



# Suicidal Behavior in the First Wave of the COVID-19 Pandemic

Lucas Giner<sup>1</sup> · Constanza Vera-Varela<sup>2</sup> · Diego de la Vega<sup>1,3</sup> · Giovanni M. Zelada<sup>4</sup> · Julio A. Guija<sup>1,5</sup>

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## Abstract

**Purpose of Review** Since the declaration of the COVID-19 pandemic, there have been numerous social changes to try to contain the spread of the disease. These sudden changes in daily life have also changed the way we relate to others, in addition to creating a climate of uncertainty and fear. Therefore, the objective of this review is to compile published data of the consequences of suicidal behavior in the first months from the onset of the pandemic.

**Recent Findings** The analysis reflects a concern about issues related to suicide since the beginning of the pandemic. A large number of online surveys have been released and have provided data on relatively large populations. The percentage of the population with suicidal ideation in that period seems to be approximately 5–15%. Many studies associate suicidal ideation with being young, female, and presence of sleep problems. Surveys of healthcare workers do not seem to indicate a higher prevalence of suicidal ideation compared to the general population. The incidence of suicide attempts seen in emergency departments did not seem to change, while the number of visits for other issues, unrelated to suicide, did decrease. The few studies on completed suicide do not indicate an increase in incidence in these first 6 months since March 2020, when the WHO declared the start of the pandemic.

**Summary** It does not seem that there have been major changes in the figures related to suicidal behavior in the studies from the first wave of the COVID-19 pandemic, although it is still too early to know the consequences it will have long term. The social and economic damages resulting from the pandemic will certainly take a long time to recover.

**Keywords** Suicide · Suicidal behavior · Suicide attempt · Suicidal ideation · COVID-19 · Pandemic · Lockdown · Depression · Natural disasters · Psychological consequences

## Introduction

On March 11, 2020, the World Health Organization (WHO) declared the spread of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus, identified in

late 2019 in China, as a new pandemic, causing the coronavirus disease 2019 (COVID-19). Its spread throughout the world has been very rapid and the intermediate and long-term social and disease consequences are not yet known. This pandemic has concerned many experts from the beginning about the possibility of an increase in suicide, calling the combination of factors “the perfect storm,” since the pandemic itself and the political-health measures to contain it favors some known risk factors for suicide [1••, 2]. Thus, some problems exacerbated by the pandemic include increased economic stress, social isolation, barriers to mental health treatment, illness and medical problems, anxiety by media coverage, healthcare professional suicide rates, firearm sales, seasonal variation in rates, decreased access to community and religious support, increased alcohol and other substance misuses, unemployment, and financial loss, relationship problems (such as intimate partner violence) and loss [1••, 2]. At the beginning of the pandemic, suicides associated with the pandemic were published in the press, either from frontline health workers or those who had been

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✉ Lucas Giner  
lginer@us.es

<sup>1</sup> Department of Psychiatry, Universidad de Sevilla, Seville, Spain

<sup>2</sup> Servicio de Psiquiatría, Centro San Juan de Dios de Ciempozuelos, Madrid, Spain

<sup>3</sup> Unidad de Hospitalización de Salud Mental. Unidad de Gestión Clínica de Salud Mental del Hospital Virgen Macarena. Servicio Andaluz de Salud, Seville, Spain

<sup>4</sup> Internal Medicine/Psychiatry, University of Texas Southwestern Medical Center, Dallas, TX, USA

<sup>5</sup> Instituto de Medicina Legal Y Ciencias Forenses de Sevilla, Seville, Spain

infected [3, 4] and alerts appeared about the possible impact on mental health in general and increased risk of suicide, particularly in specific populations such as children and adolescents [5, 6], the elderly [7–9], health workers [10, 11••, 12] and in people with financial problems [10].

The relationship between suicides and natural disasters is known, thus women, adolescents, the elderly, those who suffered depression or post-traumatic stress disorder (PTSD), and those who had less social support or were without parents, have a greater risk of suicidal behavior [13]. Concerning other pandemics, such as the one suffered by Severe Acute Respiratory Syndrome (SARS) in 2002, 2003 and Middle East Respiratory Syndrome (MERS) in 2012 [14], some studies found a relationship between an increase in suicides associated with the respiratory pandemic of SARS and other viruses [15, 16], with a 31% increase in people over 65 years in Hong Kong 2003 at the peak of SARS, and the largest increase was primarily seen in older adults in the year following the pandemic [17]. Likewise, a higher risk of suicide was observed in the 12-year follow-up according to the adjusted hazard ratio depressive disorder 3.165 (95% CI 2.465–4.077,  $p < 0.001$ ), anxiety disorder 3.172 (95% CI 2.471–4.089,  $p < 0.001$ ), sleep disorder 2.411 (95% CI 1.098–3.172,  $p = 0.001$ ), PTSD/ASD 60.360 (95% CI 49.121–77.602,  $p < 0.001$ ) [18].

The consequences of the COVID-19 pandemic are in their early stages and we do not know how far they may go. Expert opinion, which is based on extrapolations with natural disasters (including pandemics), indicates that an increase in suicides is very likely after the crisis, while there may be a reduction during the crisis [15, 19••]. For this reason, we would like to review the initial consequences of the COVID-19 pandemic on suicidal behavior.

## Method

The authors conducted a search on PubMed since 5 years before until–2020/12/15 with the following query: “suicid\*”[All Fields] AND (“sars cov 2”[MeSH Terms] OR “sars cov 2”[All Fields] OR “covid”[All Fields] OR “covid 19”[MeSH Terms] OR “covid 19”[All Fields]). A selection of studies best suited to our objective was performed, special focus was conducted on original studies with more than 20 cases that suicidal behavior (ideation, attempt, and completion) was analyzed. Moreover, reference lists from original studies were also screened.

## Results

### Suicide Concern on the Internet

The first published article that was retrieved by the prior research is a short article by Sher published in April 2020

[20] warning of the possible increased risk of suicide in relation to the COVID-19 pandemic. Media coverage of suicide cases has increased during the lockdown, at least in some countries [21]. These stories, without going into methods of transmission, generate a climate of concern when associating them to the pandemic. Through a direct assessment from surveys, an Australian study used qualitative analysis to assess the impact of the pandemic on family ( $n = 2,130$  parents with children under 18 years of age), and six themes appeared, among them: “boredom, depression, and suicide: A spectrum of emotion” [22]. However, to determine the concern about certain issues in society, studies have been conducted to analyze the terms used on the internet, which not only indicate the number of times these terms are used, but also the association with other related terms and the evolution over several days.

Thus, in numerous studies on internet searches, it has been observed that at the beginning of the pandemic, there has been an increase in the search for terms related to work problems [23] and psychological terms such as loneliness, worry, and sadness, anxiety, panic attack or problems related to sleep [23–26]. The number of searches for insomnia was directly associated with the number of deaths in each country ( $\rho = 0.64$ ,  $P = 0.003$ ), and the countries most affected in the first wave were the countries with the highest increase in searches insomnia (USA, Italy, Iran, and Spain) [27]. Other searches for terms such as stress, depression, suicide, and divorce, on the contrary, fell [23–27]. Another factor that could have influenced internet searches was the obligation of home confinement (stay-at-home orders). Thus, in the USA, the states with stay-at-home orders had a decrease in negative terms related to mental health (suicidal ideation, anxiety, negative thoughts, and sleep disturbances) compared to all other states. The terms that decreased the most were those related to suicidal ideation and anxiety [28].

In addition to internet searches, the analysis of web applications, such as Twitter or Reddit, also offers a social X-ray of concerns or issues that stand out socially. Thus, data from Twitter in the USA indicated a considerable increase in posts related to mental health (14% of crisis-mental health symptomatic expressions and 5% of demonstrations of support), which attenuated as time passed, and that the authors associated to an adaptation to the “new normal” [29]. Analyzing the Reddit Mental Health dataset, which included 826 961 posts (2018 to 2020), found that in the group of subjects with anxiety disorders, comments related to “economic stress,” “isolation,” and “home,” had already increased by January. The groups with the most negative terms during the onset of the pandemic were attention-deficit/hyperactivity disorder, eating disorders, and anxiety disorders. The groups related to loneliness and suicidality doubled their activity and their activity

was significantly closer to the borderline and PTSD groups [30].

### Effect on Suicidal Ideation

The need to know all aspects related to and against the clock with COVID-19 has led to the development of various online surveys due to their easy distribution through emails and social networks. In the few studies on emergency care for suicidal ideation, it was found that care was either increased [31] or maintained [32, 33]. In the case of the surveys that asked about suicidal ideation in relation to the pandemic among the general population, there are numerous studies in various countries, divided into specific populations, that have been repeated at different stages to see the evolution.

The studies with the general population began in China, as it is the country where the first SARS-CoV-2 infections were identified and from where the alarm was raised to the rest of the world, specifically in Wuhan. In February 2020, a survey was conducted with 1,397 participants from Wuhan and 2,794 controls from other Chinese cities, noting that subjects from Wuhan had more than double the risk of having anxiety and depression (adjusted OR = 2.65, 95% CI = 2.14–3.29 and adjusted OR = 2.11, 95% CI = 1.74–2.54, respectively) and a slight increase in the OR for suicidal ideation (OR = 1.60, 95% CI = 1.28–2.02) [34]. Another survey in China (January–March 2020; n = 1172) identified clinically significant symptoms of depression through the Patient Health Questionnaire (PHQ-9  $\geq$  10) in 18.8%, and anxiety through the General Anxiety Disorder-7 (GAD-7  $\geq$  8) in 13.3%, and elevated suicide risk measured by the suicide subscale of the MINI at 2.8%. In addition, clinical insomnia was found in 7.2% and clinical post-traumatic stress disorder symptoms in 7.0% [35]. Larger percentages were found in 19,515 pregnant women [36], where 44.6% had probable depression, 29.2% probable anxiety, 7.4% indicated having had suicidal ideation in the last 2 weeks and 0.7% had had it every day (PHQ-9, item 9), although the initial rate of suicidal ideation was 5.2% in the same population before the pandemic [37]. In a Hong Kong study on the use of a mask with 11,072 participants between 18 and 59 years old, they used the PHQ-9 to evaluate depression and suicidal ideation, finding that 15.5% had suicidal ideation for several days, 5.1% more than half of the days and 1.9% almost every day. With regards to depressive symptoms, 31.2% experienced mild symptoms, while 71.2% experienced moderate or severe depressive symptoms [38]. Lockdown itself seems to have a more important influence on mental health in the younger population, as indicated by the survey of students from 26 Chinese universities (n = 24 378), whose risk of suffering from probable depression was OR = 2.54, while that of suicidal ideation or self-harm was OR = 4.98 compared to those without restrictions [39].

In other eastern countries, such as Taiwan (n = 1970), 10.8% reported having had suicidal ideas in the previous week (which were associated with having less perceived social support, being younger, having less frequency of handwashing, and worse physical health) and 55.8% reported sleep problems [40]. In Bangladesh (n = 10 067), reported depression in 33% and suicidal ideation in 5% (associated with being young, female, smoker, medical comorbidity, fear of COVID-19, and presence of sleep problems) [41]. In the same country, the prevalence of suicidal ideation was higher in the university population (n = 3 366) at 12.8%, and was related to sleep problems, tobacco use, depression, anxiety, a history of suicidal ideation or suicide attempts, and a family history of suicidal behavior [42]. These figures were similar to those found in French university students (n = 69 054), which reported suicidal ideas in 11.4%, severe distress in 22.4%, severe depression in 16.1%, and high levels of anxiety in 27.5% [43]. In Libya (n = 2 430), however, the figures for medical students were much higher, with suicidal ideation in 22.7%, depressive symptoms in 88% (moderate or severe in 21.6%), mild anxiety in 37.5%, and moderate or severe anxiety in 27%, although this study was conducted in a country in which there was a civil war [44].

With regards to Anglo-Saxon countries, in the UK (n = 3 077) they conducted a survey three times from the beginning of April to mid-May (the authors reported three waves), indicating a decrease in anxiety from 21% to 16.8% (OR = 0.82 [0.74–0.90],  $<$  0.0001), maintained levels of depressive symptoms (26.1% -23.7%), while they indicate an increase in suicidal ideation in the period studied, from 8.2% to 9.8% (OR = 1.24 [1.07–1.44],  $p$  = 0.005). The population group with the worst results were young people between 18 and 29 years old [45]. In Australia, despite having a minor impact of COVID-19 in this first wave, the percentages are similar in terms of depressive symptoms and much higher in terms of suicidal ideation. In a study of 13,829 subjects conducted in April 2020, 27.6% had clinically significant symptoms of depression (PHQ-9  $\geq$  10), 21% had clinically significant symptoms of anxiety (GAD-7  $\geq$  10), 35.5% had ideas of death (PHQ-9, item 9) over several days in the last 2 weeks, 14.6% had more than half of the days, and 9.1% almost every day [46]. Figures comparable to those in another study over a longer time course (12 weeks; n = 5 455), indicated that both depressive symptoms (around 70%) and suicidal ideation (around 30%) have remained stable throughout the entire follow-up period, and suicidal intention/planning gradually decreased from 3.7% in the first 4 weeks to 2.1% in the last weeks, although this difference was not significant [47]. In the neighboring country of New Zealand (n = 2 010), distress (moderate to severe) was observed in 30% and high anxiety in 16%. With regards to suicidal behavior, 6% presented suicidal ideation, 2% planned suicide, and 2% attempted suicide (the worst results

being related to younger age, loss or reduction of work, poor health, and a history of mental disorder) [48]. The largest samples were collected in the USA, and even with it being the beginning of the pandemic and with restrictive measures ( $n = 10\,625$ ), a prevalence of suicidal ideation of 4.5% was found in the last month, with no differences in the subjects who were confined by the stay-at-home order, compared to those who weren't. Suicidal ideas in the last month were related to fights with a partner or serious legal problems [49]. In another study with a similar sample ( $n = 10\,368$ ), they found higher numbers of subjects at risk of suicide, measured by the Suicide Behaviors Questionnaire-Revised (SBQ-R), at nearly 15%, where the groups with the highest risk included ethnic minorities (Blacks, Native Americans, Hispanics), having children, singles, and the youngest age. Religion was identified as a protective factor, as were those with more social ties [50]. In a survey at the end of the first wave (end of June 2020,  $n = 5\,470$ ), 10.7% of the population had seriously thought about committing suicide in the last month, more than double than in 2018 (more frequent in women, young people of 18–24 years and 24–44 years, ethnic minorities, employed persons, and essential workers) [51]. In the American university population ( $n = 2\,031$ ) they found higher figures than in the general population, with suicidal ideas in 18.04%, moderate-severe depression (PHQ-9) in 48.14%, and moderate-severe anxiety (GAD-7) in 38.48% [52].

Studies in other countries show similar figures, such as in Colombia ( $n = 700$ ), with 7.6% of subjects at high risk of suicide (associated with depression, perceived stress from COVID-19, and insomnia) [53]. In Czechoslovakia, when comparing two samples, one from 2017 ( $n = 3000$ ) and another during the pandemic ( $n = 3000$ ), they found that both the major depressive disorder and the risk of suicide tripled (3.96% to 11.77% and 3.88% to 11.88%, respectively), and anxiety disorders went from 7.79% to 12.84% [54]. On the other hand, a Greek study ( $n = 3\,399$ ), where COVID-19 had had little impact in the first wave, indicated that in 4.42% of the sample, suicidal ideas had increased and in 10.41% it had decreased [55].

A population that has been very important in its fight against the pandemic has been that of health personnel. Surveys of this population do not indicate a higher percentage of suicidal ideation than the general population, although they do in terms of other pathology. In China, a study of 4,692 first-line nurses indicated suicidal ideation in 6.5%, while the presence of depressive and anxious symptoms was 9.4% and 8.1%, respectively [56]. Identical figures regarding suicidal ideation were found in another study of 8,817 hospital workers (6.5%, with a higher risk associated with being a woman, ethnic minority, lower educational level, among others), while the figures for depression and anxiety were 30.2% (PHQ-9) and 20.7% (GAD-7), respectively [57].

In direct comparison with the general population, the prevalence of suicide risk among medical staff ( $n = 606$ ), measured by the suicidal module of the MINI, did not indicate differences in prevalence (13.0% vs. 11.6%, respectively). Additionally, there appeared to be an inverse relationship between years of experience and family income and suicide risk ( $p = 0.03$ ,  $p < 0.001$ ). However, a higher prevalence of depression measured by PHQ-9 (57.6% vs. 47.6%), anxiety by GAD-7 (45.4% vs. 33.8%), and insomnia using the Insomnia Severity Index (ISI) (32.0% vs 25.1%), was found in medical staff compared to the general population [58]. On the other hand, family members of first-line health workers had figures more similar to that of the general population, with 8.3% having suicidal or self-injurious thoughts. Additionally, clinically significant depressive symptoms were found in 12.2% of the sample, and anxiety problems in 49% [59]. In a survey in Bangladesh, which compared the general population ( $n = 2554$ ) with healthcare workers ( $n = 3\,388$ ), similar figures were found in persistent suicidal ideation or suicide attempt concerning the pandemic in health workers (6.1%) compared to the general population (6%). In both health workers and the general population, suicidal ideation was more prevalent among women than among men (health workers: 8.1% vs 3.3%;  $p < 0.001$ ; general population: 8.5% vs 3.6%;  $p < 0.001$ ). The risk factors were similar in the health workers and in the general population, which included, being a woman (OR = 2.50; 95% CI = 1.83–3.42;  $p < 0.001$ ), being divorced (OR = 3.77; 95% CI = 1.64–8.68;  $p < 0.001$ ), and not having children (OR = 1.793; CI = 1.318–2.437;  $p < 0.001$ ) [60]. These figures are similar to those reported in other studies, where 5% of neurosurgeons (international sample  $n = 375$ ) [61] and of health workers ( $n = 1\,685$ ) responded having suicidal ideation [59]. In this last study, it was also found that 29% had mild depressive symptoms while 17% had moderate or severe depressive symptoms [59].

## Mediators of Suicidal Ideation

It has also been of particular interest to evaluate the psychological consequences of quarantine that could contribute to suicide risk and that, according to studies of previous disasters, can persist years later [62]. Among them, loneliness and PTSD stand out. In the USA, Killgore et al. studied loneliness at 3 weeks ( $n = 1\,013$ ) [63••], in the first 3 months ( $n = 3\,121$ ) [64] and the progression at 6 months ( $n = 6186$ ) [65], and found a correlation between feelings of loneliness (43% of the sample) (measured by the UCLA Loneliness Scale-3) with depressive symptoms and suicidal thoughts (PHQ-9) in the first months (April  $\rho = 0.42$ ), May  $\rho = 0.40$ , June  $\rho = 0.39$ , all  $p$  values  $< 0.00001$  and over 6 months ( $\rho = 0.40$ ;  $p < 0.00001$ ) [64, 65]. In the progression, they



observed that feelings of loneliness were greater in places where there had been restrictions (states with stay-at-home, shelter-in-place, or lockdown) and these feelings remained even though restrictions had been withdrawn [64, 65]. On the other hand, suicidal ideas increased every month in places with restrictions, and not in those without those restrictions [66]. The aftermath of the pandemic and lockdown has been related to an increase in the prevalence of PTSD, as some experts had already warned [67], and thus in the USA 14% of first-line health personnel ( $n = 1\,685$ ), and 10.4% of relatives in China ( $n = 671$ ) met criteria for PTSD screening within months of the onset of the pandemic [59, 68]. Once the lockdown ended, in China ( $n = 673$ ) 10.8% of the workers met the criteria for PTSD, while 3.8% did so for anxiety, 3.7% for depression, and 2.3% for insomnia [69]. A third of the patients with previous psychiatric pathology met the PTSD criteria [70]. This is very important because the core symptomatology of PTSD related to COVID appears to be self-destructive/reckless behavior [71, 72]. Other identified mediators of suicidal ideation have been insomnia [73], psychological inflexibility [74], and the thwarted belongingness of the interpersonal theory of suicide [75].

### Incidence of Suicide Attempts

Although cases of subjects with suicide attempts and debut psychotic symptoms with content closely related to the pandemic have been detected in Spain [76] and Germany [77], the objective would be to identify changes in the incidence of suicide attempts in general. Thus, in the USA, the incidence of suicide attempt in the last month at the beginning of the pandemic, was between 1.2 and 1.5% according to the survey ( $n = 10\,625$ ), without the presence of restrictive measures related to life-threatening illness/injury of friend/family [49]. With regards to suicide attempts treated in hospitals, the Psychiatric Liaison service experienced an increase in consultations for suicide attempts (OR 8.0, 95% CI 2.03 to 31.57,  $p = 0.003$ ), where the most common causes were related to relationship problems and loss of privacy during the lockdown [78]. In the surgical services, both in India and Scotland, the number of cases of suicide attempts by stabbing increased [79, 80].

In the ED, the number of visits generally saw a drastic decrease in different countries during lockdown [31, 33], even in more recently published [81]. However, the incidence of suicide attempts compared to previous periods seems to be similar [32, 33] or lower, either in general [82] or only in the child–adolescent population [32]. Although it could be that there was an initial decrease and a subsequent increase, as indicated in an Irish study, where the initial decrease in attempts was 35% then increases to 104%, with associated substance use [83].

### Completed Suicide Figures

There are few studies in this regard, and it may be too early to measure the impact that the COVID-19 pandemic has on the number of suicides and we may have to wait months or years to assess it more accurately. One of the contributing factors to these predictions is based on the economic consequences, which are yet to be known. The calculations of suicide numbers related to a possible increase in unemployment have been the basis for the studies by McIntyre and Lee in the USA [84••] and in Canada [85], where they propose three scenarios according to the increase in unemployment: no change, moderate increase, and large increase. Thus, they calculated an increase in suicide rates by 1% when the unemployment rate increased by 1% between the years 1999 and 2018 (95% CI 1.02–1.06,  $p < 0.0001$ ). If in 2018 the suicide rate was 14.8 per 100 000, then in 2021 it would increase to 15.7 per 100 000 (95% CI 15.3–16.1) if there was no increase in unemployment, or to 16.2 (95% CI 15.7–16.8) if there is a moderate increase in unemployment, and to 17.4 (95% CI 16.8–18.0) if unemployment rates increase extremely [84••]. Following the same analysis, the same authors calculate the possible increase in suicides in Canada, based on the rate of 10.9 suicides per 100 000 in 2019, and they calculated that the increase in suicides in 2021 would be 11.0 (95% CI 10.3–11.8) per 100 000 for an unchanged unemployment rate, or 11.5 (95% CI 10.7–12.3) with a moderate increase in unemployment, and 13.6 (95% CI 12.7–14.6) for an extreme increase in unemployment [85].

Despite how early it is to fully assess the consequences, we know that the situation has an influence on suicide, and at least the fear of the disease or the experience of lockdown have been identified as a precipitant of some reported cases of suicides [86–88], extended suicides [89] and suicide pacts [90]. To identify the precipitant of the disease, we need to know the last circumstances of the person, and the psychological autopsy is still considered the best method, even more so in the pandemic, where the collection of data from the medical history may be impaired due to the difficulty of accessibility to medical care [91]. The data available to us at this time is based on epidemiological data, no psychological autopsy studies have yet been published. Thus, in Japan, they found that during the summer months there was an increase in suicides in women, from July to September, between 20 and 30%, compared to men and previous years [92]. In this same country, they found an increase in suicides in May in those under 20 years of age (incidence rate ratio (IRR) = 1.34, 95% CI 1.01 to 1.78), although the possible association with the closure of schools was ruled out [93]. Aside from these correlations, other studies did not find an increase in suicide figures in the first months of the pandemic. In a Norwegian study that collected official national figures during the first 3 months of the pandemic,

they found a decrease in suicides, without demographic differences, compared to suicides in the previous 5 years [94]. A similar study in Peru found a decrease in the suicide rate (more evident in men) that increased just after lockdown was implemented, although without reaching pre-lockdown rates [95]. In local studies, there was no change in the number of suicides, and neither in Athens (Greece) during the first month of lockdown [96], nor in Queensland (Australia) in the months February to August 2020 [97]. Data from Connecticut (USA) indicate a 13% reduction in suicides during lockdown compared to the previous 5 years, although the non-white percentage was increased (23% vs 11.7%;  $X^2=7.13$ ;  $p<0.01$ ), without a difference between sex and age [98].

### Suicide Risk in Subjects With Previous Psychiatric Pathology

In patients with mental disorders, somatic health is, to a certain extent, at greater risk than in the general population due to various peculiarities. For example, those of the psychiatric patient (higher prevalence of medical comorbidities, impaired comprehension ability, behavioral alterations that, in some cases, may make preventive measures, treatment, and monitoring difficult) or of individuals in inpatient settings, as in the psychiatric wards, or areas in the hospital without providers trained in somatic problems or challenging socioeconomic conditions [99–101]. Studies on the impact on suicidal ideation in individuals with previous pathology are sparse; thus, in subjects with substance use, an increase in suicidal ideation and risky consumption was observed related to COVID-19, although it did not seem to increase the risk of overdose [102]. Older individuals (mean age 69) with depressive disorder in the first 2 months of the pandemic indicated that, despite having a worse quality of life, they had not stopped having social contact and were more concerned with contagion than isolation. The intensity of depressive symptoms, anxiety, and suicidal thoughts were similar to the pre-pandemic period [103].

### Suicidal Behavior in COVID Patients

Although cases of first-episode psychosis and suicide attempt [104–106] or suicide have been described as a possible adverse effect in the use of Hydroxychloroquine for COVID-19 [107], the incidence of suicidal behavior in COVID + patients is anecdotal, as indicated by a study in NYC in the first wave March–April, where COVID + subjects compared to COVID- treated in the emergency room had a lower incidence of suicidal ideation (16.7% vs 54.4%), attempted suicide (0% vs 5.3%), depression

(33.3% vs. 49.1%) and major psychotic episode (66.7% vs. 35.1%) [32]. On the other hand, a retrospective study of 40,469 from a global health collaborative clinical held from January to June 2020 [108], described that 3.8% of COVID + patients presented with mood disorders (3.8%) and only 0.2% had suicidal ideation. Regarding the psychological interventions carried out by psychiatrists via telephone in COVID + patients, it was reported that 9% had suicidal ideation, 18% had anxiety, 39% had depression, 30% had sleep problems, and a third of the patients noted improvement after initiating drug treatment [109]. In admitted or outpatient recovered patients ( $n=284$ ), 9.9% had one or more than one positive item of the short version of the MINI Suicidality Scale, only 2.8% presented a moderate risk, and none had high risk. According to this study, the highest risk would be associated with PTSD symptoms [72]. Some authors have suggested that SARS-CoV-2 virus may have a direct action on biological pathways related to suicidal behavior, which could also explain the increased risk of suicide observed in subjects with SARS (18, 110).

### Conclusions

The COVID-19 pandemic is going to be a before and after in the history of health in the contemporary age. Like any natural disaster of this magnitude, it entails a series of consequences for humanity. The first and obvious, cases of morbidity and mortality from COVID, some of which include psychiatric disorders due to the direct action of SARS-CoV2. However, the great psychiatric blow comes indirectly, either by the loss of lives caused by the virus itself, by the deterioration of health care in general, or by the consequences secondary to the state of alarm and the strategies that have been implemented to reduce infection transmission and avoid a decline in health. Suicidal behavior will be among the consequences, no doubt. The true impact that COVID-19 has on suicide remains unknown, since this review only includes very preliminary studies, exclusively from the first wave, where there does not appear to have been significant changes in the number of people who have committed suicide or that suicide has been attempted. Nevertheless, the COVID-19 tsunami is still on land and the waters have not yet returned to the sea, making it difficult to quantify the damages and how long they will last, including the economic ones. We need time to understand the influence of the pandemic, as well as the mechanisms, in which suicidal behavior will be impacted.

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## Compliance with Ethical Standards

**Conflict of Interest** Lucas Giner, Constanza Vera-Varela, Giovanni M. Zelada, and Julio A. Guija each declare no potential conflicts of interest. Diego de la Vega has received personal fees from Janssen.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

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