Long-term impact of celebrity suicide on suicidal ideation: results from a population-based study

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Background: The short-term effect of celebrity suicide on the overall suicide rate is widely known, but long-term effects remain unclear.
Objective: To examine whether celebrity suicide is associated with suicidal ideation over a longer period.
Design: This is a study on the effect of the suicide of a famous Hong Kong entertainment celebrity, who committed suicide on 1 April 2003, on suicide thoughts of the community. A population-based survey was conducted between December 2003 and July 2004. Respondents were asked about their suicidal ideation, psychological well-being, life events, and whether or not they had been affected by celebrity suicide.
Setting: Hong Kong Special Administrative Region, the People's Republic of China.
Participants: 2016 respondents aged between 20 and 59 years.
Results: After controlling for some known suicide risk factors, celebrity suicide was shown to be independently associated with suicidal ideation. People who had indicated to have been affected by celebrity suicide were 5.93 times (95% CI 2.56% to 13.72%, p = 0) more likely to have severe level of suicidal ideation (Adult Suicidal Ideation Questionnaire score ≥ 31) than people who had not been affected. Respondents having greater anxiety symptoms, less reason for living and more focus on irrational values were also found to have had their suicide ideation affected by celebrity suicide.
Conclusions: Celebrity suicide is a risk factor for suicidal ideation over a short term as well as over a long term. Raising awareness of the possible negative effect of celebrity suicide through suicide prevention programmes in the community is needed.

C urrent evidence shows an association between celebrity suicides or death and a subsequent increase in the suicide rate.[1–4] In addition, media coverage of suicide cases may influence suicidal behaviour in others, as well as the choice of the suicide method.[5–7] Also, studies measuring the effects of celebrity suicides are more likely to find an imitation effect than studies of non-celebrity suicides.[6]

However, existing studies have methodological limitations. Most of the results are derived from aggregated data and are subject to the limitations of ecological fallacy.[4 8] Furthermore, most of the research focuses on the short-term effect, say 2–4 weeks after the incidence.[1 2 9] Limited information is available regarding whether or not media reporting on celebrity suicides may influence an individual's suicidal thoughts over the longer term.[10] Also, it suggests that celebrity suicides affect vulnerable people the most. This suggests that the influence of celebrity suicide is not an independent risk factor, but could be mediated by other risk factors for suicide.[8 11] Hence, whether or not a celebrity suicide is an independent risk factor for suicidal ideation is still uncertain.

Hong Kong's famous pop star Mr Leslie Cheung had depression and died by jumping from a height on 1 April 2003. His death generated extensive media coverage that might have prompted suicidal thoughts in others. After 8–15 months, a population-based household survey was conducted to study suicidality in Hong Kong between December 2003 and July 2004. The aim of the survey was to gauge respondents' views about their level of suicidal ideation, psychological well-being, life events, and whether or not they had been influenced by the celebrity suicide.

In this paper, three hypotheses were examined in relation to the celebrity suicide:

(H1) The long-term influence of celebrity suicide was associated with suicidal ideation.

(H2) The long-term influence of celebrity suicide was an independent risk for suicide ideation after controlling for other known risk factors.

(H3) Some risk factors would have a moderating effect on the impact of celebrity suicide on suicidal ideation. Note that the "long-term" is referring to the period from 8 months to 15 months.

METHOD
Design
This population-based study adopted a two-wave longitudinal household survey design. The results reported in this paper were obtained from the first wave. A two-stage, stratified random sampling method was also used. The sampling frame was the Frame of Quarters maintained by the Census and Statistics Department, Hong Kong SAR Government, and was the most complete and updated register of residential addresses in Hong Kong. Households were selected randomly from the Frame of Quarters, and one household member was then randomly selected to participate in the study. This study was approved by the ethics committee of the Faculty of Social Science, The University of Hong Kong, Hong Kong, China.

The survey was the first community-based survey to study the prevalence rate of suicidal behaviour in Hong Kong. From previous literature, life-time suicidal thought from nine countries was estimated to be 18.5%.[12] We expected that the rate of suicidal ideation in Hong Kong was a bit higher and that it might range from 25% to 35%. If precision level was within 2%, with 95% level of confidence, the sample size was estimated to range from 1800 to 2185.

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During the data collection, 2016 people aged between 20 and 59 years participated in the study with 955 (47.4%) and 1061 (52.6%) of them being men and women, respectively. Table 1 gives the sample age–gender distribution. The subject pool contact rate—that is, the percentage yielding a successful contact with valid households—was 87%, and the response rate was 62% of those who were contacted. Given a sensitive survey topic like suicidal behaviour, the response rate was considered satisfactory. Other population-based surveys in Hong Kong on less sensitive topics typically obtain similar response rates.[13] There was no significant difference in age and gender distribution between the sample and the population at large. The precision level of the estimate of suicidality in the sample is around ±2.2%.

Face-to-face interviews were held, and each interview lasted for about 45–60 min. Self-report booklets were also used for sensitive questions. All questions were administered in Chinese and the interview was conducted in Cantonese, the most common language in Hong Kong, as 90% of the population spoke Cantonese.

Before the field work, a pilot study was conducted to test the wordings of the questionnaire and the translated instruments. Feedbacks from the pilot, such as ambiguous wordings or misunderstanding, were corrected and rectified.

Data collection field work was carried out between 1 December 2003 and 4 July 2004. All interviewers were trained on how to administer the interview, particularly on how to handle cases in which respondents were an imminent suicidal risk or requested professional help. During the fieldwork stage, follow-ups were carried out by clinical staff for those cases where the respondent required consultations or referral services. The research team also carried out independent quality control measures continuously over the data collection period, including appraisals, telephone interviews with randomly selected respondents and reviews of completed questionnaires.

Measures
Influence of celebrity suicide
The influence of celebrity suicide was measured by two questions asked in a self-report booklet. Respondents were asked about their level of distress brought on by a celebrity suicide: ''Have you ever been disturbed by the news of a celebrity suicide?'' (question A). There were five response categories: ''very disturbed'', ''somewhat disturbed'', ''moderately disturbed'', ''a little disturbed'' and ''no disturbance at all''.

The second question investigated their possible mindset change after a celebrity suicide: ''Did you change the way you view suicides following a celebrity suicide?'' (question B). They could choose their responses from among the four choices— namely, ''Suicide is more acceptable than what I had previously thought'', ''Suicide is more acceptable than what I previously

thought and it spurred my own suicidal thoughts as well'', ''Suicide is less acceptable than what I had previously thought'' and ''No change''.

The coding scheme was as follows: if question A was not answered as ''no disturbance at all'' or question B was answered either as ''Suicide is more acceptable than what I had previously thought'' or as ''Suicide is more acceptable than what I had previously thought and it spurred my own suicidal thoughts as well'', the influence of the celebrity suicide was coded as ''Yes''. Otherwise, it was coded as ''No''. The question is very specific in examining the effect and the extent of whether celebrity suicide has any effect on the respondent.

Positive thinking after celebrity suicide
One choice in question B was ''Suicide is less acceptable than what I had previously thought'' and this could be understood as a positive effect from celebrity suicide. If the influence of celebrity suicide was coded as ''No'' and Question B was answered as ''Suicide is less acceptable than what I previously thought'', the positive thinking after a celebrity suicide was coded as ''Yes''. Otherwise, it was coded as ''No''.

Suicidal ideation
Suicidal ideation—Adult Suicidal Ideation Questionnaire (ASIQ)[14]—was a 25-item self-report measure of the severity of suicide ideation. The scale incorporated a 7-point item response format on which the respondents noted their frequency of occurrence of suicidal ideation during the past month. It was used for a sample of people aged >20 years. The range of scores was from 0 to 150. The cut-off score of ≥31 suggested a severe level of suicidal thought. Evidence of reliability and validity of the scale was reported for the community of adults and college student samples.[14] The scale was also forward and backward translated from English to Chinese by two bilingual clinical psychologists. The Chinese version of the ASIQ showed excellent internal reliability (Cronbach's $\alpha = 0.98$). A significant correlation between ASIQ and anxiety, hopelessness and prior suicide attempts (0.34, 0.27 and 0.31, respectively) was found to support convergent validity. Its validity was further confirmed by a significant difference in ASIQ mean score between suicide attempters and non-attempters ($t = 4.25$, $p<0.001$). The instrument ASIQ was translated into Chinese with the permission of the Psychological Assessment Resources (Odessa, Florida, USA).

Demographic characteristics
Basic demographic characteristics of the respondents (ie, age and gender), were reported.

The following risk and protective factors for suicide were included as control variables. The used instruments were obtained from either author or public domain.

Age group (years)		Gender		
		Men	Women	Total
<25	Count	99	114	213
	% within gender	10.4%	10.7%	10.6%
25–39	Count	367	448	815
	% within gender	38.4%	42.2%	40.4%
40–59	Count	489	499	988
	% within gender	51.2%	47.0%	49.0%
Total	Count	955	1061	2016
	% within gender	100.0%	100.0%	100.0%

Table 1 Sample distribution by age and gender

Anxiety

Anxious symptoms in the week before the interview were measured by the 7-item anxiety subscale of Depression Anxiety Stress Scales.[15] Anxiety was suggested to be a risk factor for suicide attempt.[16] The Chinese version of Depression Anxiety Stress Scales used in this study was a valid assessment of anxiety among the Chinese-speaking population.[17] This subscale had good internal reliability (Cronbach's $\alpha = 0.82$). The summary score ranged from 4 to 28, with higher scores indicating higher levels of anxious mood states during the past week.

Hopelessness

The 20-item Chinese version of the hopelessness scale (C-HOPE)[18] was used to measure hopelessness, which has been demonstrated as an important predictor of suicidal behaviour.[19] Hopelessness was found to be a significantly stronger indicator of suicidal risk than depression.[20] The C-HOPE used in this study was shown to be moderately correlated with depressive and psychiatric symptoms in Chinese college students, revealing good internal reliability (Cronbach's $\alpha = 0.85$).[18]

Reasons for living

The 12-item Brief Reasons for Living (BRFL) Scale, answered on a 6-point scale, was used to measure a range of beliefs potentially important as reasons for not committing suicide.[21] The six subscales of the BRFL scale were as follows: responsibility to family, moral obligations, child-related concerns, fear of social disapproval, survival and coping beliefs, and fear of suicide. Again, the scale was forward and backward translated from English to Chinese by two bilingual clinical psychologists. The Chinese version of the BRFL showed good internal reliability (Cronbach's $\alpha = 0.77$). Its validity was supported by a significant difference in the scale's mean score between people who had thought about suicide in the past 12 months and people without this ideation ($t = 5.43$, $p < 0.001$).

Irrational values

The Irrational Values Scale was a 9-item scale to measure endorsement of irrational values that would lead to emotional disorders.[22] The score was based on a 9-point Likert-type scale. The scale was forward and backward translated from English to Chinese by two bilingual clinical psychologists. The Chinese version of this scale showed fairly good internal reliability (Cronbach's $\alpha = 0.77$). Its significant correlation with anxiety supported convergent validity ($r = 0.31$).

Impulsivity

The Plutchik Impulsivity Scale was used to measure the level of impulsivity found to be associated with suicidal risk.[23] Six items from the original scale were selected to assess the tendency to engage in impulsive behaviours such as deliberate self-harm or suicide.[24] The scale was forward and backward translated from English to Chinese by two bilingual clinical psychologists. The internal reliability of the abbreviated scale was found to be satisfactory (Cronbach's $\alpha = 0.68$). Significant differences of the scale's mean scores between suicide attempters and non-attempters was found to support its validity ($t = 5.84$, $p < 0.001$).

Prior suicide attempt

Prior suicide attempt behaviour was investigated by the following question: "Have you attempted suicide in the past 12 months?" It was a dichotomous measure requiring either a Yes or a No response.

A question on psychiatric history, "Have you ever received psychiatric treatment?" (received psychiatric treatment), was also asked. It was a dichotomous measure with Yes or No as the response.

Negative life events

Respondents were asked "Have you ever been abused physically, mentally or sexually?" (Abuse history), "Have you had severe interpersonal conflicts over the past 12 months?" (Interpersonal conflicts), "Do you have a debt problem (excluding mortgage)?" (Debt problem) and "Do you have chronic illness or pain?" (Health problem). All of these questions were dichotomous, requiring either a Yes or a No response.

Statistical analysis

SPSS V.12.0 was used for all statistical analyses in this paper. The level of significance was chosen to be $p < 0.05$. Moreover, a bivariate logistic regression was used to examine the age–gender-specific associations to the influence of celebrity suicide. A multiple linear regression was also used to test the nested model, with suicide ideation as a dependent variable measured by an ASIQ score and adopting the forward enter approach method. Hierarchical regression was then applied to test the effects of entering the influence of celebrity suicide (step 1), known risk and protective factors for suicide (step 2) as well as potential moderators for the model (step 3). Statistical tests were carried out to assess the significance of the standardised coefficients. In the proposed model, we use standardised coefficients rather than dichotomised variables of the covariates to examine the effects on ASIQ in order not to lose information and statistical power due to dichotomisation of continuous variables. The effects on some of the risk and protective factors of suicidality can be found in another paper.[25] The primary interest of this paper is to examine the effect of celebrity death on suicidality in the presence of other covariates. All continuous variables in those cross-product terms were mean-centred to minimise co-linearity in moderator test.[26] A Variance Inflation Factor (VIF) was used to diagnose the severity of the co-linearity. If VIF was < 10, it indicated that no severe co-linearity was present in the model.[27] In order to obtain clinically and epidemiologically useful results, a binary logistic regression model was also established. Sensitivity analysis was then conducted to assess whether the non-response bias may have any effect on the analysis.

RESULTS

Descriptive statistics

In total, 38% (767/2016) of the respondents admitted to the experience of being influenced by a celebrity suicide. About 43.4% (460/1061) of women and 32.1% (307/955) of men had been influenced by celebrity suicide, and this difference was significant ($\chi_1^2 = 26.8$, $p = 0$). A significant difference was detected among different age groups ($\chi^2 = 7.6$, $df = 2$, $p = 0.02$)—that is, people aged 40–59 years (35.1%, 347/988) were less likely to be influenced than groups aged <25 years (38.5%, 82/213) and 25–39 years (41.5%, 338/815).

Table 2 shows the age–gender-specific relationship. By treating the influence of celebrity suicide as a dependent variable, a bivariate logistic regression was used to examine the age–gender-specific relationship. After stratification by gender, we observed that men aged 25–39 years had a significantly higher risk of being influenced by a celebrity suicide than those aged 40–59 years. No other age–gender group showed any significant relationship.

A multiple regression for suicidal ideation

The multiple linear regression model was fitted to test the relationship between suicide ideation and the influence of

Table 2 ORs for the influence of celebrity suicide on age groups of both genders, a bivariate logistic regression

Age group (years)	Men		Women	
	OR (95% CI)	p Value	OR (95% CI)	p Value
<25	1.10 (0.69% to 1.76%)	0.68	1.17 (0.78% to 1.76%)	0.45
25–39	1.38 (1.03% to 1.84%)	0.03	1.22 (0.94% to 1.58%)	0.13
40–59	1.00		1.00	

celebrity suicide. Suicide ideation measured by ASIQ was treated as a dependent variable. Since the distribution of the suicidal ideation was not normal, a log transformation was performed to normalise this distribution. The influence of celebrity suicide was entered into the model as an independent variable at step 1. The standardised coefficient of the influence of celebrity suicide was found to be significant. In fact, the influence of celebrity suicide explained 4% of the variance of suicidal ideation. This result supported hypothesis H1, implying that influence of celebrity suicide was associated with suicidal ideation.

To rule out the possibility that the influence of celebrity suicide indirectly exerted an effect on suicidal idealion—that is, whether it was mediated by other risk factors for suicide anxiety symptoms, hopelessness, reasons for living, impulsivity, irrational values, prior suicidal behaviour, received psychiatric treatment and negative life events (abuse history, debt problem, health problem and interpersonal conflicts) were entered into the model as control variables at step 2. This forward entering approach was used for the multiple linear regression. After all variables had been entered into the model, the proportion of missing cases was 1.6%. Table 3 gives the results of a multiple linear regression, stepwise change of R^2 as well as the standardised coefficients at steps 1 and 2.

Although the known risk factors for suicide had been controlled, the standardised coefficient for the influence of celebrity suicide was found to be significant at step 2. Moreover, all VIF statistics were found to be <10, which suggested no severe co-linearity. The results supported the hypothesis H2 that celebrity suicide was an independent risk for suicide ideation after controlling for other known risk factors.

Test for moderator

Hierarchical regression was used to study the effects of potential moderators for the influence of celebrity suicide. Cross-product terms of the influence of celebrity suicide and their potential moderators (including all the previously described control variables) were entered at step 3 and a backward elimination method was used. Only significant cross-product terms yielded by hierarchical regression were re-entered into the model. Table 3 shows the stepwise changes of R^2 and the final standardised coefficient at step 3.

From these results, having more anxiety symptoms, less reason for living and more reinforcement of irrational values were found to moderate the effects of the influence of celebrity suicide on suicidal ideation. These cross-product terms helped to explain the additional 2% of variance in suicidal ideation. The results supported hypothesis H3, implying that some risk factors have some moderating effect on the effect of celebrity suicide on suicidal ideation.

Positive thinking after celebrity suicide

Among the 2016 respondents, 68 people were not disturbed by the news of a celebrity suicide and answered ''Suicide is less acceptable than what I had previously thought''. We defined this group as having ''positive thinking after celebrity suicide''. Among this group, 29 were men and 39 were women. No gender differences were observed ($\chi^2 = 0.63$, p = 0.252). All 68 people had no indication of severe suicidal ideation—that is, their ASIQ scores were lower than the cut-off score of 31. If we treated positive thinking after celebrity suicide as a dependent variable and controlled for age and gender, the logistic regression showed that impulsivity (OR 0.93, 95% CI 0.86% to 0.99%; p = 0.04) and whether the individual had health problems (OR 1.77, 95% CI 1.04 to 3.00; p = 0.03) were associated with their positive effect after the celebrity suicide.

Clinical and epidemiological implication

A binary logistic regression model was established to obtain clinically and epidemiologically useful results. As suggested by Reynolds[14], a cut-off score of 31 was used to dichotomise the continuous ASIQ score. There were 44 respondents among the 2016 respondents whose ASIQ scores were ≥31. Independent variables and control variables were used as in the previous model. Table 4 gives the results after controlling for some known suicide risk factors; people who had been influenced by celebrity suicide were 5.93 times (95% CI 2.56% to 13.72%,

Table 3 Hierarchical regression for significant cross-product terms included in suicidal ideation

Predictors	R² change at step*	β at step 1	β at step 2	Final β
Step 1: Enter influence of celebrity suicide				
Influence of celebrity suicide	0.04	0.20†	0.14†	0.14†
Step 2: Enter risk and protective factors for suicide‡				
Anxiety symptoms	0.27		0.20†	0.13†
Hopelessness			0.13†	0.11†
Reason for living			−0.12†	−0.06†
Prior suicide attempt			0.19†	0.18†
Received psychiatric treatment			0.05†	0.05†
Abuse history			0.11†	0.11†
Debt problem			0.05†	0.05†
Interpersonal conflicts			0.16†	0.14†
Step 3: Enter cross-product terms				
Anxiety symptom × Influence of celebrity suicide	0.02			0.09†
Reason for living × Influence of celebrity suicide				−0.13†
Irrational values × Influence of celebrity suicide				0.08†

*Total $R^2 = 0.33$.
†p<0.05.
‡Health problems, impulsivity and irrational values were found to be non-significant at step 2 and were then discarded.

Table 4 Binary logistic regression model for suicidal ideation, Adult Suicidal Ideation Questionnaire

Predictors	B	Exp (B)	Sig.
Influence of celebrity suicide*	1.78	5.93	0
Anxiety symptoms†	0.15	1.16	0
Hopelessness†	0.07	1.07	0
Reason for living†	−0.07	0.93	0
Prior suicide attempt‡	1.41	4.10	0.019
Interpersonal conflicts§	0.80	2.22	0.048

* Reference group: no influence of celebrity suicide.
†Continuous score.
‡Reference group: no prior suicide attempt.
§Reference group: no interpersonal conflict.
Remarks:
1. Total Nagelkerke $R^2 = 0.436$.
2. Received psychiatric treatment, abuse history and debt problem were found to be non-significant and were then discarded.

$p = 0$) more likely to have a severe level of suicidal ideation (ASIQ score ≥ 31) than people who had no such influence. However, the results were slightly different from those shown in table 3, as some variables (received psychiatric treatment, abuse history and debt problem) had become insignificant in the logistic model due to the reduction in power resulting from dichotomising the ASIQ scores.

Sensitivity analysis

Sensitivity analysis[28] was conducted to assess whether the non-response bias may affect the significance of the result. We consider the situation that there are dissimilarities of prevalence of suicidal ideation, due to the non-response bias, between the response and non-response groups in both being influenced by the celebrity suicide group (influence group in short) and not being influenced by the celebrity suicide group (non-influence group in short). Then we examine the scenarios that could give a smaller estimated overall OR. If the estimated overall OR (after the adjustment of the non-response) is still shown to be significant, then the effect of non-response in our sample has no significant effect on the result obtained.

Suppose r_1 is the ratio of prevalence of suicidal ideation between the non-response and response groups in the influence group and r_2 is the ratio of prevalence of suicidal ideation between the non-response and response groups in the non-influence group. In the case of $r_1 < 1$ or $r_2 > 1$, the overall OR would decrease. We assume that r_1 is 0.7, 0.6 or 0.5 (ie, the prevalence in non-response group is 30–50% lower than that in

Table 5 Sensitivity analysis: estimated OR under different assumptions about the ratio of the prevalence of suicidal ideation between the non-response and response groups

Ratio between the prevalence of suicidal ideation in the non-response and response groups			
Being influenced by celebrity suicide (r_1)	Not being influenced by celebrity suicide (r_2)	Estimated OR	χ^2 test
0.7	1.3	4.57	35.6, p=0
0.7	1.4	4.33	34.1, p=0
0.7	1.5	4.24	32.8, p=0
0.6	1.3	4.28	31.6, p=0
0.6	1.4	4.06	30.1, p=0
0.6	1.5	4.06	30.2, p=0
0.5	1.3	4.08	29.0, p=0
0.5	1.4	3.87	27.6, p=0
0.5	1.5	3.68	26.2, p=0

the response group) and that r_2 is 1.3, 1.4 or 1.5 (ie, the prevalence in the non-response group is 30–50% higher than that in the response group). Table 5 gives the estimated ORs in all scenarios that are found to be significant. This result suggests that non-response bias is unlikely to alter the result.

DISCUSSION
Age–gender-specific effect
Previous studies on the effects of celebrity suicides or death were found to have age–gender-specific effects on suicide.[2][4] In this study, men aged 25–39 years were more likely to be influenced. On analysing the profile of suicide cases immediately after Cheung's death, men aged 25–39 years who committed suicide using the same method as Cheung (ie, by jumping from a height) were found to have increased significantly.[29]

This age–gender-specific effect can be explained by the fact that although Cheung died at the age of 46 years, according to his fan club website (http://lesliecheung.cc), ''a turning point in his career'' was the release of his album ''Monica'' in 1984 when he was 28 years. Teenagers at that time, who belonged to a generation keen on pop music and aged between 25 and 39 years in 2003, were more likely to identify with Cheung's behaviour.

Long-term influences
Most of the published studies assume that celebrity suicides or deaths exert a short-term triggering impact on people's suicidal thoughts. The effective period was from 2 to 4 weeks.[1][2][9] Some researchers hypothesised that exposure to news of the suicide in the media might exert a long-term effect on non-impulsive people and ''sow the seeds of suicide in the distant future''.[4] However, none of the current studies validated this possibility of the long-term effects of celebrity suicide on suicidal ideation.

In this study, the time duration between the date of the celebrity suicide (1 April 2003) and the study period of suicidal ideation (between 1 December 2003 and 4 July 2004) was at least 8 months, and <15 months. This result outlines the first population-based study, which reveals that celebrity suicide might lead to a non-triggering and even long-term effect on people's suicidal ideation. According to the observational learning theory,[30] an individual who had memorised the celebrity's behaviour and had been sufficiently motivated could harbour suicidal ideation even over a longer period of time. Thus, apart from the short-term effect shown by previous studies, celebrity suicides that had drawn high public attention might spur suicidal thoughts in those who had identified with and been motivated by the celebrity.

Independent risk for suicidal thought
Another implication of this study is the evidence that the effect of celebrity suicide is associated independently with people's suicidal ideation, even while the known risk and protective factors for suicide are controlled. Previous published studies have assumed that a celebrity suicide has an effect mostly on vulnerable people, who may be having depression or experiencing negative life events. If this assumption holds true, then the effect of celebrity suicide on suicidal ideation can be said to be mediated by those risk factors. However, our findings indicate that the effect of celebrity suicide on people's suicidal ideation was an independent risk. This means that celebrity suicide may trigger suicidal ideation in anyone within the community, regardless of whether he or she were otherwise vulnerable for suicide. Although there is only a relatively small percentage (4%) of variance explained by celebrity suicide compared with 27% of variance explained by other known risk factors, it is still important to be aware of the possible negative effect.

What is already known

- A celebrity suicide or death is associated with a short-term increase in the suicide rate.

Moderating effect

Individuals' attributes such as age, gender or suicidal history have also been shown to differentiate the extent of the effect of media on suicidal thought.[4] However, little is known about how an individual's psychological well-being or cognitive thinking plays a role in this respect. Our findings indicate that having a greater level of anxiety symptoms, less reason for living and more irrational values bolstered the effect of celebrity suicide on suicidal ideation.

Positive effect

Some respondents reported positive reactions to celebrity suicide—that is, suicide is less acceptable than before. Our findings reinforced the notion that no one displayed symptoms of severe suicidal ideation. This reflected the idea that positive or healthy thinking after a celebrity suicide was a strong predictor of not having severe suicidal ideation. Being less impulsive and having health problems were found to be significant associated factors for this positive reaction.

Implications

The Hong Kong Chinese media reporting on suicides is truly exceptional, including many graphics, photos or diagrams. It is not uncommon for a suicide report to appear in the front page with sensational headlines.[31] This type of reporting does not comply with the World Health Organization's recommendations on how to convey suicide news coverage. In Hong Kong, guidelines for responsible reporting have been issued for media professionals, and one of the key elements is to avoid sensational portrayals of celebrity suicides.[32 33]

Our findings comprised the first population-based study, which showed evidence on how the influence of celebrity suicide is independently associated with a long-term effect, rather than having a triggering effect on suicidal ideation. These results have significant public health implications in that, apart from groups that are vulnerable for suicide, a large group of otherwise non-vulnerable people are also being exposed to potential harmful media influences. Issuing media's recommendation in reporting suicide news and professional media training are needed to increase the media's awareness on the possible harmful after-effects of suicides.[3 34] Vienna's case showed that the measures could reduce the suicide rate.[35] However, more research should be done to evaluate the overall effectiveness of these recommendations.

What this study adds

- The results show that the effect of a celebrity suicide is associated with suicidal ideation over a longer term using information on an individual level rather than an aggregated one.
- The effect of a celebrity suicide is an independent risk for suicidal ideation within the community.
- Having more anxiety symptoms, less reason for living and more reinforcement of irrational values were found to bolster the effects.

Policy implications

- These results would have significant public health implications in that, apart from vulnerable groups for suicide, a large number of non-vulnerable people will also be exposed to the potential harmful effects of media coverage of suicides.
- Issuing media's recommendation and professional media training would be useful to increase media's awareness on the possible harmful after-effects of extensive reporting on celebrity suicide.
- The public should also be aware of the negative effects of celebrity death induced by the mass media.
- However, more research should be done to understand the mechanism in this area and to evaluate the overall effectiveness of some of the preventive measures.

Limitations

The findings in this study were subject to certain limitations. The data were obtained from a cross-sectional design, which only indicates statistical association rather than causation. Participants' self-reported data were subject to human error or memory bias. Sensitive information such as a history of suicide attempts or suicidal ideation might also have been under-reported. In this study, we did not collect data on the level of exposure to a celebrity suicide or the detailed characteristics of the celebrity. We are not aware of any incidence of celebrity suicide that happened in the past few years, except Cheung's death. It is unlikely that the respondent thought of another ''celebrity suicide'' in this context, 8–15 months after an overwhelming incidence of celebrity suicide. There was a memorial service a year after his death, which might also have affected the respondents. But apparently, it did not generate media coverage comparable to his death on 1 April 2003. According to an electronic news-clipping database, there were only 157 news articles with his English name or Chinese name during the period 2 April 2004 to 9 April 2004. This was compared with 1243 news articles in 2003 during the same period[29]; on 6 of the 8 days at least one newspaper reported news of Cheung's death on the front page during the period 2 April 2003 to 9 April 2003. But none of those 157 articles in 2004 was printed on the front page and the effect was expected to be minimal.

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REFERENCES

1 **Stack S**. Celebrities and suicide: a taxonomy and analysis, 1948–1983. *Am Sociol Rev* 1987;**52**:401–12.

2 **Hawton K**, Harriss L, Appleby L, *et al.* Effect of death of Diana, Princess of Wales on suicide and deliberate self-harm. *Br J Psychiatry* 2000;**177**:463–6.

3 **Hawton K**, Williams K. Influences of the media on suicide. *BMJ* 2002;**325**:1374–5.

4 **Schmidtke A**, Schaller S. The role of mass media in suicide prevention. In: Hawton K, Heeringen K, eds. *The international handbook of suicide and attempted suicide.* New York: Wiley, 2000:675–97.

5 **Gunnell D**, Lewis G. Studying suicide from the life course perspective: implications for prevention. *Br J Psychiatry* 2005;**187**:206–8.

6 **Stack S**. Media coverage as a risk factor in suicide. *J Epidemiol Community Health* 2003;**57**:238–40.

7 **Chan KP**, Yip PS, Au J, *et al.* Charcoal-burning suicide in post-transition Hong Kong. *Br J Psychiatry* 2005;**186**:67–73.

8 **Pirkis J**, Blood RW. Suicide and the media. Part I: reportage in nonfictional media. *Crisis* 2001;**22**:146–54.

9 **Phillips DP**. Influence of suggestion on suicide—substantive and theoretical implications of Werther effect. *Am Sociol Rev* 1974;**39**:340–54.

10 **Hawton K**, Williams K. The connection between media and suicidal behavior warrants serious attention [editorial]. *Crisis* 2001;**22**:137–40.

11 **Stack S**. Suicide in the media: a quantitative review of studies based on non-fictional stories. *Suicide Life Threat Behav* 2005;**35**:121–33.

12 **Weissman MM**, Bland RC, Canino GJ, *et al.* Prevalence of suicide ideation and suicide attempts in nine countries. *Psychol Med* 1999;**29**:9–17.

13 **Lau SK**, Lee MK, Wan PS, *et al. Indicators of social development: Hong Kong 1995.* Hong Kong: Hong Kong Institute of Asia-Pacific Studies, Chinese University of Hong Kong, 1997.

14 **Reynolds WM**. *Adult Suicidal Ideation Questionnaire (ASIQ): professional manual.* Odessa, FL: Psychological Assessment Resources, 1991.

15 **Lovibond PF**, Lovibond SH. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther* 1995;**33**:335–43.

16 **Bronisch T**, Wittchen HU. Suicidal ideation and suicide attempts: comorbidity with depression, anxiety disorders, and substance abuse disorder. *Eur Arch Psychiatry Clin Neurosci* 1994;**244**:93–8.

17 **Taouk M**, Lovibond P, Laube R. *Psychometric properties of a Chinese version of the 21-item Depression Anxiety Stress Scales (DASS21).* Report for New South Wales Transcultural Mental Health Centre, Cumberland Hospital, Sydney, 2001.

18 **Shek DT**. Measurement of pessimism in Chinese adolescents: The Chinese Hopelessness Scale. *Soc Behav Pers* 1993;**21**:107–19.

19 **Kuo WH**, Gallo JJ, Eaton WW. Hopelessness, depression, substance disorder, and suicidality: a 13-year community-based study. *Soc Psychiatry Psychiatr Epidemiol* 2004;**39**:497–501.

20 **Kovacs M**, Beck AT, Weissman A. Hopelessness: an indicator of suicidal risk. *Suicide* 1975;**5**:98–103.

21 **Ivanoff A**, Jang SJ, Smyth NJ, *et al.* Fewer reasons for staying alive when you are thinking of killing yourself—the brief reasons for living inventory. *J Psychopathol Behav Assess* 1994;**16**:1–13.

22 **MacDonald AP**. Irrational values scale. In: Corcoran K, Fischer J, eds. *Measures for clinical practice: a sourcebook.* 3rd edn. New York: Free Press, 2000:418–20.

23 **Plutchik R**, Van Praag H. The measurement of suicidality, aggressivity and impulsivity. *Prog Neuropsychopharmacol Biol Psychiatry* 1989;**13**(Suppl):S23–34.

24 **Hawton K**, Rodham K, Evans E, *et al.* Deliberate self harm in adolescents: self report survey in schools in England. *BMJ* 2002;**325**:1207–11.

25 **Cheung YB**, Law CK, Chan B, *et al.* Suicidal ideation and suicidal attempts in a population-based study of Chinese people: risk attributable to hopelessness, depression, and social factors. *J Affect Disord* 2006;**90**:193–9.

26 **Aiken LS**, West SG, Reno RR. *Multiple regression: testing and interpreting interactions.* Newbury Park, CA: Sage Publications, 1991.

27 **Kleinbaum DG**, Kupper LL, Muller KE. *Applied regression analysis and other multivariable methods.* Boston, MA: PWS-Kent Pub, 1988.

28 **Greenland S**. Basic methods for sensitivity analysis and external adjustment. In: Rothman KJ, Greenland S, eds. *Modern epidemiology.* 2nd edn. Philadelphia: Lippincott Williams and Wilkins, 1998:343–59.

29 **Yip PSF**, Fu KW, Yang KCT, *et al.* The effects of a celebrity suicide on suicide rates in Hong Kong. *J Affect Disord* 2006;**93**:245–52.

30 **Bandura A**. Social cognitive theory of mass communication. In: Jennings B, Zillmann D, eds. *Media effects: advances in theory and research.* London: Lawrence Elbaum Associates, 2002:121–53.

31 **Au JS**, Yip PS, Chan CL, *et al.* Newspaper reporting of suicide cases in Hong Kong. *Crisis* 2004;**25**:161–8.

32 **World Health Organization**. *Preventing Suicide: a resource for media professionals*: Geneva: Department of Mental Health, Social Change and Mental Health, WHO 2000.

33 **CSRP**. *Suicide and the media: recommendations on suicide reporting for media professionals (*http://csrp.hku.hk*)*, HongKong: The Hong Kong Jockey Club Center for Suicide Research and Prevention, the University of Hong Kong 2004.

34 **Mann JJ**, Apter A, Bertolote J, *et al.* Suicide prevention strategies: a systematic review. *JAMA* 2005;**294**:2064–74.

35 **Etzersdorfer E**, Sonneck G. Preventing suicide by influencing mass-media reporting. The Viennese experience 1980–1996. *Arch Suicide Res* 1998;**4**:67–74.