**Suicides in the pandemic – are we well informed regarding current risks and future perspectives?**

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**Introduction**

The COVID-19 pandemic has dramatically changed the life of billions of people all around the world. Among the many anticipated negative health effects, there were many concerns from psychiatrists and psychologists about the increasing risk of suicide [1,2]. Some of the authors have even used a theory of “perfect storm” for modeling possible consequences of a pandemic for suicidal behavior [3]. There were expressed concerns that risk may increase due to the anxiety, depression and sleep disturbances during social isolation, economic stress and unemployment, fear of catching the disease, distress due to family members suffering from a disease, stigmatization of patients with COVID-19 and their families, as well as alcohol consumption and domestic conflicts during quarantine [4,5]. Quickly organized studies (mostly internet surveys) have revealed that feelings of being stressed, depressive symptoms and anxiety have really grown during most harsh containment measures in different categories of respondents, especially in students, women, and medical staff [6-8]. Negative expectations were expressed widely, however objective studies are essential to evaluate the suicide risk in any specific crisis, social situation, or disaster, with regards to age and gender groups and most vulnerable contingents.

Humanity has experienced several severe epidemics that may serve as quasi-experimental situations relevant in this sense. Therefore, the question is what can be learned regarding suicide rates changes from previous cases? Quite surprisingly, the information appeared to be scarce and inconsistent. In the 90s of the XX century, American suicidologist Ira Wasserman using official statistics assessed the impact of three major social events in the USA in the period from 1910 to 1920: World War I (1914-1918), the Spanish flu pandemic (1918-1920) and the introduction of the “prohibition law" (since 1919) on suicide deaths. According to his analysis, the war did not have any effect, the pandemic led to an increase, while alcohol restrictions – to decrease in rates of suicide [9]. Later in a study from Hong Kong, where the SARS epidemic had caused serious mortality between 1993 and 2004, authors have found a significant increase in suicide rates among older age (>65) people after the peak of the epidemic has passed [10].

This scanty list gives an impression that previous pandemics (or more local epidemics) did not attract much attention from suicidologists. However, attention was paid to other types of crises that confronted humanity across history, like wars, natural catastrophes, and other disasters. Emile Durkheim in his sociological study has pointed that such events usually lead to lowering of suicide rates [11]. He discussed it from the point of view of the ‘pulling together’ effect in the society that unites people in the face of a vital threat. In confirmation, several reports from different countries shortly after the announcement of the COVID-19 pandemic have presented data that suicide attempts and suicides do not rise, on the contrary, seem to go down during the introduction of “stay at home” orders [12-14].

While this immediate effect may be well understood from the point of view of a sociological theory, further tendencies during a pandemic need much more attention and objective description. As a response to this challenge an international initiative COVID-19 Suicide Prevention Research Collaboration aiming to the monitoring of suicide rates and development more adequate prevention measures was recently established [15]. The initiative that unites more than 30 countries by now is aiming to provide a thorough analysis of the situation in a real time manner. This implies better interdisciplinary interaction and communication, involving sociologists, psychologists, psychiatrists, forensic medicine specialists, and the law enforcement system. Here we provide our experience in establishing and developing such communication, which eventually resulted in some preliminary observations regarding immediate change of suicide rates in St. Petersburg shortly after the introduction of the strict quarantine on March 30.

**Materials and methods**

In the mid of April, the Ministry of Public Health of the Russian Federation has issued a letter to the leading centers of psychiatric research requesting to evaluate the possible evolution of risks for completed and attempted suicide in the pandemic. As a response to this request, V.M.Bechterev National Medical Center of Psychiatry and Neurology in collaboration with scientific and educational medical institutions of St. Petersburg made an effort to collect relevant data. Our primary aim was to evaluate the possible changes of suicidal behavior in the earliest phase of the crisis in St. Petersburg with the perspective of prolongation of observations and widening of the catchment areas. Numbers and demographic data of those who died by suicide for the period from 01 of January 2016 (first available year) to 31 of July 2020 (the last point for confirmed suicides previously referred to as “probable”) were obtained from the Saint-Petersburg state Bureau of forensic medical examinations.

The initial data (suicidal cases per month in absolute units) were recalculated as monthly frequencies per 100000 of the population for the period 2016-2019 and were compared with corresponding months in 2020. The methods of Fisher, Clopper-Pearson, and Wilson were tested to calculate the confidence intervals (CI), finally Wilson’s method was selected. Demographic data on the population of St. Petersburg for the specified period were obtained from official sources (Rosstat).

**Results**

 In a current study, a whole set of suicide cases (N = 1647) that occurred in St. Petersburg in the period from 01 of January 2016 to 31 of July 2020 is used. Of these cases, 427 belonged to females and 1220 to males (M : F ratio = 2,857). Completed suicides for the whole population in the first 7 months in 2016-2019 and separately in 2020 are presented in Fig. 1. A decrease in the frequency of suicides per month per 100000 population can be noticed already in March 2020 by 18.3% (0,4446, 95% CI: 0,2988 - 0,6616 as compared to 0,5440, 95% CI: 0,4536 - 0,6525) with a more pronounced decrease in April by 30.3% (0,4446, (95% CI: 0,2988 - 0,6616 as compared to 0,6378 (95% CI: 0,5393 - 0,7544). However, this decline was not statistically significant. Subsequently, there was an increase of 13.3% in June and then a decrease of 14.0% in July. The total accumulated number of completed suicides in the first 6 months of the year 2020 constituted 93.8% from the average in the first 6 months in 2016-2019.

Fig. 1

A closer look revealed that the decline in March-April 2020 was more pronounced among men (by 18.4 and 36.3%, respectively). In men in the lowest point (April 2020) the frequency per 100000 reached 0,5898 (95% CI: 0,3683 - 0,9446), though the fall was also insignificant. Among women, the decrease in the frequency of suicides per month in 2020 was 20.2, 12.4, and 23.8% in March-April-May, respectively (the lowest level in May is 0,2293 (95% CI: 0,1161 - 0,4524). All changes were insignificant (fig. 2 and 3). The total number of cases in the first 6 months of the year 2020 in men was 88.7% of the average for the same period in 2016-2019, while among women it increased by 10%

Fig. 2

Fig. 3

Fig. 2

It may be noticed that after a short decline of suicide frequencies in males, it reversed already in May, while in females there was a 50% rise in June. All observed fluctuations in rates were not significant. Considering that the most pronounced changes were among the male part of the population, the fluctuations in the frequency of suicides in different age groups of men were scrutinized. Given the comparatively small general number of cases per month the following wider age groups were chosen: young (15-34), mature (35-54), adults (55-74), and seniors (>75). It was found that from January to March among men of different age groups, suicides changed in different directions, while in April a decrease was observed in all groups, with the most pronounced (by 58.3 and 58.7%) among men aged 55-74 and 75 and more years. At the same time, already in May, this decline gave way to a rise, which was most pronounced among young men aged 15-34 - by 87.9%.

**Discussion**

There is almost a consensus in suicidology that in the acute phase of any crisis (war, terroristic violence, natural disaster, or mass infection) suicides usually go down [16]. A recent coronavirus crisis in this sense is a “perfect storm” – more global than any local disaster, like tsunami or earthquake, and more dangerous than war conflict due to the inability to escape and identify the source of danger [17]. Since Durkheim, the main explanation of this effect is that suicides go down due to social integration, strengthening of the invisible links that make societies more united in the face of danger for the whole population [11].

Our results are consistent with those studies and comments that find or predict a drop in suicide incidence in the acute phase of the crisis [12-14]. We have used a blunt method of evaluation of suicide incidence change known as excess mortality – comparison between incidence during the fixed period (i.e. April) in 4-5 previous years and in the index year, also covering adjusted periods. April is the best period from this point of view so far as government containment measures were just introduced, and they were rather harsh and severe (Draconian, as some authors formulate it) [18]. This can provide even more explanations for the drop in suicides. In this sense, it is necessary to mention that not only completed but also attempted suicides hospitalizations and referrals to mental health providers have dropped, as well as psychiatric emergency consultations [19]. It is confirmed by observations from St. Petersburg ambulance, which registered a substantial drop in the number of self-intoxications in April and by specialists of the V.M.Bechterev Center clinical departments. Therefore, not only actualization of vital (adaptive) tendencies and societal cohesion, but also fading into the background of psychological (and even psychiatric) problems of individuals may contribute to the observed tendency [20].

Our evaluations have several limitations, including the inability to encounter and eliminate fluctuating seasonal peaks and falls and the influence of the general trend (during 7-10 recent years suicide rates in Russia are slowly but rather consistently going down). However, we consider that our findings deserve some attention. The objective studies regarding suicide rates during a pandemic are still scarce and every drop of knowledge may be important. In every country, given the unique political, economic, social, and cultural situation the change in suicides may differ. Moreover, our results may serve the goal to raise awareness regarding suicides in professional circles and in the wide public as well.

These preliminary results should not become a reason for complacency and denial of a possible increase of suicides in the future. We would like to draw special attention to the quick reverse of lowered suicide rates already in May in young males and in June in females. After the complete results of the year 2020 will be announced a clearer picture will appear, however, it is already necessary to develop more efficient (or adjust existing) preventive measures with an eye to more distant periods of the development of the situation with the pandemic. This is important in view of the possible accumulation of economic problems of the families (is spite of all compensatory measures taken by the government), rising unemployment, the bankruptcy of small businesses holders, as well as academic stress affecting young people who seem to be less resilient to global shocks and who appeared in a dramatically changed educational environment with online education.

Pandemic is not at all over, new emerging waves are rather unpredictable. Several studies from other sites have already registered disturbing evolution of suicides, for instance, in Japan after lowering of suicide numbers (by 14%) in the first 6 months of the pandemic (February-June 2020) by contrast, monthly suicide rates increased by 16% during the second wave (July to October 2020), with a larger increase among females (37%) and children and adolescents (49%) [21]. Some researchers are returning to records of mortality during the Spanish flu pandemic 100 years age, for instance in a study from Taiwan it was shown that during the first wave when about 22% of the population were infected suicide rates were not higher than expected, while in the second wave in about a year when only 4,3% were infected, there was an increase of suicide indexes in 33-35% at the beginning of the wave [22].

In a pandemic, new efforts are needed to organize and implement suicidal prevention measures. We fully agree with the statement that while we are waiting for a clearer picture prevention measures must be prioritized [23]. Existing evidence-based studies provide a set of relevant strategies that require careful adaptation and tuning to implement in a pandemic situation. In Russia, along with the use of all the accumulated world experience, it would be reasonable to pay more attention to educational technologies, raising the status of suicidology as an academic discipline and generalizing the existing regional experience in suicide prevention.

**Conclusions**

We are providing here preliminary evidence that during the period of most severe restrictions due to COVID-19 pandemic in a 5,5 mln of people metropolis in the northwestern region of Russia suicidal behavior did not raise, on the contrary, it seems to have dropped. This observation is consistent with the point of view that during the acute phase of the crisis suicides usually go down. However, we are still not informed sufficiently regarding the situation with suicides across huge territories and diverse ethnic and cultural groups of the Russian Federation. Further monitoring and data accumulation from wider populations and federal entities are needed to draw more informed conclusions regarding the impact of COVID-19 on suicide rates in Russia, with special attention to specific age groups. The decrease may turn into an increase when long-lasting effects will accumulate, therefore even more efforts are needed to enhance prevention activities.

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