

ORIGINAL ARTICLE

“Breaking the silence” suicide Prevention media campaign in Oregon: Evaluation of impact on help-seeking and suicide mortality

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Abstract

Introduction: Research has established that suicide-related media can impact suicide rates both positively and negatively, supporting efforts to engage the media in the service of suicide prevention. The goal of the current study is to evaluate the impact of a suicide prevention media campaign implemented April 7–14, 2019 in Oregon.

Methods: Several indices of help-seeking behavior and suicide risk were employed: suicide-related Google Health API searches, National Suicide Prevention Lifeline (Lifeline) (currently known as the 988 Suicide and Crisis Lifeline) call volume, and state suicide mortality data from April 7, 2016—May 6, 2019. Eight states with similar 2016–2018 average suicide rates were compared with Oregon. Bayesian structural time-series modeling in R was used to test intervention effects.

Results: During the 30 days following the start of the campaign, there was a significant increase in Lifeline calls from Oregon area codes (2488 observed vs. 2283 expected calls, $p = 0.03$). There were no significant changes in suicide mortality or suicide-related Google searches in Oregon.

Conclusions: The campaign appeared to increase help-seeking behavior in the form of Lifeline calls, without any indication of an iatrogenic suicide contagion effect. However, the campaign’s potential to reduce suicide mortality was unmet.

KEYWORDS

evaluation, media campaign, suicide prevention

INTRODUCTION

Effective suicide prevention strategies are needed to address the suicide deaths occurring globally (703,000 in

2019) (World Health Organization, 2021) and in the U.S. (48,183 in 2021) (Centers for Disease Control and Prevention, 2023). In light of the extensive research on the impact of the media on suicide in the past four

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decades (Niederkrotenthaler et al., 2020), one prevention strategy focuses on safe media reporting on suicide (O'Carroll & Potter, 1994; SAVE, 2020; World Health Organization, 2017). Research has long identified that certain suicide-related media content, for example., stories on completed celebrity suicides and headlines detailing the suicide method, can be significantly associated with increases in subsequent suicide rates, termed the “Werther effect” (Niederkrotenthaler et al., 2020; Phillips, 1974). More recent research has demonstrated that other media content, namely stories on the adoption of coping strategies and help-seeking over suicidal behavior in adverse circumstances, can be associated with a decrease in subsequent suicide rates, termed the “Papageno effect” (Niederkrotenthaler et al., 2022). Suicide reporting has been shown to have a dose–response effect on subsequent suicides, with a greater volume of stories yielding a greater impact (Pirkis & Blood, 2001); exposure to suicide reporting has also been shown to have a greater impact on individuals in the same demographic group or utilizing the same suicide method as the publicized model (Lake & Gould, 2014; Stack, 2005). While media effects on suicide are not universal or monolithic, there is enough evidence (Pirkis et al., 2006; Stack, 2005) that suicide reporting can impact future suicides to justify the development and dissemination of media guidelines for safe suicide reporting (O'Carroll & Potter, 1994; SAVE, 2020; World Health Organization, 2017) which are designed to enhance the likelihood of a Papageno effect and minimize the likelihood of a Werther effect.

To date, research examining the impact and effectiveness of the dissemination of media guidelines is sparse (Zalsman et al., 2016). Research indicates that adherence to media guidelines is inconsistent (Fu & Yip, 2008; Pitman & Stevenson, 2015; Tatum et al., 2010), few newspapers meet adherence thresholds for high fidelity (Sheftall et al., 2019), and there are many instances where no significant changes in reporting are evident and/or journalists are not aware of the guidelines (Bohanna & Wang, 2012). Fewer studies have examined outcomes other than adherence, such as changes in help-seeking behaviors or suicide rates (Stack, 2020). An Austrian study reported an association between the implementation of media guidelines and reduced suicide rates (Etzersdorfer & Sonneck, 1998; Sonneck et al., 1994) and also found that a significant decrease in suicides occurred in areas where compliant newspapers reached a certain threshold (e.g., 67%) of the population (Niederkrotenthaler & Sonneck, 2007). Other studies have reported inconsistent associations between fidelity to specific media guideline components and suicide deaths, suggesting that more needs to be understood about media effects and how to manage them (Stack, 2020).

A related strategy involves media campaigns, wherein suicide prevention messaging is disseminated via media such as billboards, signs, posters, public service announcements, and newspaper advertisements (rather than news stories). In a systematic literature review, Pirkis et al. (2019) identified 20 studies of the impact of suicide prevention media campaigns. Most studies examined whether the campaign exposure led to improvements in knowledge and awareness of suicide or attitudes toward suicide, and found evidence of a positive impact. Some reviewed studies examined a campaign's impact on help-seeking, with mixed results. Few studies have had sufficient statistical power to examine the impact on suicides; those that did reported significant reductions. Pirkis et al. (2019) concluded that there is a need for additional evaluations that “employ rigorous designs assessing the most pertinent outcomes.”

Unlike other suicide prevention media campaigns, in which brief and targeted media messages are developed by teams of suicide prevention professionals, a campaign in Oregon—“Breaking the Silence” (<https://www.breakingthesilenceor.com>)—involved independent media outlets partnering to develop and release a concentrated dose of suicide-related news stories adhering to safe reporting guidelines. The news outlets were provided guidance on safe reporting on suicide through a “series of roundtables between Oregon media organizations and ... Lines for Life, a Portland-based suicide prevention nonprofit that also runs a number of crisis lines” (Zimmerman, 2019). During the campaign, implemented from April 7–14, 2019, 30 media outlets across Oregon collectively released over 100 campaign-related stories via broadcast TV, radio, online and print media. The campaign had the described goals of “highlight[ing] the public health crisis of death by suicide” and “offer[ing] our readers, listeners and viewers resources to help if they—or those they know—are in crisis” (The Oregonian Editorial Board, 2019).

An evaluation complementary to the current study examined the content of all media stories with a major focus on suicide published in Oregon and Washington states in April 2019, and compared the 104 stories generated by the Breaking the Silence campaign to 511 media stories not related to the campaign (Niederkrotenthaler et al., n.d.). The number of suicide-related media items published in Oregon that month was markedly elevated above the monthly average, while the number in Washington State remained average. Campaign-related stories scored better for most reporting characteristics listed as protective in media guidelines compared to other news stories with a similar educational focus but not related to the campaign. Some putatively harmful characteristics, for example., the portrayal of several suicidal acts within one media article, were still relatively

common even in campaign stories. Campaign stories typically used a narrative featuring suicide advocacy, policy, or prevention efforts. Stories of coping with adversity and mastery of crisis were scarce in spite of the evidence for such stories being safe and potentially having positive effects on the audience. The study also assessed attention to the campaign by measuring the volume of campaign-related tweets, and found that the social media footprint on Twitter was small in scale and limited to the campaign week.

The goal of the current project was to evaluate the impact of the “Breaking the Silence” suicide prevention media campaign on several indices of help-seeking behavior and suicide risk, including suicide-related Google queries, National Suicide Prevention Lifeline calls, and suicide mortality. In light of the potential of suicide-related media coverage both to increase and decrease suicide risk, we examined the possibility of suicide-preventative as well as suicide-promoting (iatrogenic) effects. The impact of the media campaign in Oregon will help determine if a similar campaign should be implemented nationally. Thus, the results of the research project will inform the planning of future suicide prevention activities in the United States.

METHODS

Overall design

Both time and place were employed to establish comparison conditions for evaluating the outcomes of the “Breaking the Silence” suicide prevention media campaign in Oregon. The time period for our data compilation was April 7, 2016—May 6, 2019, representing 3 years before and 30 days after the start date of the campaign. The states compared with Oregon were Arizona, Arkansas, Missouri, Nevada, New Hampshire, Oklahoma, Utah, and West Virginia. To identify the comparison states, when ranking states by their 2016–2018 average suicide rate, we selected the four states immediately higher and the four states immediately lower than Oregon, excluding any state with an average of less than five suicides per week during that 3-year period (Table S1).

Data sources

Google Health API searches

Google Health API is privately available to academic researchers after an application is submitted to gain access. Google Health API yields a scaled proportion (i.e., the proportion multiplied by 10 million) of all searches performed

in a specific region and time period. For the states and time period described previously, we compiled daily data on suicide-related Google searches. Our search queries were based on those used in previous research that examined their association with suicide rates (Lee, 2020). The queries were categorized into three groups: “suicide-neutral” (e.g., suicides+suicidal; suicidality); “suicide-seeking” (e.g., want to die+wanna die; how to kill yourself+how to kill myself); and “help-seeking” (e.g., suicide help+suicide helping; suicide hotline+crisis hotline+lifeline+crisis line+suicide lifeline+18,002,738,255). The conceptually similar terms within each group were combined using Boolean logic (See Table S2 for complete list of queries).

National Suicide Prevention Lifeline (Lifeline) Calls

The Lifeline (known since July 2022 as the 988 Suicide and Crisis Lifeline) is a national network of local crisis centers that provide mental health crisis services by telephone, chat and text (988 Suicide & Crisis Lifeline, n.d.). Vibrant Emotional Health, the administrator of the Lifeline, provided us with daily routing data for calls originating from any area code in Oregon and the comparison states during the study period.

Suicide mortality data

Each of the nine states' Departments of Health (DOH) reviewed our protocol and their state suicide mortality data was compiled from either their Vital Statistics data system or Violent Death Reporting System (VDRS). Incident-level daily data on suicide deaths or daily counts of suicide deaths (ICD 10 codes X60–X84, Y87.0, U03) for the time period of interest was shared directly from eight states' DOH; for one state (OK) the Centers for Disease Control (CDC) provided the state data from the National VDRS.

The project's protocol was approved by the Institutional Review Board of the New York State Psychiatric Institute and the Columbia University Department of Psychiatry.

Statistical analyses

For each data source, the pre-campaign period was specified as April 7, 2016 through April 6, 2019, comprising 3 years prior to the initiation of the campaign. The combined campaign and post-campaign period was defined as April 7, 2019 through May 6, 2019, comprising 30 days beginning the first day of the campaign. A 3-year pre-campaign period was chosen in order to improve fit of

time-series modeling and reduce the risk of misinterpreting short-term (e.g., seasonal) fluctuations as significant trends. The multi-year pre-period also minimized the impact of short-term spikes or drops in the data caused by external influences unrelated to the intervention. The choice of a post-intervention period beginning on the first day of the campaign and lasting for 30 days was grounded in literature on the impact on suicide rates of suicide-related media reporting. According to a review by Pirkis and Blood (2001), the Werther effect of media portrayals of suicide on subsequent suicidal behavior peaked within the first 3 days after story publication and attenuated by about 2 weeks after story publication (see summary in Pirkis et al., 2006).

Bayesian structural time-series modeling in R, package *CausalImpact* v1.2.7 (Brodersen et al., 2015), was used to test intervention effects by comparing the Oregon time series to time series in control states. *CausalImpact* is designed for analyzing data from observational studies. *CausalImpact* calculates a counterfactual posterior distribution of the response variable that simulates what the observed time series would have been if the intervention had not taken place. The Bayesian structural time series model is trained on the pre-intervention period data to understand Oregon's data as a function of the control data; this model is then used to predict Oregon's data as a function of the control data in the post-intervention period. *CausalImpact*'s Bayesian approach offers a comprehensive framework to address both deterministic and stochastic trends. By integrating various sources of information (historical data and control series behavior), *CausalImpact* provides a nuanced and adaptable synthetic control that provides a more robust estimation of the counterfactual (what would have occurred in the absence of the intervention). This is especially beneficial when some control series capture similar shocks as the primary series. Commonly used methods such as autoregressive integrated moving average (ARIMA) modeling can be sensitive to model misspecification and require stationary data, and segmented regression may not always distinguish genuine change points from random or seasonal fluctuations (Schaffer et al., 2021). *CausalImpact* addresses these challenges through its unique integrative and Bayesian approach, resulting in a potentially more robust framework for assessing causal impacts in observational settings.

The *CausalImpact* model is improved through the incorporation of at least five control time series (in our case, data from eight other states) that are unaffected by the intervention. While *CausalImpact* could generate a synthetic control with only the pre-intervention period data from Oregon, model precision greatly improves when control data from other sources are incorporated.

By having eight control states, a broader range of potential confounding factors can be accounted for, which improves the accuracy of our causal effect estimates. This approach aligns with established best practices (Brodersen et al., 2015) in causal inference within the framework of the *CausalImpact* package. *CausalImpact* calculates the relative importance of each of the control states in the model and weights the model for each outcome accordingly. In other words, for each outcome, *CausalImpact* can assign greater weight to comparison states which have the best fit to Oregon's data on that measure in the pre-period. *CausalImpact*'s algorithm is also improved by using at least 30 post-intervention data points to yield reliable and robust results. Research on other suicide-related media events has identified their impact as lasting no longer than 30 days (Niederkrotenthaler et al., 2021; Phillips & Carstensen, 1986). Therefore, we employed a 30-day post-intervention period and a daily time resolution for each data source to yield the required 30 post-campaign data points.

For each data source, *CausalImpact* yields the expected and observed daily average and cumulative total. 95% credible intervals were calculated for the expected cumulative and relative effects.

For Google Health API data, because *CausalImpact* does not support missing data in the pre-intervention period, the lowest overall minimum search value higher than zero for the data collection period in each state was used in place of zero count daily search values. Zero counts in the Google Health API data may indicate no volume, or that the group of queries did not get sufficient searches to surpass Google's privacy threshold, implemented to prevent individual users from being identified. As such, these may not be "true" zero counts. Seasonal and yearly changes in minimum search values were examined, and no significant trends were found. Thus, different minimal search values by season and year were not necessary.

RESULTS

Google Health API searches

There were no significant changes in the proportional volume of help-seeking, suicide-seeking or suicide-neutral Google queries in Oregon compared to what would have been expected in the absence of a campaign (150,246.9 observed help-seeking searches compared to an expected 147,069.8, a 2% increase; 24,933.4 observed suicide-seeking searches compared to an expected 23,290.4, a 7% increase; 95,415.1 observed suicide-neutral searches compared to an expected 89,342.6, a 7% increase) (see Table 1).

TABLE 1 Summary of results from Bayesian structural time-series analyses: Effect of “Breaking the Silence” media campaign on Google Searches, Lifeline call volume and state suicide mortality in Oregon.

Data source	Observed daily average (<i>n</i>)	Expected daily average (<i>n</i>)	Observed cumulative total (<i>n</i>)	Expected cumulative total (<i>n</i>)	Relative effect, (% 95% CI)	<i>p</i> -value
Google Searches–Help-Seeking	5008.2	4902.2	150,246.9	147,069.8	2.2 (–6.8, 11.2)	0.32
Google Searches–Suicide-Seeking	831.1	776.4	24,933.4	23,290.4	7.1 (–13.5, 27.3)	0.25
Google Searches–Suicide-Neutral	3181.5	2978.1	95,415.1	89,342.6	6.8 (–5.6, 19.1)	0.15
Lifeline Call Volume	82.9	76.1	2488	2282.9	9.0 (0.6, 17.4)	0.02
State Suicide Mortality (counts)	2.5	2.4	74	72.5	1.9 (–23.2, 27.6)	0.44

National Suicide Prevention Lifeline (Lifeline) calls

There was a significant increase in the number of Lifeline calls in Oregon compared to what would have been expected in the absence of a campaign (2488 observed calls compared to an expected 2282.9 calls, $p=0.03$, a 9% increase) (see [Table 1](#)). There was an observed daily average of 82.9 Lifeline calls in Oregon in the 30 days following the start of the campaign, compared to an expected daily average of 76.1 calls.

Suicide mortality data

There was no significant difference in the number of suicide deaths in Oregon compared to what would have been expected in the absence of a campaign (74 observed deaths compared to an expected 72.6 deaths, a 2% increase) (see [Table 1](#)). There was an observed daily average of 2.5 suicide deaths in Oregon in the 30 days following the start of the campaign, compared to an expected daily average of 2.4 deaths.

DISCUSSION

The “Breaking the Silence” suicide prevention media campaign implemented in Oregon from April 7 to 14, 2019 appears to have raised awareness of suicide prevention resources, as indicated by the significantly higher than expected call volume to the National Suicide Prevention Lifeline during the 30 days following the start of the campaign. Seeking help by calling the Lifeline was highlighted as an “action step” in the news stories published during the campaign (The Oregonian Editorial Board, 2019; Zimmerman, 2019). There was no comparable increase in Google searches for suicide prevention or crisis resources. Another key finding was the absence of any evidence of an unintended negative consequence of the media campaign, as evidenced by our finding no significant increase in either the observed proportional volume of suicide-seeking Google queries, or the number of suicide deaths in Oregon.

Our finding of a significant increase in call volume to the Lifeline during the 30 days following the start of the “Breaking the Silence” campaign is consistent with studies reporting that suicide prevention media campaigns can increase crisis line utilization (Bossarte et al., 2014; Jenner et al., 2010; Oliver et al., 2008). These earlier media campaigns utilized public or community service announcements that played on radio or television, in cinemas, via the internet, or were displayed in public transit or

on billboards. No earlier campaign engaged news media to facilitate their developing and publishing a concentrated dose of news stories based on safe suicide reporting guidelines, as was the strategy used by the “Breaking the Silence” campaign.

In the 30-day period beginning with the week-long media campaign, Lifeline received a 9% increase over the expected number of calls from Oregon area codes. This effect size is comparable to the nearly 7% increase in Lifeline call volume across the United States in the cumulative 34-day period of greatest public attention to Logic’s hip hop song “1-800-273-8255” (Niederkröthaler et al., 2021). While the period of public attention to the Logic song also exhibited a significant decrease in US suicide mortality, there was no significant decrease in suicide mortality in Oregon in the 30 days beginning with the start of the “Breaking the Silence” campaign. This is despite the fact that the campaign was considered to have the potential to save lives of suicidal individuals (Zimmerman, 2019).

Findings from our companion study involving a content analysis of all media items related to the “Breaking the Silence” campaign (Niederkröthaler et al., n.d.) support several possible interpretations of our current results. First, the absence of a suicide-preventive effect may be due to the content of the campaign stories. Despite the campaign’s stories scoring better than other suicide-related stories in Oregon and Washington with regard to their adherence to many of the safe reporting recommendations, they rarely focused on personal stories of hope and recovery from suicidal crisis, which have been shown both to have a protective effect on suicidal ideation in vulnerable individuals (Niederkröthaler et al., 2022) and to be associated with a decrease in suicides (Niederkröthaler et al., 2010). Instead, “Breaking the Silence” stories were more likely than other stories to have a general focus on suicide or a focus on advocacy efforts, which have not been reported to be associated with a protective effect on suicidal ideation or suicide (Niederkröthaler et al., 2022, 2010). Second, the absence of a suicide-preventive effect may be due to the limited reach of the campaign. Public attention to the “Breaking the Silence” campaign, as measured by tweets referencing the campaign, was low and largely limited to the campaign week itself, which stands in contrast to the sustained, high levels of attention garnered by media events such as coverage of the suicide death of Robin Williams (Fink et al., 2018) or the publicity around the awards show performances of the hip hop song “1-800-273-8255” (Niederkröthaler et al., 2021), which were associated with raised and lowered suicide rates, respectively. However, in light of the imperfect adherence of campaign stories to suicide reporting

guidelines, and of the risk posed by the campaign’s elevated dose of suicide-related stories, it has to be considered that the absence of an iatrogenic effect might also be due to the limited reach of the campaign.

The main limitation to the design and interpretation of the findings involves the selection of the comparison locations and time period. While we have identified comparison states that are comparable on suicide rates to Oregon, these states vary on other factors which we were unable to control. However, for each of our outcome analyses, CausalImpact weights the importance of the control states based on their similarity to Oregon on that outcome in the pre-period, thus minimizing the impact of any differences between Oregon and the control states. Employing a longer or shorter “pre-campaign” and/or “post-campaign” period may also impact the findings. Given that public attention to the “Breaking the Silence” campaign appears to have been limited to the week of the campaign (Niederkröthaler et al., n.d.), it is possible that the campaign’s impact was also limited to that week. We were unable to limit our CausalImpact analyses to the week of the campaign, or to conduct sensitivity analyses using time periods less than 30 days, given our use of daily data and need for at least 30 post-intervention data points. We did not consider it useful to examine time periods greater than 30 days because, as previously noted, it does not seem reasonable in light of existing research (Niederkröthaler et al., 2021; Phillips & Carstensen, 1986) to expect the impact of a week-long media campaign to last that long. Another limitation is that the numbers of suicide deaths in Oregon may have been too small to show an effect (positive or negative). Next, we examined total population outcomes and exposures because we did not have access to age- or gender-specific outcomes or exposures. Therefore, it is not known if age- or gender-specific impacts exist. Another limitation is that calls from Oregon area codes may not have originated from Oregon, and likewise for the comparison states. It is estimated that approximately 10% of cell phone owners have area codes that do not correspond to their current state of residence (Dost & McGeeney, 2016). We do not know what proportion of callers may be calling from landlines, to which this limitation would not apply. Nevertheless, we would not expect this degree of noise to alter our findings.

As a last limitation, the Google search data reflects the search terms we selected which may not perfectly capture the effect of interest. However, it can be noted that our selected terms in the suicide-seeking and suicide-neutral categories were sensitive to a national suicide-related media event which occurred during our pre-intervention period, i.e., the highly publicized suicide deaths of Kate Spade and Anthony Bourdain on June 5, 2018 and June 8, 2018,

respectively. The proportional volume of suicide-seeking Google searches in Oregon began to rise above average levels on June 6, 2018 and reached a peak on June 9, 2018 of 5.8 times the 2018 average; the proportional volume of suicide-neutral Google searches began to rise on June 5, 2018 and reached a peak on June 8, 2018 of 5.9 times the 2018 average. The elevated search attention in the suicide-seeking and suicide-neutral categories subsided to average levels by June 11, 2018, showing an observable impact period of less than a week. This observed pattern is consistent with the myriad of research that has shown that celebrity suicides, and media coverage thereof, can trigger suicide contagion (Niederkrotenthaler et al., 2020). There were no observable changes in the proportional volume of help-seeking Google searches, the volume of Lifeline calls from Oregon area codes, or in suicide mortality in Oregon for the days on and after these deaths. Thus, whereas the “Breaking the Silence” media campaign yielded no observed increase in the volume of suicide-related Google queries in Oregon, the potential impact of a media event on Google searches using our queries is illustrated by the case of these celebrity suicide deaths.

Notwithstanding the limitations of this research, the study has numerous strengths. The major strengths of the study include its design, employing several years of pre-campaign data, not merely post-campaign data, which improves our modeling and minimizes the impact of seasonal trends and unrelated events; and employing several comparison states, not merely a pre-post design of the campaign state, which again improves our modeling and minimizes the bias introduced by hidden confounders. Another strength is our assessment of behavioral outcomes, not merely awareness, knowledge, attitudes, or behavioral intentions, which may or may not translate into behaviors.

In conclusion, the “Breaking the Silence” media campaign’s association with an increase in the volume of calls to the Lifeline, without evidence of an iatrogenic suicide contagion effect, suggests this could be a safe suicide prevention strategy with the potential to increase help-seeking behavior. However, the campaign’s potential to decrease suicide mortality was unmet. To enhance the potential of a future media campaign to decrease suicide deaths, a greater emphasis on personal stories of hope and recovery are recommended.

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CONFLICT OF INTEREST STATEMENT

MSG received funding from Vibrant Emotional Health for the current project and to evaluate the effectiveness of the National Suicide Prevention Lifeline (currently known as

the 988 Suicide and Crisis Lifeline); TN received funding from Vibrant Emotional Health to conduct a complementary evaluation of the “Breaking the Silence” campaign. The other authors have no conflicts to declare.


DATA AVAILABILITY STATEMENT

Data are not available from the authors. Sharing of mortality data is prohibited as per the data use agreements with the vital statistics jurisdictions that provided the mortality data. Lifeline data and Google search data are subject to third party restrictions set by Vibrant Emotional Health and Google, respectively, which own their data.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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