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# Anxiety, depression and sleep problems: a second wave of COVID-19

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Dear Editor,

During the early spring of 2020, as the COVID-19 (coronavirus disease 2019) pandemic spread across the globe like a viral tsunami, many countries urgently implemented unprecedented mitigation measures to slow it down, following the example of China, where the disease first emerged at the end of 2019. As a result, more than 3 billion unprepared people worldwide had to cope with living under stringent lockdown measures for weeks or months, depending on the country. Together with the deaths of hundreds of thousands of people from this disease, a frightening emotional shock has touched populations everywhere around the planet. Millions have lost their jobs, others have had their personal lives changed drastically; the elderly, for example, have sometimes been isolated from any visits. To our knowledge, no guidelines to prevent psychological trauma have been proposed, even for the most vulnerable individuals. Nonetheless, before this crisis began, several experts had warned about the potential impact of such measures on the populations' mental health, based on previous experiences of quarantine, as summarised in a review published, as this pandemic reached Europe and before any lockdowns.<sup>1</sup> This warning was confirmed a few days later by the publication of a nationwide study conducted in China reporting that the quarantine triggered a wide variety of psychological disorders.<sup>2</sup> In France, one of the hardest hit countries in Europe, a nationwide lockdown started on 17 March and lasted till 11 May. Public health authorities made daily recommendations on how to prevent COVID-19 infection with almost no specific advice on psychological prevention.

Our interest was, therefore, to assess the French population's mental health after the onset of this unprecedented 8-week lockdown. At the end of March 2020, we began repeated weekly national cross-sectional

online surveys, the COCONEL (COronavirus & CONfinement, Enquête Longitudinale) survey. Representative samples of the French population aged 18 years and older were drawn from an online research panel of more than 750 000 households stratified for sex, age, occupational status, education level, size of town and region. The survey conducted during the last 4 days of lockdown (7–10 May) focused on mental health (participants: n=2003) and included the Patient Health Questionnaire-9 (PHQ-9) and the General Anxiety Disorder-7 (GAD-7) instruments to screen, respectively, for major depression and generalised anxiety disorders during the previous 2 weeks.<sup>3,4</sup> We applied a cut-off point of 15 for the PHQ-9 to identify individuals with moderate to severe depressive symptoms, and a cut-off point of 15 on the GAD-7 to define severe anxiety. For the PHQ-9, we also used a second lower cut-off point of 10 to identify individuals with moderate depressive symptoms and compare our results with the data collected in France in 2014.<sup>5</sup> Participants were also asked if they had experienced sleep problems over the last week and if they felt they needed psychological support from a health professional during the lockdown. We used the following item to assess sleep problems: did you have sleep problems during the last week: (A) not at all, (B) few, (C) a lot? It initially came from the quality-of-life scale 'The Duke health profile'.<sup>6</sup> It has been regularly used in French surveys during the last decade, and we found that it was significantly associated with the claim of insomnia (according to International Classification of Sleep Disorders, Second Edition, and Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)).<sup>7</sup> We used it because this allowed us to compare prevalence rates during the lockdown to those before the lockdown. Questions regarding the pandemic generally included whether they had been diagnosed with COVID-19

and whether someone close to them (either a relative or a friend) had been admitted to intensive care for this disease. We also collected information on participants' gender, age, education level and household income level, as well as about their social and occupational situation during the lockdown (still working outside the home, teleworking or had been laid off, and whether or not they were confined in an overcrowded dwelling).

We assessed media exposure to COVID-19 by asking respondents how much time per day they spent looking for information about the epidemic (on television, radio, newspapers, online websites and social media) in the past week. The '≥4 hours per day' category corresponds to respondents who spent on average about 8 hours a day looking for information about COVID-19. Multivariate logistic models analysed the associations of the four mental health outcomes (moderate to severe depressive symptoms, severe anxiety, sleep problems and reported need for psychological support from a health professional) with sociodemographic characteristics and exposure to both the virus and the media.

Our survey provides an overview of the French population's mental health after 8 weeks of lockdown. The prevalence of moderate to severe depressive symptoms reached 8.8%, and the prevalence of severe anxiety was 8.7%; 68.1% of respondents complained of sleep problems during the past week (few or a lot), and 12.2% reported the need for psychological support from a health professional during the lockdown. Among those who felt the need for psychological support, 90% also reported either severe depressive symptoms, severe anxiety or sleep problems (see [table 1](#)). The prevalence of sleep problems can be easily compared with the 'prelockdown' situation: it was measured among the French adult population at 49% in 2017,<sup>8</sup> vs 68.1% in the present survey. Notably, this prevalence had peaked at 74% 2 weeks after lockdown.<sup>9</sup> The prevalence of moderate depressive symptoms (PHQ9≥10) reached 22.9% in the present survey, compared with 7% in the French version of the European Health Interview Survey conducted in 2014.<sup>5</sup> This large difference underlines the major impact of this sanitary crisis on mental health.

Moreover, contrary to previous observations among the French population,<sup>8</sup> young people (aged 18–25) reported the highest prevalence of sleep problems, while respondents aged 18–45 were more likely to report depressive symptoms than their older counterparts. Recent Chinese and US studies during the COVID-19 lockdown found similar differences in psychological distress and anxiety.<sup>2 10</sup> Various interpretations have already been suggested for this unexpected result: compared with the rest of the population, young adults may be more exposed to stressful information on social media, suffer more from isolation resulting from social distancing<sup>11</sup> and fear disruption of their future as a result of the current crisis. Students, for example, may be vulnerable to the impact of the lockdown because of its repercussions on their studies.<sup>12</sup>

Our results made it possible to disentangle some effects of the lockdown from those of the pandemic. Results about the lockdown itself included associations between confinement in an overcrowded dwelling with higher risks of psychological distress, sleep problems and need for psychological support (only the last association remained significant in multivariate analysis). On the contrary, working outside the home full-time was associated with fewer mental health problems (depressive symptoms, anxiety or sleep problems) than staying at home (even for teleworking, except for anxiety).

Of course, the COVID-19 pandemic was another source of psychological distress, as illustrated by the association between exposure to the disease and mental health outcomes. The prevalence of depressive symptoms, anxiety and need for psychological support was notably higher among respondents who were diagnosed with COVID-19 than among the general population, as was the need for psychological support during the lockdown among those who had someone close to them in an intensive care unit because of COVID-19. One reason for this strong effect is probably the paucity of contacts between these people and health professionals (including their own general practitioners) because of the lockdown and the quarantine procedure for infected people. Health authorities repeatedly recommended that those with suspected COVID-19 infection stay at home, isolate themselves from their household and call an emergency number (which often did not answer because the emergency services were unprepared for and overwhelmed by the demand) if their symptoms worsened. This situation was extremely stressful for many individuals. Although severe and even lethal, the viral epidemic was quite limited: at the end of lockdown, three French adults out of four reported that no one in their household or among their friends or relatives had been infected.<sup>13</sup> Many more people were affected by the emotional and psychotraumatic shock associated with COVID-19, to which they were exposed mainly through media information.

Our results suggested that intensive media exposure to news about COVID-19 was detrimental for mental health, as the prevalence of the four mental health problems surveyed was significantly higher among those who spent at least 4 hours a day (and about 8 hours on average) looking for information about COVID-19, and these associations remained highly significant after adjustment for other covariates. This result echoed those of previous studies of smaller and non-representative samples<sup>14 15</sup>: uncontrolled spread of false information on social media can certainly fuel confusion, anxiety and panic,<sup>16</sup> but massive exposure to more or less reliable information on mainstream media may also act as a stressor, with a potential traumatic impact. Of course, the media played a crucial role in informing the public about the COVID-19 pandemic and promoting preventive behaviours, but it probably came at a cost, especially because of the unprecedented combination of lockdown and massive and stressful media coverage of the epidemics: the lockdown

**Table 1** Mental health in the French general population after 8 weeks of lockdown (COCONEL survey, France, n=2003, 7–10 May 2020)

	Depressive symptoms PHQ9≥15	Anxiety GAD≥15	Sleep problems few, a lot	Perceived need for psychological support
	% (95% CI)			
Proportion in the whole sample	8.8 (7.6 to 10.0)	8.7 (7.5 to 9.9)	68.1 (66.1 to 70.1)	12.2 (10.8 to 13.6)
	Row %			
Gender:	(P<0.001)*			
Male (n=954)	7.8	7.9	60.7	11.8
Female (n=1049)	9.7	9.4	74.8	12.6
Age (in years):	(P=0.001)			
18–25 (n=229)	11.8	7.9	76.4	16.2
26–45 (n=629)	11.8	9.2	70.5	16.7
46–65 (n=695)	7.2	8.3	65.7	7.6
>65 (n=450)	5.3	8.9	64.2	11.3
Education level:				
<High-School (n=1017)	8.2	10	66.1	11.8
High-school, first university degree (n=634)	9.8	8	70.5	12
>2 years completed at university (n=352)	8.8	6.3	69.6	13.9
Household income level†	(P=0.003)			
Low income (n=473)	12.3	13.3	71.2	15.2
Medium income (n=1076)	8	7.5	69.1	10.6
High income (n=454)	6.8	6.6	62.6	13
Confined in an overcrowded dwelling ‡	(P=0.022)			
No (n=1826)	8.5	8.3	67.7	11.3
Yes (n=177)	11.2	12.9	72.3	21.3
Occupational status since lockdown:	(P=0.031)	(P=0.039)	(P<0.001)	
Still working full time out of home (n=357)	6.4	6.2	56	10.1
Teleworking (n=282)	10.6	5.7	72.2	14.2
Not working, other (n=1364)	9.3	10	70.5	12.5
Respondent diagnosed with COVID-19:	(P=0.001)	(P<0.001)		(P<0.001)
No (n=1950)	8.3	8.2	68	11.5
Yes (n=53)	25.9	26.4	72.2	39.6
Someone close sent to intensive care unit:	(P=0.003)			
No (n=1870)	8.3	8.5	68	11.3
Yes (n=133)	14.3	12	70.7	24.8
Daily media exposure to COVID-19:	(P<0.001)	(P<0.001)	(P=0.001)	(P<0.001)
<1 hour (n=478)	5.6	8.2	60.8	8.6
1 to 2 hours (n=617)	5.2	6.2	68.1	10.1
2 to 4 hours (n=421)	6.9	6.2	71.2	10
≥4 hours (n=489)	18	14.3	72.6	21.4

95% CI: 95% Confidence Interval; COCONEL: COronavirus, CONfinement: Enquête Longitudinale; GAD, General Anxiety Disorder; PHQ-9, Patient Health Questionnaire-9

\*For each outcome (column variables), the p values in brackets have been computed for each covariate after adjustment for other covariates (logistic regressions). Only p values below the 0.05 threshold were reported.

†We computed each participant's equalised household income per month, taking into account its household size and composition. 'Low income' refers to the first quartile, 'medium income' to the second and third quartiles, 'high income' to the fourth quartile.

‡<194 square feet per capita.



ensured that people were even more highly exposed to this media coverage than usual and less able either to escape their television, computer or telephone screens or to cope with stress and sleep issues by exercising outside.

Our cross-sectional survey cannot allow us to conclude that the COVID-19 lockdown was a direct cause of the occurrence of mental health symptoms, nor does it establish trends during the lockdown in the prevalence of major depression and anxiety disorders, according to the DSM-V. However, our results strongly supported the hypothesis that this lockdown has had a massive impact on the mental health of the French population. Continued monitoring of this public health issue is necessary to determine if it will be transitory and if so, for how long it may last. There are serious reasons—the social disruption and economic consequences of the lockdown will probably persist for several months, perhaps even years—to remain alert about the possibility of a ‘second wave’ of the pandemic that might already have arrived: a long-lasting psychological impact, especially among the youth and most vulnerable people. Long-term follow-up and prevention are needed to avoid chronic complications of these post-traumatic mental disorders.

**Collaborators** The COCONEL Group: Patrick Peretti-Watel, Valérie Seror, Sébastien Cortaredona, Odile Launay, Jocelyn Raude, Pierre Verger, Caroline Alleaume, Lisa Fressard, François Beck, Stéphane Legleye, Damien Léger, Olivier L'Haridon, Jeremy Ward.

**Contributors** PPW wrote the first draft. CA carried out the statistical analyses. DL, FB and PV critically revised the manuscript. All the authors contributed to and approved the final manuscript.

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