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## Could the decrease of the number of hospitalizations for suicide attempts in France be related to limited access to care?

Evidence has shown that the COVID outbreak negatively impacted the mental health of the population in general. Still, few have commented on how this impact has translated into suicidal behaviors although many experts alerted on the potential risk of suicide with COVID emergence. The first studies considering only 2020 reported no difference or reduced emergency department (ED) attendances for self-harm during the epidemic vs. non-epidemic periods in adults (Rogers et al., 2021; Svetlicic et al., 2021). But one must take the case seasonal component accounting for the variations observed during the year into account. Relative to a similar period in 2019, the number of ED visits for suicide attempts (SA) remained stable among American adults aged 18–25 during summer 2020 and winter 2021 (Yard, 2021). During spring 2020 vs. 2019, the number of SA-related hospitalizations significantly decreased in France (Olié et al., 2021), whereas an increase in admissions for deliberate self-harm was observed in the UK (Shields et al., 2021). These results are difficult to interpret as studied periods are heterogeneous for seasons and restrictive measures due to COVID-19. It is thus essential to consider the whole year 2020 to investigate the global evolution of suicidal risk since the COVID outbreak and determine which periods are at higher or lower risk of SA in 2020.

We used the French national hospital discharge database (Programme de Médicalisation des Systèmes d'Information, PMSI) to identify SA-related hospitalizations (ICD-10 codes X60 to X84) in the Medicine/Surgery services of public- and private-sector hospitals from January 2018 to December 2020. Patients aged 10 years and older were included. We compared the patients' SA methods, death rate during hospitalization, and age (<30, [30–60] and ≥60-year-old) for each trimester in 2020 vs. corresponding trimesters in 2019 and 2018. The evolution of SA was modeled using a negative binomial regression for numbers and Poisson regression with  $\ln(\text{SA number})$  as an offset for rates with the year, trimesters, and their interaction as fixed factors. We considered trimesters because the epidemic tipping point was the implementation of the French national lockdown on the 16th of March 2020. Pairwise post hoc comparisons were performed between years globally and for each trimester, and the p-value was corrected with Bonferroni's method. LS-means with 95% confidence intervals were reported.

In total, 257 485 hospital stays for SA were identified, 19.2% of these SAs having been violent or severe (i.e., other methods than self-poisoning or self-cutting or need of intensive care unit admission). When modeling the evolution of the SA number, it appeared significantly lower in 2020 and more precisely for the 3 last trimesters (i.e., since the COVID outbreak in France) compared to the corresponding periods in 2019 and 2018 (Table 1). The severe or violent SA rate increased during both the 2nd and 3rd trimesters 2020 vs. 2019 and 2018. The interaction between year and trimester did not appear

significant for death rates during hospitalizations. In exploratory analyses, these death rates during the hospitalization and following a non-violent SA only increased during the 2nd trimester of 2020 (i.e., early months of the pandemic including the national lockdown) vs. 2019 and 2018 (results not shown).

Moreover, we failed to show a triple interaction between age classes, year, and trimester. However, the number of SA appeared to be significantly lower for the 30- to 60-year-olds during the first 3 trimesters of 2020 compared to 2019 and 2018. The same findings were observed for the 2nd trimester for the < 30 years old, associated with an increased severe/violent SA rate. The severe/violent SA rate also increased during the 2nd trimester of 2020 for the 30- to 60-year-olds, with a significant difference vs. 2018 (results not shown).

Our results confirm the global decline of hospitalizations for SA following the COVID-19 outbreak, with a lasting effect until the end of 2020. Even if inference from these epidemiological observations is quite difficult, we hypothesize that it may reflect a lack of availability of psychiatric services or difficulty for psychiatric patients in accessing care since the outbreak. Indeed, the decline is especially marked during the 2nd trimester of 2020, when the government enforced its most restrictive measures. Moreover, it is concomitant with an increase in the death rate following non-violent SA, which may result from limited or delayed access to adequate care for non-serious SA (Gómez-Ramiro et al., 2021). As underlined by the International Academy for Suicide Research, mental health issues among people with psychiatric disorders went untreated due to 1) fear of visiting clinics during the crisis, 2) redistribution of mental health resources to other health care sectors, or 3) a decrease in hospitalizations and referrals to psychiatric emergency rooms (Zalsman et al., 2020). Interestingly, we found that the rate of severe or violent SA was increased in subjects < 60 but not in those ≥60-years-old during the 2nd trimester, which is consistent with the lower negative psychological impact (depression, anxiety, and suicidal ideation) of lockdown on the elderly (O'Connor et al., 2020).

Our study has limitations. Firstly, we were unable to ascertain the suicide rate of the population during the study period. It will be crucial to correlate the decline in SA-related hospitalizations with the actual suicide rate once it becomes available. Secondly, the PMSI database may underestimate SA frequency because it records emergency stays lasting more than 24 h. The figures for December 2020 may be underestimated as the data extraction was performed in early 2021. Thirdly, our results are not generalizable to the general population, but only apply to those hospitalized for self-harm.

Let us not rejoice too soon at this decrease in the number of SA-related hospitalizations, which may not reflect a decrease in SA. Indeed, it may indicate that the prevention of suicide through the care of those most at risk of suicide (i.e., suicide attempters) cannot be achieved

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**Table 1**

Monthly number of SA-related hospitalizations and rate of violent or severe SA for each trimester  
LS-means [95% CI] and p-values of comparisons between years (Bonferroni correction).

Periods		2018	2019	2020	2020 vs. 2019	2018 vs. 2020	2018 vs. 2019
Global	SA-related hospitalization	7493 [7292;7699]	7322 [7125;7523]	6630 [6451;6813]	<0.0001	<0.0001	0.7140
1st trimester January-March	Rate violent or severe SA	18.5 [18.2 ;18.8]	19.2 [18.9 ;19.5]	19.8 [19.5 ;20.2]	0.0069	<0.0001	0.0034
	SA-related hospitalization	7471 [7076;7888]	6935 [6567;7323]	7008 [6637;7400]	1.0000	0.3073	0.1724
2nd trimester April-June	Rate violent or severe SA	17.4 [16.8;17.9]	19.1[18.6;19.7]	18.8[18.2;19.4]	1.0000	0.0019	<0.0001
	SA-related hospitalization	7895 [7478;8335]	7576 [7176;7999]	6349 [6012;6706]	<0.0001	<0.0001	0.8764
3rd trimester July-September	Rate violent or severe SA	18.6 [18.1;19.2]	19.3[18.7;19.9]	21.1[20.5;21.8]	<0.0001	<0.0001	0.3193
	SA-related hospitalization	7366 [6976;7777]	7297 [6911;7705]	6625 [6274;6997]	0.0417	0.0210	1.0000
4th trimester October-Dec.	Rate violent or severe SA	19.1 [18.5;19.7]	19.2 [18.6;19.7]	20.3 [19.7;21]	0.0183	0.0109	1.0000
	SA-related hospitalization	7255 [6871;7660]	7495 [7099;7914]	6556 [6208;6923]	0.0019	0.0296	1.0000
	Rate violent or severe SA	19 [18.4;19.6]	19.1 [18.6;19.7]	19.2 [18.6;19.8]	1.0000	1.0000	1.0000

because this care is not provided. Suicide prevention should remain a priority during the COVID-19 pandemic, especially during lockdown periods, with the reinforcement of adequate access to care for the most vulnerable subjects, including providing emergency cares for suicidal individuals.

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**Emilie Olié:** Conceptualization, Writing – original draft, Writing – review & editing. **Erika Nogue:** Data curation, Formal analysis, Writing – review & editing. **Marie Christine Picot:** Supervision, Writing – review & editing. **Philippe Courtet:** Conceptualization, Writing – review & editing.

#### Declaration of Competing Interest

None.

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