Suicide Policy Research

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About this journal

This is an open access, peer-reviewed journal to disseminate latest, expeditious trends of suicide and suicide countermeasures worldwide. The journal has a special focus on useful, practical evidence for suicide policy making and suicide reduction. Not only to provide an evidence of academic research, but also to disseminate cases for giving clue for the better future practice, or lessons learned from various case of suicide countermeasures in frontline. Our journal tries to contribute to better solution of suicide reduction worldwide.

Announcement

The publisher and editorial office of the Suicide Policy Research has transferred to Japan Suicide Countermeasures Promotion Center (JSCP) on 1st April, 2020. JSCP was established on the basis of Article 4 Paragraph 1 of the *Law on Promotion of Surveys and Research to Facilitate Comprehensive and Effective Implementation of Suicide Countermeasures and Utilization, etc. of Outcomes thereof, etc*. This journal will disseminate information about the advanced research deliverables on suicide prevention policy and deal with a wide range of studies, such as Original Articles, Reviews, Reports and Commentaries. This journal will be published semi-annually on the website and in print.

INSTRUCTIONS FOR AUTHORS

Suicide Policy Research (SPR) is an open access journal published by Japan Support Center for Suicide Countermeasures (JSSC). The journal provides articles addressing the latest suicide policy research. Submitted articles should be written in English (basically) or other languages. All manuscripts are peer-reviewed by two or more reviewers. Manuscripts that do not meet minimum standard in grammar or syntax of the language will immediately be returned to the authors.
The authors are asked to adhere to the following guidelines.

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Submitted articles must be original papers that are not under consideration for publication elsewhere. The submission of a manuscript means that the authors agree to automatic transfer of the copyright to JSSC.

Manuscript Categories
· Original Article
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General Format
The manuscripts must be submitted as .doc /.pdf file. If you concern about garbles or any layout changing, submit as PDF file. Figures or Tables should be inserted, in principle, in the text, or submitted as attachment. Use Times New Roman 11 or 12 point font on A4 size paper. The margin, line-space and column do not have specific rules.

Title:
You do not need to separate the title page from the body page. Put titles on top of the first body page of the paper and highlight it with using bigger font size or indicating in bold. Capitalize the first character of each word except prepositions. Subtitles must follow the title with colon [:].

Authorship:
The author(s) should be indicated immediately below the title and subtitle. Each author's full name and professional affiliation should be included. Co-authored papers need to have been read and approved by all the authors and indicate a corresponding author with email address.

Abstract:
Abstract should consist around 250 words. Summarize the main points of Background, Methods, Results and Conclusions of the article. If you indicate any key words, give 3 to 10 at the end of the abstract.

Main body:
· Background – purpose, why this study was necessary
· Method – design and setting of the study
· Results – findings of the study
· Discussion – discuss the implications of the findings
· Conclusion – explanation of the importance of the study reported
· Declarations – competing interests, finding, author's contributions, acknowledgements etc.

Figure/Table:
Check out errors, omissions, repetition and garbles. Do not use photos as data in principle.

Reference:
Literature citations in the text must be provided as footnote. Reference should be indicated by a superscript Arabic numeral without square blanket (e.g. According to WHO's latest data,[1]). If the title of the literature is not English, Romanization the original title and English translation should be followed. (e.g. Chiiki no Jisatsu Taisaku [Local Suicide Countermeasures]) See examples below.

Reference Examples
Use the "Vancouver Style" for indicating your citation.

Book by author(s):
1. Doe T, Paxton A. Introduction to pathological science. Clifton Park (NY): *Thomson Cosmo Learning;* 2005.

Book by government:
1. Canadian Bureau of Statistics. Disability and ageing: summary of findings. *Toronto: CBS;* 1969. CBS publication 50.0.

Journal:
1. Anthony B, Carrol P, Heather T. A guideline of evidence-based medicine. *Best Pract Res Clin Obstet Gynaecol.* 1995; 8(3):19-26. doi:16.1011/c.bpolyn. 2016.10.013.

Website:
1. World Health Organization. Suicide mortality rate [Internet]. *Geneva: WHO;* 2017 Dec [cited 2018 Jan 15]. Available from: http://apps.who.int/gho/data/node.sdg.3-4-viz-2?lang=en

Newspaper:
1. Sakamoto, T. Rehabilitation for first-episode patients: neurological recovery. *Yomiuri Online;* 2010 May 26: 14.

2. Chung, T. A guide to the management of mental illness. *The New York Times* [newspaper on the Internet]. 2006 Dec 14. Available from: http://www.nytimes.com [cited 2016 Nov 4].

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Contents

Possible explanations of the decrease in suicide during the initial phase of COVID-19 pandemic in Japan

Masashi Kizuki[1), 2)], Sayaka Yoshino[1)], and Yutaka Motohashi [1)]

The increase or decrease in suicide rates in Japan is attracting media attention. Japan's suicide rates decreased substantially in April and May 2020, the initial phase of COVID-19 pandemic, compared to the previous year. A joinpoint analysis of daily number of suicides in 2020 showed a sharp decrease in the first 3 weeks of April (Figure 1). This occurred after the gradual increasing trend until the end of March, and was followed by the gradual increasing trend from middle of April to the end of May. Then, in early June, the suicide rates began to decrease. No such joinpoint was observed during the same periods in 2018 and 2019.

Many experts have expressed concern that loss of employment, isolation, and socioeconomic stressors in relation to the COVID-19 pandemic could increase the risk of suicide globally[1]. Japan experienced the "first wave" of infection between February and May, and the unemployment rate increased from 2.4% in February to 2.9% in May, despite national and local economic measures to support business.

There are several possible explanations for this suicide reduction. First, existing comprehensive suicide prevention measures might have mitigated the impact of socioeconomic crisis, as observed in the 2007-2008 financial crisis[2,3]. In addition, the national government requested that local governments strengthen the coordination in suicide prevention policy within and between public services to support the needy people in early March.

Second, socially pervasive collective anxiety about the pandemic from mid-March and government regulations to prevent the spread of COVID-19 might have created the sense of solidarity, and suppressed the Durkheim's "anomic suicide," particularly in vulnerable and socially isolated people. For example, decrease in suicides after the 1995 Great Hanshin-Awaji Earthquake could be explained by the decreased level of anomie[4]. A suicide reduction was also observed after the Great East Japan Earthquake in 2011.

Third, the visualization of social efforts to protect people's lives could have increased the level of trust in government and community, a well-known protective factor against suicide[5]. On March 18, it was announced that the government had begun discussions on cash payment to support households, which later resulted in payments of 100,000 JPY each to all residents. According to the Google Trends, peoples' interests in the word "cash payment", and "corona" associated with collective anxiety started to raise around that time. Daily trends in the interest were significantly associated with the number of suicides in Japan. These findings

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will have valuable implications for suicide countermeasures in other countries.

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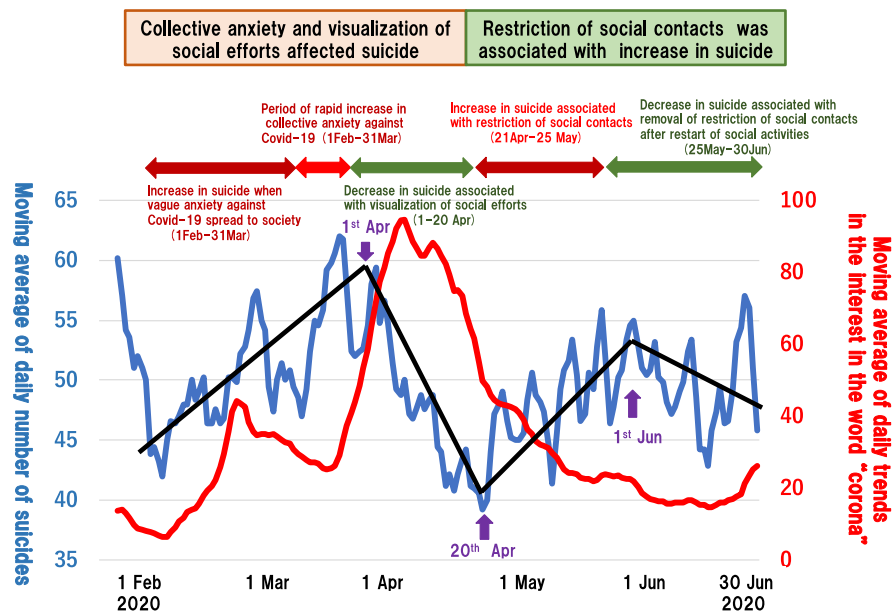
Figure 1. The daily number of suicides and the daily interest in the word "corona" associated with collective anxiety during the initial phase of COVID-19 pandemic in Japan. The time-series data betweenFebruary1st and June 30th are shown. There are three statistically significant inflection point days by a joinpoint analysis (1st April, 20th April and 1st June).

Original article

Increase in Suicide during the COVID-19 Pandemic in Japan: Possible link between Contingent Employment and Suicide by VAR Time-Series Analysis

Yutaka Motohshi[1], Masashi Kizuki[1], and Sayaka Yoshino[1]

Abstract

Background: The COVID-19 pandemic has had a serious impact on Japan's socio-economic activities and suicide. The purpose of this study was to clarify whether the impact of the COVID-19 pandemic on the number of suicides was dependent on employment type categories (regular or contingent employment). **Methods:** We analyzed monthly time-series data of suicide number and the number of contingent workers (men and women) from 2013 to 2020, using the vector autoregression analysis (VAR) and the Granger causality Walt tests. **Results:** The results showed statistically significant Granger causality between monthly the number of suicides and contingent workers for longitudinal time-series data from 2013 to 2019. It was also found that the number of contingent workers is negatively correlated with the number of suicides. The female contingent workers aged 15 to 64 years were the most severely affected group by the deterioration of employment. **Interpretation:** The increase in the number of suicides since July 2020 could be partly explained by a decrease in the number of contingent workers. It is necessary to take effective suicide countermeasures focusing on contingent female workers aged 15 to 64 years, the most vulnerable group for suicide during the COVID-19 pandemic.

Keywords: suicide, COVID-19 pandemic, contingent employment, vector autoregression analysis, Granger causality

Introduction

The COVID-19 pandemic has had a serious impact on Japan's socio-economic activities and employment-related indicators, such as the unemployment rate, have been negatively affected since April 2020, raising concerns about an increase in the number of suicides during an economic crisis[1]. However, the number of suicides in Japan decreased during April–June in Japan despite the increase in the unemployment rate. The reason the number of suicides decreased in April–June 2020 was thought to be related to the increase in collective anxiety[2]. On the other hand, the number of suicides has increased since July 2020. Thus, the

change in the number of suicides associated with COVID-19 is likely to be dynamic. There are some background factors to be taken into consideration contributing to the increase in suicide numbers such as deterioration of labor market indicators and of mental health due to refraining from going out, among others.

In this paper, we would like to clarify whether the impact of the COVID-19 pandemic on the number of suicides is dependent on employment type categories (regular or contingent employment), because it has been reported that those most severely hurt by the COVID-19 pandemic are women, contingent workers, and low-skilled workers in the labor

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market[3]. We conducted a time-series analysis using monthly data on both the number of suicides and the number of contingent workers from 2013 to 2020 and verified causality between these two sets of longitudinal data using the vector autoregression analysis (VAR) and the Granger causality test.

Methods

Monthly numbers of suicide were provided from suicide statistics published monthly by the Ministry of Health, Labor and Welfare of Japan[4]. Monthly numbers of regular/contingent workers were provided from the Labor Force Survey by the Ministry of Internal Affairs and Communications of Japan[5]. Monthly time-series datasets from January 2013 to October 2020 were prepared for numbers of suicide and numbers of regular/contingent workers in order to conduct time-series analyses. The vector autoregression analysis (VAR) was applied to two sets of longitudinal time-series data, and Granger causality Walt tests were also conducted to verify the causality of two sets of time-series data. In addition, the presence of significant correlation was examined using correlation analysis. All statistical analyses were performed using Stata 16 software (LightStone Inc., 2019)[6] with a significance level set at 5%.

Results

Figure 1 shows the increase/decrease in the number of contingent (*hiseiki or non-regular*) workers from January to October 2020 compared to the number in February just before the COVID-19 pandemic began in earnest in Japan. In Japan, contingent employment includes part-time workers, temporary workers, dispatched workers, contract employees, and others. The number of contingent female workers decreased significantly by 1.08 million in April compared to February. This figure suggests that 1.08 million contingent female workers lost their jobs in April. From April to July, the decrease in the numbers of contingent female workers exceeded 1 million, but from August to October, the decrease showed a declining trend. In October, the number of contingent female workers decreased by 0.66 million. The decrease in male contingent workers was smaller than that in women, and it became clear that there is a gender gap in the impact of job losses in the labor market. Regarding the type of industry, the number of jobs in industries including "accommodation and food service," "construction," and "life-related services and entertainment" decreased significantly, which means that contingent, low-skilled, female workers who worked in industries that employ many female workers suffered from the COVID-19 crisis.
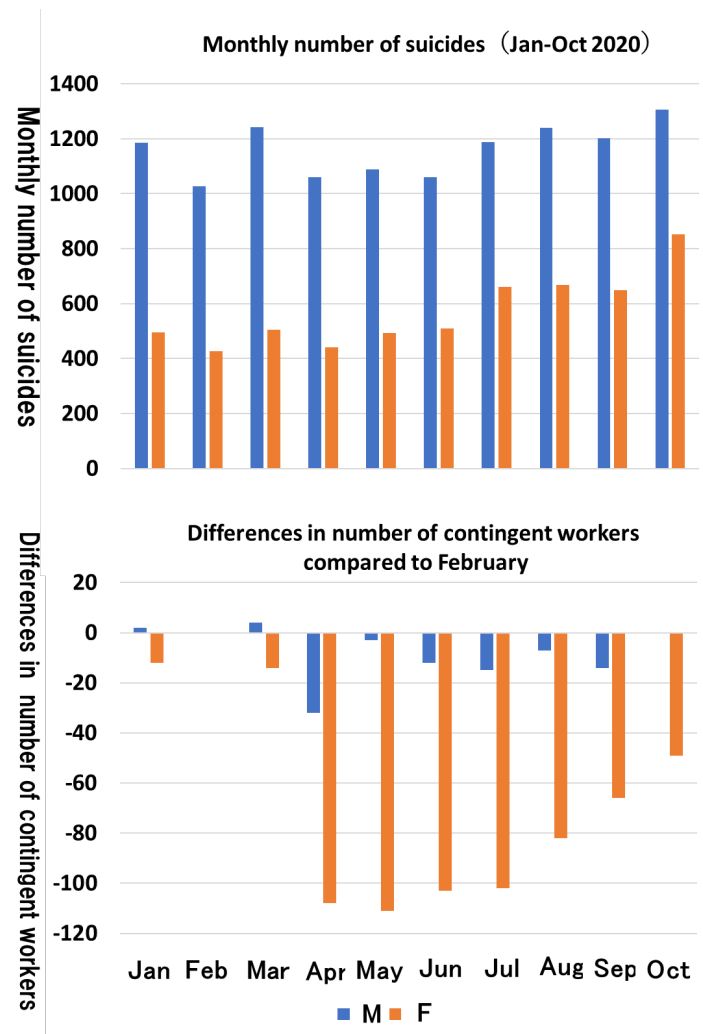
Figure 1. Increase/decrease in the number of contingent workers from January to October 2020 compared to the number in February just before the COVID-19 pandemic began in earnest in Japan

Figure 2 showed the monthly time-series trend data of numbers of suicide and the number of contingent workers (men and women) from January 2013 to October 2020. It was shown that the number of suicides decreased as the number of contingent workers increased. The increase in the number of suicides since July 2020 could be partly explained by a decrease in the number of contingent workers. The vector autoregression analysis (VAR) and Granger causality Walt tests[5] revealed statistically significant Granger causality between the number of suicides and the number of contingent workers for longitudinal time-series data from 2013 to 2019. The chi-square values were 9.2 (p<0.01) for the total (men and women), 10.2 (p<0.006) for men, and 10.9 (p<0.004) for women.
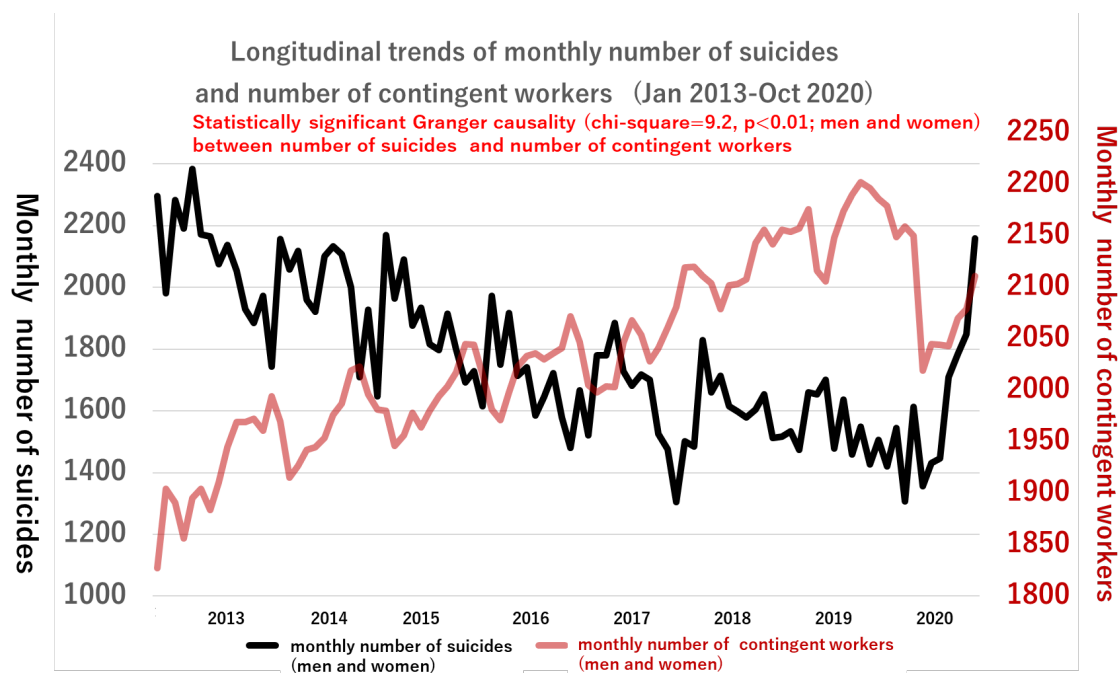
Figure 2. Monthly time-series trend data of suicide number and the number of contingent workers (men and women) from January 2013 to October 2020. The vector autoregression analysis (VAR) and Granger causality Walt tests[5] revealed statistically significant Granger causality between suicide number and number of contingent workers for longitudinal time-series data from 2013 to 2020 (chi-square = 9.2, p < 0.01)

Figure 3 shows the correlation between the number of contingent workers and the suicide rate. The correlation from January 2013 to February 2020 (non-crisis period) showed a statistically significant negative correlation, and it was found that the larger the number of contingent workers, the lower the suicide rate (y = -0.022x + 62.84, R² = 0.66, P <0.001). Data from April–July 2020 during the economic crisis associated with the COVID-19 pandemic are clearly different from the non-crisis period from 2013 to 2019. Looking at the changes in the suicide rate, a phase transition was observed between March and April 2020, and the suicide rate decreased from April to June compared to March. This period of decrease in suicide rate coincided with the period when collective anxiety increased, which was indicated by the number of Internet searches for the word "Corona" according to Google Trends[2]. The decrease in suicide rate seemed to also be associated with the refrain from going out due to the state of emergency. The suicide rate in July–September turned around and showed an increasing trend; this increasing trend was influenced by the deterioration of labor market indicators as indicated by the decrease in the number of contingent workers and the increase in the unemployment rate.
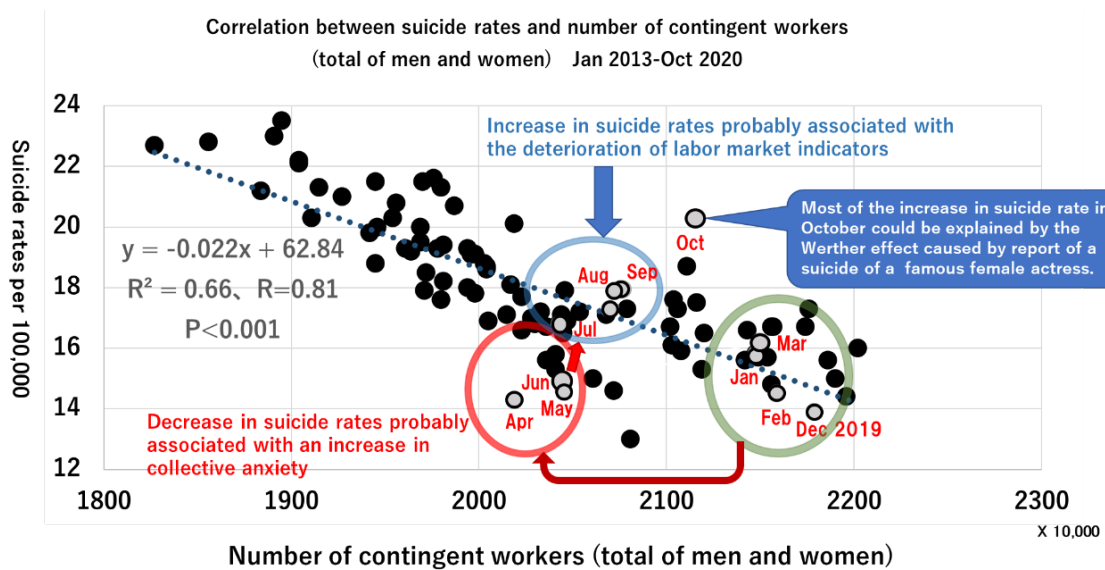
Figure 3. Correlation between the number of contingent workers and the suicide rate. The time period from January 2013 to February 2020 (non-crisis period) showed a statistically significant negative correlation, and it was found that the larger the number of contingent workers, the lower the suicide rate (y = -0.022x + 62.84, R² = 0.66, P <0.001).

Regarding the correlation between the suicide rate and the number of workers, we further performed a correlation analysis by stratifying by gender (male/female) and age (15–64 years old/65 years old or older) according to employment-type categories (regular/contingent). The correlation between the suicide rate and the number of workers was statistically significantly negative for regular female workers (15–64 years old, 65 years old or older), contingent female workers (15–64 years old, 65 years old or older), regular male workers (15–64 years old, 65 years old or older) and contingent male workers (65 years old or older). We found that only contingent male workers aged 15–64 years had a statistically significant positive correlation with suicide rates.

Discussion

It has been reported that there is a strong correlation between the suicide rate and the unemployment rate with regard to the negative impacts of the economic crisis on the labor market[3]. However, the unemployment rate is not the only employment-related indicator associated with the increase in the number of suicides. Since the number of contingent workers has gradually increased in Japan's labor market since the 1990s[7], it is necessary to consider the number of contingent workers as an employment-related indicator that affects the suicide rate. However, insufficient research has thus far been conducted. In the economic crisis associated with the COVID-19 pandemic in 2020, the gender and age of the affected populations differ from those during the 2008–2010 Lehman shock. It has been reported that contingent female workers have suffered more job losses associated with the COVID-19 pandemic[3].

The results of the Granger causality test revealed that the number of contingent workers could affect the increase/decrease in the number of suicides. During the COVID-19 pandemic period, the relationship between the number of contingent workers and suicide tended to be disturbed, although they were fundamentally closely related. It is necessary to attend to the

increase/decrease in the number of contingent workers as well as suicide trend data.

As already mentioned, the decrease in the number of suicides from April to June was mostly due to an increase in collective anxiety[2]. The data from August to October nearly returned to the linear regression equation from 2013 to 2020 during the non-crisis period, and, from the data, the trend seemed to have entered a different phase from April to June. The deterioration of employment-related indicators such as the decrease in the number of contingent workers is thought to be behind the increase in number of suicides. Furthermore, economic policies as well as employment policies such as basic employment insurance allowances, small emergency loans, and general support loans might suppress the increase in the suicide rate[8]. Regarding the increase in the number of suicides from July to September, it is possible that the policy effects of basic employment insurance allowances, small emergency loans, general support loans, and so on decreased, leading to an increase in suicides. Other factors to be taken into consideration are an increase in those who are in need of financial support due to the expiration of the basic employment insurance allowance for contingent young women and insufficient access to financial support measures, which might affect the increase in suicides. It has also been noted that the increase in female suicides may be related to the increase in domestic violence due to refraining from going out and engaging in remote work[8].

The present study suggests that contingent female workers aged 15 to 64 years were the most severely affected group by the deterioration of employment, the so-called "COVID-19 shocks.[3] It is necessary to take effective suicide countermeasures focusing on contingent female workers aged 15 to 64 years, the most vulnerable group for suicide during the COVID-19 pandemic.

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