increased risk of morbidity and mortality  
78 (14,15). Stress reactions, anxiety and depressive symptoms were shown to be common  
79 responses to job loss (16). In addition, unemployment increases the risk of poverty,  
80 contributes to inequality and may jeopardize access to health care (14,17). Moreover, it has  
81 been linked to unhealthy behaviors (18), such as greater substance use (i.e., tobacco, alcohol  
82 and cannabis use). In observational studies, unemployed individuals had a higher prevalence  
83 of substance use compared to those with a job (13,19), and substance use was found to  
84 significantly increase as a response to job loss (18,20). In addition, substance use increases  
85 the likelihood of losing one's job (21). Although the adverse consequences of substance use  
86 on job loss and reciprocally have been thoroughly examined, the role of substance use on  
87 employment among job seeking individuals has not been well studied (22–25).

88 A longitudinal observational study in California examined the differences between 120 non-  
89 smokers in the previous year before study enrolment and 131 smokers; in attaining  
90 employment over a 12-month period. The results showed that non-smokers were 24% more  
91 likely to be reemployed compared to smokers after adjustment for sociodemographic and  
92 clinical factors (22).

93 Few studies investigated the role of alcohol use in employment with conflicted findings (24–  
94 26). Claussen et al. found that at-risk alcohol use (Alcohol Use Disorder Identification Test  
95 (AUDIT) >10) was significantly more prevalent among unemployed than reemployed  
96 participants at five-years of follow-up (25). While, Skärlund et al. reported that at-risk alcohol  
97 use (AUDIT >8) was not significantly associated with unemployment at one-year of follow-  
98 up (25). Several studies reported that chronic illicit drug use, including cannabis use, was  
99 associated with reduced likelihood of employment (27–29). However, to the best of our  
100 knowledge, even though, there is literature documenting the association of unemployment and  
101 tobacco use, data on cannabis and alcohol use is not yet well studied using longitudinal data.  
102 Therefore, the aim of this study was to examine prospectively the association of tobacco,

103 alcohol and cannabis use with attaining employment at one-year of follow-up among job  
104 seeking adults at baseline while considering sociodemographic and clinical factors and  
105 duration of the last unemployment period. We took advantage of the French national  
106 population-based CONSTANCES cohort that includes a large sample of adults from various  
107 sociodemographic backgrounds and are followed annually. We hypothesized that individuals  
108 who use substances would be less likely to get a job and that this association would follow  
109 different pathways for each substance. Our findings may be informative for preventive  
110 approaches targeting individuals who are seeking a job.

111

## 112 **Methodology**

### 113 **Participants**

114 The French population-based CONSTANCES cohort randomly recruited participants aged 18  
115 to 69 at inclusion between 2012 and 2020 (n = 202,674 in 2020). At baseline and then  
116 annually, participants completed self-administered questionnaires that assessed health-related  
117 behaviors, occupational conditions and sociodemographic factors (30). The CONSTANCES  
118 Cohort was authorized by the French Data Protection Authority (Commission Nationale de  
119 l'Informatique et des Libertés, CNIL) and approved by the Institutional Review Board of the  
120 National Institute for Medical Research – INSERM (no. 01-011). All the participants  
121 provided an informed consent.

122 In the present study, the sample was restricted to individuals who had a previous work  
123 experience but were unemployed and seeking a job upon study enrolment (n= 11,333). From  
124 the latter sample, participants who had data on employment or unemployment at one year of  
125 follow-up were selected and included in the statistical analyses (n=5 114). Participants who  
126 were included after 2018 (n=955) who had no follow-up data (n=4,005), reported being a  
127 student, retired, not working for health reasons, or other (n=1,078) and did not report their  
128 employment status (n=181) were excluded from the analyses (**Figure 1**).

### 129 **Substance use at baseline**

#### 130 **Tobacco**

131 Smoking status was self-reported at baseline and categorized as follows: never smoker,  
132 former smoker or current smoker. Among current smokers, the number of cigarettes per day  
133 was further collected. Tobacco use was then categorized as follows: 1) Never smokers, 2)

134 Former smokers, 3) Current light smokers (1–9 cigarettes per day), 4) Current moderate  
135 smokers (10–19 cigarettes per day), and 5) Current heavy smokers (>19 cigarettes per day), as  
136 defined in several previous studies (31,32).

137

### 138 **Alcohol**

139 Alcohol use at baseline was evaluated using the French version of the Alcohol Use Disorders  
140 Identification Test (AUDIT) that includes 10 items (33). The total AUDIT score was obtained  
141 by adding the scores of the ten items and was then categorized as such: 1) No use (a score of  
142 0), 2) Low-risk (1-7), 3) Moderate risk (8-15), 4) High or very high-risk (>15).

143

### 144 **Cannabis**

145 At baseline, the frequency of cannabis consumption was self-reported by answering the  
146 following questions: 1) “Have you ever consumed cannabis? If yes, over the past 12 months,  
147 have you consumed cannabis? And 2) Over the past 30 days, have you consumed cannabis? If  
148 yes, how many times have you consumed cannabis over the past 30 days?”. We computed a  
149 categorical variable from the previous questions as such: 1) Never consumed 2) No  
150 consumption during the last 12 months; 3) At least once during the last 12 months but less  
151 than once a month; 4) At least once a month but less than once per week; and 5) Once per  
152 week or more.

153

### 154 **Employment status at follow-up**

155 Employment status was self-reported at one-year of follow-up with the following question :  
156 “What is your current employment situation?”: 1) employed, including on sick leave, leave  
157 without pay or availability, maternity/paternity/adoption/parental leave; 2) unemployed and  
158 job seeker; 3) retired or withdrawn from business; 4) in training (high school student, student,  
159 trainee, apprentice or other; 5) does not work for health reasons; 6) at home without  
160 employment; 7) other situation. In the present analyses, we only included participants who  
161 answered “employed” or “unemployed and seeking a job”.

162

### 163 **Covariates at baseline**

164 We considered the following sociodemographic variables at baseline: age, gender and  
165 education. Age was analyzed as a continuous variable. Education was based on the  
166 International Standard Classification of Education (ISCED 2011) and modeled as a  
167 categorical variable as follows: less than an associate degree (level 0-4), associate degree or  
168 more (level 5-8) (34).

169 The duration of unemployment was considered as a binary variable: unemployed for one year  
170 or less and unemployed for more than a year (35).

171 At baseline, depressive symptoms were evaluated with the Center of Epidemiologic Studies  
172 Depression scale (CESD). The CESD score was dichotomized and a score  $\geq 19$  was  
173 considered as indicating a depressive state (sensitivity/specificity for the diagnosis of major  
174 depression: 0.85/0.86) (36).

175 Self-rated health was reported at baseline with the following question: "How would you  
176 describe your general health compared to someone you know of the same age?". Participants  
177 could answer from 1="Very good" to 8="Very Poor".

178

## 179 **Statistical Analysis**

180 Descriptive statistics for the prevalence of substance use were conducted according to  
181 employment status at one-year of follow-up and chi-square or t-tests were calculated as  
182 adequate (i.e., categorical *versus* continuous variables). Second, logistic regression analyses  
183 were conducted separately for the association of each substance use at baseline and the  
184 outcome of not attaining employment at one year of follow-up. The analyses were adjusted  
185 for age, gender and education.

186

187 Third, several supplementary analyses were performed:

- 188 1. The analyses were stratified by the duration of unemployment at baseline to examine  
189 whether the role of substance use may differ according to the duration of  
190 unemployment.
- 191 2. The analyses were re-conducted after the exclusion of participants with a depressive  
192 state at baseline.

- 193 3. The three substances were introduced simultaneously in the same model to examine if  
194 one substance has a stronger association with employment rate compared to others.
- 195 4. The analyses were rerun with education as a continuous variable to examine if the  
196 associations could differ while taking into account the five categories of ISCED 2011  
197 (assuming that these categories are ordinal representation of underlying sets of  
198 continuous units such as years of education). (37).
- 199 5. Interactions between the date of the year of follow-up and the substances were tested  
200 to account for yearly fluctuations.
- 201 6. Analyses excluding participants with poor self-reported health at baseline (score >5)  
202 were conducted because poor health condition may interfere in the search process and  
203 in finding an employment.
- 204 7. E-values were calculated to estimate the minimal estimate of an association that an  
205 unmeasured confounder would need to have with both the employment status and the  
206 substances to fully explain the reported associations (38).

207 The following variables had missing data: education (1.4%), AUDIT score (18.4%), tobacco  
208 use (8%) duration of unemployment (18%) and depressive status (4%) which was handled by  
209 multiple imputation with 10 datasets (39).

210 A two-sided value of  $P < .05$  was considered statistically significant. All analyses were  
211 conducted using SPSS IBM Statistics for Windows version 21.

212

## 213 **Results**

### 214 **Participants' characteristics**

215 At baseline, 64.4% of the 5,114 participants had been unemployed for less than a year. From  
216 the 5,114 participants, 4.4% were current heavy smokers, 4.1% were alcohol users at high or  
217 very high-risk, and 10.1% consumed cannabis at least once per week. At one-year of follow-  
218 up, 2,490 participants (49.7%) were still unemployed. Participants' characteristics according  
219 to employment status at follow-up are presented in **Table 1** and all the bivariate associations  
220 between substances and employment status at follow-up were significant. Characteristics of  
221 the 11,333 job seekers at baseline according to their employment status at one year of follow-  
222 up are presented in **Supplemental Table 1**.

### 223 **Tobacco use**

224 Current moderate and heavy smokers had increased odds of not getting an employment at  
225 one-year of follow-up compared to non-smokers: ORs [95% CI] 1.33 [1.08-1.64] and 1.42  
226 [1.04-1.93], respectively (**Table 2**).

### 227 **Alcohol use**

228 Participants who do not consume alcohol and those who are at-high or very high-risk of  
229 consumption at inclusion had a higher odd of not getting employed at one-year of follow-up  
230 compared to low-risk users: 1.40 [1.03-1.83] and 2.10 [1.53-2.87], respectively (**Table 3**). In  
231 addition, the odds of not getting employed in participants with a high or very high-risk  
232 alcohol use was significantly higher than in non-users ( $Z$ -score= 3.32,  $p < 0.001$ ).

### 233 **Cannabis use**

234 Consuming cannabis at least once per week was associated with an increased odd of not  
235 getting an employment at one-year of follow-up 1.63 [1.33-2.01] (**Table 4**).

### 236 **Supplementary analyses**

- 237 1) After stratifying for the duration of unemployment at baseline (one year or less *versus*  
238 more than one year), the only associations that remained significant were for  
239 participants who have been unemployed for one year or less (**Supplemental Table 2**).  
240 There were no significant interactions however between substances and the duration  
241 of unemployment (all  $p$  for interactions  $> 0.05$ ).
- 242 2) The exclusion of participants with a depressive state at baseline ( $n = 1,369$ ), did not  
243 change the interpretation of the results (**Supplemental Table 3-5**).
- 244 3) The addition of the three substances in the same model yielded the same  
245 interpretations for participants who do not use alcohol (OR 1.47, 95%CI 1.07 to 2.00),  
246 for high or very high-risk alcohol users (OR 1.88, 95%CI 1.37 to 2.60) and for  
247 cannabis use at least once per week (OR 1.50, 95%CI 1.19 to 1.88). However, the  
248 associations with tobacco use did not persist (**Supplemental Table 6**).
- 249 4) Using education as a continuous variable did not change the significance of the results,  
250 except for no alcohol use, for which effect size the was similar but did not reach  
251 significance ( $p = 0.05$ ) (**Supplemental Table 7-9**).
- 252 5) There were no interactions between the number of years of follow-up and the three  
253 substances (all  $p > 0.137$ ).

254 6) After excluding participants with a poor self-rated health at baseline, all associations  
255 remained significant with a similar effect sizes, except for heavy tobacco use  
256 **(Supplemental Table 10-12).**

257 7) Unmeasured confounders would have to have an OR of 1.57-fold increased risk of  
258 unemployment and be 1.57 times more prevalent in moderate tobacco use to explain  
259 the observed odds ratio for moderate smoking (95%CI 1.24 – Not applicable (NA)).  
260 These e-values were of 1.67 (95%CI 1.16 - NA) for heavy tobacco use, 1.64 (95%CI  
261 1.13 - NA) for no alcohol use, 2.25 (95%CI 1.77 - NA) for at high or very high-risk  
262 alcohol use and 1.87 (95%CI 1.57 - NA) for at least weekly cannabis use.

263

## 264 **Discussion**

265 In the present study, we aimed to examine prospectively the association between tobacco,  
266 alcohol and cannabis use with attaining employment at one-year of follow-up among job  
267 seeking unemployed adults from a national population-based cohort. All the three substances  
268 were significantly associated with employment status at one-year of follow up after adjusting  
269 for age, gender and education. Moderate or heavy smoking, no alcohol use or using alcohol at  
270 high or very high-risk and at consuming cannabis at least once per week were associated with  
271 decreased likelihood of attaining employment at follow-up. All these associations remained  
272 significant after the exclusion of participants with a depressive state at baseline. These  
273 associations concern especially unemployed job seekers for one year or less and the role of  
274 alcohol and cannabis use were stronger than tobacco use.

275 Current moderate and heavy smokers were less likely to be employed at follow-up. This result  
276 supports the findings of an earlier longitudinal study which found that non-smokers were  
277 more likely to be employed compared to smokers but where no comparison between never  
278 smokers and former smokers was made (22). A meta-analysis on smoking and employment  
279 concluded that smokers were 33% more likely to be absent from work and to take extra sick  
280 leave compared to non-smokers (40) and a study by Berman et al estimated that in the US, a  
281 smoking employee costs an extra \$5816 annually (41). These issues could discourage  
282 employers from recruiting smokers. In fact in a qualitative study, unemployed job seeking  
283 daily smokers expressed their concern that smoking prevented them from finding a job and  
284 mentioned their feeling about the physical characteristics of smoking (e.g., the smell of  
285 cigarette smoke, altered vocal chords and teeth discoloration) that could have impeded their

286 chances of getting employed (23). Furthermore, one study showed that cigarette consumption  
287 ranks second behind food about spending behaviors among job seeking heavy smokers (42).  
288 Thus, smoking was prioritized over job seeking resources (e.g., cell phone, transportation)  
289 and health care.

290 Alcohol non-users were more likely to remain unemployed at follow-up compared to low-  
291 risk alcohol users while high or very high-risk alcohol users had a higher likelihood of staying  
292 unemployed. In line with previous studies regarding health outcomes, these results reveal a  
293 non-linear relationship between alcohol use and employment (24,26,43). Low-risk alcohol  
294 users may have better physical and mental health than those who are heavy drinkers and  
295 individuals who do not consume alcohol at all (because some people do not drink for health  
296 reasons and some are also former heavy drinkers who have stopped drinking (44). However,  
297 since not using alcohol remained associated with employment status after the exclusion of  
298 participants with poor self-rated health, other factors may account for these associations. For  
299 instance, since alcohol consumption is a common habit in France, (45) no alcohol  
300 consumption may limit social networking and therefore opportunities to meet potential  
301 employers or increase the chance to hear more about new job offers. Moreover, high-risk  
302 alcohol use can promote cognitive disorders (e.g., motivation processes), inappropriate  
303 behaviors (e.g., disinhibition, irritability) and health issues (e.g., hepatitis, pancreatitis)  
304 leading to decreased chances of finding a job. In addition, employers may notice alcohol  
305 consumption during job interviews (e.g., smell of alcohol or withdrawal symptoms such as  
306 tremors).

307 Participants who use cannabis for at least once a week were more likely to remain  
308 unemployed at follow-up compared to participants who do not use it. This result is in line  
309 with prior literature regarding the decreased employment rate in middle-aged adults who were  
310 regular cannabis users during their adolescence, compared to non-users or experimenters (46).  
311 Regular cannabis use can adversely affect cognitive functioning (e.g., difficulty in attention  
312 and concentration, deterioration in thought structuring and expression, memory disorders),  
313 psychomotor functioning (e.g., perceptual and motor coordination), physiological functioning  
314 (e.g., drowsiness, sleep disorders) and can promote psychiatric disorders (47). Such symptoms  
315 may hinder job searching, performance during job interviews which may decrease the  
316 likelihood of getting a job. In addition, at least in France where cannabis is illegal, employers  
317 may be reluctant to hire cannabis users, whenever noticeable, in order to avoid legal issues.

318 Our study is, to the best of our knowledge, the first to assess the association between tobacco,  
319 alcohol and cannabis use and the likelihood of getting employed among unemployed adults  
320 who are seeking a job. Moreover, we adjusted for sociodemographic factors and we took into  
321 consideration the duration of unemployment and the depressive state using a standardized  
322 assessment tool.

323 This study has several limitations. First, although the participants of the CONSTANCES  
324 cohort were randomly recruited, voluntary participation is subject to selection bias and thus  
325 the participants are not representative of the general population. They have higher education  
326 level and consume less tobacco, alcohol or cannabis compared to the general population (48).  
327 Second, since data were collected before the Covid-19 pandemic, findings must be  
328 extrapolated with great caution to the pandemic period. Third, response rate at follow-up was  
329 of 59.7% and non-responders could differ from responders such as their use of substances  
330 which was higher at baseline for individuals who did not respond at follow-up. It must be  
331 noted however that participants who did not respond to follow-up had not answered the entire  
332 questionnaire and not specifically the question about their employment status. Unfortunately,  
333 this loss to follow-up can lead to a decreased statistical power. Fourth, since the data on  
334 substance use were self-reported, they could be subject to social desirability and/or recall bias.  
335 However, self-reported health risk behaviors via confidential questionnaires was found to be  
336 one of the collection methods that were least associated with social desirability bias (49,50).  
337 Fifth, we cannot draw a causal conclusion since it is an observational study and unmeasured  
338 confounding factors may play a role in the associations between substance use and  
339 employment (e.g., personality traits including impulsivity, environments with few  
340 opportunities, being part of a sexual minority among other factors). However, education, a  
341 variable known to be strongly associated with both substance use and employment (51,52)  
342 had a strength of association of 1.4. Thus, according to the calculated e-values (1.57 for  
343 moderate smoking, 1.67 for heavy smoking, 1.64 for no alcohol use, 2.25 for high or very  
344 high alcohol use and 1.87 for at least weekly cannabis use), such confounders should have a  
345 greater effect size than education to fully explain the reported associations, and even an effect  
346 size of at least 60% larger than that of education for high or very high alcohol use (53,54).

347

## 348 **Conclusion**

349 Our results suggest that public health campaigns should inform the general population (i.e.,  
350 employed and unemployed subjects) on the greatest difficulties of substance users for being  
351 employed when they seek a job. Such information might be useful to motivate individuals  
352 who have started looking for a job to try decreasing their substance use and seek help before  
353 they get into a vicious circle of a worsening of substance use and prolonged unemployment.  
354 The associations between substance use and employment were only significant among  
355 participants who have been unemployed for a year or less. This highlights the urge for  
356 considering substance use at the very beginning of unemployment since after a prolonged  
357 period of unemployment (e.g., more than a year), other factors may take over the role of  
358 substance use in finding a job such as discouragement leading to a less active job search, loss  
359 of professional networks and reluctance of employers to hire a long-term unemployed person.  
360 Further studies should investigate the benefits of the SBIRT approach (Screening, Brief  
361 Intervention, Referral to Treatment) on the odds of employment among job seekers. Lastly,  
362 the role of other substances (e.g., stimulants, benzodiazepines, hallucinogens) should be  
363 investigated (55).

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#### 377 Conflicts of interest

378 Guillaume Airagnes has received speakers and/or consulting fees from Pfizer, Lundbeck and  
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383 Goldberg, Maria Melchior, Yves Roquelaure, Frédéric Limosin, and Marie Zins report no  
384 conflicts of interest.

385 **References**

- 386 1. Griswold MG, Fullman N, Hawley C, Arian N, Zimsen SRM, Tymeson HD, et al. Alcohol use and  
387 burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global  
388 Burden of Disease Study 2016. *The Lancet*. 2018 Sep 22;392(10152):1015–35.
- 389 2. Kuntsche E, Rehm J, Gmel G. Characteristics of binge drinkers in Europe. *Soc Sci Med*. 2004 Jul  
390 1;59(1):113–27.
- 391 3. Semple S. Employment, Smoking, and Health: The Role of the Hygienist. *Ann Occup Hyg*. 2015  
392 Jun 1;59(5):529–33.
- 393 4. Marten R, Kadandale S, Nordström A, Smith RD. Shifting global health governance towards the  
394 sustainable development goals. *Bull World Health Organ*. 2018 Dec 1;96(12):798-798A.
- 395 5. World Drug Report 2021 [Internet]. United Nations : Office on Drugs and Crime. [cited 2021 Sep  
396 10]. Available from: [//www.unodc.org/unodc/en/data-and-analysis/wdr2021.html](http://www.unodc.org/unodc/en/data-and-analysis/wdr2021.html)
- 397 6. Consommation d'alcool en France : où en sont les Français ? [Internet]. [cited 2021 Sep 10].  
398 Available from: [https://www.santepubliquefrance.fr/les-actualites/2020/consommation-d-](https://www.santepubliquefrance.fr/les-actualites/2020/consommation-d-alcool-en-france-ou-en-sont-les-francais)  
399 [alcool-en-france-ou-en-sont-les-francais](https://www.santepubliquefrance.fr/les-actualites/2020/consommation-d-alcool-en-france-ou-en-sont-les-francais)
- 400 7. European Monitoring Centre for Drugs and Drug Addiction. European drug report 2021: trends  
401 and developments. [Internet]. LU: Publications Office; 2021 [cited 2021 Sep 10]. Available from:  
402 <https://data.europa.eu/doi/10.2810/18539>
- 403 8. Statistical Bulletin 2021 — prevalence of drug use | [www.emcdda.europa.eu](http://www.emcdda.europa.eu) [Internet]. [cited  
404 2021 Sep 10]. Available from: [https://www.emcdda.europa.eu/data/stats2021/gps\\_en](https://www.emcdda.europa.eu/data/stats2021/gps_en)
- 405 9. Slow jobs recovery and increased inequality risk long-term COVID-19 scarring [Internet]. 2021  
406 [cited 2021 Sep 9]. Available from: [http://www.ilo.org/global/about-the-](http://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_794834/lang--en/index.htm)  
407 [ilo/newsroom/news/WCMS\\_794834/lang--en/index.htm](http://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_794834/lang--en/index.htm)
- 408 10. Au quatrième trimestre 2020, le taux de chômage se replie à nouveau, à 8,0 % - Informations  
409 rapides - 037 | Insee [Internet]. [cited 2022 Apr 28]. Available from:  
410 <https://www.insee.fr/fr/statistiques/5044459#tableau-chomage-g1-fr>
- 411 11. Wanberg CR, Kanfer R, Hamann DJ, Zhang Z. Age and reemployment success after job loss: An  
412 integrative model and meta-analysis. *Psychol Bull*. 2016;142(4):400–26.
- 413 12. Andersson K. Predictors of re-employment: a question of attitude, behavior, or gender? *Scand J*  
414 *Psychol*. 2015 Aug;56(4):438–46.
- 415 13. Henkel D. Unemployment and substance use: a review of the literature (1990-2010). *Curr Drug*  
416 *Abuse Rev*. 2011 Mar;4(1):4–27.
- 417 14. Bambra C. Yesterday once more? Unemployment and health in the 21st century. *J Epidemiol*  
418 *Community Health*. 2010 Mar;64(3):213–5.
- 419 15. Sorlie PD, Rogot E. Mortality by employment status in the National Longitudinal Mortality  
420 Study. *Am J Epidemiol*. 1990 Nov;132(5):983–92.

- 421 16. Guindon MH, Smith B. Emotional barriers to successful reemployment: implications for  
422 counselors. *J Employ Couns.* 2002;39(2):73–82.
- 423 17. Huang J, Birkenmaier J, Kim Y. Job Loss and Unmet Health Care Needs in the Economic  
424 Recession: Different Associations by Family Income. *Am J Public Health.* 2014  
425 Nov;104(11):e178–83.
- 426 18. Morris JK, Cook DG, Shaper AG. Non-employment and changes in smoking, drinking, and body  
427 weight. *BMJ.* 1992 Feb 29;304(6826):536–41.
- 428 19. Compton WM, Gfroerer J, Conway KP, Finger MS. Unemployment and substance outcomes in  
429 the United States 2002-2010. *Drug Alcohol Depend.* 2014 Sep 1;142:350–3.
- 430 20. Deb P, Gallo WT, Ayyagari P, Fletcher JM, Sindelar JL. The effect of job loss on overweight and  
431 drinking. *J Health Econ.* 2011 Mar;30(2):317–27.
- 432 21. Airagnes G, Lemogne C, Meneton P, Plessz M, Goldberg M, Hoertel N, et al. Alcohol, tobacco  
433 and cannabis use are associated with job loss at follow-up: Findings from the CONSTANCES  
434 cohort. *PLoS One.* 2019;14(9):e0222361.
- 435 22. Prochaska JJ, Michalek AK, Brown-Johnson C, Daza EJ, Baiocchi M, Anzai N, et al. Likelihood of  
436 Unemployed Smokers vs Nonsmokers Attaining Reemployment in a One-Year Observational  
437 Study. *JAMA Intern Med.* 2016 May 1;176(5):662–70.
- 438 23. Michalek AK, Wong SL, Brown-Johnson CG, Prochaska JJ. Smoking and Unemployment: A Photo  
439 Elicitation Project. *Tob Use Insights.* 2020;13:1179173X20921446.
- 440 24. Claussen B. Alcohol disorders and re-employment in a 5-year follow-up of long-term  
441 unemployed. *Addict Abingdon Engl.* 1999 Jan;94(1):133–8.
- 442 25. Skärlund M, Åhs A, Westerling R. Health-related and social factors predicting non-  
443 reemployment amongst newly unemployed. *BMC Public Health.* 2012 Oct 23;12(1):893.
- 444 26. Jørgensen MB, Pedersen J, Thygesen LC, Lau CJ, Christensen AI, Becker U, et al. Alcohol  
445 consumption and labour market participation: a prospective cohort study of transitions  
446 between work, unemployment, sickness absence, and social benefits. *Eur J Epidemiol.* 2019 Apr  
447 1;34(4):397–407.
- 448 27. DeSimone J. Illegal Drug Use and Employment. *J Labor Econ.* 2002;20(4):952–77.
- 449 28. French MT, Roebuck MC, Alexandre PK. Illicit Drug Use, Employment, and Labor Force  
450 Participation. *South Econ J.* 2001;68(2):349–68.
- 451 29. Alexandre PK, French MT. Further Evidence on the Labor Market Effects of Addiction: Chronic  
452 Drug Use and Employment in Metropolitan Miami. *Contemp Econ Policy.* 2004;22(3):382–93.
- 453 30. Zins M, Goldberg M. The French CONSTANCES population-based cohort: design, inclusion and  
454 follow-up. *Eur J Epidemiol.* 2015;30:1317–28.
- 455 31. Lohse T, Rohrmann S, Bopp M, Faeh D. Heavy Smoking Is More Strongly Associated with  
456 General Unhealthy Lifestyle than Obesity and Underweight. *PLoS One.* 2016;11(2):e0148563.

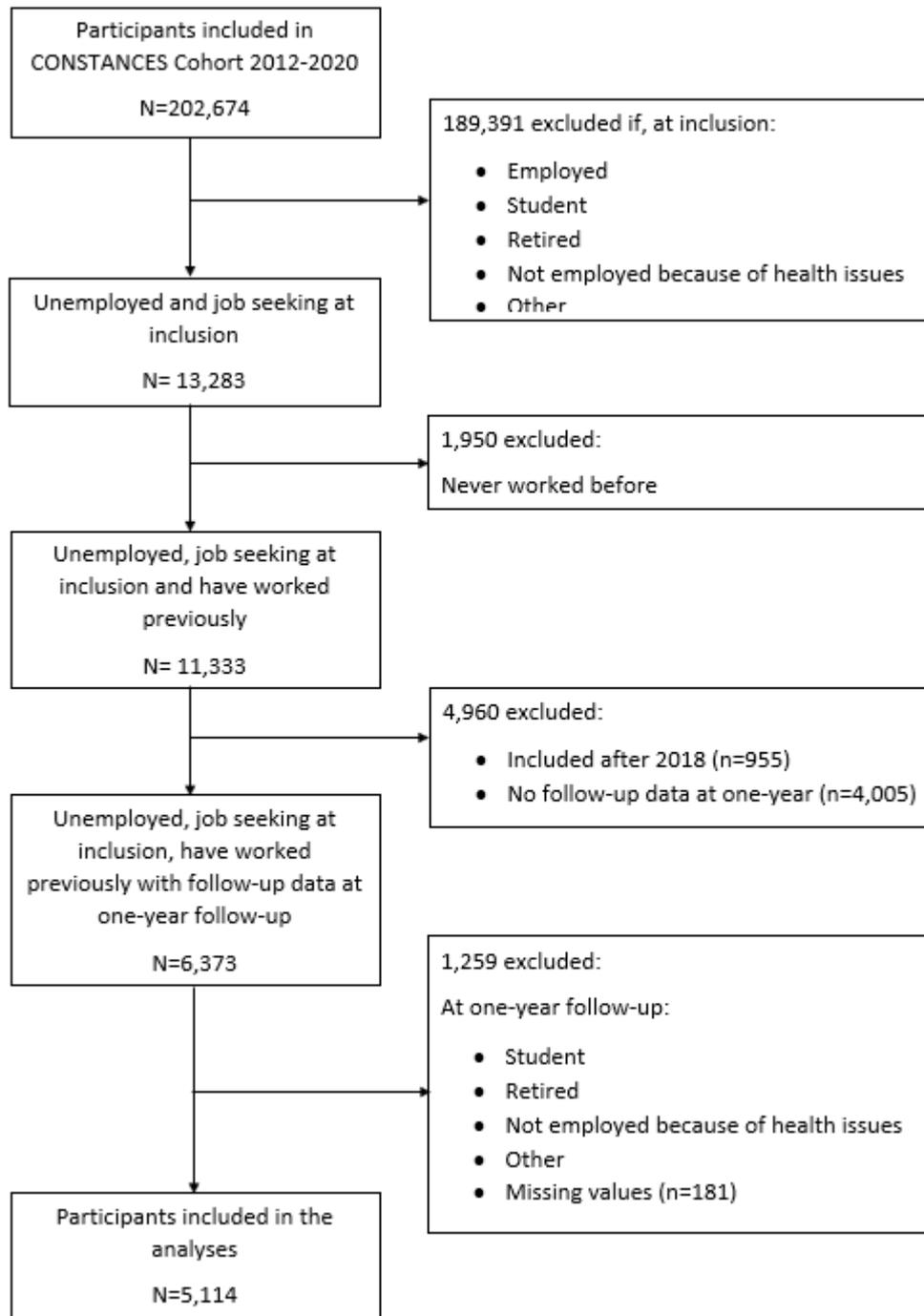
- 457 32. Clift AK, Ende A von, Tan PS, Sallis HM, Lindson N, Coupland CAC, et al. Smoking and COVID-19  
458 outcomes: an observational and Mendelian randomisation study using the UK Biobank cohort.  
459 *Thorax*. 2022 Jan 1;77(1):65–73.
- 460 33. Gache P, Michaud P, Landry U, Accietto C, Arfaoui S, Wenger O, et al. The Alcohol Use Disorders  
461 Identification Test (AUDIT) as a screening tool for excessive drinking in primary care: reliability  
462 and validity of a French version. *Alcohol Clin Exp Res*. 2005 Nov;29(11):2001–7.
- 463 34. International Standard Classification of Education (ISCED) [Internet]. ILOSTAT. [cited 2021 Sep  
464 13]. Available from: [https://ilostat.ilo.org/resources/concepts-and-definitions/classification-  
465 education/](https://ilostat.ilo.org/resources/concepts-and-definitions/classification-education/)
- 466 35. Définition - Chômeur de longue durée | Insee [Internet]. [cited 2021 Nov 23]. Available from:  
467 <https://www.insee.fr/fr/metadonnees/definition/c1689>
- 468 36. Morin AJS, Moullec G, Maïano C, Layet L, Just JL, Ninot G. Psychometric properties of the  
469 Center for Epidemiologic Studies Depression Scale (CES-D) in French clinical and nonclinical  
470 adults. *Rev Epidemiol Sante Publique*. 2011 Oct;59(5):327–40.
- 471 37. Winship C, Mare R. Regression Models with Ordinal Variables. *Am Sociol Rev*. 1984;
- 472 38. VanderWeele TJ, Ding P. Sensitivity Analysis in Observational Research: Introducing the E-Value.  
473 *Ann Intern Med*. 2017 Aug 15;167(4):268–74.
- 474 39. Haukoos JS, Newgard CD. Advanced statistics: missing data in clinical research--part 1: an  
475 introduction and conceptual framework. *Acad Emerg Med Off J Soc Acad Emerg Med*. 2007  
476 Jul;14(7):662–8.
- 477 40. Weng SF, Ali S, Leonardi-Bee J. Smoking and absence from work: systematic review and meta-  
478 analysis of occupational studies. *Addict Abingdon Engl*. 2013 Feb;108(2):307–19.
- 479 41. Berman M, Crane R, Seiber E, Munur M. Estimating the cost of a smoking employee. *Tob  
480 Control*. 2014 Sep;23(5):428–33.
- 481 42. Stinson S, Chieng A, Prochaska JJ. Discretionary spending priorities of unemployed, job-seeking  
482 adults who smoke cigarettes. *Addict Behav Rep*. 2020 Mar 20;11:100270.
- 483 43. Johansson E, Alho H, Kiiskinen U, Poikolainen K. The association of alcohol dependency with  
484 employment probability: evidence from the population survey 'Health 2000 in Finland.' *Health  
485 Econ*. 2007;16(7):739–54.
- 486 44. Stockwell T, Zhao J, Panwar S, Roemer A, Naimi T, Chikritzhs T. Do "Moderate" Drinkers Have  
487 Reduced Mortality Risk? A Systematic Review and Meta-Analysis of Alcohol Consumption and  
488 All-Cause Mortality. *J Stud Alcohol Drugs*. 2016 Mar;77(2):185–98.
- 489 45. Hill C. Mise au point sur la consommation d'alcool en France, ses conséquences sur la santé et  
490 la dose recommandée. *Nutr Clin Métabolisme*. 2021 Sep 1;35(3):161–7.
- 491 46. Windle M, Wiesner M. Trajectories of marijuana use from adolescence to young adulthood:  
492 predictors and outcomes. *Dev Psychopathol*. 2004;16(4):1007–27.
- 493 47. Abuse NI on D. What is the scope of marijuana use in the United States? [Internet]. National  
494 Institute on Drug Abuse. -- [cited 2021 Oct 1]. Available from:

- 495 [https://www.drugabuse.gov/publications/research-reports/marijuana/what-scope-marijuana-](https://www.drugabuse.gov/publications/research-reports/marijuana/what-scope-marijuana-use-in-united-states)  
496 [use-in-united-states](https://www.drugabuse.gov/publications/research-reports/marijuana/what-scope-marijuana-use-in-united-states)
- 497 48. Fry A, Littlejohns TJ, Sudlow C, Doherty N, Adamska L, Sprosen T, et al. Comparison of  
498 Sociodemographic and Health-Related Characteristics of UK Biobank Participants With Those of  
499 the General Population. *Am J Epidemiol*. 2017 Nov 1;186(9):1026–34.
- 500 49. Crutzen R, Göritz AS. Social desirability and self-reported health risk behaviors in web-based  
501 research: three longitudinal studies. *BMC Public Health*. 2010 Nov 23;10:720.
- 502 50. Link MW, Mokdad AH. Effects of survey mode on self-reports of adult alcohol consumption: a  
503 comparison of mail, web and telephone approaches. *J Stud Alcohol*. 2005 Mar;66(2):239–45.
- 504 51. Beard E, Brown J, Jackson SE, West R, Kock L, Boniface S, et al. Independent Associations  
505 Between Different Measures of Socioeconomic Position and Smoking Status: A Cross-Sectional  
506 Study of Adults in England. *Nicotine Tob Res*. 2021 Jan 1;23(1):107–14.
- 507 52. Sata M, Cui R, Chiang C, Singeo ST, Watson BM, Yatsuya H, et al. Determinants of alcohol  
508 consumption and marijuana use among young adults in the Republic of Palau. *Environ Health*  
509 *Prev Med*. 2021 Jan 22;26(1):12.
- 510 53. Chamorro J, Bernardi S, Potenza MN, Grant JE, Marsh R, Wang S, et al. Impulsivity in the  
511 general population: A national study. *J Psychiatr Res*. 2012 Aug;46(8):994–1001.
- 512 54. Hart CL. Viewing addiction as a brain disease promotes social injustice. *Nat Hum Behav*. 2017  
513 Feb 17;1(3):1–1.
- 514 55. Wamsley M, Satterfield JM, Curtis A, Lundgren L, Satre DD. Alcohol and Drug Screening, Brief  
515 Intervention, and Referral to Treatment (SBIRT) Training and Implementation: Perspectives  
516 from 4 Health Professions. *J Addict Med*. 2018 Aug;12(4):262–72.

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522 *Table 1. Characteristics of the 5114 participants included at baseline according to their employment status at one- year of*  
 523 *follow-up.*

	<b>Total</b>	<b>Employed</b>	<b>Unemployed</b>	<b>Chi square</b>	<b>P value</b>
	5114 (100%)	2624 (51.3)	2490 (48.7)		
<b>Tobacco Use</b>				44.82	<0.001
Non-smoker	2110 (41.3)	1169 (44.5)	941 (37.8)		
Former smoker	1617 (31.6)	776 (29.6)	841 (33.8)		
Current light smoker	591 (11.6)	327 (12.5)	264 (10.6)		
Current moderate smoker	570 (11.1)	264 (10.1)	306 (12.3)		
Current heavy smoker	226 (4.4)	88 (3.3)	138 (5.5)		
<b>Alcohol use (AUDIT)<sup>a</sup></b>				26.54	<0.001
No use (0)	230 (4.5)	105 (4.0)	125 (5.0)		
Low risk (1-7)	3799 (74.3)	1999 (76.2)	1799 (72.2)		
Moderate risk (8-15)	876 (17.1)	446 (17)	431 (17.3)		
High or very high-risk (>15)	209 (4.1)	74 (2.8)	135 (5.4)		
<b>Cannabis Consumption</b>				43.42	<0.001
Never consumed	2427 (47.5)	1201 (45.8)	1226 (49.2)		
Not during the previous year	1655 (32.4)	892 (34.0)	763 (30.6)		
At least once during the last 12 months but less than once a month	329 (6.4)	207 (7.9)	122 (4.9)		
At least once a month but less than once per week	189 (3.7)	106 (4)	83 (3.3)		
Once per week or more	514 (10.1)	218 (8.3)	296 (11.9)		
<b>Age</b>	41.98 ±11.52	38.7±10.65	45.35±11.35	-21.27 <sup>e</sup>	<0.001
<b>Gender</b>				19.86	<0.001
Men	2147 (42.0)	1023 (39.0)	1124 (45.0)		
Women	2967 (58.0)	1601 (61.0)	1366 (54.9)		
<b>Education<sup>b</sup></b>				84.07	<0.001
Less than an associate degree	2219 (43.4)	976 (37.2)	1243 (49.9)		
Associate degree or more	2895 (56.6)	1648 (62.8)	1247 (50.1)		
<b>Duration of Unemployment</b>				203.18	<0.001
< 1 year	3293 (64.4)	1934 (73.7)	1360 (54.6)		
≥ 1 year	1821 (35.6)	690 (26.3)	1130 (45.4)		
<b>Depressive Symptoms<sup>c</sup></b>				27.89	<0.001
No	3745 (73.2)	2009 (76.6)	1736 (69.7)		
Yes	1369 (26.8)	615 (23.4)	754 (30.3)		
<b>Self-rated Health Score<sup>d</sup></b>				25.50	<0.001
≤5	4684 (91.6)	2455 (93.6)	2229 (89.5)		
> 5	430 (8.4)	169 (6.4)	229 (10.5)		

<sup>a</sup> Alcohol Use Disorders Identification Test to evaluate alcohol use.

<sup>b</sup> Based on the International Standard Classification of Education.

<sup>c</sup> Measured using the Center of Epidemiologic Studies Depression scale and a score ≥19.

<sup>d</sup> Self-rated health score from 1="Very good" to 8="Very Poor"

<sup>e</sup> Independent t-test for continuous variable.

524

525 *Table 2. Association between tobacco use and not returning to employment at one-year follow-up (n=5,114).*

<b>Not employed at one-year of follow-up</b>	
<b>OR</b>	<b>95% CI</b>

<b>Tobacco Use</b>			
Non-smoker	Ref	-	-
Former smoker	1.06	0.91	1.22
Current light smoker	1.11	0.91	1.36
Current moderate smoker	<b>1.33</b>	<b>1.08</b>	<b>1.64</b>
Current heavy smoker	<b>1.42</b>	<b>1.04</b>	<b>1.93</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	<b>0.88</b>	<b>0.78</b>	<b>0.99</b>
<b>Education<sup>a</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.72</b>	<b>0.64</b>	<b>0.81</b>

<sup>a</sup> Based on the International Standard Classification of Education.

526

527 *Table 3. Association between alcohol use and not returning to employment at one-year of follow-up (n=5,114).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Alcohol use (AUDIT)<sup>a</sup></b>			
Low risk	Ref	-	-
No use	<b>1.40</b>	<b>1.03</b>	<b>1.89</b>
Moderate risk	1.17	0.99	1.38
High or very high-risk	<b>2.10</b>	<b>1.53</b>	<b>2.87</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.05</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.91	0.81	1.03
<b>Education<sup>b</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.72</b>	<b>0.64</b>	<b>0.81</b>

<sup>a</sup> Alcohol Use Disorders Identification Test to evaluate alcohol use.

<sup>b</sup> Based on the International Standard Classification of Education.

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529

530 *Table 2. Association between cannabis consumption and not returning to employment at one-year of follow-up (n=5,114).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Cannabis consumption</b>			
Never consumed	Ref	-	-
Not during the previous year	1.06	0.93	1.21
At least once during the last 12 months but less than once a month	0.92	0.71	1.18
At least once a month but less than once per week	1.25	0.92	1.70
Once per week or more	<b>1.63</b>	<b>1.33</b>	<b>2.01</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.90	0.80	1.00
<b>Education<sup>a</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.71</b>	<b>0.63</b>	<b>0.80</b>

<sup>a</sup>Based on the International Standard Classification of Education.

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## 533 Supplemental Tables

534 *Supplemental Table 1. Characteristics of the 10,378 participants at baseline according to their response to employment*  
 535 *status at one year of follow-up.*

	Included			Not included	
	Unemployed	Employed	Total	Other <sup>a</sup>	Missing
	2490	2624	5114 (49.3%)	1078 (10.4)	4186 (40.3)
<b>Tobacco Use</b>					
Non-smoker	898 (36.1)	1125 (42.9)	2023 (39.6)	392 (36.4)	1400 (33.4)
Former smoker	779 (31.3)	710 (27.1)	1489 (29.1)	373 (34.6)	970 (23.2)
Current light smoker	198 (8.0)	279 (10.6)	477 (9.3)	77 (7.1)	463 (11.1)
Current moderate smoker	272 (10.9)	237 (9.0)	509 (10.0)	105 (9.7)	626 (15.0)
Current heavy smoker	127 (5.1)	82 (3.1)	209 (4.1)	46 (4.3)	277 (6.6)
Missing	216 (8.7)	191 (7.3)	407 (8.0)	85 (7.9)	450 (10.8)
<b>Alcohol use (AUDIT)<sup>b</sup></b>					
No use (0)	117 (4.7)	98 (3.7)	215 (4.2)	54 (5.0)	298 (7.1)
Low-risk (1-7)	1433 (57.6)	1708 (65.1)	3141 (61.4)	632 (58.6)	2030 (48.5)
Moderate risk (8-15)	291 (11.7)	360 (13.7)	651 (12.7)	140 (13.0)	472 (11.3)
High or very high-risk (>15)	102 (4.1)	64 (2.4)	166 (3.2)	36 (3.3)	199 (4.8)
Missing	547 (22.0)	394 (15.0)	941 (18.4)	216 (20.0)	1187 (28.4)
<b>Cannabis Consumption</b>					
Never consumed	1226 (49.2)	1201 (45.8)	2427 (47.5)	566 (52.5)	1788 (42.7)
Not during the previous year	763 (30.6)	892 (34.0)	1655 (32.4)	315 (29.2)	1179 (28.2)
At least once during the last 12 months but less than once a month	122 (4.9)	207 (7.9)	329 (6.4)	52 (4.8)	301 (7.2)
At least once a month but less than once per week	83 (3.3)	106 (4.0)	189 (3.7)	41 (3.8)	188 (4.5)
Once per week or more	296 (11.9)	218 (8.3)	514 (10.1)	104 (9.6)	730 (17.4)
Age	45.3±11.35	38.7±10.65	41.98±11.52	46.7±13.01	40.13±11.56
<b>Gender</b>					
Men	1124 (45.0)	1023 (39.0)	2147 (42.0)	478 (44.3)	2035 (48.6)
Women	1366 (54.9)	1601 (61.0)	2967 (58.0)	600 (55.7)	2151 (51.4)
<b>Education<sup>c</sup></b>					
Less than an associate degree	1218 (48.9)	963 (36.7)	2181 (42.6)	531 (49.3)	2345 (56.0)
Associate degree or more	1226 (49.2)	1637 (62.4)	2863 (56.0)	534 (49.5)	1739 (41.5)
Missing	46 (1.8)	24 (0.9)	70 (1.4)	13 (1.2)	102 (2.4)
<b>Duration of Unemployment</b>					
≤1 year	1242 (49.9)	1774 (67.6)	3016 (59.0)	489 (45.4)	2275 (54.3)
>1 year	777 (31.2)	399 (15.2)	1176 (23.0)	380 (35.3)	1101 (26.3)
Missing	471 (18.9)	451 (17.2)	922 (18.0)	209 (19.4)	810 (19.4)
<b>Depressive Symptoms<sup>d</sup></b>					
No	1660 (66.7)	1954 (74.5)	3614 (70.7)	731 (67.8)	2644 (63.2)
Yes	705 (28.3)	589 (22.4)	1294 (25.3)	289 (26.8)	1264 (30.2)
Missing	125 (5.0)	81 (3.1)	206 (4.0)	58 (5.4)	278 (6.6)
<b>Self-rated Health Score<sup>e</sup></b>					
≤5	2135 (85.7)	2350 (89.6)	4485 (87.7)	926 (85.9)	3508 (83.8)
> 5	251 (10.1)	165 (6.3)	416 (8.1)	112 (10.4)	453 (10.8)
Missing	104 (4.2)	109 (4.2)	213 (4.2)	40 (3.7)	225 (5.4)

<sup>a</sup> Retired, in training, does not work for health reasons, at home or other situations.

<sup>b</sup> Alcohol Use Disorders Identification Test to evaluate alcohol use.

<sup>c</sup> Based on the International Standard Classification of Education.

<sup>d</sup> Measured using the Center of Epidemiologic Studies Depression scale (CESD) and a score ≥19

<sup>e</sup> Self-rated health score from 1="Very good" to 8="Very Poor"

536 *Supplemental Table 2. Association between alcohol, tobacco and cannabis use and not returning to employment at one-year*  
 537 *of follow-up stratified on the duration of unemployment at baseline (n=5,114).*

		<b>Not employed at one-year of follow-up</b>		
		<b>OR</b>	<b>95% CI</b>	
<b>≤ 1 year of unemployment</b> N= 3293	<b>Tobacco Use</b>			
	Non-smoker	Ref	-	-
	Former smoker	1.14	0.96	1.36
	Current smoker	<b>1.33</b>	<b>1.10</b>	<b>1.61</b>
	<b>Alcohol use (AUDIT)<sup>a</sup></b>			
	Low risk	Ref	-	-
	No use	1.32	0.91	1.91
	At-risk	<b>1.35</b>	<b>1.11</b>	<b>1.63</b>
	<b>Cannabis consumption</b>			
	Never used	Ref	-	-
	Less than once weekly	1.11	0.95	1.30
Once per week or more	<b>1.76</b>	<b>1.36</b>	<b>2.28</b>	
<b>&gt; 1 year of unemployment</b> N= 1821	<b>Tobacco Use</b>			
	Non-smoker	Ref	-	-
	Former smoker	0.94	0.72	1.23
	Current smoker	1.07	0.79	1.45
	<b>Alcohol use (AUDIT)<sup>a</sup></b>			
	Low risk	Ref	-	-
	No use	1.45	0.86	2.42
	At-risk	1.18	0.86	1.62
	<b>Cannabis consumption</b>			
	Never used	Ref	-	-
	Less than once weekly	1.00	0.80	1.25
Once per week or more	1.43	0.98	2.09	

A separate model was performed for each substance adjusted for age, gender and education.

<sup>a</sup> Alcohol Use Disorders Identification Test to evaluate alcohol use.

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541 *Supplemental Table 3. Association between tobacco use and not returning to employment at one-year of follow-up after*  
 542 *excluding participants with depressive symptoms (n=3,745).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Tobacco Use</b>			
Non-smoker	Ref	-	-
Former smoker	1.04	0.87	1.23
Current smoker	<b>1.22</b>	<b>1.02</b>	<b>1.46</b>
<b>Age</b>	<b>1.05</b>	<b>1.05</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.93	0.81	1.06
<b>Education<sup>a</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.74</b>	<b>0.64</b>	<b>0.86</b>

<sup>a</sup> Based on the Standard International Classification of Education

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546 *Supplemental Table 4. Association between alcohol use and not returning to employment at one-year of follow-up after*  
 547 *excluding participants with depressive symptoms (n=3,745).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Alcohol use (AUDIT)<sup>a</sup></b>			
Low risk	Ref	-	-
No use	1.33	0.94	1.88
At-risk	<b>1.28</b>	<b>1.06</b>	<b>1.55</b>
<b>Age</b>	<b>1.05</b>	<b>1.05</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.96	0.83	1.10
<b>Education<sup>b</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.74</b>	<b>0.64</b>	<b>0.85</b>

<sup>a</sup> Alcohol Use Disorders Identification Test to evaluate alcohol use.

<sup>b</sup> Based on the Standard International Classification of Education

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551 *Supplemental Table 5. Association between cannabis consumption and not returning to employment at one-year of follow-up*  
 552 *after excluding participants with depressive symptoms (n=3,745).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Cannabis consumption</b>			
Never consumed	Ref	-	-
Less than once weekly	1.09	0.94	1.27
Once per week or more	<b>1.62</b>	<b>1.26</b>	<b>2.09</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.95	0.83	1.09
<b>Education<sup>a</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.74</b>	<b>0.64</b>	<b>0.85</b>

<sup>a</sup> Based on the Standard International Classification of Education

553

554 *Supplemental Table 6. Association between alcohol, tobacco and cannabis consumption and not returning to employment at*  
 555 *one-year of follow-up (n=5,114).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Tobacco Use</b>			
Non-smoker	Ref	-	-
Former smoker	1.04	0.89	1.22
Current light smoker	0.99	0.80	1.25
Current moderate smoker	1.18	0.94	1.48
Current heavy smoker	1.24	0.90	1.72
<b>Alcohol use (AUDIT)<sup>a</sup></b>			
Low-risk	Ref	-	-
No use	<b>1.47</b>	<b>1.07</b>	<b>2.00</b>
Moderate risk	1.09	0.92	1.30
High or very high-risk	<b>1.88</b>	<b>1.37</b>	<b>2.60</b>
<b>Cannabis Consumption</b>			
Never consumed	Ref	-	-
Not during the previous year	1.04	0.90	1.21
At least once during the last 12 months but less than once a month	0.85	0.65	1.10
At least once a month but less than once per week	1.14	0.82	1.59
Once per week or more	<b>1.50</b>	<b>1.19</b>	<b>1.88</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.93	0.82	1.05
<b>Education<sup>b</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.73</b>	<b>0.65</b>	<b>0.83</b>

<sup>a</sup> Alcohol Use Disorders Identification Test to evaluate alcohol use.

<sup>b</sup> Based on the Standard International Classification of Education

556

557 *Supplemental Table 7. Association between tobacco use and not returning to employment at one-year of follow-up*  
 558 *(n=5,114).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Tobacco Use</b>			
Non-smoker	Ref	-	-
Former smoker	1.04	0.90	1.20
Current light smoker	1.09	0.89	1.34
Current moderate smoker	<b>1.28</b>	<b>1.04</b>	<b>1.58</b>
Current heavy smoker	<b>1.37</b>	<b>1.01</b>	<b>1.87</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	<b>0.87</b>	<b>0.78</b>	<b>0.99</b>
<b>Education<sup>a</sup></b>	<b>0.80</b>	<b>0.75</b>	<b>0.85</b>

<sup>a</sup> Based on the International Standard Classification of Education.

559

560 *Supplemental Table 8. Association between alcohol use and not returning to employment at one-year of follow-up*  
 561 *(n=5,114).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Alcohol use (AUDIT)<sup>a</sup></b>			
Low-risk	Ref	-	-
No use	1.35	1.00	1.83
Moderate risk	1.16	0.98	1.37
High or very high-risk	<b>2.07</b>	<b>1.51</b>	<b>2.84</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.90	0.80	1.02
<b>Education<sup>b</sup></b>	<b>0.80</b>	<b>0.75</b>	<b>0.85</b>

<sup>a</sup> Alcohol Use Disorders Identification Test to evaluate alcohol use.

<sup>b</sup> Based on the International Standard Classification of Education.

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563

564 *Supplemental Table 9. Association between cannabis consumption and not returning to employment at one-year of follow-*  
 565 *up (n=5,114).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Cannabis consumption</b>			
Never consumed	Ref	-	-
Not during the previous year	1.07	0.93	1.22
At least once during the last 12 months but less than once a month	0.92	0.72	1.19
At least once a month but less than once per week	1.26	0.92	1.74
Once per week or more	<b>1.59</b>	<b>1.30</b>	<b>1.96</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.89	0.79	1.00
<b>Education<sup>a</sup></b>	<b>0.80</b>	<b>0.75</b>	<b>0.85</b>

<sup>a</sup>Based on the International Standard Classification of Education.

566

567 *Supplemental Table 10. Association between tobacco use and not returning to employment at one-year of follow-up after*  
 568 *excluding participants with poor self-rated health (n=4,684).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Tobacco Use</b>			
Non-smoker	Ref	-	-
Former smoker	1.09	0.94	1.26
Current light smoker	1.13	0.91	1.39
Current moderate smoker	<b>1.37</b>	<b>1.10</b>	<b>1.69</b>
Current heavy smoker	1.35	0.97	1.87
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.88	0.78	1.01
<b>Education<sup>a</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.72</b>	<b>0.64</b>	<b>0.82</b>

<sup>a</sup>Based on the International Standard Classification of Education.

569

570 *Supplemental Table 11. Association between alcohol use and not returning to employment at one-year of follow-up after*  
 571 *excluding participants with poor self-rated health (n=4,684).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Alcohol use (AUDIT)<sup>a</sup></b>			
Low-risk	Ref	-	-
No use	<b>1.37</b>	<b>1.01</b>	<b>1.87</b>
Moderate risk	1.14	0.96	1.36
High or very high-risk	<b>2.01</b>	<b>1.45</b>	<b>2.78</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.05</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.91	0.81	1.03
<b>Education<sup>b</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.72</b>	<b>0.64</b>	<b>0.81</b>

<sup>a</sup> Alcohol Use Disorders Identification Test to evaluate alcohol use.

<sup>b</sup> Based on the International Standard Classification of Education.

572

573 *Supplemental Table 12. Association between cannabis consumption and not returning to employment at one-year of follow-*  
 574 *up after excluding participants with poor self-rated health (n=4,684).*

<b>Not employed at one-year of follow-up</b>			
	<b>OR</b>	<b>95% CI</b>	
<b>Cannabis consumption</b>			
Never consumed	Ref	-	-
Not during the previous year	1.06	0.92	1.21
At least once during the last 12 months but less than once a month	0.98	0.75	1.27
At least once a month but less than once per week	1.20	0.86	1.67
Once per week or more	<b>1.71</b>	<b>1.38</b>	<b>2.12</b>
<b>Age</b>	<b>1.05</b>	<b>1.04</b>	<b>1.06</b>
<b>Gender</b>			
Men	Ref	-	-
Women	0.90	0.80	1.02
<b>Education<sup>a</sup></b>			
Less than an associate degree	Ref	-	-
Associate degree or more	<b>0.71</b>	<b>0.63</b>	<b>0.81</b>

<sup>a</sup> Based on the International Standard Classification of Education.

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