The effects of media reports of suicides by well-known figures between 1989 and 2010 in Japan

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Abstract

Background: Many studies have shown that media reporting of suicide incidents can trigger suicidal behaviours in viewers and readers. Yet little is known about the exact timing and duration of the imitative effects.

Methods: We estimated the Poisson regression model using original data on 109 celebrity suicides and daily suicide counts (n = 8035) in Japan from 1989 through 2010. Various fixed effects were included in the model to control for the effects of seasonal variations and time-specific shocks.

Results: The media reports on celebrity suicides were associated with an immediate increase in total suicides. The total number of suicides increased by 4.6% (95% confidence interval (CI): 2.4–6.7) on the day that media reports on celebrity suicides were published. The increase during the post-report period lasted for about 10 days after the publication of news reports. The average effect of celebrity suicides on total suicides over the 10-day post-reporting period was estimated to be highest when the suicide by nationally recognized politicians was reported (14.8%; CI: 10.9–18.7), whereas reports on the deaths of entertainment celebrities were followed by a 4.7% increase (CI: 2.9–6.5) in suicide counts.

Conclusions: This study presents evidence that media reports on celebrity suicides have an immediate impact on the number of suicides in the general population. Our findings also highlight the importance of responsible and cautious media reporting on suicide.

Key words: Suicide, media, imitation, mental health, Japan
Introduction

Many studies have shown that media reporting of suicide incidents can trigger suicidal behaviors in viewers and readers.1–20 In particular, sensational news coverage of celebrity suicide is shown to result in a rise of the suicide rate among the general population.7 Yet the existing evidence of this relationship has two important limitations. First, most of the previous studies used weekly or monthly suicide data, while leaving unspecified exactly when the copycat acts occurred and how many days the news coverage continued to be influential. Several studies used daily suicide data, but they did not explicitly examine the timing and duration of the effect.10,12,16–17 The notable exception is a seminal study by Bollen and Phillips, which investigated the timing and duration of the imitative effects of television news stories using daily suicide data.2 However, their findings were based on seven suicide stories in the 1970s, and it remains unclear whether their findings still hold if we use more recent data and a more comprehensive list of highly publicized suicides. Second, although there are some important exceptions,4,12,20 most of the past studies focused on the suicides of a handful of entertainment celebrities, or even just one, over limited time periods,8,9,11,13–15 which makes it difficult to understand whether the estimated magnitudes of their impact are generalizable to any types of celebrities or to different time periods.

This study seeks to overcome these limitations by creating a dataset of celebrity suicides in Japan for the period from 1989 through 2010. We constructed a list of more than 100 well-known figures in Japan who died by suicide, by consulting the archives of a leading national newspaper. These prominent figures included politicians, artists, professors, athletes, corporate executives and entertainment celebrities. Accordingly, our dataset allowed us to examine whether the effect of a well-publicized suicide on the public differs with the occupations of the celebrities. We combined the data of celebrity suicides with the daily counts of suicide deaths in the population in order to precisely estimate the timing and the duration of the imitative behavior.

Methods

Daily suicide data for the population were obtained from the Vital Statistics of Japan, which were compiled by the Ministry of Health, Labour and Welfare, for the period from 1989 through 2010. Deaths coded as E950-E959 under the ICD-9 standard (1989–94) and X60-X84 under the ICD-10 standard (1995–2010) were classified as deaths by suicide and were thus included in our dataset. For each day, we calculated the total number of suicides. The total number of observations was 8085.

As in some previous studies, we used a media archive to identify the deaths of well-known figures.13,20 We considered the deceased to be ‘well-known’ if the national media decided to report his or her death. As discussed below, we excluded some cases from the analysis based on specified criteria, even if their deaths were reported in the national media. We consulted the digital archive of the Yomiuri Shimbun, in order to make a list of prominent people who died from suicide. The Yomiuri has the largest circulation in Japan (9.9 million copies per day, as of 2012), and is circulated throughout the country. The newspaper is published twice a day, in morning and evening editions. We conducted a keyword search using ‘jisatsu’ (suicide) as the keyword.

To identify articles on suicide by well-known figures from the retrieved pool of articles on suicide in general, we developed the following procedures. First, because the deaths of well-known figures are always reported with their name and age, we kept articles that contain a two-digit parenthesis with a number in between, which is a consistent pattern used to report the age of a person. This filtering left us with 3620 articles.

Then, each of the three authors separately read all of these articles to remove names unlikely to be known to the general public. Our rule to exclude the irrelevant cases is as follows. First, for managers of a company, we excluded individuals if the company was relatively small (with annual revenues less than 100 billion yen) or if the individual was not a top executive. Similarly, the deaths of bureaucrats were excluded from our list. Second, we excluded individuals if the deceased was not famous, but a boss or relative of the deceased was well-known. In addition, the deaths of criminals or suspected criminals were excluded if they were only known for their criminal acts.

For each of the well-known figures in our final list, we recorded the date of death, date of report, method of suicide, and name, age and occupation of the deceased.

Key Messages

• Media reports on celebrity suicides were associated with an immediate and substantive increase in total suicides.
• The size of the media influences varies by the occupations of well-known figures.
• Our findings highlight the importance of responsible and cautious media reporting on suicide.
Additionally, we also counted the total number of articles that mentioned his or her suicide over the subsequent 21 days, as well as the total number of Japanese characters in these articles.

After making the final list, we categorized the well-known figures into the following seven groups, in order to test whether the imitative effects of celebrity suicide vary by their professions: (i) members of national parliament and high government officials; (ii) mayors and governors; (iii) artists, writers and movie directors; (iv) actors, actresses, singers and other entertainers; (v) athletes; (vi) professors; and (vii) the executives of a large corporation with annual revenues greater than 100 billion yen. This categorization largely corresponds to the one adapted by Stack,\(^4\) except that his list contained criminals. We did not distinguish whether the deceased held the occupation at the time of death or had already retired or resigned.

Using the data described above, we estimated the following Poisson regression model:

$$\log (\mu_{dmy}) = \sum_{k=0}^{20} \beta_k R_{dmy,k} + \gamma_{my} + \lambda_d + \rho_w,$$

where the dependent variable, \(\log (\mu_{dmy})\), is the Poisson rate of suicides on day \(d\) in month \(m\) of year \(y\). The main independent variable is \(R_{dmy,0}\), which is a dummy variable that equals one, if a particular celebrity’s suicide was reported for the first time on day \(d\) in month \(m\) of year \(y\). We lagged this dummy variable forward up to 20 days and added each of them separately to the model as \(R_{dmy,1}\) to \(R_{dmy,20}\). These lagged variables were expected to capture the lagged influence of the news report on the number of suicides in the post-reporting period. For example, if the suicide of a well-known figure was reported on 1 January 2001, this report was expected to affect the count of suicides on the same date (as captured by \(\beta_0 R_{dmy,0}\)) as well as the following 20 days until 21 January (as captured by \(\beta_{19} R_{dmy,1}\) to \(\beta_{20} R_{dmy,20}\)).

All of these variables should have a positive coefficient if the media reporting of the celebrity suicide heightened the suicidal risk of the general population. In addition, we also lagged the variable of the first reporting of celebrity suicide backward up to 20 days as \(R_{dmy,-1}\) to \(R_{dmy,-20}\). Using the same example discussed above, \(R_{dmy,-1}\) equals one on 12 December 2000, 20 days before the first report on 1 January 2001. The coefficients of these variables were expected to be zero. We included these dummy variables in order to compare the number of suicides before and after the report of the celebrity suicides.

The Poisson regression model included year-month, day and day of the week fixed effects to control for seasonal variations and time-specific shocks. The year-month fixed effects, \(\gamma_{my}\), equalled one if day \(d\) was included in a particular month of a year (e.g. January 2001) and zero otherwise.

In total, the model included 144 year-month fixed effects, which were expected to capture the influences of any year-month specific factors, such as unemployment rate, humidity and temperature. Note that the year-month fixed effects also controlled for the change in the population structure over the study period. The day of the month fixed effect, \(\lambda_d\), and the day of the week fixed effects, \(\rho_w\), were also present in the model because a particular day of the month or the week may have an influence on celebrity and population suicides.

To further examine the possibility that media influence varies by the occupations of well-known figures, we also estimated the same model separately for each of the seven occupation groups described.

### Results

During our study period, the average daily count of suicides was 74.277 [standard deviation (SD) = 19.86], and a total of 596,816 people, including 109 well-known figures, died by suicide. The average interval between two celebrity suicides was 73 days.

Of the 109 suicides by well-known persons, suicides of actors/actresses and singers (25) accounted for 22% of our observations, followed by those of artists, writers and movie directors (20) and corporate executives (19). As a validity check, we compared our list with a wikipedia entry that lists the names of people who died or were suspected to have died by suicide (as of 26 April 2013). During the study period, the wikipedia page included 204 people of whom 104 are included in our list. The remaining 100 people on the wikipedia page were not included in our list either because their deaths were not reported in the Yomiuri, or because the occupations of the deceased did not fall into our definition of ‘well-known figures’.

The top panel of Figure 1 shows the estimation results when the data on suicides by all 109 well-known figures were used. The x-axis indicates the number of days from the publication of news about a celebrity suicide; day 0 is the day the news was published, days 1 to 20 are the post-reporting period and the negative range indicates the pre-report period. The y-axis shows the estimated size of the media influence on the corresponding days. The influences were converted to incidence rate ratio (IRR); thus, the height indicates the percentage increase in the number of suicides from the baseline period.

As expected, the top panel of Figure 1 shows that the media report of a celebrity suicide had no discernible effect on the number of suicides in the population for the pre-report period. In contrast, the post-report period exhibits a sharp increase in the number of suicides starting from day...
0, which is the day when the celebrity suicide was first reported. The IRR on day 0 is 0.046 (CI: 0.024, 0.067), meaning that on average the number of suicides in the population increased by 4.6% immediately after the media report. The influence remained approximately 6% higher than the baseline period for about 9 subsequent days. The average increase in IRR over the 10-day post-reporting period was estimated to be 0.055 (CI: 0.046, 0.065).

The bottom panel of Figure 1 shows the results when we conducted the same analysis with a subset of well-known figures whose deaths were mentioned at least twice by the newspaper in the post-report period. Although the 109 well-known figures included in this study were likely to be the elite of the Japanese society, some of them might have been known only to a limited segment of the population; thus, their deaths might have had a trivial impact on the suicidal risk of the population. In order to focus on celebrities who were widely known by the public, we estimated the same model with a subset of figures with more than two posthumous articles on their deaths. This is because the deaths of relatively unknown figures are likely to be reported only once, whereas the suicides of highly prominent figures are likely to be followed by multiple articles. The suicides of 44 figures (40%) were reported at least twice, with the mean number of articles at 3.6, whereas the deaths of the remaining 65 figures (60%) were reported only once at the time of their deaths. The bottom panel shows that highly publicized suicide stories were followed by larger increases in suicide counts, as compared with the results reported in the top panel. On the day of
the report, the number of suicides increased by 0.070 (CI: 0.036, 0.103); 3 days after the first report, the increase was estimated to be 0.118 (CI: 0.084, 0.151). The average increase over the 10-day post-reporting period was estimated to be 0.063 (CI: 0.048, 0.078).

Table 1 summarizes the estimation results of the model that allowed the impact to vary by the occupation of the celebrities. To conserve space, we reported the average influence during the first 10-day post-report period for each occupation. As in Figure 1, the average influences were converted into IRR; thus, the effect indicates the percent increase in the number of suicides from the baseline period. The first column shows the influence of the media report on the total population by including all 109 celebrities, and the second column shows the influence of 44 celebrities whose deaths were reported at least twice in the Yomiuri, respectively.

According to Table 1, among the seven occupation groups prominent politicians had the largest impact on the general population; on average, the number of suicides increased by about 14.8% (IRR = 0.148; CI: 0.109, 0.187), during the 10-day post-report period. Media reports of suicides by other types of well-known figures were also estimated to be associated with an increase in total suicides, but by a smaller magnitude. For example, reports on the deaths of entertainment celebrities were followed by a 4.7% increase in suicide counts.

As reported in Table 1, we found a larger post-report increase after the deaths of highly prominent politicians, artists and athletes when we limited our sample to those with multiple posthumous articles. However, the average effects were no longer discernible from zero for mayors, governors and professors.

**Discussion**

Using the data on 109 celebrity suicides combined with the daily suicide data in Japan, this study provides evidence that media reports on celebrity suicides were associated with an immediate increase in total suicides. On average, the total number of suicides increased by around 5% on the day that media reports on celebrity suicides were published. Our analysis also indicates that this increase in the post-report period was quite persistent; it lasted for about 10 days after the publication of news reports. The main contribution of this study is that it estimated the exact timing and duration of the imitative effects, by using daily, as opposed to monthly or weekly, data.

In order to distinguish highly publicized suicides from those that received relatively little attention from the media, we also conducted the same analysis with a subset of suicides with multiple posthumous articles. We found that the news reports on the deaths of these high-profile celebrities were associated with a larger increase in the number of suicides in the population; the average increase was estimated to be 6.3% in the 10-day post-report period.

Our findings also suggest that the size of the media influences varies by the type of well-known figures. The post-report increase in suicide was estimated to be highest when the suicides of nationally-recognized politicians were reported. The magnitude of the increase was even higher than the increase observed after suicide reports on entertainment celebrities, which is in contrast to past findings.4 This may be attributable to the fact that some of the politicians included in our study were considerably high-profile figures. One was the minister of agriculture in service (Toshikatsu Matsuoka), and the other two were involved in prominent financial scandals that had received wide media attention (Shokei Arai and Youjiro Nakajima). As a result, the number of media reports following their deaths was substantial. The average number of posthumous articles was 6.71 (SD = 5.31) for politicians, with the maximum at 17 (for Shokei Arai), whereas the average number was 1.74 (SD = 1.53) for other well-known figures. Following the death of Shokei Arai, major national newspapers even issued extras. Thus, it is possible that

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**Table 1.** The average effect of celebrity suicides on total suicides over 10-day post-reporting period, by occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>All N</th>
<th>IRR (95% CI)</th>
<th>Two articles and more N</th>
<th>IRR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members of national parliament and high government officials</td>
<td>7</td>
<td>0.148 (0.109, 0.187)</td>
<td>6</td>
<td>0.182 (0.139, 0.226)</td>
</tr>
<tr>
<td>Mayors and governors</td>
<td>13</td>
<td>0.067 (0.035, 0.098)</td>
<td>2</td>
<td>−0.129 (−0.268, 0.009)</td>
</tr>
<tr>
<td>Artists, writers and movie directors</td>
<td>20</td>
<td>0.036 (0.012, 0.061)</td>
<td>6</td>
<td>0.055 (0.005, 0.104)</td>
</tr>
<tr>
<td>Actors, actresses, singers and other entertainers</td>
<td>25</td>
<td>0.047 (0.029, 0.065)</td>
<td>10</td>
<td>0.040 (0.007, 0.073)</td>
</tr>
<tr>
<td>Athletes</td>
<td>10</td>
<td>0.043 (0.009, 0.078)</td>
<td>2</td>
<td>0.095 (0.027, 0.163)</td>
</tr>
<tr>
<td>Professors</td>
<td>15</td>
<td>0.042 (0.011, 0.074)</td>
<td>5</td>
<td>−0.039 (−0.099, 0.02)</td>
</tr>
<tr>
<td>Corporate executives</td>
<td>19</td>
<td>0.066 (0.041, 0.092)</td>
<td>13</td>
<td>0.066 (0.036, 0.096)</td>
</tr>
</tbody>
</table>

N, number of celebrities in each type of occupation; IRR, incident rate ratios; 95% CI in parentheses.
politicians evoked a larger impact because they received much more media attention compared with the others.

The media reports on suicides by mayors, governors and corporate executives were also followed by a sizeable increase in the number of suicides in the population. The increases found after the publication of news reports on the suicides of politicians and economic elites were larger than those observed after the deaths of entertainment celebrities. Although entertainment celebrities have been a focus of many past studies, our results indicate that well-known individuals in some other professions should also be included in future studies.

Regarding the magnitude of the effect, our estimates indicate that a report on a celebrity suicide is associated with an average increase in the suicide rate of 0.03 (CI: 0.026, 0.038) during the 10-day post-report period. This effect size is smaller than those reported by the pooled estimates of 10 studies included in a recent meta-analysis on celebrity suicides, which found an average effect of 0.26 (CI: 0.09, 0.23) in the month after a suicide report, with individual effects ranging from -0.18 to 0.67. The difference in the effect sizes is partly attributable to the fact that this study includes a wide range of celebrities whose publicity varied greatly, whereas the previous studies tended to focus on the limited number of celebrities who were known widely to the public.

Our results are largely consistent with those found by Bollen and Phillips. Both the present study and their study only found an immediate increase in total suicides after the appearance of suicide stories, not before, thus providing compelling evidence that the news reports indeed triggered the increase. However, the estimated duration of the effects found by Bollen and Phillips contrasts with our findings. Bollen and Phillips only found two significant post-report peaks in suicide, one immediately after the reports and another after a week, but we found that the level of subsequent suicides remained elevated for about 10 days.

The prolonged impacts of the news about celebrity suicides found in this study can be explained in several ways. First, there could be a time lag before a person actually receives information about celebrity suicides after it becomes public. Second, it may take some time until one makes a decision to die by suicide after being exposed to the news. Finally, even if one engages in an act of self-harm immediately after the publication of the news, he or she may stay alive for several days under medical care. Our dataset does not allow us to distinguish these possibilities because the vital statistics do not record the timing of the self-harming behavior if it differs from the date of death. However, it seems reasonable to assume that the time lag between self-harming acts and death is generally short, since 70% of suicides in Japan occur by hanging or jumping from a high place.

This study has some limitations. First, as in the case of past ecological studies, the ecological nature of our study does not allow us to distinguish whether those who died by suicide were actually exposed to the media coverage of celebrity suicides. However, because we used daily data, we were able to precisely estimate the timing of its effects. It seems highly unlikely that the immediate surge in suicide observed in the post-report period can be explained by other factors. Second, the present study is based on newspaper reporting from one media outlet. Although the Yomiuri is the largest newspaper that is circulated throughout Japan, its contents may differ from the contents reported in other types of media, including television. In addition, the contents of media reports are not considered in this study. Examining the association between the tone and contents of reports and the size of their impact is an important future research agenda.

This study presents important evidence that media reports on celebrity suicides have a substantive impact on the number of suicides in the general population. Our results suggest that the 109 celebrity suicides resulted in additional 4453 suicides in the population, which accounted for 0.7% of the total suicide count between 1989 and 2010 in Japan.

Our findings also highlight the importance of responsible and cautious media reporting on suicide. The World Health Organization and others have developed several guidelines for the media, although the media do not necessarily comply with these guidelines, and there are no official media guidelines regarding suicide reporting in Japan. In our sample, among the 109 newspaper headlines for celebrity suicides, 101 contain ‘suicide’ (n = 94) or seven other terms that are clearly indicative of suicide, despite the World Health Organization’s recommendation against such practices. More work is needed to understand the association between the manner in which news is reported and the size of imitative effects.

Conflict of interest: None declared.

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