*Original Research*

# Suicide in the Province of Foggia: Retrospective Study and Analysis of the Difference between Men and Women

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**Abstract**

**Background**: Suicide is a significant cause of mortality affecting each age, gender, and country. In 2018, the Italian National Institute of Statistics (ISTAT) estimated that 3820 people committed suicide, with the highest incidence in males between 35 and 64 years old. The present study aims to report and analyze the data relating to suicides collected by the Institute of Forensic Medicine of Foggia compared to the data presented in the literature. **Methods**: The present study represents a retrospective analysis of crime scene investigations and autopsies records relating to all suicides from January 2015 to December 2021 referred to the archives of the Institute of Forensic Medicine of Foggia. The analyzed features were: the sex of the victim, method of suicide, age, the season of death, and presence of psychiatric or addiction history. **Results**: We selected 226 cases of suicide during the period from January 2015 to December 2021, from a total of 1184 deceases. 78% of the victims are men of average age; the most common methods of suicide are hanging and precipitation. **Conclusions**: The results of this study highlight the importance of personalized and gender-specific interventions and can inform policy-makers in the development of provincial suicide prevention plans and public health interventions. Studying suicidality in a well-defined population can help implement targeted interventions.

**Keywords:** suicide; suicidal attempts; hanging; psychiatric anamnesis; depression; gender-related difference; gender-related suicide; suicidal behavior

## 1. Introduction

Suicide is a significant cause of mortality affecting each age, gender, and country. The World Health Organization (WHO) [1] defined *suicide* as an act deliberately initiated and performed by a person in the full knowledge or expectation of its fatal outcome.

In 2019, the WHO assessed 703,000 deaths by suicide each year, with a global age-standardized rate of 9.0 deaths by suicide per 100,000 population [2]. This rate varies among countries, age groups, and gender, especially in developing countries, the elderly, and males (12.6 deaths by suicide per 100,000 population rather than 5.4 deaths by suicide per 100,000 female population). Furthermore, suicide is the fourth leading mortality cause in youth aged 15–29 years, after road accidents (unintentional injuries), tuberculosis, and interpersonal violence. In 2016, the European Union (EU) [3] estimated nearly 48,700 deaths by suicide, corresponding to 1% of all deaths to the year. In 2017, among the European States, Lithuania had the highest rate of suicide (26 deaths by suicide per 100,000 population), followed by Slovenia (20 deaths by suicide per 100,000 population), Latvia (18 deaths by suicide per 100,000 population), Estonia and Hungary (both 17 deaths by suicide per 100,000 population). Among, Cyprus reported the lowest rate of suicide (4 deaths by suicide per 100,000 population), followed by Greece and Malta (both 5 deaths by suicide per 100,000 population), Italy (6 deaths by suicide

per 100,000 population) and Slovakia (7 deaths by suicide per 100,000 population) [3]. According to these rates, Italy ranks as a low suicide risk country. Among the general population, suicide rates in males are four to five times greater (average rate 20.7) than females (average rate 4.7) across the EU. Suicide is also related to age, with young people under 25 and older adults interested the most in the risk of suicide, although it proportionally increases with age [4]. Suicide rates among adults have generally declined over the past two decades, differently from the ones for young people [5]. In 2018, the Italian National Institute of Statistics (ISTAT) estimated that 3820 people committed suicide, with the highest incidence in males between 35 and 64 years old. Moreover, considering Italy divided into 4 geographical areas (North, Center, South, and Islands), the highest suicide rate was found in the North with a decreasing trend through the Center and the South, suggesting a marked North-South suicide rate gradient.

Potential explanations for variations in suicide rates include socioeconomic factors, cultural factors (discrimination, abuse, violence, conflictual relationships), health system and social factors (difficult health care access, availability of methods for suicide, inappropriate media content report) [6], public health initiatives to improve the detection and treatment of mental illness, mental health, and suicide prevention. Another pivotal risk factor to be considered is the current COVID-19 pandemic. During the past two

years, collective quarantine measures have already been associated with an increased risk of suicide [7]. The health and economic consequences of the pandemic could be an additional risk factor for the suicide rate [8,9]. Job loss, regression, and unemployment could have dramatic psychological effects and increase the risk of suicide. The level of development in each country also affects the link between economic crisis and suicide: the economic inequalities, the solidity of the health system, the ability to prevent suicide at the state level, and the perceived social integration are essential elements to value the suicidal phenomenon [10,11]. Currently, the long-term emotional effects of "social distancing", home confinement, cohabitation with a family member affected by COVID-19, and the limitations in health care access are not well known. The fear of being positive for COVID-19 or infecting family members and the economic consequences of the pandemic (losing the job) generates an intense state of anxiety and concern for the future, which will affect the mental health of the population and the risk of suicide [12].

The present study aims to report and analyze the data relating to suicides collected by the Institute of Forensic Medicine of Foggia from January 2015 to December 2021, compared to the data presented in the literature. This study seeks to summarize the characteristics of suicide victims in order to suggest a supportive and preventive strategy to reduce the suicide rate.

## 2. Materials and Methods

The present study represents a retrospective analysis of crime scene investigations and autopsies records relating to all suicide cases observed from January 2015 to December 2021 in the Institute of Forensic Medicine of Foggia. The Institute of Forensic Medicine covers the entire area of the Province of Foggia with a population of nearly 800,000 inhabitants, with a slight predominance of the female population. From every necroscopic report we analyzed: the sex of the victim, method of suicide, age, the season of death, and presence of psychiatric or addiction history; some reports are incomplete and do not present all the necessary data. The survey conducted and the analysis of such variables are purely statistical, providing descriptive information.

## 3. Results

We selected 226 cases of suicide during the period from January 2015 to December 2021, from a total of 1184 deceases. During 2015 there were 33 cases of suicide (14.60%) corresponding to 5.2 cases per 100,000, in 2016 only 30 cases (13.27%) corresponding to 4.8 cases per 100,000, in 2017 40 cases (17.69%) corresponding to 6.4 cases per 100,000, in 2018 28 cases (12.38%) corresponding to 4.5 cases per 100,000, in 2019 34 episodes (15.04%) corresponding to 5.6 cases per 100,000, in 2020 29 cases (12.83%) corresponding to 4.8 cases per 100,000, and during 2021 32 cases (14.15%) corresponding to 5.3 cases per

100,000 (Fig. 1). The suicide number per year remains stable (the standard deviation ($\sigma$) is 3.730). The year with the higher number of suicide was 2017. The suicide rate of the Foggia population is 19.08% of the total deaths.
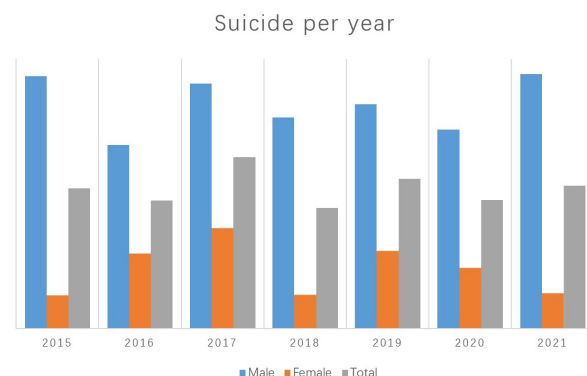


**Fig. 1. Suicide per year (cases per 100,000 population).**

Many suicides regard males, as summarized in Fig. 2: 177 cases of suicides involve men (78.31%), while only 49 deceased are women (21.68%).
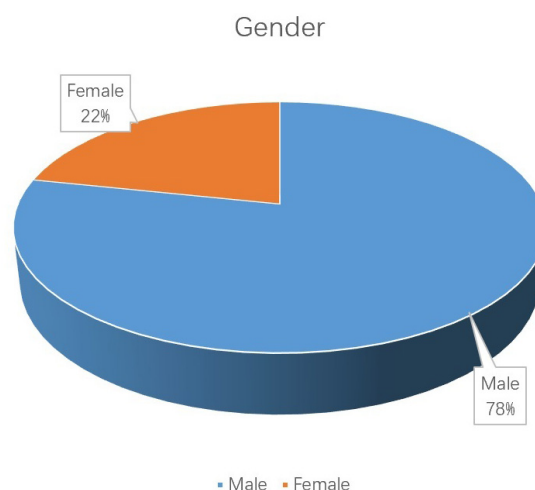


**Fig. 2. Gender of the deceased.**

We analyzed the methods used to commit suicide as represented in Fig. 3. Hanging was the most used method, detected in 124 cases (54.87%) corresponding to 20.6 cases per 100,000, followed by falling from height in 38 cases (16.9%) corresponding to 6.3 cases per 100,000, firearms in 27 cases (11.95%) corresponding to 4.5 cases per 100,000, drowning in 20 cases (8.84%) corresponding to 3.3 cases per 100,000, self-stabbing in 7 cases (3.10%) corresponding to 1.2 cases per 100,000, poisoning in 5 cases (2.21%) corresponding to 0.8 cases per 100,000, self-burning in 3 cases (1.32%) corresponding to 0.5 cases per 100,000 and train impact in 2 cases (0.89%) corresponding to 0.33 cases per 100,000.
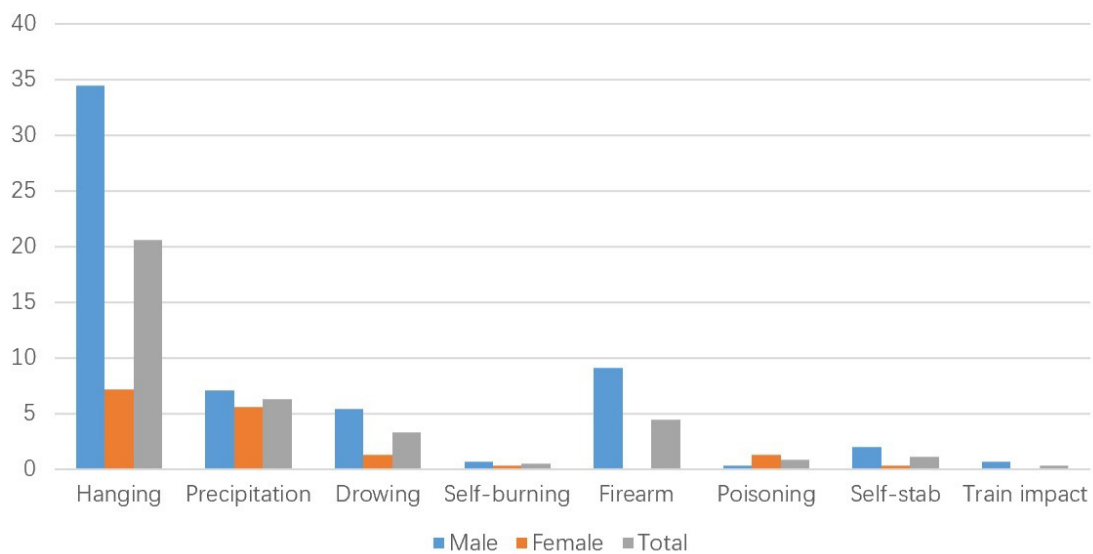
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**Fig. 3. Methods of suicide (cases per 100,000 population).**

Our data analysis shows that the women do not use firearms to commit suicide but choose poisoning or precipitation.

Regarding the age in which suicide is carried out (Fig. 4), our data lacks 103 deceased: 45 victims were not identified (age unknown). In 58 cases, the lack of information is due to their absence from the police reports. The age of 76 males (42.93%) and 27 women (55.10%) are unknown. We grouped the victims by age in 9 decades.

In men, we observed a higher frequency of cases in the group 80–89 years old (58.9 cases per 100,000 population) and over 90 years old (53.6 cases per 100,000 population).

In women, the suicide rate is stable, even in the 60–79 age group, while in men, it decreases. These differences may be due to the lack of age data in more than half of the female victims in our series.

The study of the seasonality (Fig. 5) showed that most suicides occur during the spring (34.07%) corresponding to 12.8 cases per 100,000 and the summer (26.54%) corresponding to 9.96 cases per 100,000, followed by winter (22.12%) corresponding to 8.3 cases per 100,000 and autumn (17.25%) corresponding to 6.5 cases per 100,000.

We analyzed the presence of psychiatric or addiction history, shown in Fig. 6, finding them in only 32 cases (14.1%).

Most subjects with diagnosed psychiatric illness suffer from depressive syndrome (53.12%) corresponding to 2.8 cases per 100,000. There is no history of suicide attempts and drug addiction in female victims in our data. The scarcity of deceased with a psychiatric/addiction history could be due to the difficulty of collecting clinical data and/or sub-clinical and undiagnosed diseases.

## 4. Discussion

The analysis of our case series tried to show the suicide rate, methods, age, seasonality, and psychiatric anamnesis among the inhabitants of the province of Foggia, paying specific attention to the differences between men and women.

### 4.1 Gender and Psychiatric/addiction History

First, an important consideration is that the males are more vulnerable to suicidal risk, with a relatively stable trend over the analyzed period ($\sigma = 3.45$). These data are in disagreement with the prevalence of major depression in women than in men [13]. In our series, many victims with a diagnosis of major depression are men.

According to literature data, women commit less suicide than men for social questions [14]. Traditionally, in order for men to be masculine, they are expected to display attributes such as strength, power, and competitiveness and show emotion and affectionless openly [15]. Women are more likely to be weak and to seek help. The traditional role of the male gender appears to increase the risk of suicidal behavior in men [16,17]. Single marital status, unemployment, retirement, and physical illness are commonly known risk factors for male suicidal behavior; from the literature study, relationship problems are the main reason for the suicide act [18].

Instead, women attempt suicide three times more often than men, even though they are less likely to complete suicide [19]. We observed only three cases with previous suicide attempts in our series, while no women reported any attempt. This could be in agreement with literature data that report a minor efficiency in suicide attempts in women in
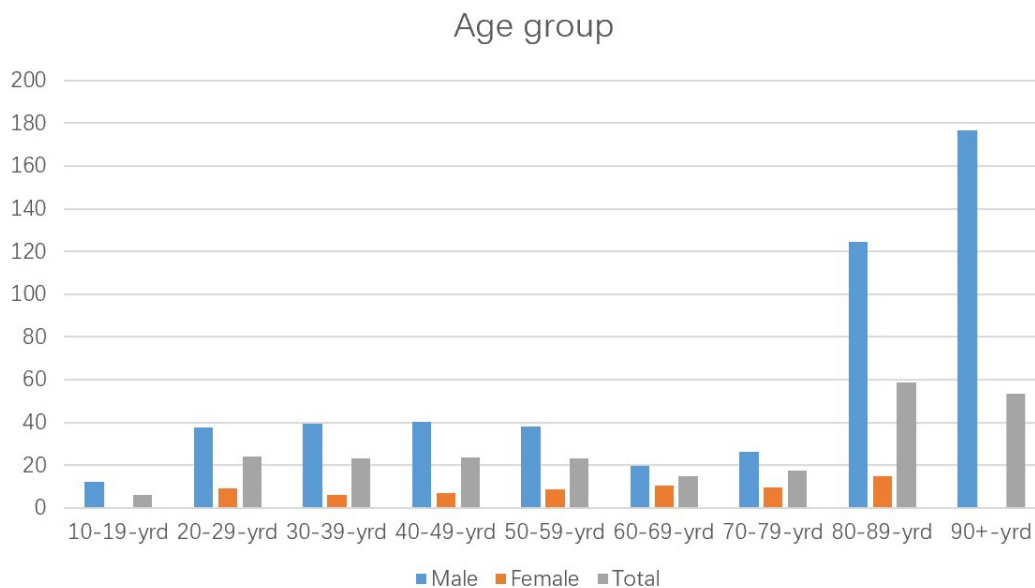
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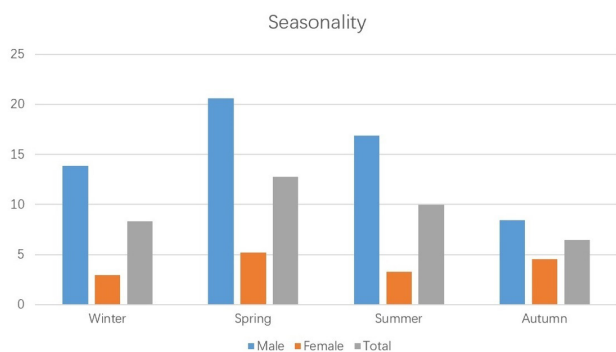**Fig. 4. The age group of the victims (cases per 100,000 population).**



**Fig. 5. Seasonality of the suicide (cases per 100,000 population).**

addition to the inadequate anamnestic collection that does not allow the collection of this data.

The number of psychiatric cases is much lower than in the literature. Several factors could explain. First of all, the victim's medical history is often unknown during the crime scene investigation. Furthermore, there are fewer psychiatric workers and psychiatric clinics in the province of Foggia than the national average. Specifically, the number of psychiatric clinics and beds is 1.3 and 7 per 100,000 inhabitants in Puglia, compared to the national data of 2.5 clinics per 100,000 inhabitants with 10.3 beds. The number of staff employed in psychiatric services (51.1 per 100,000 inhabitants) is 9.8% lower than the national average [20,21]. Finally, some people are reluctant to undergo psychiatric treatment for cultural and social reasons (the stigma of psychiatric pathology, for example). We did not observe any relevant organic pathologies (for example, cancer, diabetes, amputations) unless not statistically significant in a few cases.

### 4.2 Methods

Regarding the methods of suicide, the most commonly used is hanging (54.87%) for both men and women in the present study. These data agree with other studies [22], and can be explained the easy finding of a suitable means (e.g., ropes, laces, sheets) and with the needs of poor organization.

Falling from height (16.9%) is the second most frequent method observed in our series. This is a method of suicide easily accessible that does not need precise structuring but has a high lethal outcome.

The higher gender-related differences in the methods used to commit suicide emerge from the use of firearms that we observed in 27 cases of male suicides (11.95%), while no cases were involved.

The self-poisoning method of suicide, despite a small number of registered cases, is most frequently usedby women than men.

As the previous observations, we can assume that, while men select more destructive methods of suicide (firearms and fall from height), women choose destructive and immediately fatal methods (fall from height) and not disfiguring and not immediately fatal methods (self-poisoning). These data are in agreement with other studies in which the cases are extrapolated from a socio-cultural context similar to our territory [23], while they are in disagreement with other social realities where the methods of suicide are differently distributed in various population-group [24].

### 4.3 Age

In our study, the most significant number of cases are in the 80–89 age group, as in other studies [25], but we ob-
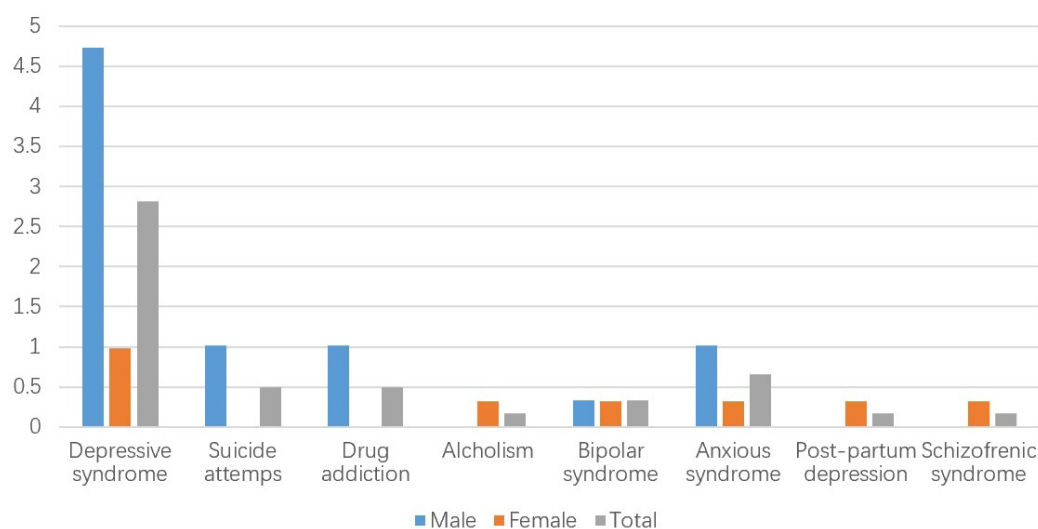
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**Fig. 6. Psychiatric/addiction history (cases per 100,000 population).**

served cases in every single age group; these data demonstrate an interest in all age groups. Regarding the age of suicide, the most significant number of cases of suicide of males are in the 80–89 and the 90+ years age groups. Our data agree with other studies showing a higher incidence of suicide rate in the elderly over the 80s and the youth group [17]. Regarding the 30–59 age group of males, the suicide numbers may be due to their social role or the loss of jobs and economic problems [26], and to the loneliness of living alone [27]. The reasons that lead males in the 80–89 years age group to commit suicide are mainly linked to the condition of living alone and widowing [28] or to the presence of various disabling pathologies [29]. On the other hand, women do not show distribution peaks among the various age groups, showing no cases in the 10–19 and 90+ age groups. These data do not agree with other studies revealing an increase in suicide rates related to age [30].

### 4.4 Seasonality

In our study, the seasons in which the most suicides occur are spring and summer. Concerning the sex of the victims, spring is the season when both males and females commit suicide more frequently. These results agree with others studies [31], where the peak of suicides occurred in spring. Various authors attempted to explain this trend. Durkheim *et al.* [32] asserted that seasonal neurochemical changes in the human body were implicated in the seasonality of suicidal behavior. Other authors hypothesized that the change in social life in the various seasons and an increase in spring and summer could affect the suicide rate [33]. Yarza *et al.* [34] demonstrated that suicide attempts become more frequent when the temperature is anomalously high compared with an average period. ther authors highlighted that the temperature changes and the light/dark cy-

cle duration affected the seasonal variability of suicidal-rate [35,36].

### 4.5 Practical Implications

Identifying the population groups at risk can lead to the identification of fragile individuals. More structures and professionals could help give patients a better assessment and medical assistance, especially those with psychiatric pathologies, and provide more support to the elderly.

The evaluation of anamnestic indices in the general population can assist the suicide prevention, such as the presence of depression through the PHQ-9 index (also usable in non-psychiatric patients) [37] and the presence of suicidal ideation with the Beck scale [38,39].

### 4.6 Limitations and Strengths

Our study tells of a dramatic cross-section of the population's life in the province of Foggia, suggesting the need to implement social support for the elderly population. Furthermore, any underestimation of psychiatric diagnoses must reflect the difficulty or reluctance of accessing psychiatric facilities. Our data, however, are partially incomplete; the age of some victims, such as the marital and professional status, is unknown. These leaks lead to lesser effectiveness of the individuation of people at suicidal risk.

## 5. Conclusions

Suicide is a worldwide and dramatic issue both from a socio-economic and public health point of view that needs to be better understood to carry out an action to prevent it [40].

The present study analyzed autopsy reports of cases of suicide observed in the period 2015–2021 by the Institute of Forensic Medicine of Foggia. Rates were con-

sistently higher for males than females, and they have remained seemingly constant during the considered period. The age group with many suicides between the men is 30–49-years-old and over 80-years-old while women maintain a reasonably stable suicide rate. Most suicides occur during spring, and the method most used is hanging. Even psychiatric comorbidities play an important role, showing that depressive syndrome is the most common condition associated with suicide, higher in males.

Studying suicidality in a well-defined population can help to implement targeted interventions. In the province of Foggia, psychological support can play a fundamental role, especially in middle age (those in which social obligations become heavier) and in old age (characterized by the loneliness of the elderly). Considering the seasonality data, general practitioners could assist elderly patients in identifying the people most at risk of suicide.

Improving the regional health network (beds, nurses, and medical staff) could have positive repercussions on the decrease in the regional suicide rate and consequently also in the local area of Foggia. More structures and professionals could help give patients a better assessment and medical assistance, especially those with psychiatric pathologies, and provide more support to the elderly.

The results of this study highlight the importance of personalized and gender-specific interventions and can inform policy-makers in the development of provincial suicide prevention plans and public health interventions.

## Author Contributions

GP—conceptualization. FC—analyzed the data. SDS, FC, MAB—wrote the manuscript. RLR and EG—analyzed separately the literature. LC—revisioned and approved the whole work. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

## Ethics Approval and Consent to Participate

All procedures performed in the study were in accordance with the ethical standards of the institution and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Consent for publication was obtained from Ethical Committee of Foggia (Approval number 099).

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## Conflict of Interest

The authors declare no conflict of interest. LC is serving as one of the Guest editors of this journal. We declare that LC had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to Akira Tsujimura.

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