Alcohol and Tobacco Use After One Month of Containment Measures for the COVID-19 Sanitary Crisis in France

FRANÇOIS BECK, PH.D., STÉPHANE LEGLEYE, PH.D., & PATRICK PERETTI-WATEL, PH.D.

aCESP: Centre de recherche en Epidemiologie et Sante des Populations, Paris, France
bSanté publique France, Saint Maurice, France

Received: April 14, 2021. Revision: August 13, 2021.

This work was supported by the French National Research Agency, the Fondation de France and the French National Research Institute for Sustainable Development (grant number ANR-20-COVI-0035-01). Patrick Peretti-Watel designed the survey and was the lead investigator in the COronavirus et CONfinement: Enquête Longitudinale [COCONEL] project. Stéphane Legleye and François Beck designed the questionnaire of the study. Patrick Peretti-Watel, François Beck, and Stéphane Legleye designed the study. Stéphane Legleye made the computations and wrote the first draft of the manuscript. Patrick Peretti-Watel, Stéphane Legleye, and François Beck made critical revisions of the manuscript.

*Correspondence may be sent to Stéphane Legleye at the CESP: Centre de recherche en Epidemiologie et Sante des Populations, 97 boulevard de Port-Royal, Paris, 75014 France, or via email at: stephane.legleye@inserm.fr.
ABSTRACT. Objective: The measures put in place to contain the coronavirus epidemic in France have led to fears of a massive increase in the consumption of alcohol, tobacco, and other drugs. Method: Taking advantage of an ongoing weekly Internet survey monitoring living conditions of the French population during the containment, we introduced questions on alcohol and tobacco use 1 month after the start of the first containment. Analyses were conducted with multivariate Poisson regressions. Results: Tobacco consumption remained almost unchanged. By contrast, more than a third of French people did change their weekly alcohol intake: 13% increased it, whereas 21% decreased it, indicating that the containment measures were often taken as an opportunity to reduce alcohol consumption, especially among those who drank less than 4 days per week before. Men were more likely to decrease their alcohol intake and less likely to increase it than women, probably because of a differential impact of the reduction of social activities on gendered social roles. The people most affected were smokers and those living in a dwelling in which someone had been infected, including themselves. Conclusions: The crisis tended to polarize alcohol consumption toward extremes. If the new drinking habits were to continue, the consequences could be beneficial for occasional drinkers but harmful for heavier drinkers. (J. Stud. Alcohol Drugs, 83, 000–000, 2022)
TO MITIGATE THE CORONAVIRUS disease 2019 (COVID-19) pandemic, many countries have implemented unprecedented containment measures. In France, between March 17 and May 11, 2020, all nonessential economic activities were stopped and people had to stay at home: outings and outdoor activities were kept to a strict minimum. After 10 days, one French adult out of 10 was confined in an overcrowded dwelling, and, among those who were employed before the containment, 40% were still working out of their home, 20% were teleworking, and 40% had to stop working and stay at home (COronavirus et CONfinement: Enquête Longitudinale [COCONEL], 2020a). Limiting contacts with others often contributes to the development of negative feelings, isolation, and loneliness. These living conditions have been reported to likely cause stress and worries (Brooks et al., 2020). Additionally, some persons have been personally infected, or have experienced the illness or death of friends and relatives. In France, after 2 weeks of containment measures, 37% of French adults reported poor mental health (Peretti-Watel et al., 2020). Moreover, 74% had sleeping issues (COCONEL, 2020b), compared with 49% in 2017 (Peretti-Watel et al., 2020).

Anxiety related to the Covid-19 pandemic has been found to be associated with alcohol use in the United States (Avery et al., 2020). In Germany, an increase of alcohol use during the same period was reported (Koopmann et al., 2020). Practitioners as well as public health researchers have also warned about potential deleterious consequences of the containment, including failing to make a successful quit attempt, relapse after quitting smoking or drinking, or an increase of alcohol misuse (Clay & Parker, 2020; Patwardhan, 2020; Testino, 2020). Indeed, for many individuals, this containment period increased the amount of unstructured time and the number of opportunities to drink alcohol or smoke tobacco. More generally, the literature on motivational models of alcohol use and smoking (e.g., Avery et al., 2020; Cox & Klinger, 1988;
Revell, 1985) points out that people may use cigarettes or alcohol to help them cope with stressful life events, either at the micro level (e.g., divorce) or at the macro level (e.g., economic recession). During the containment, people had to cope with various stressors: worries about being infected, or about infected relatives, income or job loss, and living in unsuitable housing.

The objectives of this study are to describe evolutions in alcohol and tobacco consumption in the French population during the containment and to investigate associated factors, including several indicators of stressors related to either the pandemic or the containment itself. The underlying hypothesis was that the containment had a different effects on alcohol and tobacco consumption according to living conditions.

**Method**

*Design of the survey*

The COCONEL survey was based on a cross-sectional sample randomly selected each week from an online research panel of more than 750,000 French individuals, authorized by the French National Agency for Data Protection (CNIL). We applied a sampling method to achieve a sample of 1,005 respondents (including 530 women) out of the 25,800 invitations mailed out, representative for the French population aged 18 and over in terms of age, gender, occupation, and population in the area of residence. Collected data were weighted to match official French census statistics for age, gender, geographical area, size of municipality, household income, education level, and occupation. The study design was approved by the ethical committee of the University Hospital Institute Méditerranée Infection (#2020-018). The data collection took place after 4 weeks of containment.

*Data*
Regarding COVID-19–related stressors, respondents were asked how much they worry about being infected by the coronavirus, with a mark from 0 (*not worry at all*) to 10 (*great worry*) encoded into a ternary outcome: low worry (mark < 6), medium worry (6–7), high worry (8–10). Respondents were asked about confirmed cases of COVID-19 in their household (including themselves) or among their relatives. Containment-related stressors—household size and housing surface area—were used to identify respondents confined in overcrowded households (<200 square feet per capita). We also collected information about financial difficulties experienced because of the containment measures and current occupational status: currently working from workplace, teleworking, unemployed because of the containment measures, unemployed or out of work before the containment measures.

We asked for frequencies of alcohol consumption before and during the containment with two questions derived from the Alcohol Use Disorders Identification Test–Consumption questions (AUDIT-C; Bush et al., 1998): “Prior to containment/Since the containment, how often did you drink alcoholic beverages, i.e. wine, beer, spirits or other alcoholic beverages such as cider, port, champagne?” Response items were as follows: *every day, 4–6 days a week, 2–3 days a week, 1 day a week, less often.* A third question asked for the change in quantities consumed on a consumption day: “Since the containment, your alcohol consumption may have changed. Since the containment, on a day you drank alcohol”, Response items were: “You drink larger quantities than before containment,” “You drink smaller quantities than before containment,” “You drink the same amount as you did before the containment.”

Finally, we assessed tobacco cigarette smoking before and during the containment with two questions: “Prior to containment/Since the containment, did you smoke tobacco cigarettes? This included all forms of tobacco cigarettes (rolled, tubed, manufactured) but not the e-
cigarette.” Response items were as follows: no smoking, smoking less than one cigarette a week, less than one cigarette a day, 1–5 cigarettes a day, 6–10, 11–20, more than 20 cigarettes a day.

Statistical analysis

We combined the three alcohol-related questions in a three-level synthetic indicator of change of weekly alcohol intake since the containment: decrease (decrease in frequency and quantity; decrease in either frequency or quantity and stability in the other), increase (defined symmetrically), and stability (none of the previous). We assessed potential changes in smoking by comparing respondents’ answers to the two questions regarding smoking before and during the containment. The agreement/stability between frequencies of alcohol and of tobacco use before and during the containment were computed using the weighted kappa indicator (Cohen, 1968); values of .61–.80 and of .81–1.00 indicating strong and almost perfect agreement, respectively (Landis & Koch, 1977). Bivariate statistics used the Pearson chi-square test. Multivariate adjusted risk ratios (aRRs) and 95% confidence intervals (CIs) were computed using modified Poisson regressions with robust variance (Zou 2004). All analyses were conducted using SAS Version 9.4 (SAS Institute Inc., Cary, NC).

Results

Changes in alcohol use

The comparison of alcohol consumption frequencies before and during the containment showed a good stability ($\kappa = .79$): the proportions of daily drinkers and almost daily drinkers (4–6 days a week) were respectively 8% and 6% before the containment and 9% and 7% after. Overall, 21% of respondents decreased their weekly alcohol consumption; 66% reported stability and 13% an increase. The decrease was more frequent among infrequent drinkers (less than 3 days of consumption per week) than among the more frequent drinkers (22% vs. 13%, $p = .016$),
whereas the increase was equally reported by these two categories (13% each, \( p = .900 \)). The
decrease of alcohol intake was more frequent among people engaged in a noncohabiting couple,
unemployed people, and people who did not smoke before the containment measures (\( p < .05 \)
when compared with stability or increase; Table 1). Surprisingly, the fear of being infected was
not linked with any change in the weekly intake.

[COMP: Table 1 about here]

Multivariate regressions confirmed most of these results (Table 1). Characteristics
positively associated with a reduction of the weekly alcohol intake during the containment (as
opposed to stability or increase) were being a man (aRR = 1.41, [1.04, 1.92]); being unemployed
before the containment (aRR = 1.68, [1.06, 2.66]) (as opposed to currently working outside);
having a high education level (at least 3 years of university instead of less than high
school (aRR = 1.47 [1.04, 2.07]); being in a noncohabiting couple (aRR = 1.82 [1.14, 2.89]) or single (aRR =
1.69 [1.21, 2.38]), as opposed to living as a couple at home. Characteristics negatively associated
with a reduction were being older than 70 years old (aRR = 0.53 [0.29, 0.98]) as opposed to
being ages 18–30, having been drinking at least 4 days a week (aRR = 0.60 [0.37, 0.98], or
having been smoking more than 10 cigarettes a day before the containment (aRR = 0.49 [0.27,
0.87]), as opposed to having been a nonsmoker. Belonging to a household where someone has
been infected by the COVID-19 and the level of worries of being infected had no significant
effect.

In contrast, the only characteristics associated with an increase in the weekly alcohol
intake were living in an overcrowded dwelling (aRR = 0.35 [0.15, 0.78] and a great worry of
being infected (aRR = 0.59 [0.36, 0.98]).

Changes in tobacco consumption
Before the containment measures, 17% of respondents were daily tobacco smokers with 8% smoking 10 cigarettes or more per day. The corresponding figures during the containment were respectively 18% and 9%, showing a remarkable stability (κ = .88). Overall, only 2.8% of respondents reported smoking more since the containment (that is, 9.6% of the smokers), and 1.2% having reduced or ceased their consumption (9.4% of the smokers). People who were forced to stop working or to telework increased their consumption compared with the people who continued working (5.5% vs. 1.9%, \( p = .0479 \)) or with those who were not working (5.5% vs. 1.4%, \( p = .001 \)). People living in overcrowded dwellings increased their smoking less often than the others (2.3% vs. 7.4%, \( p = .002 \)). None of these effects remained significant in multivariate analysis (results not shown).

**Discussion**

Before discussing our results, we have to acknowledge limitations of the present study. First, a noncoverage bias: only 89% of the households had access to the Internet in 2019 (Legleye & Rolland, 2019). Unequipped households are older and have lower socioeconomic status than the others, two features relating to alcohol and tobacco use (but accounted for by the weighting procedure). Second, our study relies on respondent’s self-declarations. Social desirability bias is generally low in online surveys (Kreuter & Presser, 2008), but asking current and past frequencies of use at the same time may still bias reports of each in similar ways. As a consequence, this should not have affected much the measurement of change, which was our variable of interest. Our sample is of small size (\( n = 1,005 \)) but more gender-balanced (52.7% of women) than most collected online (70% to 80%; Busse et al., 2021; Schmits & Glowacz, 2021; Vanderbruggen et al., 2020).
Our first result is that the containment led to reductions more often than increases in alcohol consumption. It is corroborated by another recent French online survey in which 24% of the past drinkers decreased their use whereas 11% increased it during the containment (Guignard et al., 2021) and by the sales data that were down during the containment compared with the same period the year before (Observatoire Français des Drogues et des Toxicomanies [OFDT], 2020).

The COVID sanitary crisis led to specific societal and cultural trends in the relationship to alcohol (Chick, 2020), but alcohol use increased in many countries. For example, in a study in Bergen in April 2020, self-assessed increased alcohol consumption during the lockdown period was reported by 13% of the sample (Eiken Alpers et al., 2021). In Belgium, a study showed that individuals drank a bit more alcohol during the containment than before (Vanderbruggen et al., 2020) and the same was found in the United States (McKetta et al., 2021), whereas reports of increases (35%) were almost twice as frequent as those of decreases (19%) in Germany (Koopmann et al., 2020). That alcohol use decreased in France is thus somewhat surprising. Indeed, France has many classic features of the wet alcohol drinking culture (Room & Mäkelä, 2000): Drinking occasions are associated with particular moments of conviviality that have largely disappeared during the containment. But this is not unique to France, and the convergence of drinking patterns across cultures (Savic et al., 2016) invites caution in using a general cultural argument.

However, the French Government immediately applied unconditional measures to support economic activity and compensate for lost income (salaries, unemployment benefits, allowances), and social rights. This specificity may have helped limit the economic consequences of the health crisis and the associated stress, especially among the most vulnerable.
In fact, we did not find significant differences according to reported financial difficulties, pre-existing or because of the lockdown; living in an overcrowded dwelling was associated with reduced risk of increasing one’s alcohol consumption; a low education level was associated only with fewer chances to have reduced one’s consumption; and the unemployed more frequently reported a decrease in their use during this period. The global picture is thus that the most at-risk populations have not been as affected as specialists feared at the beginning of containment. We nevertheless acknowledge that further investigations are needed to understand the global decrease in alcohol use in France.

Nevertheless, a part of the population (13%) increased its alcohol intake during the containment. Several factors may have contributed to this increase. Social isolation and loneliness have been identified as predictors of alcohol use and misuse (Algren et al., 2020; Leigh-Hunt et al., 2017), especially in older people (Kharicha et al., 2007) and in problematic users (Ingram et al., 2020). Individuals personally affected by the virus (or whose relative was affected) were also more at risk, as in (Avery et al. 2020).

In our study, men were more likely to decrease their weekly alcohol intake and less likely to increase it than women. This result is opposed to what has been observed in previous public health crises (Rehm & Probst, 2018) or economic crises (de Goeij et al., 2015), considering that the COVID-19 pandemic is a social and economic crisis. It could, however, be explained by traditional gendered social roles: the reduction of activities resulted in fewer opportunities to drink outside the home for men more than for women, whereas the latter assumed greater responsibility for the education of children deprived of schooling (Albouy & Legleye, 2020), resulting in increased stress.
Our second result is the stability of tobacco smoking reports. It seems less robust as it is not confirmed in the study by Guignard et al. (2021) that found more increase (27%) than decrease (19%) nor in official selling data (OFDT, 2020).

The containment was a period of social isolation, psychological distress, and, for some, of economic losses. It also reduced the access to addiction care services and support networks, which may have had deleterious consequences for patients. However, the sanitary crisis has allowed the development of measures such as telemedicine (Uscher-Pines et al., 2020) and remote harm reduction for illicit drugs (Crowley & Delargy, 2020), which could contribute to reduce territorial inequalities in access to addiction care (Leibowitz et al., 2021; López-Pelayo et al., 2020). The long-term balance of the two is still uncertain.

In 2020, in France, about 65,000 people died because of COVID-19, whereas tobacco and alcohol are responsible respectively for 73,000 and 41,000 deaths every year. It is thus crucial to monitor their use during and in the months and years after the COVID-19 crisis to distinguish short-term from long-term effects, especially by gender and socioeconomic status (Kontopantelis et al., 2018; Rehm & Probst, 2018). It is also crucial to implement effective, innovative, and evidence-based actions aiming at maintaining healthy lifestyles and reducing alcohol and tobacco consumption (Lange et al., 2020).

Conflict-of-Interest Statement

The authors have no conflicts of interest to declare.

References


Legleye, S., & Rolland, A. (2019). Une personne sur six n’utilise pas Internet, plus d’un usager sur trois manque de compétences numériques de base [One in six people do not use the Internet, more than one in three users lack basic digital skills]. *Insee Première*, 1780.


<table>
<thead>
<tr>
<th>Variable</th>
<th>Sample</th>
<th>Reduction</th>
<th>Stability</th>
<th>Increase</th>
<th>Reduction vs. stability or increase</th>
<th>Increase vs. stability or decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>aRR [95% CI] p*</td>
<td>aRR [95% CI] p*</td>
</tr>
<tr>
<td>Women</td>
<td>47.6</td>
<td>19.2</td>
<td>66.4</td>
<td>14.4</td>
<td>.223</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>52.4</td>
<td>22.5</td>
<td>66.1</td>
<td>11.4</td>
<td></td>
<td>1.41 [1.04, 1.92] .027</td>
</tr>
<tr>
<td>18–30</td>
<td>17.2</td>
<td>30.9</td>
<td>57.5</td>
<td>11.6</td>
<td>.001</td>
<td>0.67 [0.42, 1.07] .097</td>
</tr>
<tr>
<td>31–50</td>
<td>34.7</td>
<td>17.6</td>
<td>65.9</td>
<td>16.5</td>
<td>0.69 [0.46, 1.03] .068</td>
<td>1.23 [0.66, 2.31] .510</td>
</tr>
<tr>
<td>51–70</td>
<td>31.4</td>
<td>20.5</td>
<td>66.7</td>
<td>12.8</td>
<td>0.75 [0.49, 1.15] .189</td>
<td>1.02 [0.48, 2.21] .950</td>
</tr>
<tr>
<td>&gt;70 years old</td>
<td>16.8</td>
<td>17.5</td>
<td>75.0</td>
<td>7.5</td>
<td>0.53 [0.29, 0.98] .041</td>
<td>0.63 [0.22, 1.82] .393</td>
</tr>
<tr>
<td>&lt;High school</td>
<td>50.6</td>
<td>18.4</td>
<td>69.5</td>
<td>12.1</td>
<td>.222</td>
<td></td>
</tr>
<tr>
<td>High school, first university degree</td>
<td>18.9</td>
<td>22.9</td>
<td>64.6</td>
<td>12.6</td>
<td>1.21 [0.83, 1.78] .326</td>
<td>1.03 [0.61, 1.72] .916</td>
</tr>
<tr>
<td>&gt;2 years completed at university</td>
<td>30.5</td>
<td>23.4</td>
<td>61.9</td>
<td>14.7</td>
<td>1.47 [1.04, 2.07] .028</td>
<td>0.98 [0.58, 1.67] .952</td>
</tr>
<tr>
<td>Working</td>
<td>18.6</td>
<td>15.7</td>
<td>69.1</td>
<td>15.3</td>
<td>.033</td>
<td></td>
</tr>
<tr>
<td>Teleworking</td>
<td>12.6</td>
<td>14.9</td>
<td>66.8</td>
<td>18.3</td>
<td>0.79 [0.46, 1.36] .396</td>
<td>1.24 [0.68, 2.28] .479</td>
</tr>
<tr>
<td>Stopped working</td>
<td>19.3</td>
<td>21.8</td>
<td>64.0</td>
<td>14.2</td>
<td>1.43 [0.87, 2.35] .160</td>
<td>0.99 [0.55, 1.77] .972</td>
</tr>
<tr>
<td>Unemployed</td>
<td>49.5</td>
<td>23.8</td>
<td>65.9</td>
<td>10.3</td>
<td>1.68 [1.06, 2.66] .028</td>
<td>0.93 [0.49, 1.77] .822</td>
</tr>
<tr>
<td>Financial difficulty: No</td>
<td>44.2</td>
<td>18.6</td>
<td>68.2</td>
<td>13.3</td>
<td>.668</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>33.3</td>
<td>22.1</td>
<td>65.1</td>
<td>12.8</td>
<td>1.29 [0.90, 1.86] .170</td>
<td>0.96 [0.58, 1.59] .873</td>
</tr>
<tr>
<td>Yes, due to containment</td>
<td>22.5</td>
<td>23.0</td>
<td>64.2</td>
<td>12.8</td>
<td>1.38 [0.89, 2.13] .149</td>
<td>0.87 [0.52, 1.43] .577</td>
</tr>
<tr>
<td>Overcrowded dwelling: No</td>
<td>89.1</td>
<td>21.0</td>
<td>65.1</td>
<td>13.9</td>
<td>.023</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10.9</td>
<td>18.9</td>
<td>75.8</td>
<td>5.2</td>
<td></td>
<td>0.65 [0.40, 1.06] .086</td>
</tr>
<tr>
<td>In couple at home</td>
<td>60.7</td>
<td>15.5</td>
<td>69.1</td>
<td>15.4</td>
<td>.001</td>
<td>0.35 [0.15, 0.78] .010</td>
</tr>
<tr>
<td>In non-cohabiting couple</td>
<td>8.0</td>
<td>33.3</td>
<td>53.8</td>
<td>12.8</td>
<td>1.82 [1.14, 2.89] .012</td>
<td>0.85 [0.31, 2.36] .762</td>
</tr>
<tr>
<td>Single</td>
<td>31.3</td>
<td>27.8</td>
<td>63.9</td>
<td>8.4</td>
<td>1.69 [1.21, 2.38] .002</td>
<td>0.55 [0.34, 0.87] .011</td>
</tr>
<tr>
<td>≤3 days alcohol/weeka</td>
<td>86.1</td>
<td>22.0</td>
<td>65.1</td>
<td>12.9</td>
<td>.051</td>
<td>0.60 [0.37, 0.98] .040</td>
</tr>
<tr>
<td>≥4 days alcohol/week</td>
<td>13.9</td>
<td>13.1</td>
<td>73.6</td>
<td>13.3</td>
<td></td>
<td>1.11 [0.56, 2.21] .769</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Nonsmoker  a</td>
<td>81.2</td>
<td>22.1</td>
<td>65.9</td>
<td>12.1</td>
<td>.114</td>
<td></td>
</tr>
<tr>
<td>1–9 cig./day</td>
<td>10.1</td>
<td>18.1</td>
<td>65.0</td>
<td>16.9</td>
<td>0.80 [0.50, 1.27]</td>
<td>.345</td>
</tr>
<tr>
<td>≥10 cig./day</td>
<td>8.7</td>
<td>11.9</td>
<td>71.3</td>
<td>16.8</td>
<td><strong>0.49</strong> [0.27, 0.87]</td>
<td>.015</td>
</tr>
<tr>
<td>Low worry (1–5)</td>
<td>44.5</td>
<td>21.4</td>
<td>63.0</td>
<td>15.5</td>
<td>.242</td>
<td></td>
</tr>
<tr>
<td>Medium worry (6–7)</td>
<td>23.1</td>
<td>20.5</td>
<td>68.4</td>
<td>11.2</td>
<td>1.04 [0.71, 1.54]</td>
<td>.832</td>
</tr>
<tr>
<td>High worry (≥8)</td>
<td>32.4</td>
<td>20.1</td>
<td>69.1</td>
<td>10.8</td>
<td>1.08 [0.75, 1.54]</td>
<td>.684</td>
</tr>
<tr>
<td>Infection at home: No</td>
<td>72.3</td>
<td>21.8</td>
<td>67.0</td>
<td>11.2</td>
<td>.020</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>27.7</td>
<td>18.1</td>
<td>64.3</td>
<td>17.6</td>
<td>0.89 [0.62, 1.29]</td>
<td>0.544</td>
</tr>
</tbody>
</table>

**Notes:** COCONEL survey, April 15–17 2020, N = 1,005; modified Poisson regressions with robust variance. **Bold** indicates aRR with p < .05; underlined indicates p < .1. p = Pearson chi-square p value for the percentages; aRR = adjusted risk ratio; CI = confidence interval; p* = Wald chi-square p value for the risk ratios; cig. = cigarettes. aBefore the containment.