

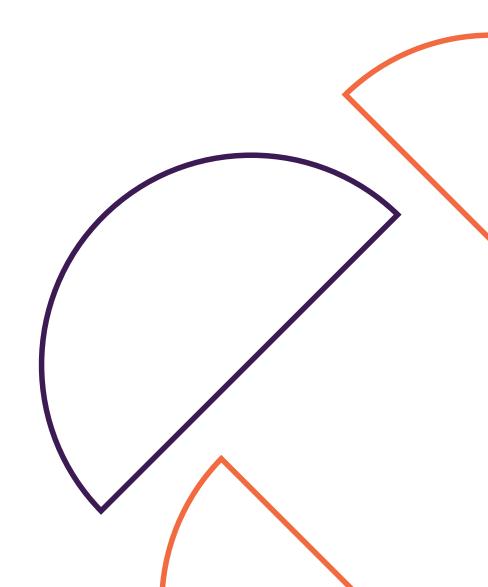


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Suicide and the news and information media

A Critical Review

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Executive summary

This critical review was written by Jane Pirkis and Warwick Blood, Georgina Sutherland and Dianne Currier. It is a review of an earlier critical review published in 2010. The work was commissioned by **Everymind** as part of *Mindframe*, with funding from the Australian Government Department of Health.

Background

The question of whether media portrayals of suicide can lead to imitation has been debated for over two centuries, but it is only in the last 50 years or so that scientific studies have been conducted on this subject. This review considers studies of news and information media, both traditional (newspapers, television, books) and new media (the Internet). It also considers mixed media. The current review constitutes an update of an earlier review of the news and information media (Pirkis and Blood 2001a, Pirkis and Blood 2010a). It is accompanied by a review of studies of the entertainment media (Pirkis, Blood et al. 2018).

Method

Article selection

Searches of MEDLINE, PSYCHLIT, PSYCINFO, COMMUNICATION AND MASS MEDIA COMPLETE, ERIC, DISSERTATION ABSTRACTS and APAIS were conducted from these databases' respective years of inception to January 2010. The search aimed to retrieve English-language articles containing the following elements (truncated search terms are listed in brackets):

- Suicide (suicid*);
- Imitation (Werther, copycat, imitat* or contagio*);
- Media (media or (newspaper* or print or press) or radio* or televis* or book* or (Internet or cyber* or web*)).

Potentially relevant references were retrieved by this means, and their reference lists scanned for further possible articles. Efforts were also made to discover unpublished articles of relevance.

Study classification

Studies considering the association between news and information media presentation of suicide and actual suicidal behaviour were excluded if the media type was not explicit. As noted above, five media types were included: newspapers, television, books, the Internet and mixed media. Studies classified by study type as follows:

- Descriptive studies: These were defined as detailed studies of individual cases or group of individuals with no comparator;
- Analytical studies: These were defined as studies of groups of individuals where a comparison was made with another group. The analytical studies were divided into two subtypes:

> Ecological studies: These were studies in which the outcome variable (usually suicide rates) for one group was compared with that for another group. The groups were usually differentiated by location (for example, suicide rates in one United States city in which a media stimulus was presented versus suicide rates in another in which no

stimulus was presented), or by time (for example, suicide rates during the month in which a media stimulus was presented versus suicide rates during a month in which no such stimulus was presented). A key characteristic of ecological studies is that the data are analysed at the aggregate level, rather than the individual level.

> Individual-level studies: These were studies in which the outcome variable for individuals in one group was compared with that for individuals in another group. Typically, the outcome variable was a self-reported attitude towards suicide or likelihood of suicidal behaviour. Groups were differentiated by type of media stimulus (for example, one group might be exposed to a newspaper report about a 10-year-old child taking his own life, and the other might be exposed to an identical report in which the subject was a 17- year-old). A key characteristic of individual-level studies is that the data are analysed at an individual level. This is made possible because the exposure status and the outcome status of each individual is known.

Critically reviewing the studies

This review gave consideration to methodological issues associated with each body of studies, and critically examined the effect of these issues on the interpretation of findings. Particular attention was given to the extent to which any methodological issues limited inferences that could be made about the relationship between portrayal of suicide in the given media and actual suicidal behaviour. Any relationship was considered in terms of: (a) the strength of the association; and (b) the extent to which it could be considered causal. Hill (1971), among others, has suggested that the following criteria should be used to judge whether a given association is causal:

- Consistency: The association between media coverage of suicide and an increase in actual suicides (or removal of media coverage and a decrease in actual suicides) is consistently observed, regardless of study design and population sampled;
- Strength: The association is statistically significant, and there may be evidence of a dose- response effect such that the greater the exposure to the media coverage of suicide, the greater the increase in suicide rates;
- Temporality: The association should make sense in chronological terms, in that the exposure variable (media coverage of suicide) should have occurred before the outcome variable (actual suicides);
- Specificity: The association is clear, such that most people who experience the outcome of suicide have been exposed to media coverage of suicide. It is acknowledged that the multi- factorial risk factors for suicide means that some of those who suicide will have been exposed to or exhibit other risk factors;
- Coherence: The association should be in line with known facts concerning the outcome of interest; actual suicides, attempted suicides or suicidal ideation. There should be a reasonable explanation for the association in this light. This criterion could be extended as a requirement to rule out rival explanations, especially in the context of known theory.

Key findings

In total, 163 studies on the association between presentation of suicide in news and information media and actual suicidal behaviour were identified. Table 1 provides a breakdown of these studies by media type and study type.

Table 1: Studies concerning the association between presentation of suicide in news and information media and actual suicidal behaviour

	Descriptive studies	Analytical studies: Ecological	Analytical studies: Individual-level	Total
Newspapers	1	42	13	56
Television	0	12	0	12
Books	3	2	0	5
The Internet	33	10	7	50
Mixed media	8	25	7	40
Total	45	94	34	163

Newspapers

Fifty-six studies (one descriptive study, 42 ecological studies and 13 individual-level studies) have examined the relationship between newspaper reports of suicide and actual suicidal behaviour. The vast majority of these studies suggest that an association exists between the two. The association would appear to be *consistent*, with the effect being reliably observed under almost all study methodologies, *strong* (with a dose-response effect being evident such that the greater the newspaper coverage of a particular suicide, the more substantial the increase in subsequent suicides) and *coherent* (with the findings making sense in the light of what is already known about the influence of the media and suicide).

Although the evidence from ecological studies is less reliable with regard to *temporality* (with only a limited number of studies permitting a determination of whether the media stimuli preceded an increase in suicide rates) and *specificity* (with few studies being able to demonstrate that a reasonable proportion of those who subsequently died by suicide were exposed to the media stimulus), some individual-level studies suggest that these conditions may also be satisfied. Under these circumstances, it is reasonable to regard the association as causal.

Television

Twelve studies, all of which have employed ecological designs, have examined the relationship between television news reports of suicide and actual suicidal behaviour. It is fair to say that the majority provide support for the existence of an association. Despite a few exceptional studies with null findings, the association would appear to be *consistent*. The association also demonstrates *strength*, in that it is most evident immediately after the media stimulus and then dissipates. The association is *coherent*, considering what is known about the influence of the media and suicide.

The condition of *temporality* and *specificity* are less readily satisfied because the ecological studies fail to demonstrate that the publicised suicide occurred before the actual suicides (because their data are almost always based on monthly, rather than daily, figures) or that those who subsequently died by suicide saw the televised stimulus. The ecological studies concerned with television are not complemented by descriptive studies or individual-level analytical studies which might shed more light on these criteria.

Although the evidence for the influence of television on actual suicidal behaviour is not as strong as that for newspapers, there is cautious support for a causal relationship.

Books

Five studies (three descriptive studies and two ecological studies) have examined the impact of *Final Exit*, a best-selling book advocating suicide for those who are terminally ill. They found a *consistent* association that suggested that the book has been influential in the choice of method of suicide in a number of cases. The *temporality* of the association was demonstrated on several occasions, with the acquisition and scrutiny of *Final Exit* routinely preceding the suicide attempt. The *specificity* of the effect was also demonstrated, as evidenced by the significant number of individuals showing evidence of having been influenced by the book. The association has also shown *coherence*, in that it makes theoretical sense that a nonfiction book providing advice about suicide could influence suicidal individuals.

The studies were not designed in a way that enabled an examination of the *strength* of the association. All were based on exposure to a single stimulus, thus precluding any examination of adose-response effect.

To the extent that the association satisfies the conditions of *consistency, temporality, specificity* and *coherence*, it would appear to be reasonable to deem it to be causal. Having said this, some caution should be exercised in generalising this finding to other non-fiction books, since all studies refer to *Final Exit* alone.

The Internet

There has been a substantial increase in research on the role of the Internet and suicidal behaviour in recent years which has yielded evidence from 50 studies (33 descriptive studies, 10 ecological study and 7 individual-level study) with respect to the association between suicide-related Internet activity and some aspect of suicidal behaviour. The association would appear to be *consistent*, with almost all study findings telling a similar story. The findings of the majority of ecological and individual-level studies concur with the conclusions of the case studies. The association would also appear to have *coherence*, in that it makes theoretical sense that a web site providing advice about suicide, or participating in pro-suicide discussion groups or social media could influence suicidal individuals.

The *temporality* of the association has been demonstrated in the case studies, with strong evidence that the individuals described in these studies were exposed to suicide-related material on the Internet before making their suicide attempt. Prospective individual-level studies provide further evidence of temporality. There is also some evidence for the *specificity* of the effect, both in case studies showing evidence of individuals having been influenced by web-based suicide-related material, and analytic studies of individuals which investigate their suicide related Internet activity.

Both ecological and individual level studies demonstrate dose-response relationships whereby level of exposure is associated with level of suicidal behaviour, providing evidence of the *strength* of the association.

Studies published in the past 10 years provide mounting support for a causal association between exposure to suicide-related material and/or participation in suicide-related online activity on the Internet and actual suicidal behaviour.

Mixed media

Forty studies (eight descriptive studies, twenty-five ecological studies and seven individual-level studies) of the effect of mixed media have been conducted. With only one or two exceptions, these studies suggest an association between media reporting of suicide in mixed media and actual suicidal behaviour, suggesting that the relationship is *consistent*. The *temporality* of the association has been well demonstrated in most of these studies, because unlike studies of specific media, the starting point in these studies is usually a specific media event. There are also suggestions that the effect may have *specificity*, with many studies demonstrating that new methods of suicide exponentially gained popularity following publicity of an index suicide. The association would also appear to have *coherence*, in that it replicates the relationships between media reporting and suicidal behaviour observed in studies of the individual media that included in mixed media studies.

It is difficult to draw conclusions about the *strength* of the association, because the magnitude of the exposure is not assessed in many studies. Having said this, a number of more recent ecological studies found that increasing volume of media reports is associated with increasing suicide rates, suggestive of a dose-response effect.

To summarise, these studies offer some support for a causal association between exposure to suiciderelated stories in mixed media and actual suicidal behaviour. Having said this, some caution should be exercised in interpreting the findings in this way, because of the heterogeneous nature of the media that have been studied. It is perhaps more useful to think of these studies as collectively providing support for the general contention that presentation of suicide in news and information media can influence actual suicidal behaviour, rather than viewing them as providing support for the notion that undifferentiated 'mixed media' have this sort of impact.

Conclusions

Presentations of suicide in news and information media can influence copycat acts in particular circumstances. The findings of the current review should not be interpreted as a call for censorship of the media; it is acknowledged that the media has a role to play in raising awareness of suicide as a public health issue. Rather, the findings should be interpreted as an indication that media presentation of suicide should be done responsibly, and balanced against the public's 'right to know' in order to reduce the potential harm confirmed by the evidence.

Chapter 1: Introduction and method

Background

The question of whether media portrayals of suicide can lead to imitation was raised at least 235 years ago, and has been hotly debated since that time. In 1774, Goethe published *The Sorrows of Young Werther*, in which the hero took his own life because his love was unattainable. The book was widely read in Europe and reportedly had a great impact. Men dressed like Werther, and affected his manner. An increase in suicides in several European countries led to the assertion that the book was directly influencing some of its readers to take their own lives in the fashion of Werther (Thorson and Oberg 2003). Consequently, the book was banned in a number of European countries. Other historical examples of spates of suicide following publicity about an index suicide have been described (Krysinska and Lester 2006, Andriessen 2007, Motto 1967), but the case of Werther remains the most well-known. Phillips (1974) coined the term 'Werther effect', and this is now commonly used to describe the posited relationship between media portrayals of suicide and imitation acts, including completed suicides, attempted suicides and suicidal thoughts.

Until the 1960s, the debate was based on anecdotal reports and impressions, with little in the way of social scientific inquiry. Since then, however, there have been a plethora of studies examining the relationships between media portrayals of suicide and subsequent suicidal behaviours. This review considers studies of news and information media, both traditional (newspapers, television, books) and new media (the Internet). It also considers mixed media. The current review constitutes an update of an earlier review of studies of the news and information media (Pirkis and Blood 2001a, 2001b, 2010a, 2010b). It is accompanied by a review of studies of the entertainment media (Pirkis, Blood et al. 2018).

Purpose and scope of the literature review

This report provides a systematic review of relevant studies in the area. It considers studies that have looked at the relationship between news media reporting and actual suicidal behaviours or thoughts. Consistent with guidelines produced by the National Health and Medical Research Council (1999), the purpose of the review is 'to evaluate and interpret all available research evidence relevant to the question (is there a causal link between news media reporting of suicide and actual suicidal thoughts and acts?)'. The findings of individual studies are drawn together in a consistent manner, in order to determine whether the media does exert a causal influence on suicidal behaviour.

It is acknowledged that the review of traditional media (newspapers, television, books) considers only those studies that have sought to establish a direct link between news and information media presentation of suicide and actual suicidal behaviour. These studies have been termed 'media influence studies', and they sit within a 'media effects' tradition which has been dominated by the disciplines of medicine, sociology and psychology. They have been conducted relatively independently of studies of health communication and risk which take more of a 'cultural theory' perspective, and examine the full spectrum of news and information media processes and content, from how suicide stories are produced ('news production studies'), to what information they contain and how this is framed ('content analysis studies'), to how this information is received and perceived ('audience reception studies').

In the case of the Internet, the model of media influence used above does not cover the interactive nature of the medium and the considerable agency users have beyond being mere consumers of published/broadcast materials as understood in the 'media-effects' tradition. Therefore, for the

Internet, the scope of the review has been broadened to capture the expanded range of interactions with suicide-related material that the medium permits. This includes actively searching for information, sourcing materials for suicide attempts, participation in suicide-related dialogues, reading online news reports on suicides, and self-publishing/broadcasting of suicidal thoughts and actions and opinions of the suicidal behaviour of others.

The review is 'systematic' in the sense that it: (a) makes a concerted attempt to identify all relevant primary research; (b) makes judgements about the overall quality of the literature; (c) systematically synthesises the findings of studies of acceptable quality; and (d) makes judgements about the extent to which the studies suggest there is a causal association between media presentations and actual suicidal behaviours/thoughts. These features are consistent with the definition of a 'systematic' review as provided in the National Health and Medical Research Council (1999) guidelines.

Method

Article selection

Searches of MEDLINE, PSYCHLIT, COMMUNICATION ABSTRACTS, ERIC, DISSERTATION ABSTRACTS and

APAIS were conducted from these databases' respective years of inception to August 2017. The search aimed to retrieve English-language articles containing the following elements (truncated search terms are listed in brackets):

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Ecological studies: These were studies in which the outcome variable (usually suicide rates) for one group was compared with that for another group. The groups were usually differentiated by location (for example, suicide rates in one United States city in which a media stimulus was presented versus suicide rates in another in which no stimulus was presented), or by time (for example, suicide rates during the month in which a media stimulus was presented versus suicide rates during a month in which no such stimulus was presented). A key

characteristic of ecological studies is that the data are analysed at the aggregate level, rather than the individual level.

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Critically reviewing the studies

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- Strength: The association is statistically significant, and there may be evidence of a dose- response effect such that the greater the exposure to the media coverage of suicide, the greater the increase in suicide rates.
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- Specificity: The association is clear, such that most people who experience the outcome of suicide have been exposed to media coverage of suicide. It is acknowledged that themulti- factorial risk factors for suicide means that some of those who suicide will have been exposed to or exhibit other risk factors.
- Coherence: The association should be in line with known facts concerning the outcome of interest; actual suicides, attempted suicides or suicidal ideation. There should be a reasonable explanation for the association in this light. This criterion could be extended as a requirement to rule out rival explanations, especially in the context of known theory.

Daly, Bourke and McGilvray (1991) acknowledge that these criteria are fairly stringent, but suggested that they should provide guidance in determining whether an association was causal. This review therefore makes qualitative judgements about the extent to which a given body of studies meets these criteria.

Other reviews and commentaries exist, but none has used these criteria to assess causality (Hafner and Schmidtke 1986, Goldney 1989, Gunnell 1994, Hawton 1995, Gould and Kramer 2001, Hawton and Williams 2002, Gould, Jamieson et al. 2003, Crane, Hawton et al. 2005, Hawton 2005, Insel and Gould 2008) (Schmidtke and Hafner 1989, Phillips, Lesyna et al. 1992, Martin 1998, Schmidtke and Schaller 1998, Schmidtke and Schaller 2000, Jamieson, Jamieson et al. 2003, Krysinska 2003, Pirkis 2009, Stack 1987, Stack 2000, Stack 2003, Sudak and Sudak 2005, Tor, Ng et al. 2008).

Chapter 2: Newspapers

Descriptive studies

Over the years, there have been several anecdotal case studies that suggest that there is a link between newspaper reporting of suicides and actual suicides. In Australia, Hills (1995) cited an example of a patient of a mental health unit threatening to take her own life in Hobart the day after the Mercury published a front-page picture of a person engaging in the same behaviour.

Analytical studies: Ecological

The earliest scientific study of the impact of newspaper reports of suicide on imitative suicides tested a negative hypothesis: that the suppression of newspaper reports on suicide would lead to a reduction in suicides. Motto (1967) determined suicide rates in seven United States cities during periods of newspaper blackouts, ranging from 25 to 135 days, between 1945 and 1965. Each figure was then compared with the mean rate for the previous five years. Using the same methodology, he conducted a subsequent study that was restricted to a single city (Detroit), but considered a blackout of much longer duration (268 days) (Motto, 1970). In the first study, the newspaper blackouts appeared to have no effect on suicide rates, but in the second the blackout was associated with a significant lowering of the suicide rate for females (particularly those aged under 35). A subsequent replication of Motto's studies by Blumenthal and Bergner (1973), which considered suicide rates in the context of a 140-day newspaper strike in New York in 1966, also found that, although the overall suicide rate was not significantly lower during the strike period, the rate for women aged under 35 was.

After Motto and Blumenthal and Bergner's work came a series of large-scale ecological studies assessing the relationship between newspaper reports of suicide and actual suicides. The first of these was conducted by Phillips (1974). Using a quasi-experimental design, Phillips examined the frequency of suicide in months in which a front-page suicide article appeared in the United States press between 1947 and 1968, and compared this with the frequency in corresponding months (in which no such article appeared) in the preceding and subsequent years. So, for example, if a suicide story occurred in November 1965, he compared the number of suicides for that month with the expected number based on the average of November 1964 and November 1966 (assuming no suicide story appeared in the comparison months). Adjusting for seasonal effects and changing trends in this way, he found a significant increase in the number of suicides after 26 front-page articles, and a decrease after seven of them. The effect increased as a function of the amount of publicity given to the story, was particularly evident for young people, and was strongest in the geographical areas where the suicide story was published.

Hypothesising that some motor vehicle accidents are actually covert suicide attempts, Phillips extended his methodology to an examination of the impact of front-page suicide stories on automobile fatalities in California between 1966 and 1973 (Phillips, 1977, 1979). He found that, on average, the number of motor vehicle fatalities (particularly single-vehicle accidents) was significantly higher in the week following a suicide story than would have been expected on the basis of the number in comparison periods. The increase was highest three days after a publicised suicide, and peaked again at eight days. The ages of drivers correlated significantly with the ages of those featured in the suicide stories. Bollen and Phillips (1981) replicated these findings in a study in Detroit. Phillips went on to propose that some aeroplane fatalities may be disguised murder-suicides, and examined the relationship between United States national aeroplane fatalities and murder-suicide stories presented on the front page of the national press, or on national television network evening programs between 1968 and 1973 (Phillips, 1978, 1980). He found that the number of fatal aeroplane crashes significantly increased after a publicised murder-suicide story. Consistent with his other findings, the magnitude of the effect was influenced by geographical location and amount of publicity. Again, the increased death rate peaked on day three, returning to normal by about day nine.

Several studies have re-examined Phillips (1974) original findings, using more sophisticated statistical techniques. Wasserman (1984) used a multivariate time-series technique that corrected for seasonal effects, national unemployment rates and war, and examining rates rather than raw numbers (thus controlling for changes in population size and structure). He extended the period studied by an additional nine years (1947–77). Wasserman hypothesised that not all stories about suicide would be expected to trigger further suicides, only those about prominent celebrities. He found that there was no significant overall effect of front-page suicide stories on the national suicide rate, but that significant increases in the national suicide rate occurred in the months when the suicide of a celebrity was publicised in the press. Once again, the magnitude of the effect was proportional to the amount of publicity given to the story.

A replication of Wasserman's work by Stack, which extended the period studied by an additional three years (1948–80), found that Wasserman had missed approximately three-quarters of the celebrity stories, and included several that did not meet appropriate criteria. Controlling for potential confounders, Stack (1987a) considered subcategories of publicised celebrity suicides, and found that only reports of the suicides of entertainers and politicians were associated with increased suicide rates. He also found that reports of non-celebrity suicides were associated with increased monthly suicide rates, although the effect was less than for celebrity suicides (Stack, 1990c). Again, the amount of publicity given to a reported suicide affected the size of the increase in the suicide rate. Using data from the same period (1948–80), and adopting the same methodology, Stack (1990b) also examined the effect of suicide stories featuring divorced or maritally distressed individuals. He found an increase in the suicide rate for those aged over 16 in the months in which such stories were published.

Hittner (2005) also re-analysed Phillips' (1974) original data, arguing that the initial analysis did not control for the positive correlation between the expected and observed suicide rates before examining the impact of media publicity on the observed number of suicides. Using a five-step statistical procedure which took this into account (but excluded some observations that did not meet certain statistical assumptions), he found no association between heightened levels of media exposure and increases in the observed numbers of suicides.

Stack (1988) examined United States suicide rates from an earlier period (1910–20), chosen because the confounding effects of radio and television news were controlled by their absence and because the interaction between war and the print media could be considered. Stack identified months in which suicide stories were published on page one of the *New York Times*, the *Washington Post* and the *Charleston News-Courier*, and considered monthly suicide rates (extrapolated from yearly figures). Using regression techniques, he found that suicide stories printed during wartime had no impact on the suicide rate, whereas those published in peacetime were associated with an increased rate. These findings were replicated by Wasserman (1992).

On the assumption that societal suicidogenic mood is low during war time, Stack and Gundlach (1992) designed a similar study to assess whether the effect of the media might be heightened in a time where community receptivity to suicidal modelling is high, such as during the Great Depression. Using data from 1933–39, they found little supporting evidence for this hypothesis. Only stories concerning political leaders were associated with suicide.

Romer, Jamieson and Jamieson (2006) examined suicide news reporting for four months in 1993 in six United States cities, arguing that a study of the local impact of local news was more precise than the previous studies in the United States of national news. They employed a sophisticated design, where they identified stories in newspaper sources in each of the cities and examined their association with suicide rates in these cities, while controlling for the effect of a number of confounders (including other news and information media and entertainment media sources of suicide stories). They found that local newspaper reports of suicide were associated with increases in local suicide rates. Taking the issue beyond the United States, Jonas (1992) accessed daily suicide statistics (1968–80) in Baden-Württemberg, a German federal state, and considered them in the context of articles on the suicides of prominent people in newspapers and magazines during the same period. His use of daily suicide statistics improved on the approach of most of the United States studies, which relied on aggregated data that precluded an examination of whether the suicide occurred before or after the news item. He conducted two separate sets of analyses, one using the quasi-experimental approach of Phillips (1974), and the other using a more powerful time-series regression analysis. Both revealed a significant increase in the suicide rate in the weeks following a suicide story, but the effect was amplified in the former.

Ishii (1991) calculated the amount of suicide news in two national Japanese newspapers for each month from 1954 to 1986. To do this, he multiplied the number of headlines in each paper by the circulation of each, and added the two newspaper totals together. He then correlated each monthly figure with the national monthly suicide rate for males and females, and with the combined rate for the Tokyo area (where the greatest readership was concentrated). Applying a concept known as Grainger's causality to the data to estimate multivariate autoregressive models, he was able to demonstrate that suicide news had a causal effect on actual suicides (and not vice versa) for both males and females at the national level. At the local level, the picture was more complex, as a two-way relationship between suicide news and suicides was demonstrated.

Stack (1996) also undertook a study in Japan. Using the same methodology as in his United States work, he examined monthly national suicide rates for 1955–85 in the context of stories of Japanese celebrity and non-celebrity suicides published in the front three pages of the Japan Times. He found that the publicised suicide of a Japanese person was associated with an increase in suicides during the month of the story.

In Australia, Hassan (1995) developed a scoring system based on story size, position and content, and identified 'high impact' suicide stories published in the *Age* and the *Sydney Morning Herald* between 1981 and 1990. He found that the national daily average suicide rate for males increased significantly after such stories, but not for females. Hassan argued that this gender difference may reflect the newspapers' emphasis on reporting male suicides, which then increased the number of possible imitations. Males also read newspapers more than females. The gender difference may also be related to the suicide method used by males: in Australia, males tend to use more violent, and so more lethal, suicide methods than females.

Barraclough, Shepherd and Jennings (1977) and Littmann (1985) approached the problem from the opposite direction in studies in the United Kingdom and Canada, respectively. Both sets of investigators used individual suicides as their starting point, rather than stories on suicide. Barraclough, Shepherd and Jennings (1977) identified all suicides in Portsmouth between 1970 and 1972, and then considered all newspaper reports identified in the only local newspaper for approximately the same period. Combining this information, they were able to calculate the likelihood of a day on which a suicide occurred being preceded by a newspaper report of suicide and compare this with the likelihood of a day on which no suicide occurred being preceded by the same stimulus. They found a significant effect for males under 45, but no effects for any other age or sex groups. In Canada, Littmann (1985) took subway suicide figures from 1966–77, and noted that there was an epidemic of subway suicides in 1971. He calculated the frequency of suicide news items in Toronto's major newspaper for varying intervals before and after each suicide, and then calculated annual 'before' and 'after' averages. He found that suicide news items were just as likely to be found before and after a suicide in both epidemic and non-epidemic years.

Twenty years later, Tousignant, Mishara and colleagues (2005) conducted a further study in Canada in which examined the impact of the media coverage of the suicide of Gaetan Girouard, a popular male television reporter who died on 15 January 1999 in Quebec .They analysed stories published in 10 daily newspapers for the subsequent year, and identified 98 articles, one third of which were published in the two days after his death, and another third of which were published within three days to a week. Significant numbers of these articles had strong emotional overtones, included pictures of the deceased and his family, described the method, presented simplistic explanations that made no reference to underlying psychological problems, and/or glorified the death. Overall suicide rates and suicide rates for men aged 20-49 (the age group of the reporter) in Quebec were significantly higher in most months of 1999 than the corresponding months of 1988. An analysis of 79 coroners' records between January 15 and February 6 1999 found that 10 showed some direct evidence of influence by the reporter's death. There was an increase of 46% in calls to five Quebec suicide prevention centres in January 1999 compared with January 1998, with the rise being 200% in the four days following the reporter's suicide. The increase was 15% in February and March 1999.

Back in Hong Kong, Yip, Fu et al. (2006) conducted a similar study to Tousignant, Mishara et al.'s (2005) Canadian study. They examined the press coverage of the suicide of Leslie Cheung, a local singer and actor, who took his life on 1 April 2003. They identified 1243 newspaper articles about his death published in the following eight days, and on six of these eight days there was at least one front-page newspaper report. They considered the monthly suicide rates for January-June 2003, and compared these with the average rates for the equivalent months from 1998-2002. They found that there was a significant increase in suicides in the 2003 months, and that this was particularly marked for males and for suicides by the same method. Like Tousignant et al., they found evidence from coroner's records that Cheung's death had played a role in subsequent suicides; there were 13 cases in 2003 which his death was mentioned in a suicide note or in the records of the police investigation.

Three more recent studies from South Korea (Kim, Park et al. 2013, Chen, Yip et al. 2014, Park, Choi et al. 2016) have investigated the influence of newspaper reports of celebrity deaths on suicide rates as well as on method choice, and modelling effects. All three studies note substantial newspaper coverage of the celebrity deaths, including descriptions of the methods used.

Kim et al. (2013) compared weekly suicide rates before and after the deaths of two Korean celebrities (an actress, Ms Choi in Oct 2008, and ex-prime minister Mr Roh in May 2009). Comparing the three weeks before and after there was a 62% and 5% increase in weekly suicides following the deaths of Ms Choi and Mr Roh respectively, and an increase in suicides using similar methods, with a 31% increase in hanging (used by Ms Choi) and a 61% increase in suicides from falling (Mr Roh). In this initial period, there was a greater increase in suicides in those less than 50 years for Ms Choi, and over 50 years for Mr Roh. The increases were observed for a period of six weeks following the suicide of Ms Choi and four weeks for Mr Roh. The authors point out that there was much more intense news coverage of Ms Choi's death, with almost three times as many stories in the first three weeks, and that this may explain the longer effects. While there were increases in suicides in both genders, following Ms Choi's suicide the was a stronger effect seen among women.

Chen et al. (2014) examined weekly counts of suicide by the same method (charcoal burning) in the 12 months before and 14 months following the death of the celebrity Mr Ahn, in September 2008. Prior to 2008 charcoal burning had been rare in South Korea accounting for 0.85% of suicides, but in the year following Mr Ahn's death it accounted for 4.8% of suicides in 2014. During the study period, there

was a 704% increase in charcoal burning suicides, and a 38.4% increase in suicide by other methods. The increase in charcoal burning suicides was greatest in the demographic group resembling Ahn, males under 45 years of age, and there was an increase in the use of cars as a location from 6% prior to 16% that was sustained over the following 12 months.

Park and colleagues (2016) looked at suicide rates for the 30 days before and during the first and second 30 days after the suicides of nine celebrities that occurred between 1990 and 2010. They found that six of the nine celebrity suicides had significant impacts on overall suicide rates in first 30 days, and four celebrity suicides continued to have influence in second 30 days. Four of the celebrity suicides had gender effects, whereby the magnitude of impacts in both phases were greater in the gender corresponding to the celebrity except in one instance where it changed between similar gender in the first 30 days.

Collectively these three studies find increases in suicide following extensive media coverage of celebrity suicides, including an increase in use of the same method. All studies find evidence, stronger in some than others, that individuals of similar age and gender as the celebrity are more vulnerable to influence.

These studies from South Korea are supported by reports from two other countries in the Asian region; Taiwan and Japan.

In Taiwan, Chen, Liao et al. (2012) examined suicide counts in the two weeks following initial newspaper reporting in November 2008 on the suicide of Ivy Li, a 24-year-old emerging singing star. They examined weekly suicide counts from 2006 to 2008, controlling for seasonality, weather and unemployment rates. They observed an increase in risk of 17% in the two weeks following the first reporting, and calculated that an excess number of 25 suicides in that two weeks were attributable to media reporting. There was a clear increase in risk in those of similar gender and age to Ms Li, as well as an increase in the use of the same method (charcoal burning) which had been described in detail in news reports.

Ueda and colleagues (2014) more directly examined the relationship between newspaper reporting of celebrity suicides and subsequent changes in suicide rates in Japan. Examining daily suicide counts following 109 celebrity deaths reported between 1989 and 2010, they found that media reports on celebrity suicide were associated with an immediate increase in total suicides. There was a 5% average increase on the day suicide reports were published which persisted for 10 days (5.5%). Highly publicised suicide stories were followed by larger increases in suicide compared to those which were not so frequently reported with a 7% increase on the first day, 11.8% increase three days later 11.8% increase and a 10-day average of 6.3% following highly reported celebrity suicides. Another area of investigation has focused on the role of newspaper reporting on the use of particular methods for suicide.

Studies in the United Kingdom and Hong Kong provide support for suicide clusters occurring after reports of suicide by a particular method being publicised in the press. Ashton and Donnan (1979; 1981) reported an epidemic of suicides by burning in England and Wales in the year after a widely publicised political suicide using this method. Likewise, Veysey, Kamanyire and Volans (1999) noted an increase in the number of intentional poisonings by a particular substance reported to the British National Poisons Information Service after the report of an inquest into a suicide by this method was reported in the Independent. In Hong Kong, Chung and Leung (2001) collected reports of suicide by charcoal burning during 1998 and 1999 from six major national newspapers, and examined their relationship to actual suicides by this method occurring in the same two-year period. Prior to November 1998, there were no suicides by this method and no reports relating to it. In November 1998, a 35-year old woman used this method to end her life, and her death was widely and graphically

reported. Fifty-six reported suicides by the same method followed, 22 (39%) of which occurred in the nine weeks after the first reported incident.

In Austria, Etzersdorfer and his colleagues have conducted several ecological studies relating to the influence of newspaper reporting on suicides using particular methods. In one, they showed that, where guidelines were introduced to improve the quality of media reporting of suicide, there was a corresponding drop in the number of subway suicides and attempts (Etzersdorfer, Sonneck et al. 1992, Sonneck, Etzersdorfer et al. 1994, Etzersdorfer and Sonneck 1998, Etzersdorfer, Voracek et al. 2001, Etzersdorfer, Voracek et al. 2004, Niederkrotenthaler and Sonneck 2007). In another, they demonstrated that newspaper coverage of the firearm suicide of the owner of a famous Viennese hotel was associated with an increase in suicides by the same method. Specifically, they found that there was an increase in suicides by this method in the three weeks after Austria's leading tabloid newspaper, *Neue Kronezeitung (NKZ)*, ran the story (compared with the previous three weeks). There was evidence of a dose-response effect, whereby the increase was greatest in the regions of the highest distribution of *NKZ* (Etzersdorfer et al., 2001, 2004).

Hagihara and colleagues (2014) examined the influence of newspaper reports on the proliferation of a new method in Japan. Following an initial report in February 2008 on three young people who met on the Internet and then met in a hotel room where they used hydrogen sulphide gas to suicide. Death by hydrogen sulphide poisoning was extremely rare in Japan prior to this, occurring usually in the context of workplace accidence or exposure to volcanic emissions. The researchers examined ambulance dispatches for hydrogen sulphide poisoning for 56 days from March to May 2008 and looked at daily variations in newspaper articles about hydrogen sulphide suicides and number of poisoning cases per day. The majority (202/220) of call-outs were fatalities. The number of articles about suicide using hydrogen sulphide was related to suicide attempts with a time lag of one or three days. The authors calculated that an increase of 10 newspaper articles about hydrogen sulphide in national and local papers can lead to increases of 1.1 and 1.3 respectively in number of suicide attempts one day after the report. A front-page article had an effect four times as strong as the magnitude of impact of newspaper articles overall. The authors also examined the magnitude of impact of the articles on 'copy-cat' suicide increased according to the number of violations of media suicide reporting recommendations. They found that articles violating four or fewer of the seven reporting violations were not associated with increased hydrogen sulphide suicide attempts, but those violating five or more were.

Studies in Taiwan and Hong Kong examined media reporting in relation to charcoal burning suicides. In less than 10 years suicide charcoal burning went from being a rare event to be the second most common method of suicide in Taiwan. From 2008 to 2010 it accounted for 30% of suicides. (Chen, Tsai et al. (2016) focusing on the period of 1999-2010 in which this increase occurred, examined suicide rates in the pre-publication (days -14 to -8), post-publication period (days 0 to 6) of newspaper articles on charcoal burning suicides. The first seven days were excluded because other media (TV or Internet) might have reported the event earlier than the newspapers. They also undertook content analysis and examined characteristics of reporting and suicide rates before and after the appearance of the news items. They found that news items describing details of the method were positively and significantly correlated with post-publication increase in charcoal burning suicide rates. Other characteristics such as the significance of the news item and glamorisation of the method were not related to an increase in suicide rates. They concluded that newspaper reporting on a new method increases the cognitive availability, or knowledge, of that method leading to rapid increases in suicides by that same method. In Hong Kong Cheng and colleagues (2017) examined suicide deaths by charcoal burning and noncharcoal burning methods and newspaper reporting intensities from 1998 (the year the first charcoal burning suicide was reported) to December 2005 by which time charcoal burning had been the second most used suicide method for four years. Comparing suicide rates and reporting rates of suicides by

charcoal burning and by other methods they found that suicide news showed significant effects on subsequent suicide rates in a method-specific manner. The authors calculated that on average one charcoal burning suicide news article was responsible for 0.563 charcoal burning suicide, while one non-charcoal burning suicide article elicited 0.504 non-charcoal burning suicides.

Niederkrontenthaler, Till and Kapusta et al. (2009) investigated whether the impact of suicide stories varies as a function of the social characteristics of the individual who is the focus of the media report, and their similarity to particular population groups. They identified newspaper stories on all 179 individual suicides named in the 13 largest Austrian newspapers between 1996 and 2006, and conducted logistic regression analyses to determine whether there was a relationship between the reported suicides and (a) actual suicides by similar individuals (same sex, same age group, same suicide method); (b) actual suicides by different individuals (different sex, different age group, different suicide method); and (c) actual suicides by the total population, in the 28 days after the report. They found that if the report concerned an individual who had celebrity status, who was aged 30-64, and whose death was definitively determined as a suicide, then this was heightened the risk of an increase in suicide rates among similar individuals; if the report concerned an individual suspected of criminal activity, then this was associated with a lower risk of post-report suicides among similar individuals. They found that the social characteristics of the individual described in the report had no association with an increase in dissimilar suicides, and that celebrity status of the individual was the only factor that was predictive of an increase in total suicides. Their findings about the modeling effects of celebrity suicide are supported by the more recent studies in South Korea, Taiwan and Japan, as described earlier.

While a surge in suicides following a celebrity suicide may be described as a *temporal* suicide cluster, researchers are also interested in *point* suicide clusters, that is, where suicides are clustered both temporally and geographically. Two studies have investigated if newspaper reporting contributes to the occurrence of point suicide clusters. In the USA, Gould, Kleinman et al. (2014) undertook a case control study of 48 suicide clusters in young people aged 13-20 years the occurred between 1988 and 1996. They matched two non-cluster control communities where suicides of similarly aged youths had occurred, and examined newspaper reporting of suicides between the first and second suicide death in the clusters to investigate if the reporting could have led to further suicides in the cluster. In noncluster communities they examined the same period of time after the matched control suicide. The average number of news stories about suicidal individuals published after the first suicide of a cluster was significantly greater than the average number published after a non-cluster suicide. They also found that a cluster was more likely to be reported at least once (25% vs 14%) and more likely to be reported twice or more (13% vs 1%). Several story characteristics including front-page placement, headline containing the word suicide, a description of the method and detailed description of the decedent appeared more often after index cluster suicide than non-cluster suicides. Controlling for the number of stories, two types of story characteristics were associated with cluster status - an accompanying sad picture and the celebrity status of the person who died by suicide. Stories about teen suicides had strongest effect on subsequent teenage suicide, and celebrity suicides also had an effect on teenage suicides. Overall, the authors conclude that newspaper reporting of suicide increases the risk of point cluster suicides occurring.

In contrast John, Hawton et al. (2017) did not find evidence of an effect of newspaper reporting on a point cluster of suicides of young people that occurred in a single location - Bridgend, South Wales - in 2008. They found, despite large increases in the volume of reporting about the suicides, that there was no clear relationship between the frequency of newspaper reports and deaths when examining 2- and 7-day rolling periods preceding each suicide. That study only examined a single point cluster and due to the small number of suicides may not have been able to detect the types of associations observed by Gould and colleagues.

Frei, Schenker et al. (2003) examined suicides assisted by the Swiss right-to-die society, EXIT, in the two years before and the two years after wide local and national press coverage of the double suicide of a well-known and respected couple in the Basle region. They found a significant increase in the number of EXIT-assisted suicides in that region after the newspaper reports, particularly among women aged over 65. They also examined the quality of reporting, as assessed against Centers for Disease Control and Prevention (CDC) guidelines, and found that much of it sensationalised suicide, glorifying the couple and describing their deaths in detail.

Niederkrotenthaler and colleagues (2010) undertook a content analysis of 497 suicide-related articles published in Austria from 1 Jan to 30 June 2005 to identify associations between article content and changes in suicide rates from two weeks prior (days 8-14) and the week following publication (days 0-7) to investigate if adherence to reporting guidelines could be effective in reducing suicide. They found increases in suicide rates associated with a range of reporting characteristics including: repetitive reporting, reports on suicide by falling, reports with a main focus on suicide research, stories concerning how the societal problems related to suicide are increasing, items reporting several independent suicidal acts, language referring to suicide epidemic, reporting of public myths and with dichotomous thinking. They did identify a protective influence for reports that covered suicidal ideation that was subsequently overcome. They found that the magnitude of changes in suicide rates was greater in regions where a higher proportion of the population is exposed to newspaper reports.

Analytical studies: Individual-level

In the mid-late 1980s and early 1990s, Range and her colleagues conducted a number of individuallevel studies investigating the impact of the print media on suicidality among members of the general public, building on the original work of Calhoun and colleagues (Calhoun, Selby et al. 1980, Calhoun, Selby et al. 1982, Rudestam and Imbroll 1983). All of these studies used essentially the same methodology. Participants (usually tertiary students or people in shopping centres) were presented with a hypothetical newspaper article describing the death of an individual. After they were given the opportunity to read the article, they were asked questions about their attitudes towards suicide and the likelihood of their committing such an act. Using appropriate designs, these studies varied the conditions described in the newspaper item (for example, death by suicide versus death by other causes, and death of a child versus death of an adolescent) and presented the stimulus to different groups of individuals (for example, varying age and sex groups). These studies therefore investigated the impact of the print media on suicidal tendencies in a manner that complements the ecological studies described above.

The majority of these studies found that participants were unlikely to report that they would be influenced to engage in suicidal behaviour by a newspaper report of suicide, regardless of the circumstances of the suicide. For example, the participants in McDonald and Range's (1990) study saw themselves as unlikely to imitate the behaviour of the subject of a written report. In this study, the individual described was a high school student called John, who had many problems, including knowing someone who had died, either by suicide or through a viral illness. Similarly, Higgins and Range (1996) found that participants were generally unlikely to report that they would imitate the behaviour of Pat, a 16-year-old high school student whose suicide was described in a newspaper article. There was no difference between participants, regardless of how Pat's circumstances were presented. Despite tending to deny that they themselves would imitate suicidal behaviour reported in a newspaper, participants in some studies suggested that others may be susceptible to the imitation phenomenon. In McDonald and Range's (1990) study, for example, participants were likely to predict that John would attempt suicide if his friend had died by suicide, and he had observed the response to this death to be sympathetic. The findings were similar in a study by Gibson and Range (1991), in which participants were exposed to a written report about a teenager with problems. Half were told that the

teenager had a friend with similar problems who had taken his or her own life, and half were told that the teenager had a friend with similar problems who had sought professional help. Asked to predict the response of the teenager, members of the former group were more likely to indicate suicide (particularly male respondents), and members of the latter were more likely to indicate help-seeking behaviour (particularly female respondents).

A recent US individual-level study (Williams and Witte 2017) examined an expanded range of outcomes including affect (mood), attitudes toward suicide, knowledge about suicide and suicide warning signs, attitudes toward help-seeking, and fearlessness about death. They divided 296 college students into three groups and presented them with 1) suicide article with preventative resources and psychoeducational information; or 2) the original suicide article which adhered to the 'no photo' guideline only; or 3) a non-suicide article (control group). Overall, they found no effect of exposure to a suicide news article with or without the preventative resources and psychoeducational information compared to the control group, on almost all outcomes. Additionally, comparing the two suicide article groups, they did not find any effect of including educational material. This is consistent with the findings of an earlier US study (Anestis, Bryan et al., 2015) which also found no differences in plans and preparation for suicide, negative affect or suicide risk between groups of college students who read either a suicide article violating reporting guidelines, a suicide article with violations removed or non-suicide control article.

Arendt and colleagues (2016), in a study of 112 Austrian university students investigated the influence of news articles on implicit suicide cognition. Implicit cognition occurs when one concept automatically activates another, for example a suicidal individual may automatically associate the concept of 'death' with 'self'. This kind of implicit suicidal cognition has been shown to predict suicide-related behaviour (Nock and Banaji 2007). One group of students read a news article unrelated to suicide, and two intervention groups read a print article with a protagonist who copes with suicide crisis by contacting an intervention centre. The two intervention groups were different in terms of social similarity (i.e. how similar they were to the protagonist in the article). All then completed an Implicit Association Test that included two suicide related categories - (death, life), and identification (I, they) and an identification scale. There was some indication of a protective effect on suicidal cognition in participants who were exposed to the suicide article but who did not identify with the protagonist, while similarity to the person in the story did not have any effect on suicidal cognition. Several of these individual-level studies also suggested that newspaper reports may influence the attitude of readers towards people who suicide and their families. Calhoun, Selby and Faulstich (1980; 1982) found that participants were more likely to react negatively towards the family of a child whose death was described in a newspaper report if the child had died by suicide rather than as the result of an illness. Ginn, Range and Hailey (1988) and Range and Kastner (1988) found that participants were equally as likely to respond negatively towards the family when the child had attempted suicide as when he or she had completed suicide.

Other work has suggested that the way in which the reader views the person who dies by suicide and his or her family may be mediated by certain factors. Range, Bright and Ginn (1985) showed that varying the method used had no effect on the response of participants to the family. However, varying the age of the child (10, 13 and 17 years) did affect the response of participants to the family, with more negative responses being associated with the suicides of younger children. Participants were also more likely to think it appropriate for a newspaper item to report the cause of death in the case of older children.

Range and Martin (1990) found that participants were more likely to respond favourably to the report of a 35-year-old man taking his own life if he had done so in response to terminal illness rather than psychological pain.

In a Taiwanese study, exploring newspaper reporting of a celebrity suicide in a sample of individuals who have made an attempt on their life, Chen, Tsai et al. (2010) interviewed 63 individuals who have made an attempt on their life who had presented to a hospital in Taipei soon after media reporting of the suicide of a young female singing star Ivy Li. Participants were asked about news exposure and 68% of the participants indicated they had seen news reports of Ms Li's suicide while 37% reported being influenced by media reporting of the event. The researchers compared those who had been exposed to newspaper reports and those who had not and found that those who were exposed were more likely to have used the same method (charcoal burning) and were more socially similar to Ms Li in that they were younger and more likely to have experienced relationship loss, although there were more men in the exposed group.

Methodological issues

Various criticisms have been levelled at the above studies. Some have been specific, such as criticisms of Phillips' (1978; 1980) definitions of both murder-suicides and aeroplane fatalities (Altheide 1981). Others have been more general, and have been concerned with overall methodology (Wasserman 1984, Baron and Reiss 1985a, Baron and Reiss 1985b, Jonas 1992, Hittner 2005). As a general rule, the later studies have used much more sophisticated designs than the earlier studies, and have overcome many of the methodological issues identified.

It is generally recognised that descriptive studies have weaker designs than analytical studies (both ecological and individual-level) since the former are descriptive only and involve few or no comparisons. It is positive, therefore, that there is only a single descriptive study (the Australian case study by Hills (1995), and a multitude of analytical studies have been conducted.

The early ecological studies were criticised for their use of the quasi-experimental design approach, in which the frequency of suicides in an 'experimental' period in which a suicide article was published was compared with the frequency of suicides in comparable periods from previous (and often subsequent) years, and no attempt was made to control for statistical artefacts (Wasserman 1984, Baron and Reiss 1985a, Baron and Reiss 1985b, Jonas 1992, Hittner 2005). In the main, the later ecological studies have overcomethis problem by adopting more sophisticated regression analyses, and taking into account statistical artefacts such as autocorrelation (lack of independence between observations) and heteroscedasticity (lack of homogeneity of variance).

In 1992, Jonas warned that caution should be exercised in concluding from the existing body of ecological studies that there was an association between newspaper reports of suicide and actual suicides. At that time, with the exception of the studies by Motto (1967) and Blumenthal and Bergner (1973), all of the existing studies essentially adopted the same methodology to examine the same United States data (albeit that the later studies made certain methodological improvements over the earlier ones, and extended the observation period by some years). Today, however, there are numerous additional studies that have explored the phenomenon over different time periods in the United States, and in numerous other countries in Asia (Japan, Taiwan, Hong Kong, South Korea) and Europe (Germany, Austria, the United Kingdom and Switzerland). Studies in Australia and Canada have also been conducted.

Another criticism levelled at the earlier ecological studies was their lack of consideration of characteristics of the model in the newspaper story, characteristics of the alleged imitators who subsequently suicide, and the interaction between the two (Baron and Reiss 1985a, Baron and Reiss 1985b). Some early studies considered global features of the model (for example, celebrity status) (Wasserman 1984, Stack 1987a, Stack 1990), characteristics of those who suicide (for example, age and sex) (Barraclough, Shepherd et al. 1977), or the interaction between the two (for instance, the

age and sex of the model relative to the age and sex of the imitator) (Barraclough, Shepherd et al. 1977, Phillips 1977, Phillips 1979), but only in a very generalmanner. More recent studies, like that of Niederkrontenthaler, Till et al. (2009), Kim, Park et al. (2013), Chen, Yip et al. (2014) and Park et al. (2016), have done this in a more sophisticated way.

A key criticism that remains of the ecological studies is that they fall prey to the 'ecological fallacy', failing to demonstrate that those who subsequently died by suicide had actually seen the media report of interest. Again, this criticism particularly applies to the earlier studies which often were unable to demonstrate that newspaper coverage of a suicide story occurred prior to the observed increase in suicide rates, because they used aggregated (as opposed to daily) data has created difficulties in determining the chronology of events. Later studies have tended to use more precise data periods, but even many of these have not been able to present evidence to demonstrate that those who took their lives after the story was presented actually saw the stimulus. The exceptions are the studies by Yip, Fu et al. (2006) and Tousignant, Mishara et al. (2005), both of which found direct evidence in coroners' records that the reported suicide of a celebrity had influenced subsequent suicidal acts.

The latter criticism of the ecological studies is overcome by the individual-level studies, because the investigators have power over the conditions under which participants are exposed to newspaper items on suicide and over the nature of the items themselves. So, for example, in the individual-level studies the investigators can ensure that participants are exposed to the stimulus, and make certain that this exposure occurs before they are asked about their attitudes towards suicide. However, the individual- level studies have problems of their own. The most significant of these is that the dependent variable is almost always about attitudes (for example, towards those who suicide and their families) and perceptions (for example, of the likelihood of suicidal behaviour being imitated by self or others). These attitudes may have little bearing on actual behaviour. In addition, the participants in the individual-level studies are almost always drawn from the general population. It has been suggested that suicide stories in the press are most likely to influence those who are already vulnerable, and these people may be under-represented in the samples chosen to participate in the individual-level studies. Chen, Tsai et al.'s (2010) study of individuals who have made an attempt on their life, does overcome some of these issues, however as the comparison groups are people who have made an attempt on their life who were or were not exposed to the news reports it cannot answer the question of how many exposed individuals make suicide attempts, rather describes individuals where exposure to a media report may contribute to their suicidal behaviour compared to individuals where other factors are the cause of their suicidal behaviour.

It must also be acknowledged that, while there have been a handful of recent studies, most of the individual-level studies are now quite old, and work in this area does not seem to have continued in the same way that progress has been made with the ecological studies.

Summary and conclusions

In total, 56 studies (one descriptive study, 42 ecological studies and 13 individual-level studies) studies have examined the relationship between newspaper reports of suicide and actual suicides. The vast majority of these have provided at least some evidence to suggest that an association exists and that newspaper reports of suicide may exert a negative influence (see Table 2). To the extent that the effect has been reliably observed under almost all study methodologies suggests that the association is *consistent*.

Table 2: Summary of evidence from studies of newspapers

	Descriptive studies (n=1)	Analytical studies: Ecological(n=42)	Analytical studies: Individual-level (n=13)	Total (n=56)
Some evidence to suggest negative influence of media	1	37	9	47
No evidence to suggest negative influence of media	0	5	4	9

The *strength* of the relationship has also been demonstrated. Specifically, a number of studies have demonstrated a dose-response relationship, such that the greater the newspaper coverage of a particular suicide, the more substantial the increase in subsequent suicides.

Another key criterion for establishing a causal relationship between two events is that of *temporality*. In other words, a necessary condition for saying that event A caused event B is that event A occurs before event B. As noted above, only a few of the ecological studies have permitted the chronology of events to be determined. The individual-level studies are stronger in this regard, because the stimuli could be manipulated by the investigators.

Related to the temporality is *specificity*. The causes of suicide are known to be multi-factorial, so specificity is not as crucial a criterion in this area as it might be in some others. In other words, to be satisfied that a causal relationship existed between newspaper coverage and actual suicides, one would need to be sure that a reasonable proportion of those who subsequently died by suicide were exposed to the stimulus. Again, the ecological studies fail in this regard. The relationship may be highly specific, but the primary study methodology adopted in this area militates against determining this.

Coherence refers to the extent to which the findings make sense in the light of what is known about the influence of the media and suicide. The media is known to influence attitudes and behaviour in other areas. Suicide is a behaviour that has been shown to be imitated under circumstances where the original suicide model is actually known to the imitator, and this has been demonstrated in numerous studies of suicide clusters. To this extent, the findings from the studies on newspaper reports of suicide demonstrate coherence.

To summarise, then, the association between newspaper coverage of suicides and actual suicides would appear to be *consistent, strong* and *coherent*. Although the evidence is less reliable with regard to *temporality* and *specificity*, it is probably reasonable to regard the association as causal.

Chapter 3: Television

Descriptive studies

No descriptive studies were identified that examined the relationship between presentation of suicide on television news and current affairs shows and actual suicidal behaviour.

Analytical studies: Ecological

A number of ecological studies have been conducted in the United States examining the impact of televised news stories about suicide on actual suicide rates. Many of these studies suggest that an association exists, but there are some exceptions.

In the first of these studies, Bollen and Phillips (1982) searched the Vanderbilt Television News Archive for suicide stories concerning individuals carried on two or more United States evening news programs on ABC, CBS or NBC between 1972 and 1976. Once they had identified these stories by date, they examined their association with trends in the national suicide rate, using daily mortality statistics provided by the National Center for Health Statistics. They used both of the statistical approaches developed in the studies on newspaper reports of suicide: the quasi-experimental design approach originally used by Phillips (1974), and the more rigorous and conventional regression analysis used in later studies, which provides better control for extraneous variables such as seasonal and trendfactors. Bollen and Phillips found that there was an increase in the national suicide rate in the period after a televised news story about suicide. They went on to systematically investigate the duration of the effect, finding that it did not extend beyond 10 days.

Phillips and Carstensen (1986) conducted a similar study, restricting the analysis to actual suicides by teenagers between 1973 and 1979. They considered fluctuations in national numbers of suicides by teenagers in the context of suicide stories appearing on network television evening news programs (again using the Vanderbilt Television News Archive). In a regression analysis that controlled for day of the week, the month, holidays and yearly trends, they found that the number of teenage suicides increased in the seven days following a broadcast. This effect occurred regardless of whether the suicide story was about the suicide of an individual or whether it was a general information or feature item. Hittner (2005) re-analysed Phillips and Carstensen (1986) data 20 years later, at the same time as he re- analysed Phillips' (1974) (see Chapter 2). Using statistical techniques that controlled for the dependency between the expected and observed suicide rates before examining the impact of media publicity on the observed number of suicides, he found partial support for an imitation effect in some but not all of the pairwise comparisons.

Phillips and Carstensen (1988) followed their 1986 study with one that was more limited geographically (being restricted to California), but covered a longer period (1968–85), and considered the impact of televised news stories about suicide on a broader range of demographic groups. The study was also novel in that it considered suicides in terms of the date of injury as well as the date of death. Atime- series regression analysis indicated that there was a strong association between suicide stories and actual suicides, even when other variables were statistically controlled. This effect was evident for all demographic groups, but was particularly strong for teenagers.

Stack (1989) considered a specific subgroup of stories, namely those about mass murder-suicides or mass murders. He hypothesised that such stories might not only trigger suicides, but could affect

homicides. He identified murder-suicide and mass-murder stories presented on at least two network news broadcasts between 1968 and 1980. Using monthly national data and controlling for a range of seasonal and economic predictors of aggression, he found that publicised mass murder-suicides and gangland mass murders were associated with an increase in suicides (but not homicides).

As noted above, Phillips and Carstensen (1986; 1988) considered a particular audience subgroup, and Stack (1989) considered a certain subgroup of stories. Stack (1990a) took this work one step further and considered the interplay between the nature of the audience and the nature of the televised stimulus. Hypothesising that the elderly might be particularly receptive to publicised suicide stories, given their life circumstances, he considered the national number of suicides by those aged over 64 in the context of televised news reports on suicide. Using data from the Vanderbilt Television News Archive between 1968 and 1980, he identified all suicide stories and a subgroup of suicide stories in which the subject was elderly. In a regression analysis that controlled for seasonal and economic factors, he showed that months in which there was a publicised suicide story had an average of 10 additional elderly suicides. In months in which the suicide of an elderly individual was publicised, there was an average of 19 additional elderly suicides.

Using data from the same period (1968–80), Stack (1993) went on to consider whether the impact of media stories was dependent on the existing societal mood. Using unemployment levels as a proxy for suicidogenic conditions, he found that there was an interaction between media stories and the rate of unemployment, but together they were no more powerful a predictor of suicide rates than media coverage alone.

Romer, Jamieson and Jamieson (2006) examined suicide news reporting for four months in 1993 in six United States cities, arguing that a study of the local impact of local news was more precise than the previous studies in the United States of national news. They employed a sophisticated design, where they identified stories on television news in each of the cities and examined their association with suicide rates in these cities, while controlling for the effect of a number of confounders (including other news and information media and entertainment media sources of suicide stories). They found that local television reports of suicide were associated with increases in local suicide rates.

As noted above, while the majority of studies suggest that there is an association between televised suicide stories and actual suicide rates, several studies have produced null findings. Kessler and his colleagues replicated the study of Phillips and Carstensen (1986), extending the analysis period to 1973– 84, supplementing the Vanderbilt Television News Archive with the CBS News Index and the unpublished archive of NBC news stories, and adjusting for the fact that some stories are updated over a period of days (Kessler, Downey et al. 1988, Kessler, Downey et al. 1989). They also refined Phillips and Carstensen's analysis method, including a variable derived from industry statistics that defined the level of exposure to broadcasts about suicide on the given day. They found that, although the number of teenage suicides increased as a function of news stories about suicide in 1973– 80, this was not the case in 1981–84. Horton and Stack (1984) also used the Vanderbilt Television News Archive to explore the relationship between the number of seconds of coverage of suicide stories on the 6.00 pm national news and the monthly suicide rates in 1972–80. Controlling for levels of unemployment and divorce, as well as for seasonality, they found that there was no relationship between television reporting of suicide and actual suicide rates.

Few studies have been conducted outside the United States. Shoval, Zalsman et al. (2005) undertook a study in Israel that also differed in content from the other studies as well. Rather than examining the impact of television news, it was concerned with the influence of a television documentary screened in Israel in 2001, in which an adolescent girl was interviewed about her suicide plan and ultimately died. It involved a comparison of the numbers of completed and attempted suicides in Israel in the eight weeks prior to the screening of the documentary and in the four weeks subsequent to it. Data for the equivalent periods in the preceding year were examined, in order to control for seasonal effects. The investigators found no significant increase in the rates of completed or attempted suicide following the program, although there was some evidence of shifts in age and method which corresponded to the subject of the documentary.

In South Korea, Jeong, Shin et al. (2012) examined five celebrity suicide deaths reported on the three national TV news channels between January 2005 and December 2008. Using the National Emergency Department database, they calculated weekly suicide attempt visits and then calculated the expected and observed suicide attempt visits for seven observation periods: two pre-celebrity suicide weeks, one reference week, and four post-event weeks. They observed a significant increase in visits in first three weeks following a celebrity suicide compared to the reference week, with the excess visits peaking in the second week following the celebrity suicide.

Analytical studies: Individual-level

No individual-level analytical studies were identified that examined the relationship between presentation of suicide on television news and current affairs shows and actual suicidal behaviour.

Methodological issues

Many of the methodological criticisms that have been levelled at studies of the impact of newspaper reports of suicide can and have been made of the studies considering news reporting of suicide on television.

Although these studies have tended to adopt more appropriate analysis strategies than the early newspaper studies (that is, analysing time-series data by multiple regression, rather than quasi-experimental methods), the earlier studies have still been criticised for failing to control for statistical artefacts such as autocorrelation and heteroscedasticity (Baron and Reiss 1985a, 1985b).

Like their newspaper counterparts, the majority of television news studies fall prey to the 'ecological fallacy', failing to demonstrate that the publicised suicide occurred before the actual suicides, let alone to demonstrate that those who suicided saw the televised stimulus (Marks 1987, Mastroianni 1987).

In addition, the majority of these studies fail to consider the nature of the suicide story, the nature of the audience and the interaction between the two. Clark (1989)(Clark 1989), for example, was critical of Kessler's work because he and his colleagues failed to distinguish between stories of celebrity and non-celebrity suicides (Kessler et al., 1988; Kessler et al., 1989). The only study which considered model and audience characteristics in tandem was that of Stack (1990a).

How well these studies can be extrapolated to apply to other situations should also be questioned. Almost all were conducted in the United States, and, apart from the recent study by Romer, Jamieson and Jamieson (2006), most used essentially the same data. The only study conducted outside the United States was that of Shoval, Zalsman et al. (2005), and that dealt with the influence of a documentary rather than television news.

Summary and conclusions

Twelve ecological studies have been conducted which, in the main, suggest that there is an association between reporting of suicide on television news and actual suicides (Bollen & Phillips, 1982; Phillips & Carstensen, 1986, 1988; Romer, Jamieson et al., 2006; Stack, 1989, 1990a) and one with suicide attempts (Jeong, Shin et al., 2012). Although there are a few exceptional studies with null findings (Horton & Stack, 1984; Kessler, Downey et al., 1988; Kessler, Downey et al., 1989; Shoval, Zalsman et al., 2005), it is reasonable to say that this association demonstrate *consistency* (see Table 3).

Table 3: Summary of evidence from studies oftelevision

	Descriptive studies (n=0)	Analytical studies: Ecological(n=12)	Analytical studies: Individual-level (n=0)	Total (n=12)
Some evidence to suggest negative influence of media	0	8	0	8
No evidence to suggest negative influence of media	0	4	0	4

The association also demonstrates *strength*, in that it is most evident up to 10 days to three weeks after the media stimulus and then dissipates (Bollen & Phillips, 1982, Jeong, Shin et al. 2012).

The condition of *temporality* and *specificity* are less readily satisfied because the ecological studies fail to demonstrate that the publicised suicide occurred before the actual suicides (because their data are based on monthly, rather than daily, figures) or that those who subsequently died by suicide saw the televised stimulus. The ecological studies concerned with television are not complemented by descriptive studies or individual-level analytical studies which might shed more light on these criteria.

The association is *coherent*, considering what is known about the influence of the media and suicide. As noted earlier, the media is known to influence attitudes and behaviour in other areas, and suicide is a behaviour that has been shown to be susceptible to imitation, as evidenced by suicide clusters.

In summary, the association demonstrates consistency, *strength* and *coherence*. Despite the fact that *temporality* and *specificity* are less clearly demonstrated, it is probably reasonable to assert that there is cautious support for there being a causal association between reporting of suicide on television news and subsequent actual suicides.

Chapter 4: Books

Descriptive studies

Three descriptive studies conducted in the 1990s considered the impact of *Final Exit*, a bestselling book advocating euthanasia for people who are terminally ill (Humphry, 1991). The book explicitly describes methods of suicide that might be used to guarantee a relatively painless death, and one that might be less traumatic for relatives to deal with than one caused by more violent means (Humphry, 1994). *Final Exit* is aimed at those with a terminal illness, but it has been criticised for failing to address the fact that it may prompt other individuals to attempt suicide, particularly those with mental illness (Lavin, Martin et al. 1992, Sacks and Kemperman 1992, Marzuk, Tardiff et al. 1993, Marzuk, Tardiff et al. 1994, Land and Gutheil 1995, Marzuk, Tardiff et al. 1995).

The first of the descriptive studies was conducted by Lavin, Martin and Roy (1992). They reported a case of a depressed 30-year-old single black woman who was admitted to an emergency department after self-harming. She had multiple stresses (for example, she was pregnant and unable to trace the child's father, had lost her job, and was about to be evicted from her flat), but reported that she had only felt really 'down' in the last few days. She had gone to some lengths to obtain a copy of *Final Exit*, after hearing about it on television. She said that she had attempted to follow the advice provided in the book, but was thwarted by being unable to obtain drugs from a pharmacy, and thus had selected the alternative method. Soon after admission, her suicidal mood improved. At follow-up after discharge, her circumstances had improved and she reported feeling much better and hopeful about the future. Lavin, Martin and Roy concluded that it is possible that such 'how to' literature could lead to a clustering of suicide attempts.

A second study of two cases was reported by Sacks and Kemperman (1992). One was of a 47-year-old man and the other concerned a 31-year-old woman, who attempted suicide after reading *Final Exit*. The man had bought the book in order to learn the fatal dose of diazepam and the woman had bought it 'just in case'. Both followed instructions provided in the book, and felt comforted by it. Although neither of their attempts resulted in death, both had expected to die. Sacks and Kemperman concluded that clinicians should consider the availability of the book when conducting suicide risk assessments.

Land and Gutheil (1995) conducted the third descriptive study. They reported a case of a depressed 54year-old black man in a forensic psychiatric facility who attempted to order *Final Exit* from the facility's library. He had heard about the book while watching a television program about suicide. The librarian alerted clinical staff, who found the man to be depressed and suicidal. They intervened pharmacologically, and he responded well. Like Sacks and Kemperman, the investigators concluded that the clinical assessment of suicide risk should include consideration of patients' access to 'how to' literature, a recommendation supported by Marzuk, Tardiff and Leon (1994; 1995).

Analytical studies: Ecological

The above descriptive studies were complemented by two ecological studies of the impact of *Final Exit*, both conducted by Marzuk and colleagues. Marzuk, Tardiff and Hirsch et al. (1993) considered suicides occurring in New York between 1 March 1990 and 28 February 1992. This time frame made it possible to consider suicides occurring before the publication of Final Exit (on 1 March 1991) and after its publication. Classifying deaths by method, they found a significant increase in the number of suicides by

asphyxiation, and no increase in suicides by any other method (including the use of medications, recommended in Final Exit), and no increase in the total number of suicides. Marzuk et al. took their study a step further than many ecological studies do, and attempted to disaggregate the effect down to the individual level. They took all suicides by asphyxiation and/or poisoning in the year after the publication of *Final Exit*, and examined exposure to the book. Fifteen of the 144 who died by these means in that year had been exposed to the book, evidenced by the book being present at the site of the suicide, or suicide notes modelled on an example given in the book. Six of the 15 showed no evidence of serious medical illness, based on clinical notes and autopsyresults.

Marzuk, Tardiff and Leon (1994) extended their earlier work in a broader study. Taking suicide statistics for the whole of the United States, and again classifying them by method, they examined trends in the years before and after the publication of *Final Exit*. Once again, they found that there was a significant increase in suicides by asphyxiation. There was also a significant increase in suicides by poisoning. There was no increase in suicides by any other method, and no increase in the total number of suicides.

Analytical studies: Individual-level

No individual-level analytical studies were identified that examined the relationship between presentation of suicide on television news and current affairs shows and actual suicidal behaviour.

Methodological issues

The main methodological difficulty with the studies examining the effect of instructional books about suicide on suicidal behaviour is the extent to which the findings can be generalised. This is traditionally a problem with case studies, in that critical readers should always be concerned with the extent to which findings for particular individuals would be likely to be replicated among a larger sample. In this instance, the findings of the case studies are generally supported by the ecological studies. To this extent, the evidence indicates that the findings of the case studies can be generalised. However, it should still be noted that both the case studies and the ecological studies all refer to a single example of the presentation of information about suicide in books. It remains to be tested whether the findings would hold true with different stimuli.

The above studies also suffer from the methodological difficulty experienced in studies of other types of media presentation, namely the problem of making inferences about individuals from aggregated data. Having said this, it should be noted that the study by Marzuk, Tardiff and Hirsch et al. (1993) was exceptional in its efforts to move from the aggregate level to the individual level to determine the extent to which individuals who died by suicide were exposed to *Final Exit*.

An additional methodological criticism has been noted by the author of *Final Exit*. Humphry (1994) makes the point that the number of suicides by people with mental illness who adopt the methods suggested in *Final Exit* may be artificially magnified. He notes that those with terminal illness who choose to die by the euthanasia methods recommended in the book would often be supported by a family member or friend. Under these circumstances, the evidence of method would usually be removed after death, with the result that the coroner would record the underlying illness as the cause of death. By contrast, people with depression or other mental illnesses who suicide using such methods would typically do so alone, with the result that the cause and means of death would be obvious.

Summary and conclusions

The association between the presentation of suicide in instructional books and actual suicides would appear to be *consistent*. Taken together, the findings of three case studies (Land & Gutheil, 1995; Lavin et al., 1992; Sacks & Kemperman, 1992) and two ecological studies (Marzuk, Tardiff et al., 1993; Marzuk, Tardiff et al., 1994) suggest that *Final Exit* has been influential in the choice of method of suicide in a number of cases (see Table 4). What is less clear is whether the book has influenced any individuals to consider, attempt or complete suicide who otherwise would not have done so. The fact that Marzuk and his colleagues found an increase in rates of suicide by asphyxiation, but no increase in total suicide rates, after the publication of the book, suggests that its influence may have been limited to choice of method.

	Descriptive studies (n=3)	Analytical studies: Ecological (n=2)	Analytical studies: Individual-level (n=0)	Total (n=5)
Some evidence to suggest negative influence of media	3	2	0	5
No evidence to suggest negative influence of media	0	0	0	0

Table 4: Summary of evidence from studies of books

These studies have not been designed in such a way as to enable an examination of the *strength* of the association. All have been based on exposure to a single stimulus, thus precluding any examination of a dose-response effect.

The *temporality* of the association has been demonstrated on several occasions, with the acquisition and scrutiny of *Final Exit* routinely preceding the suicide attempt. The *specificity* of the effect has also been demonstrated by the significant number of individuals showing evidence of having been influenced by the book, at least in the study by Marzuk, Tardiff and Hirsch et al. (1993).

The association would also appear to have *coherence*, in that it makes theoretical sense that a nonfiction book providing advice about suicide could influence suicidal individuals.

To the extent that the association satisfies the conditions of *consistency, temporality, specificity* and *coherence,* it would appear to be reasonable to deem it to be causal. Having said this, some caution should be exercised in generalising this finding to other non-fiction books, since all studies refer to *Final Exit* alone.

Chapter 5: The Internet

Descriptive studies

A number of descriptive case studies have been cited as evidence in support of the claim that prosuicide websites can lead to loss of lives. These case studies link an individual's suicidal act to their contact with a specific website or websites and usually describe individuals (most often young people) who sought web-based information about a particular suicide method (Baume, Cantor et al. 1997, Nordt, Kelly et al. 1998, Alao and Yolles 1999, Beatson, Hosty et al. 2000, Mehlum 2000, Janson, Alessandrini et al. 2001, Athanaselis, Stefanidou et al. 2002, Chodorowski and Sein 2002, Gallagher, Smith et al. 2003, Wehner and Gawatz 2003, Becker, Mayer et al. 2004, Becker and Schmidt 2004, Prior 2004, Rajagopal 2004, D'Hulster and Van Heeringen 2006, Forsthoff, Hummel et al. 2006, Mishara and Weisstub 2007, Naito 2007, Corkery, Button et al. 2010, Schneider, Diederich et al. 2010, Cantrell and Minns 2011, Laberke, Bock et al. 2011, Musshoff, Kirschbaum et al. 2011, Gosselink, Siegel et al. 2012, Zorro 2014, Le Garff, Delannoy et al. 2016, Wong, Wong et al. 2017). Some of the individuals described in case studies were found dead with, for example, the given website listed among their 'favourites'. Others - some of whom subsequently died and some of whom survived – presented to the emergency department and told staff of their information source. Taking a different approach, Gunnell, Bennewith et al. (2012) examined 593 coroners reports on suicide cases in the UK in 2005 for evidence of Internet involvement. They found only nine reports (1.5%) contained any finding of the Internet having been involved, most usually in obtaining information on methods.

Some case studies also note that the individual used the Internet to access the materials required for their chosen method (Gosselink, Siegel et al. 2012, Le Garff, Delannoy et al. 2016). Interestingly, Biddle, Gunnell et al. (2012) in their study of 22 survivors of near fatal suicide attempts, found that the eight individuals who reported having used the information they found on the Internet to conduct their attempt did not find that information on suicide-specific or pro-suicide websites, rather they accessed professional information resources, general knowledge sites and news websites.

A number of case studies examine activity in pro-suicide forums or chat rooms. Four describe suicide pacts in which individuals attempted or died by suicide with chat room companions, either online or at a designated meeting spot (Mehlum, 2000; Mishara & Weisstub, 2007;Laberke, Bock et al. 2011) or attempted to solicit companions for a suicide pact (Wong, Wong et al. 2017). Several of these pacts involved a dominant, older person and a more vulnerable younger person (or sometimes more than one). Two further case studies describe online suicidal activity including expressing intent and describing plans (Ruder, Hatch et al. 2011) and live-broadcasting suicide attempts (including fatal ones) (Ma, Zhang et al. 2016).

Finally, three descriptive reports present content analysis of posts in online fora responding to suicidal acts, either reports of suicides in other media (Sisask, Varnik et al. 2005), or to suicidal material or behaviour encountered online (Fu, Cheng et al. 2013, Westerlund, Hadlaczky et al. 2015).

Sisask, Varnik and Wasserman (2005) conducted a larger-scale descriptive study in which they identified seven Internet portrayals of a suicide pact involving a 14-year- old girl and a 15-year-old boy who attempted suicide in their car (and survived). The Internet portrayals came from the sites of three of the most widely-read daily newspapers in Estonia, *Eesti Paevaleht (Estonian Daily Paper)*,

Potimees (Postman) and *SL Ohtuleht (Evening Paper),* and varied in terms of the extent to which they met media guidelines produced by the World Health Organization and the American Foundation for Suicide Prevention. The authors conducted a content analysis of the 188 spontaneous comments on these portrayals posted on the newspapers' websites by readers. Articles with photographs attracted the greatest number of comments. More than half of the comments expressed negative attitudes towards suicide.

Also analysing online comments about a suicide, but this time responses made before, during and immediately after the suicide, Westerlund, Hadlaczky et al. (2015) examined the 608 messages posted before, during and after the suicide. They found that nearly half the posted messages before the suicide encouraged the man to complete the suicidal act. During and after, approximately 10% of posts questioned the authenticity (despite the streaming). Among those expressing a view on the suicide 49% thought it was tragic, however 24% posts said it was exciting, interesting, or funny. Of the posts that mentioned prevention, 62% expressed the opinion the suicide could have been prevented.

Fu and colleagues (2013) analysed the content of 5971 microblogs responding to a post of a wristcutting picture that circulated widely in China in 2011. They found that 36.6% of responses were providing peer-support or help, 23.4% expressed negative attitudes, 19.5% expressed shock and 20.4% were re-posts.

Analytical studies: Ecological

Since 2011 a number of ecological studies have appeared investigating if the volume of suiciderelated Internet searches or social media activity is related to suicide rates in different countries. Multiple studies have investigated correlations with suicide rates and Internet search activity using Google Trends or Google Insights web-based software that allows gathering of statistics on queries made using the Google search engine.

In Taiwan, Yang and colleagues (2011) investigated a broad set of search terms related to suicide, including psychiatric, medical, familial, socioeconomic and pro-suicide terms, and suicide rates from 2004 to 2009. They found that searches for major depression and divorce were associated with adult (both genders combined) suicide rates, and male suicide rates, and anxiety searches with female suicide rates. They examined the timing of searches and trends in suicide data and found that no searches lagged behind suicide data, search terms including major depression, suicide or domestic violence coincided with suicide data, while others including 'complete guide to suicide' preceded suicide data.

Using a more refined set of search terms, Hagihara, Miyazaki et al. (2012) examined monthly timeseries data from Jan 2004 to May 2010 for the top 10 Google suicide-related searches and compared search volumes to suicide incidence among 20 and 30-year-olds. They found that three search terms "hydrogen sulphide", "hydrogen sulphide suicide" and "suicide hydrogen sulphide" were related the overall number of suicides in adults aged 20-29 years and 30-39 years, albeit with a time shift of 11 months. They calculated that an increase by 10 units in the frequency of queries about 'hydrogen sulphide' was related to 6.94 and 6.97 additional suicide cases approximately 11 months after people in their 20s and 30s, respectively, performed an Internet search using this term. For search queries using 'suicide hydrogen sulphide' the figures were 7.00 and 7.11 respectively. Other suicide related search terms were not correlated to incidence of suicide in either age group.

Song, Song et al. (2014) in South Korea used multi-level modeling to analyse monthly data on suicide and Google searches for the words "suicide" and "stress, exercise, and drinking" between 2004 and

2010. They found that the volume of suicide-related Google searches followed a similar trend to the actual suicide rates in Korea which increased during that period. They also noted that a greater volume of stress-related searches were associated with increased volume of suicide-related searches.

Examining monthly suicide rates and monthly Internet search volume for terms relating to suicide methods, "depression and suicide", and "suicide help", in the UK from 2004 to 2010, Bruckner, McClure et al. (2014) observed a positive relation between Internet search volume for "suicide and depression" terms and suicide deaths in the same month, but not for methods or help-related terms. Another UK study examining Google searches for suicide-related terms including "suicide", "depression", "divorce", "hopeless" and "unemployed" and suicide rates among 15 to 65-year-olds from 2004 to 2013, found a correlation for the 25 to 34-year-old group only (Arora, Stuckler et al. 2016).

Finally, Tran and colleagues (2017) investigated the volume of suicide-related searches, including searches of risk factors such as unemployment, in the USA and Switzerland (2004-2010) Germany and Austria (2004 to 2012) and suicide incidence during the same period. They found in all four countries that the volume of Internet searches on suicide did not predict national suicide rates.

Two further studies examined volume of other suicide-related Internet activity. In South Korea, Lee, Ahn et al. (2014) investigated the correlation between exposure to information about charcoalburning suicide on the Internet and the prevalence of charcoal burning suicides. They examined weekly suicide data from 2007-2011 – a period that saw a 14-fold increase in the use of that method – and weekly number of Internet news articles, posts to online communities and Internet searches related to charcoal burning suicide for the same 261 weeks. They found a positive linear relationship between Internet news and posts as well as for Internet searches relating to charcoal burning suicides and suicide by charcoal burning. The authors note that following the initial period of concentrated media coverage Internet reports and searches either followed or were simultaneous with charcoal burning suicide incidence. In the USA, Jashinsky, Burton et al. (2014) used keywords for suicide risk factors to filter at-risk tweets from the Twitter stream for a three-month period. From 1,659,274 tweets they identified 37,717 suicide-risk tweets. Examining the correlation by state, they found a strong correlation between state suicide-related twitter data and actual state age-adjusted suicide data.

As with other media, Internet studies have also investigated the role of celebrity suicides. In South Korea, Won and colleagues (2013) looked at social media activity in relation to national suicide rates in general from Jan 2008 to Dec 2010, and included an examination of effects following celebrity suicides (6 in the time period). They examined suicide and dysphoria weblog counts – that is the number of daily documents referring to either. They found both long- and short-term associations of social media volume with national suicide rate (controlling for celebrity suicides). They also found that suicide weblog activity was more responsive to celebrity suicide, and that short-term increases in weblog activity following a celebrity suicide were associated with a concurrent spiking in suicide rates.

Koburger and colleagues (2015) extended their 2013 study of the effect of media coverage of the railway suicide of Robert Enke (a German footballer) on railway suicide rates to examine Internet activity in four European countries: Germany, Netherlands, Austria, Slovakia and Hungry. They collected weekly numbers of Google Trend searches for 'Enke' and "Suicide" as separate terms and looked at correlations between searches and weekly railway suicides in the 10 weeks post-Enke's death. In Germany, there was a significant correlation between frequency of google searches for term "Enke" and frequency of railway suicides in that period, but not for 'suicide' only searches. In the other countries, the search for 'Enke' was not associated with railway suicides but in the Netherlands, there was a significant association between increased railway suicides and Google searches on 'suicide'.

Analytical studies: Individual-level

Two main types of individual-level studies explore the relationship of Internet use and suicidal behaviour. The first type look at suicidal outcomes (usually suicide ideation) associated with some aspect of suicide-related Internet use (most often participating in online suicide-related communities/forums). The second type compares individuals who use the Internet for suicide-related purposes with those who do not in order to discern any distinguishing characteristics of suicide-related Internet users. In those studies, suicidal ideation and behaviour is considered as one such characteristic. While these second group of studies do not meet the inclusion criteria for this review, they are of interest and so we have included them in a supplementary chapter at the end of the report.

Studies with suicide-related outcomes examine a range of online activities including searching for information on methods, participation in forums, and using Twitter. In a random sample of 1,808 adults from a Japanese national population survey, Aiba, Matsui et al. (2011) examine accessing suicide-related websites and suicidal ideation, controlling for stress, depression, social support, and demographics. Investigating potential causal pathways from suicide-related Internet use to actual suicidal behaviour, they found that for men in their 20s to 50s, accessing suicide websites was related to increased suicidal ideation via depression. In the total sample, those with suicidal ideation were more likely to have accessed suicide-related sites.

In the USA, a group of 719 young people aged 14-24 who participated in a national youth survey were interviewed after again after one-year interval (Dunlop, More et al. 2011) At follow-up they were asked about recent exposure to suicide (the past few months) from various sources including family and friends, online news sites, video sites such as YouTube, online forum/discussion board/self-help websites, social networking sites such as Facebook, or anywhere else online. Suicidal ideation was assessed at both time-points. Controlling for prior hopelessness and suicidal ideation, at follow-up only exposure to suicide-related material in online forums was associated with suicidal ideation. The study did examine other sources of exposure to suicidal stories, and found that while 59% of respondents had been exposed to online suicide material, other sources such as newspapers, family or friends were more common (79%).

Sueki and colleagues undertook several studies of suicide-related Internet use in Japan including two prospective studies. In 2011 he surveyed 850 Internet users once in February and again in May 2011 (Sueki 2013). He reported the frequency of four types of suicide-related Internet use (consulting with an anonymous other about mental health, sharing suicidal ideation, searching suicide methods, viewing suicide methods), as well on current suicidal ideation. The model examining change between data collection periods was a poor fit, so they analysed cross-sectional data from the second time-point only and found that more frequent suicide-related Internet use (with the exception of sharing suicidal ideation) was associated with increased suicidal ideation.

In a subsequent online prospective study 5,495 Japanese 20 to 49-year-olds were surveyed at baseline, after one week and after seven weeks (Sueki, Yonemoto et al. 2014). Suicidal ideation over time was compared between those who used Internet for suicide-related or mental health consultation-related reasons and those who did not (controls). Compared to controls, users who had consulted the Internet for suicide- or mental health-related reasons (combined) showed a significant increase in suicidal ideation from week one to week seven. Further analysis showed those who used the Internet to disclose their suicidal ideation and/or browse for information on suicide methods had a significant increase in suicidal ideation from week one to week seven, but those who consulted the Internet for mental health related necessary is showed the seven.

Finally, in a cross-sectional study in 2015, Sueki examined Twitter use and history of suicidal

behaviour in 14,529 Japanese young people in their 20s. After controlling for sex, age, sociodemographics, depression, alcohol use and anxiety, he found that having a twitter account and tweeting daily was not associated with suicidal behaviour. However, tweeting 'want to die' was associated with lifetime history of suicidal ideation, suicide plans and suicide attempt. Tweeting 'want to commit suicide' was associated with lifetime suicide attempt.

Not all individual level studies found an association. Two studies of suicide bulletin board (BSB) users found that participation was associated with lower suicidal ideation. In 2012, Sueki and Eichenberg conducted an online survey of 301 suicide bulletin board users from Germany and Japan. They questioned users about their motivations for using suicide bulletin boards, and asked them to rate the strength of suicidal thoughts before their first visit to a suicide bulletin board and their current suicidal thoughts. They identified three groups of users, a self-help group, an ambivalent group, and a non-specified group. The results indicated that for all users suicidal decreased since using the BBS, but that there was a greater reduction in suicidal thoughts in the self-help group than the other two groups. This is consistent with the earlier study by Eichenberg (2008), where 164 forum participants were asked to rate the extent of their suicidal thoughts from the period before they joined the most-frequented German-language suicide forum and at the time of the survey. Participants also reported a significant reduction in the extent of their suicidal thoughts compared to the period before they joined they joined the forum.

Overall, these individual-level studies examine a diversity of Internet uses and while most show some effects it appears that these vary across different types of Internet activity and are more or less salient in different segments of the population.

Methodological issues

The methodological issues faced in studies of other media are compounded in studies of the Internet because of the fluid nature of the medium and by its scope. Whereas it is relatively simple to identify a set of stimuli that an individual might have been exposed to in the traditional media (e.g., suicide stories appearing during a particular period in the New York Times), it is much more difficult to identify which suicide-related sites on the Internet an individual may have accessed. These sites are multitudinous: in the late 1990s, Baume and his colleagues found that a search for the word 'suicide' using a single search engine on the Internet yielded over 130,000 matches (Baume, Cantor et al. 1997, Baume, Rolfe et al. 1998); in 2000, Mehlum conducted a similar search and found more than one million web pages; repeating the search in 2010 yields about 55,000,000 hits. More recent studies have attempted to describe the scope of suicide-related material available on the Internet both in terms of volume and content. In general, they have found that there are more 'protective' websites (prevention, advice, help resources, research, support) than pro-suicide websites (Recupero, Harms et al. 2008, Kemp and Collings 2011, Westerlund, Hadlaczky et al. 2012, Till and Niederkrotenthaler 2014, Singaravelu, Stewart et al. 2015). Singaravelu and colleagues (2015) noted that the terms entered into a search engine can change the mix of pro- and anti-suicide sites, for example searches on methods or 'ways to kill yourself' resulted in more pro-suicide sites being retrieved. Biddle, Gunnell et al. (2016) documented an increase from 2007 to 2014 in the number of sites with harmful content. Tracking user follow-up of search results, Wong, Wong et al. 2013 reviewed America Online (AOL) searching/browsing behaviours for suicide related content between March and May 2006. They found that of all AOL gueries, 3392 (.026%) included word 'suicide'. Following those queries, 1314 webpages were accessed, the majority being entertainment (30%), scientific information (18%) and community resources (14%) while only two pro-suicide websites were accessed. Finally, all the above studies only included sites which are accessible through the major search platforms and not areas of the Internet such as the 'deep web' where more illicit, risky, and controversial material, including suicide-related material, is available and accessible with a relatively low-level of technical capability.

While it is difficult to determine the reach of pro-suicide related material on the Internet, the availability of analytic websites such as Google Trends means that data on volumes of search activity can be retrieved for specific pro-suicide search terms delimited by time period and geographic region. These data have been used in ecological studies adopting similar approaches used with other media in examining volume of suicide-related search activity and suicide rates. As with ecological studies of other media, these types of ecological studies of Internet use suffer from the 'ecological fallacy': they do not permit a determination of whether those who die by suicide have actually been exposed to suicide-related material or not.

Individual level studies can determine if an individual has engaged with suicide-related material on the Internet. The majority of individual level studies are cross-sectional and so cannot determine if there is a causal relationship between suicide-related Internet use and suicidal behaviour. Indeed, half the current studies use suicidal ideation as an outcome for suicide-related Internet exposure, and the other half examine suicidality as a risk-factor for engaging in suicide-related Internet use. There are, however, a small number of prospective studies, which generally do find that suicidal ideation increases over time among those who browse for/view suicide methods and/or disclose suicidal ideation online (Sueki 2014) and who participate in online suicide forums (Dunlop, Moore et al. 2011).

Despite the surge in research on suicidal behaviour and the Internet, the majority of reports remain descriptive case studies where a retrospective assessment of exposure for an individual is made. These case studies suffer from the problem of being descriptive only, reporting on very small numbers of individuals, and having no comparator.

Summary and conclusions

Drawing conclusions about the relation between suicide-related Internet activity and suicidal behaviour is complicated by the wide range of material and activities that Internet use includes. Some are comparable to traditional media, for example online news websites reporting on celebrity suicides, but most involve a greater level of user agency – for example searching for methods and procuring means, disclosing suicide ideation or intent or even broadcasting suicidal acts – as well as interaction with other individuals via social media or in suicide-related forums. These latter aspects of the Internet represent a paradigm shift from traditional media, and consequently the model of 'media effects' may need to be expanded to account for this relatively new medium.

Despite these complications, in the past 10 years there has been a substantial increase in research into the effects of suicide-related Internet use and suicidal behaviour which, despite the above methodological difficulties, contributes to mounting evidence with respect to the association between suicide-related Internet activity and actual suicidal behaviour.

The association would appear to be *consistent* (see Table 5). Case studies still predominate; however, they are large in number and come from a range of countries, and their findings appear to tell the same story. The majority of ecological studies find a correlation with volume of suicide-related Internet activity and suicide rates. Although individual level studies investigate a range of different online activities and demographic groups, the general direction of the findings supports that pro-suicide-related Internet activity influences suicidal behaviours.

Table 5: Summary of evidence from studies of the Internet

	Descriptive studies* (n=33)	Analytical studies: Ecological (n=10)**	Analytical studies: Individual-level (n=7)***	Total (n=50)
Some evidence to suggest negative influence of media	33	8	5	46
No evidence to suggest negative influence of media	0	2	2	4

* excludes studies describing the volume of pro-suicide, suicide prevention and help services material available on the internet.

** excludes studies of access to Internet in general and suicidal behaviour.

*** excludes studies which examine suicidal ideation as a predictor of suicide-related Internet activity, studies on non-suicide related Internet use and suicidal behaviour.

Case studies have not been designed in such a way as to enable an examination of the *strength* of the association. However, both ecological and individual-level studies demonstrate dose-response relationships whereby level of exposure is associated with level of suicidal behaviour.

The *temporality* of the association has been demonstrated in the case studies, with strong evidence that the individuals described in these studies were exposed to suicide-related material on the Internet before making their suicide attempt. Ecological studies and Individual level studies have likewise demonstrated temporality, particularly the two prospective studies that demonstrated a subsequent effect on suicidal ideation following exposure to suicide-related Internet content or activity.

There is some evidence for the *specificity* of the effect, in the sense that the case studies represent significant number of individuals showing evidence of having been influenced by web-based suicide-related material. Individual level analytic studies provide more robust evidence of specificity, particularly those where suicidal individuals provide information on their suicide-related Internet use activity.

The association would also appear to have *coherence*, in that it makes theoretical sense that a website providing advice about suicide could influence suicidal individuals.

To summarise, the studies published in the past 10 years provide mounting support for a causal association between exposure to suicide-related material and/or participation in suicide related online activity on the Internet and actual suicidal behaviour. There is evidence of an association which demonstrates *consistency* and *coherence*, *strength*, *temporality* and *specificity*.

Chapter 6: Mixed media

Descriptive studies

In India, Bhugra (1991) reported the self-immolation of a 20-year-old male Indian student on 19 September 1990. The student was protesting against a policy that would reserve a greater proportion of jobs for the lower castes, potentially jeopardised his own job prospects and those of his peers. Bhugra noted that this death was widely reported in newspapers and on television, and that there was an epidemic of completed and attempted suicides in response to this media coverage. He also reported that psychiatrists appealed to the media to attenuate their coverage, but that they failed to do so.

Also in India, but a quarter of a century later, Chowdhury, Brahma et al. (2007) examined the media coverage of a judicial hanging and its sequelae. The authors identified 18 cases of copycat suicide using the same method among children following media reports of the initial event, one suicide and 17 other imitation acts (five of which ended in death).

In Hong Kong, Lee and colleagues described a similar phenomenon (Lee, Chan et al. 2002, Chan, Lee et al. 2003). They observed that in 1998 a 35-year-old woman took her own life using charcoal burning. Prior to this time, no suicides by this method had been recorded. The media showed considerable interest in her death, with both newspapers and television stations providing graphic images. In the subsequent month, there were nine more deaths by this method, and within a year charcoal burning had become the most common method of suicide in Hong Kong. In a subsequent study by Chan, Yip et al. (2005), 25 individuals who had attempted suicide by this method were interviewed, and the majority indicated that they had learnt of the method from the media.

Huh, Jo et al. (2009) also conducted a descriptive study of the impact of media reporting of two deaths involving charcoal burning, this time in Korea in 2007. The individuals who died were a 32-year-old male and a 45-year-old female, and considerable news time was devoted to the deaths, again because of their novelty. Following the media reporting, there were three further cases in the same region of Korea in 2007, and an additional four in the same season in 2008.

In the United Kingdom, Zahl and Hawton (2004) interviewed 12 young people (aged 17-25) who had recently engaged in an episode of self-harm about the influence of media stories (both news reports and fictional depictions) on their actions. The majority reported some effect of at least one story presented in the media, and four reported that the story had been a catalyst in their own self-harm.

Bras, Loncar et al. (2007) described a series of suicide attempts among patients with chronic combatrelated post-traumatic stress disorder in Croatia. All of these cases employed the same method (selfimmolation), and there was significant media coverage of several of them. The implication was that media reporting of the earlier attempts influenced the later attempts, but the investigators did not explicitly test this.

Biddle and colleagues (2012) interviewed 22 individuals in the UK who had made near fatal suicide attempts between 2006 and 2009 and asked them about factors affecting their choice of method. Six reported TV and film as sources, five identified news stories, while the remainder reported non-media

sources including their own previous attempts or attempts by others they knew. Five participants also reported using the Internet to find out about methods, to search for possible methods, for accessing necessary materials (poisons) and to look at how to implement methods effectively. They did not use suicide-specific websites but general sites such as online chemists, Wikipedia or news sites.

Analytical studies: Ecological

Stack (1983) examined the monthly suicide rate in the United States between January 1977 and June 1980, the period around the Jonestown mass suicide in Guyana in November-December 1978. After statistically controlling for unemployment and divorce, Stack found no effect of the reporting of the Jonestown event on the national suicide rate. He made the observation that this may have been because of the nature of the media reporting, which tended to portray it as the involuntary action of cult members.

In Australia, Cantor, Tucker and Burnett (1991) considered annual suicide rates in two regions of north Queensland during the 1980s. They observed a significant peak in one region in 1988, the year in which there was considerable negative publicity in the media about patients' suicides in the psychiatric ward of the local general hospital. In the other, there was a non-significant peak in 1987, the year in which there was a widely reported cluster of Aboriginal deaths in custody. Neither the suicides by psychiatric patients nor those by Aboriginal people in custody were sufficient to account for the increased rate.

More recently, Pirkis, Burgess et al. (2006) constructed a dataset of 4635 suicide-related items appearing in Australian newspapers and on radio and television news and current affairs shows between March 2000 and February 2001. They linked this to national data on completed suicides occurring during the same 12 months, by a process that involved identifying the date and geographical reach of the media items and determining the number of suicides occurring in the same location in selected weeks pre- and post- each item. They found that 39% of media items were followed by an increase in male suicides, and that 31% were followed by an increase in female suicides (but that similar proportions were followed by no change or decreases in male and female suicides). Media items were more likely to be associated with increases in both male and female suicides if they occurred alongside multiple other reports on suicide (rather than occurring in isolation), if they appeared on television (instead of than on radio or in newspapers), and if they were about completed suicide (as opposed to attempted suicide or suicidal ideation).

Hamilton, Metcalfe et al. (2011) looked at all suicides from a known suicide hotspot in the UK from 1974 to 2007 and at media reports within three days of the death or inquest. They used a parametric survival model to look at media effects on subsequent suicides, stratified to account for barriers being installed on the bridge in 1998. Suicides by residents in the 'local media' area as well as in the 'wider media' area were investigated. They found that in the period before the barriers were erected there no evidence of increased hazard of suicide from the location following local media reports, while after the erection of the barriers there was a reduced rate of suicide from this location in the period after news reports. When they included wider media coverage the results were unchanged. The authors note, however that stories about suicides from the location were not prominent.

Cheng and colleagues (2011) describe a cluster of suicides from the same method at the Foxconn company which had manufacturing facilities in China, Hong Kong and Taiwan. In 2010, there were 13 deaths and 4 non-fatal attempts among employees of the company. They counted news reports in newspapers (Beijing, Shenzhen, Guangzhou, Hong Kong and Taiwan) and looked at search trends in the main Chinese language search engine (Baidu) which covers 70% of the market to see if media intensity measured by the number of newspaper reports and the number of web searches contributed to the cluster. They found that only reporting in the Beijing newspapers were associated with the occurrence

of a subsequent Foxconn suicide/attempt. The authors point out that within the company employees live in dorms and eat and socialize together so word of mouth was likely more salient than media reports in this cluster.

A German study by Kunrath, Baumert et al. (2011) examined a railway incident where three members of a police investigation team who were retrieving the body of a 'presumed suicide' were struck by a train and killed. They compared railway suicides and suicide attempts data from a National Accident Register, in the two months following the accident with the same period one year before and after, and with the one month before the accident. They observed an increase in the two months following the accident compared to the control periods, with a 44% increase in daily railway suicides/attempts in those two months compared to the control periods. This study indicates that non-celebrity suicide reports have an effect.

Three studies specifically examined the influence of media on increases in the use of particular methods. In Kingston-upon-Hull in the United Kingdom, Church and Phillips (1984) identified suicides by asphyxiation between 1 February 1971 and 31 January 1981. Dividing the 10-year period into 2-month segments, they considered segments in which there was a suicide by asphyxiation and segments in which there was no such suicide. They found that a suicide by asphyxiation in one segment increased the probability of another in the next segment. They suggested that, since the city was served by local newspaper and radio, the media played a role in influencing suicides by this method.

Nakamura, Yasunaga et al. (2012) looked at newspaper reports and Internet searches relating to an outbreak of hydrogen sulphide poisoning in Japan which occurred in April and May 2008. Newspapers first reported on this novel method, following which, information on how to create the gas became available on the Internet. Weekly newspaper and Internet search frequencies and weekly hydrogen sulphide suicide counts were examined over the period from February to September 2008. They found that the increase in number of newspaper articles was significantly associated with an increase in hydrogen sulphide suicides, but the volume of Internet searches was not.

In Taiwan, Chang and colleagues (2015) were interested in media influence on adoption of charcoal burning as a method for suicide. They examined the influence of newspaper reports in four major newspapers and number of Google searches on charcoal burning and suicides by other methods between 2008 and 2011. For charcoal burning suicides, they found that every 10% increase in Google searches (for charcoal burning) was associated with a 4.3% increase in charcoal burning suicide incidence in the same week and a 3.8% increase in the following week. For newspapers, they found that a one (charcoal burning) article increase in one major newspaper was associated with a 3.6% increase in charcoal burning suicide in the same week. When both newspapers and Google searches were included in the same analysis, only Google searches were still significantly associated in both the same and following week. For non-charcoal burning suicides and media reports, there was no association for Google search volume, but there was an increase in the following week after reporting in one newspaper.

A recent study from the Netherlands examined suicide deaths involving a 'suicide- or exit-bag' before (2004-2012) and after (2013-2014) a 2012 film depicting helium use, and publication of a book in 2013 detailing the use of helium and an exit-bag together (van den Hondel, et al. 2016). Over the entire period they found a rising trend for the use of helium and a decrease in use of other gasses. By 2014 helium accounted for 100% of suicide using gas. In 39% of helium suicides information about the method was found at the scene compared to 11% of non-helium asphyxiations.

As was observed with newspapers, there are multiple studies of mixed media focusing on media reporting of celebrity suicides and subsequent influence of suicidal behaviour. In Australia, Martin and Koo (1997) investigated the impact of the death of Kurt Cobain, the singer, guitarist and songwriter who fronted the Seattle 'grunge' band Nirvana, and took his own life on 5 April 1994. According to the

authors, his death was first reported in Australia on 8 April, 'subsequently reaching every television channel in both news and music programs, and every newspaper, with extensive detail given'. Martin and Koo examined the number of suicides in Australia by people aged 15–24 in the following month, and compared these figures with those from the corresponding period in the previous five years. They found that the rates in 1994 were lower than for the preceding years. This finding is consistent with that of Jobes, Berman et al. (1996), who examined youth suicide rates in Seattle, Washington, in the period around Cobain's death, doing so with only general reference to the extent of media reporting surrounding the event.

Cheng and colleagues conducted two ecological studies exploring the influence of widespread media coverage of the suicide of a celebrated Taiwanese actor, MJ Nee. Nee died by suicide in late April 2005, and the media coverage began on 2 May and lasted for about 17 days. The first study found that after controlling for seasonal variation, calendar year, temperature, humidity and unemployment, there was as a marked increase in completed suicides in Taiwan in the four weeks after the media coverage began (with the increase being most apparent in men and among individuals who chose the same method as Nee) (Cheng, Hawton, Lee et al. 2007). The second study found that after controlling for the same potential confounders there was a significant increase in the number of suicide attempts in the three weeks after the media reporting began, particularly for males and those who had made a previous attempt. Interviews with 124 individuals who have made an attempt on their life from 2 Taiwanese counties who indicated that they had seen the media reports revealed that about one quarter were influenced by the reports (Cheng, Hawton, Chen et al. 2007).

Fu and Yip (2009) examined the impact of media reports of the suicides of three celebrities on subsequent suicides: one from Hong Kong (Leslie Cheung, male singer and artist, aged 46); one from Taiwan (MJ Nee, male television actor, aged 59); and one from South Korea (female actor, Eun-ju Lee, aged 25). Aggregating the suicide data from the three countries from before and after the reports, and controlling for a range of potential confounders (secular trends, seasonality, economic situation, temporal autocorrelation) they found that the combined risk for suicide was 1.43 in the first week after the reports, 1.29 in the second week, and 1.25 in the third week. They continued to observe a moderate increase in suicides up to the 24th week. The impacts were greater for same-gender suicides and same-method suicides, and greater still for same-gender-and-same-method suicides.

Two studies examined suicidal behaviour in South Korea following media reports on the death of a wellknown actress Ms Choi by hanging in 2008. Lee, Lee et al. (2014) examined national mortality data for suicides between 2006-2008 for changing rates in frequencies in the four weeks before and after Ms Choi's suicide, adjusting for season, weather, and unemployment. They also undertook a content analysis of suicide-related news articles from newspapers and their websites and national network TV channels. Following Ms Choi's suicide there was an 80-fold increase in suicide-related articles, more than a third of which violated reporting guidelines, including detailing method. They found higher suicide rates among most gender and age subgroups in the four weeks following Ms Choi's death compared to the four weeks prior. The largest increase was among young women dying by hanging. Kim, Song et al. (2013) investigated Emergency Department presentations for suicide attempts at to general hospitals. They reviewed 319 visits, 158 of which took place before Ms Choi's death and 161 after. They observed a significant increase in suicide attempts by young people of a similar age to Ms Choi and in the use of hanging. The also noted that newspaper reports on Ms Choi death provided details on the kind of ligature used, violating media guidelines and providing explicit information on how to use this method.

Ji, Lee et al. (2014) examined suicides four weeks prior and four weeks after the death of South Korean actress Ms Lee in February 2005 which had been followed by 'indiscriminate media coverage'. They found a 145% increase in number of suicides in the four weeks after compared to the four weeks before Ms Lee's death. Risk for suicide increased in both genders and all age groups but was greater in under-30-year-olds and women, with young women having an almost two-fold increase in relative risk (RR

1.94). There was also a notable increase in the risk for suicide using the same method (hanging) as Ms Lee, with young women who died by hanging having the highest risk (RR 5.24).

Three other studies from South Korea examine multiple celebrity suicides. Fu and Chan (2013) examined 11 incidents of celebrity suicide that occurred in South Korea between January 2003 and December 2009 (10 individual suicides and one group of three which occurred close together). The conducted counts of suicide-related media stories in the week prior and then at a range of timepoints following the celebrity suicides. Using an autoregressive integrated moving average model, they examined the effects of celebrity suicides on weekly suicide counts, controlling for seasonality, secular trends and national unemployment rates. Of the 11 incidents, only 3 (Ms Lee, Ms Jong – 26 year-old actress, and Choi/Jang and Kim grouped together) showed an effect on overall suicide rates. The authors suggest that perhaps the differing volume of coverage of the 11 incidents influenced the effect of each on suicide rates, although they did not test this hypothesis.

Choi and Oh (2016) examined 15 Korean and seven international celebrity suicides between 1997 and 2009. They counted the total number of news items as an indicator of volume of coverage for each death, and then controlling for population level economic and demographic variables examined monthly suicide rates. They found that a Korean celebrity suicide was associated with an increase in suicide rates by 20.5%, while a non-Korean celebrity suicide has little impact on suicide rates. They also found evidence of a dose effect where the one news item increased rate by 0.02%. Based on average media exposure they calculated that a Korean celebrity suicide was associated with an overall 41.5% suicide rate increase, but noted that female suicide rates were more responsive to media exposure.

Suh and colleagues (2015) included 15 Korean celebrity suicides occurring between 1991 and 2010. They counted the number of news items in newspapers and television and examined the effect of volume of media coverage on suicide frequency in the month after each death, controlling for economic and demographic factors. They found that an overall positive correlation between the number of media (newspaper and television combined) reports and suicide incidence for 14 of the 15 celebrity suicides included in the analysis. There was a similar pattern for five of the celebrity deaths and television report alone and newspapers reports alone.

In France, a study of six celebrity suicides by Queinec, Beitz et al. (2011), comparing them to celebrities that died by other means likewise found variation. Examining daily counts of suicides in the 30 days following the announcement of the death, they observed an increase in overall suicides following the deaths of Kurt Cobain and Pierre Beregovoy (a prominent politician), however no effect observed for the other four. Consistent with other studies, for Cobain and Beregovoy there were increases in suicides using the same the method, and also greater effects among similarly aged people. Interestingly the authors note that while there was strong media coverage of Beregovoy, coverage of Cobain was not as extensive.

Two German studies focused on suicide in the aftermath of the highly publicised railway suicide of Robert Enke a high-profile German footballer. Enke's suicide was widely covered in the media, including a televised memorial service attended by 45,000 people and watched by more than 2 million viewers. Ladwig, Kunrath et al. (2012) found an 81% increase in railway suicides in the period from Enke's death on 11 November 2009 to 31 December 2009 compared to the same period in the three previous years. They also investigated if there was a compensatory deficit in the post-acute phase, which would indicate that the death's associated with Enke's were suicides which were going to happen but were just bought forward, and found no evidence this was the case. Hegerl, Koburger et al. (2013) extended that initial study to examine how long the imitation effect lasted, and to see if there was an 'anniversary' effect. They found a significant increase in the number of railway suicides for a two-year period following Enke's death compared to the two years prior that was not explained by a general increase in suicide rates, but no specific anniversary effects. Schafer and Quiring (2014) included six celebrity suicides reported in the German news media between 1993 and 2009, and analysed daily suicide data from 1992 to 2009 for frequency of all suicides and suicides with similar methods in the week before and the four weeks after each celebrity suicides compared to the average in identical weeks in the year before and the year after each death. They also counted the number of reports about each celebrity death. During the four weeks following a celebrity suicide there were more suicide deaths than expected for four of the six cases, with the largest increase in week one and week four. In five of the six cases, there was also an increase in suicides using a similar method in the first two weeks after reportage, but not detected thereafter. The number of suicide articles was significantly correlated with the increase in suicide overall and the number of suicides using a similar method, suggesting a dose relationship.

In a study that included celebrity and non-celebrity suicide reporting, Yang and colleagues (2013) looked at all suicide reports in Taiwan between 2003 and 2010 from Google news which covers all available news media. They used a time-dependent intrinsic correlation to quantify the temporal correlations between suicide deaths and suicide news. There were three major suicide events in the time period examined – two celebrity suicides and a cluster of suicides from falling at a particular company. They found a strong syncronisation of increase in suicide deaths and media reporting for the three major events, but a time lag of a month between other suicide news and peaks in suicide deaths. Examining suicide method, they found evidence of method correlation for charcoal burning and suicide from falling stories. They also noted a stronger effect of media coverage in urban than in rural areas. The authors note that given that the majority of reports were non-celebrity suicides this delayed effect is important to consider.

A recent study from Japan examined the contribution of coverage of celebrity suicide from different media sources. Ueda et al. Ueda, Mori et al. (2017) looked at newspaper and television coverage of 26 celebrity suicides between 2010 and 2014 compared to the number to tweets. They then investigated if a greater level of reaction to the deaths by twitter users and by traditional media was associated with a larger increase in suicide rates. Using the first national newspaper report as the starting day, they compared tweets 7 days before and 15 days after, and newspaper and television reports 14 days after the first report. They grouped the celebrity suicides based on whether there was a high or low volume of tweets/media reports. They found a statistically significant increase in total suicides when looking at the group of celebrity deaths that generated large posthumous reactions on twitter, but no such increase for the low volume group. Looking at cases with a high-volume of reporting, they found no association with increased suicides newspaper reports, but an association with television reports. Twitter activity tended to focus on younger entertainers, while newspapers focused on older entertainers, businessmen and politicians. Television reports were more similar to twitter. This study highlights the importance of including social media, alongside traditional media when examining effects of reporting celebrity deaths.

Analytical studies: Individual-level

Individual-level analytical studies have begun to emerge in the literature to complement the descriptive studies and ecological studies. Mercy, Kresnow et al. (2001) conducted a case-control study in which they interviewed 153 individuals (aged 13-34) who had made nearly-lethal suicide attempts and a random sample of 513 controls. Contrary to other many of the other studies of mixed media, they found that cases were significantly less likely than controls to have been exposed to accounts of suicidal behaviour in the media.

Fu and Yip (2007) conducted a population-based study in Hong Kong, interviewing 2016 respondents (aged 20-59) 8-15 months after the much-publicised suicide of a famous local male singer, Leslie Cheung. After controlling for a range of other variables known to be associated with suicidality, they found that

those who indicated that they had been affected by the celebrity's suicide were significantly more likely to have severe levels of current suicidal ideation than those who had not been, suggesting that the impact was relatively long-lasting.

Cheng, Hawton et al. (2007) used a similar methodology to that of Fu and Yip (2007) to complement their ecological studies (see above) of the impact of the extensive media coverage of the suicide of Taiwanese actor, MJ Nee. Specifically, they looked at the influence of this media coverage on the suicidal behaviour of 461 depressed patients. The treating psychiatrists of these patients recorded clinical data (including data on suicidal thoughts and suicide attempts) occurring after the first media report of the celebrity's death. They also interviewed the patients about their exposure to the media reports, their history of suicidal thoughts and behaviours, and their perceptions of the influence of the media coverage, and 38% of these claimed it had influenced subsequent suicidal behaviours. Those with severe depression and/or a recent history of suicide attempts were most susceptible to influence.

Also in Taiwan, Chiu, Ko and Wu (2007) examined the relationship between exposure to suicide news in general over the past year and levels of suicidality in the past week in 2602 college students. Using a self-report survey to assess these and other demographic and clinical variables, they found that exposure to suicide news only predicted levels of suicidality for individuals with severe levels of depression.

Brener, Simon et al. (2002) used data from the 1999 wave of the United States' longitudinal Youth Risk Behavior Survey to examine the relationship between adolescents' suicidal thoughts and the widelycovered incident at Columbine High School in Colorado, where two teenagers took their own lives after murdering 12 students and a teacher. The incident occurred part-way through the data collection period, and students who were surveyed after it were significantly less likely to report considering or planning suicide than those who were surveyed before it.

Tsai, Gunnell et al. (2011) examined a consecutive series of individuals who have made an attempt on their life from hospital admissions in Taiwan. They interviewed 37 people who attempted suicide by charcoal burning, and 28 who had used other solid/liquid poisons. Using semi-structured interviews, they explored the factors considered important in their choice of method. Media reports were frequently identified as a key influence on choosing charcoal burning (86.5%) compared to the solid/liquid poisoning group (7.9%). The authors noted that charcoal burning was no longer novel in Taiwan at the time of their study, but the findings suggest that reports of charcoal burning suicide continue to influence suicidal behaviour. The authors suggested that media coverage may 'remind' people of the existence of this method.

In a recent study, US and Canadian participants completed an online survey between 7 and 11 days following the suicide death of Robin Williams (Ma-Kellams, Baek et al. 2016). 300 participants were randomised to 6 groups; 3 different causes of death (suicide (Williams), and cases of accidental and natural death) and then 2 types of reflection – life, death. They completed a word association task for death-thought accessibility and a suicide opinion questionnaire; their depression level was also assessed. Death-thought accessibility is the tendency for thoughts to death to come to mind and prior research has found links to suicidal ideation. There was more death-thought accessibility in all groups assigned to 'death' reflection, but there was no difference by type of death group. For those who screened positive for depression, those in the 'suicide (Williams) life' group had lower death-thought accessibility than those in the 'suicide (Williams) death' group. Depressed individuals were more likely to endorse an attitude that suicide was acceptable.

Methodological issues

The mixed media studies face the same methodological difficulties as their counterparts which examine specific types of media, but they have an additional problem. Most use general media presentation of a particular suicide or suicides as their starting point, examine media reporting around it, and then consider the impact of this media reporting on subsequent suicides. Because they consider media reporting from a range of sources, they typically provide little description of the extent or nature of the media coverage. With a few exceptions like the studies by Cheng, Hawton and Chen et al. (2007), Chan, Yip, Au and Lee (2005) and Tsai et al. (2011), they generally fail to gauge whether those who died by suicide or attempted suicide were exposed to the given media reports and, if they were, whether they were influenced by them.

Summary and conclusions

With only one or two exceptions, the above studies suggest an association between media reporting of suicide in mixed media and actual suicidal behaviour. Based on the sheer number of studies and their different designs, the association would appear to be *consistent* (see Table 6)

Table 6: Summary of evidence from studies of mixed media

	Descriptive studies (n=8)	Analytical studies: Ecological (n=25)	Analytical studies: Individual-level (n=7)	Total (n=40)
Some evidence to suggest negative influence of media	7	23	5	35
No evidence to suggest negative influence of media	1	2	2	5

It is difficult to draw conclusions about the *strength* of the association, because the magnitude of the exposure is not assessed in many studies. Having said this, a number of more recent ecological studies found that increasing volume of media reports is associated with increasing suicide rates, suggestive of a dose-response effect.

The *temporality* of the association has been well demonstrated in most of these studies, because the starting point was a specific media event.

There are also suggestions that the effect may have *specificity*. The studies of new methods of suicide exponentially gaining popularity lend some support to this assertion.

The association would also appear to have *coherence*, in that it replicates the relationships between media reporting and suicidal behaviour observed in studies of individual media formats that are included in the mixed media studies.

To summarise, the studies reviewed here offer some support for a causal association between exposure to suicide-related stories in mixed media and actual suicidal behaviour. There is evidence of an association which demonstrates *consistency, temporality, specificity,* and *coherence,* and shows signs of *strength.* Further analytical studies are required to confirm this relationship. Having said this, some

caution should be exercised in interpreting the findings in this way, because of the heterogeneous nature of the media that have been studies. It is perhaps more useful to think of these studies as collectively providing support for the general contention that presentation of suicide in news and information media can influence actual suicidal behaviour, rather than viewing them as providing support for the notion that undifferentiated 'mixed media' have this sort of impact.

Chapter 7: Discussion and conclusions

Summary of key findings

This review examined the literature on the association between presentation of suicide in news and information media and actual suicide or suicidal behaviour. It demonstrated that there is an association between non-fictional media portrayal of suicide and actual suicide. Using strict criteria to establish causality, it demonstrated that, at least in some cases, this association is likely to be causal. Specifically, the association satisfies sufficient of the criteria of *consistency, strength, temporality, specificity,* and *coherence* for the association to be deemed causal in the case of non-fictional presentations of suicide in newspapers, on television and in books.

Implications of the findings for policy and practice

It is clear that presentation of suicide in news and information media should be done in a responsible manner. Several strategies have been put forward to encourage responsible reporting of suicide in newspapers and on television news, and to regulate the information on suicide that is presented on websites. These strategies are discussed below.

Newspaper and television reporting of suicide

There is little argument that suicides should be reported in a responsible manner in newspapers and on television news. The most common way in which responsible media practice is encourages is through resources and guidelines. In Australia, *Reporting Suicide and Mental Illness* (Commonwealth of Australia, 2002) provides direction in this regard. This resource was developed as one of the cornerstones of *Mindframe*, and represents a collaborative effort between the media and mental health sectors. It continues to be actively disseminated by **Everymind** (Skehan, Greenhalgh et al. 2006). In the context of newspaper reporting, regulatory bodies in some countries, including the Australian Press Council (2011) have issued standards on reporting of suicide which publications must uphold.

Equivalent guidelines have been developed overseas (Pirkis, Blood et al. 2006). The content of these guidelines is shaped by the evidence cited in the current review. They typically recommend that suicide should be reported in a manner that does not sensationalise or glamourise it, or give it undue prominence. They reinforce the message that modelled behaviour is particularly likely to occur in circumstances where the method or location of a given suicide is explicitly described, and/or when the suicide of a revered celebrity is reported. They suggest that the media can play a positive role by educating the public about suicide and by providing contact details for agencies which can provide help or support to vulnerable readers or viewers. Most also urge media professionals to take particular care when interviewing people bereaved by suicide, who may be at particular risk themselves. Some also note that journalists who report on suicide should be given de-briefing opportunities (Pirkis, Blood et al., 2006).

Process evaluations which have considered the reach of such guidelines have produced mixed results. An evaluation of the Australian resource yielded positive findings in terms of journalists' awareness and use of the resource (Skehan, Greenhalgh et al., 2006), but similar studies in the United States (Jamieson 2001, Jamieson, Jamieson et al. 2003) and New Zealand (Tully and Elsaka 2004) were less sanguine and concluded that journalists were at best unfamiliar with relevant resources and at worst

ignored them.

Impact and outcome evaluations have produced more consistent and generally positive findings with respect to the effectiveness of media guidelines. Pirkis, Dare et al. (2009) demonstrated that the introduction of *Reporting Suicide and Mental Illness* in Australia led to improvements in the quality of reporting. Michel, Wyss et al. (2000) reported similar findings when they evaluated the implementation of media guidelines in Switzerland. Etzersdorfer and colleagues went one step further in an Austrian study (Etzersdorfer, Sonneck et al. 1992, Sonneck, Etzersdorfer et al. 1994, Etzersdorfer and Sonneck 1998, Etzersdorfer, Voracek et al. 2001, Etzersdorfer, Voracek et al. 2004, Niederkrotenthaler and Sonneck 2007). They demonstrated that the introduction of media guidelines regarding reporting suicides on the Viennese subway not only resulted in a reduction in the reporting of these suicides but also led to a 75% decrease in the rate of subway suicides and a 20% decrease in the overall suicide rate. The impact of the Swiss guidelines dropped off as a function of time (Michel, Maillart et al. 2007), whereas the impact of the Austrian guidelines was largely maintained (Niederkrotenthaler & Sonneck, 2007). The longevity of the impact of the Australia's *Reporting Suicide and Mental Illness* has not yet been put to the test.

Given that the content of most media guidelines is strikingly similar, it is likely that the differences in the above evaluation findings may relate to the processes by which different guidelines are developed and implemented. In particular, close involvement of media professionals at all stages seems to be important. The Australian resources were developed by *Mindframe*, with funding from the Department of Health, which purposefully sought input from a reference group that included representatives from a range of media organisations. They have been actively disseminated by **Everymind** which has conducted information sessions, offered advice, distributed hard and soft copies of the guidelines and supporting materials, worked with peak media organisations to incorporate aspects of the guidelines into codes of practice and editorial policies, and provided ongoing follow-up and promotion (Pirkis, Blood et al., 2006; Skehan, Greenhalgh et al., 2006). By contrast, the New Zealand guidelines were developed by the Ministry of Health with only minimal input from journalists, so journalists did not feel wedded to the processor the product. The dissemination process has also been more ad hoc than its Australian equivalent (Pirkis, Blood et al., 2006). It is perhaps not surprising, therefore, that the Australian evaluation results are positive, whereas the New Zealand ones are less encouraging.

More direct evidence for the contention that media 'buy-in' underpins the success of guidelines comes from the above-mentioned work on the Austrian guidelines. Niederkrontenthaler and Sonneck (2007) found that the positive impacts associated with the guidelines were most pronounced in regions with strong media collaboration.

Information about suicide on Internet sites

The media landscape is changing rapidly and Internet based 'new media' are displacing traditional media of newspapers and television as the primary source of news and information, particularly for young people. The Internet is a medium with multiple avenues of user engagement and information dissemination. In some aspects of its use, for example as a source of information on methods or as a conduit for the proliferation of news stories about suicides, there is evidence that it has similar effects to traditional media. Other, more interactive or user generated Internet activities do not sit comfortably within the traditional model of media effects and thus the study of the influence of those aspects and suicidal behaviour is in the early stages. Nevertheless, there is evidence consistent with the association observed in traditional media for most, but not all, of those activities. The varied uses, proliferation and fast-changing new media environment raises challenges for policy and prevention.

Various solutions to the Internet issue have been proposed, including the use of voluntary guidelines and the self-regulation of sites (Becker, Mayer et al. 2004, Hitosugi, Nagai et al. 2007, Mishara and Weisstub 2007), the use of filtering software (Mishara and Weisstub 2007), collaboration between the mental health sector and the mass media (Mehlum, 2000), and the development of alternative websites that promote help-seeking behaviour (Becker et al., 2004; Mehlum, 2000; Mishara & Weisstub, 2007). There is a dearth of descriptive evidence in the scientific literature regarding instances in which these interventions have been put in place, and no evaluative information about how successful they might be.

Legal control of pro-suicide websites has generally been regarded as too difficult (Mehlum, 2000; Mishara & Weisstub, 2007), with the result that Australia is the only country to have introduced legislation that uses criminal sanctions to restrict the operation of such sites (Pirkis, Neal et al. 2009). The law makes it an offence to use the Internet or any other carriage service to disseminate material intended to counsel or incite suicide, and violators face substantial fines. The introduction of the legislation sparked much debate, with concerns expressed that the law is over-inclusive, interferes with the individual's right to die, and has no jurisdiction over off-shore websites. Its impact has not yet been rigorously evaluated, but it appears to have deterred Australian individuals and organisations who might otherwise have posted pro-suicide material on local websites, since none now appear to exist (Pirkis, Neal et al. 2009)

Limitations of the current review

As noted in Chapter 1, the current review was deliberately restricted to 'media influence studies' that are grounded in the 'effects tradition'. It did not include 'news production studies', 'content analysis studies' or 'audience reception studies'. Consequently, the review is not in a position to comment on how suicide stories are produced, what information they contain and how this is framed, or how this information is perceived and received by the community in general and by people who might be vulnerable in particular.

These other types of studies are important for interpreting the findings from the 'media influence studies', and can assist in informing media practice and communication strategies. The body of work in these other areas is not as substantial as that reviewed here, but is emerging. For example, there are a number of examples of quantitative and qualitative 'content analysis studies' which are beginning to inform the question of how the media frames suicide. In Australia, Blood, Pirkis et al. (2003) conducted a qualitative study of how the press framed a story of a 75-year-old man who was taking a commonly-prescribed anti-depressant and murdered his wife and then attempted suicide. Some newspapers were alarmist and raised fears about the safety of the anti-depressant, whereas others stressed the exceptionality of the case. Pirkis, Burgess et al. (2007) complemented this qualitative study with a quantitative content analysis which suggested that the Australian media overreports suicides by older people and females, and those involving dramatic methods. They found that reported suicides fell into three groups: suicides reported in a broader context; suicides by celebrities; and suicides involving unusual circumstances or methods. Similar studies in Austria (Niederkrontenthaler, Till et al. 2009), Hong Kong (Au, Yip et al. 2004), Israel (Weimann and Fishman 1995) and the United States (Jamieson 2003) have also suggested that the suicides reported in the media present a somewhat skewed picture of suicides in the population.

Further work is required to better align the media influence studies reviewed here with other emerging work on media reporting of suicide. Researchers from disciplines such as medicine, sociology and psychology should collaborate with researchers with backgrounds in media studies and communication theory, in order to strengthen our understanding of the imperatives that operate on media professionals when they are preparing stories on suicide, the contested frames which shape these stories, and the way in which these stories are interpreted by different readers and viewers.

Conclusions

Irresponsible presentations of suicide in news and information media can influence copycat acts. The findings of the current review should not be interpreted as a call for censorship of the media; it is acknowledged that the media has a role to play in raising awareness of suicide as a public health issue. Rather, the findings should be interpreted as an indication that media presentation of suicide should be done responsibly, and balanced against the public's 'right to know'.

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Supplementary Chapter

Additional Research on internet use and suicidal behaviour

As noted in the systematic review, the internet has unique properties as a medium that broaden how 'exposure' to suicide-related material is understood. This includes the participatory nature of the medium where users generate content, the social/interactive aspects where users engage in dialogue with each other, a searchable repository of information, as well as more traditional avenues of exposure such as a medium for distribution of stories, articles, news reports, and images relating to suicide. The systematic review included studies of all these activities where the 'exposure' in any of these formulations was to suicide-related material and the 'outcome' was suicidal behaviour. These criteria were adopted as they best allow an investigation of the question of the influence of exposure to suicide-related material in the media on risk for suicidal behaviour, albeit with limitations as described in the main report.

However, there is substantial interest and growing research activity into other aspects of the relationship between internet use and risk for suicidal behaviour. In particular, our literature search identified two additional other lines of research that did not meet inclusion criteria for the systematic review, but are likely of some interest. The first, are individual level studies that investigate the characteristics of those who use the internet for suicide-related purposes. The second are studies related to non-suicide-related internet use and suicidal behaviour. Neither fit the criteria for inclusion in the main review, the first because the suicidal characteristics of the individual is studied as a potential cause of the 'exposure' to suicide-related material on the internet, rather than a potential outcome. In the second set of studies there is no suicide-related exposure. This supplementary chapter summarises the findings of these two groups of studies.

Characteristics of those who engage in suicide-related internet use

Two Japanese studies examined characteristics of individuals who used the internet for suicide related purposes. In 2012, Sueki surveyed 1000 Japanese young adults who were registered at an online survey company, and compared those who had and had not searched for the target deliberate-self-harm (DSH) words: self-injury, wrist-cutting, overdose. He found significantly higher rates of suicidal ideation, suicide plan and previous attempted suicide in the DSH-search group compared to the non-DSH-search group. Masuda, Kurahasi et al. (2013) obtained data from *mixi* the dominant social networking service in Japan. They used membership of an active user-defined online community related to suicide as a proxy for suicide ideation. They found that an increase in the number of communities a user belongs to, and the fraction of neighbouring users with suicide ideation made the largest contribution to the likelihood that an individual will be in the suicide ideation group.

In an Australia study, the Suicidal Behaviours Questionnaire was used to identify a subset of 290 University students from a larger study as being at-suicide-risk (Harris, McLean, & Sheffield, 2009). Comparing at-suicide-risk students who went online for suicidal purposes (n=165) and those who did not (n=125) they found that suicide-related online users spent significantly more weekly time online, and had significantly greater suicidal and depressive symptoms. Online suicide site users were also indicated they were less likely to seek help for their suicidal ideation, both overall and also to go to friends for help. The main reasons suicide-related online users went online were information (64.4%), support (22.1%), communication (9.1%), seeking information about methods (1.8%). Over 70% (72.7%) visited forums, 61.8% visited suicide prevention sites, 52.1% pro-suicide sites, and 27.3% suicide pact sites.

Mitchell et al (2014) conducted a telephone survey of survey in the USA of 1560 internet users aged 10 to 17-years of age. They collected information on participants' 12-month prevalence of visiting suicide/self-harm websites and recent suicidal ideation (past 30 days). Only 1% of the sample reported visiting a self-harm/suicide website. Those who had visited a website were seven times more likely to have had suicide ideation after adjusting for other risk factors.

In the UK, Mars and colleagues (2015) examined self-harm/suicide related internet use and suicidal behaviour in 3,946 participants in The Avon Longitudinal Study of Parents and Children. Participants were 21 years old at the time of the study. They found that suicide/self-harm related internet use was prevalent among those who had self-harmed with suicide intent (70%), and was strongly associated with the presence of suicidal thoughts, suicidal plans and history of self-harm.

Examining social media users in China, Cheng et al (2015) conducted an online survey of 898 users of *Weibo* – the largest Chinese social media site. They compared the group who discussed suicide on the site with the group that did not. Those who discussed suicide were younger, less educated, preferred using blogs and online forums for expressing themselves and reported significantly greater suicidal ideation than those who did not discuss suicide on Weibo.

Finally, in a recent study by Niederkrontenthaler and colleagues (2017) in Austria recruited 53 suicidal individuals aged 18-24, and compared those who went online for suicidal purposes with those who did not. They found that at-suicide-risk individuals who went online for suicide-related purposes had higher scores on past-year suicidal ideation and disclosure of suicidal ideation, expressed a higher likelihood of future suicide and were more depressed than at-suicide-risk individuals who did not use the internet for suicide-related purposes.

In summary, these studies generally found that individuals with higher suicide risk were more likely to engage in suicide-related internet use, however the cross-sectional design of the studies means that no causality can be determined.

Non-suicide related internet use and suicidal behaviour

Another stream of research has examined internet use in general, rather than suicide-related internet use, in relation to suicidal behaviour. In the first of these studies to appear, Ryu and colleagues (2004) posited that high levels of suicidality and high levels of Internet use might be related, and conducted an individual-level study to explore the hypothesis. They found that Korean high school students who

qualified as being addicted to the Internet according to a standardised scale were significantly more likely to be suicidal and/or depressed than their non-addicted peers. Subsequent studies have also observed an association between internet addiction, or having problematic levels of internet use and suicidal ideation and attempt in 14 to 19-year-olds in Hong Kong (Fu, Chan, et al. 2010); Taiwanese 12 to 18-year-olds (Lin, Ko et al. 2014) and adults (Wu, Lee, et al. 2015)and internet gaming addiction and suicidal ideation in adults in South Korea (Kim, Kim et al., 2017).

Other studies have examined level of internet use, but not internet addiction *per se*, in relation to suicidal behaviour. A study in the US found that among young people aged 14 to 18 years using the internet for more than 5 hours a day was associated with suicide ideation and planning (Messias, Castro et al. 2011). While in South Korean middle and high-school student heavy internet use (Kim 2012) and problematic internet use (Park, Hong et al. 2013) were associated with suicide attempt and ideation. Tseng and Yang (2015) did not find problem internet use or time online increased the risk of suicidal ideation for Taiwanese High School students, but that higher web based communication increased risk for boys but not girls.

In an Australian Study, Harris et al (2014) looked at different internet activities in adults assessed at 'atrisk' for suicidal behaviour compared to 'not-at-risk' individuals and found those in the 'at-risk' group used forums, sought and made friends and romantic/sexual partners online and were less likely to seek help online than the 'not-at-risk' group. Finally, Jun and Kim (2017) found that in South Korean adults over 50 years of age internet use in general was associated with lower suicidal ideation.

In Summary, these studies examine a wide range of internet use activity, and those examining level of internet use generally concur in finding higher suicide risk in those with problematic levels of internet use or internet addiction. There is considerable variation in terms of defining problematic internet use and internet addiction and while some studies use validated instruments, others use self-reported time online as an indicator. Again, all but one of these studies are cross-sectional and so causal conclusions cannot be reliably drawn. Interestingly one Korean study found that in older adults internet use was associated with lower suicidal ideation. This is consistent with another body of research on the potentially protective role of the internet via enabling social connection, which is out the scope of this review.

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Appendix 1: Summary of newspaper

studies

Investigators	Anestis MD, Bryan CJ, May AM et al. (2015)
Study type	Analytical Study: Individual
Country	USA
Dependent variable	Plans and preparation for suicide, negative affect, suicide risk
Method	273 undergraduates were randomly assigned to three groups. Group one read an article violating suicide guidelines, group two read same article with the violations removed, and group three, the control group, read an article on cancer deaths. The three groups were compared at baseline and 1 month later. Analysis was undertaken of the full sample and in sub-samples of those with prior suicidal ideation and prior suicide attempt.
Key findings	There were no significant differences between the three group ins plans for a future suicide attempt or resolved plans and preparations at follow-up. For negative affect, group one did not differ from the other two groups, but group two (revised suicide article) differed from the control group having higher negative affect at follow-up. In subsample analysis of prior ideators, group one (original article) had a lower likelihood of future attempt compared to other two groups.
Interpretation	No evidence to suggest negative influence of media.

Investigators	Arendt F, Till B and Niederkrotenthaler T. (2016)
Study type	Analytical Study: Individual
Country	Austria
Dependent variable	Implicit cognition, suicide cognition
Method	Controlled trial of 112 university students where a control group read a news article unrelated to suicide, and two intervention groups read print article with protagonist who copes with suicide crisis by contacting intervention centre. The two intervention groups differed in terms of social similarity (i.e. how similar they were to the protagonist in the article). All groups then completed Implicit Association Test that included two suicide related categories - (death, life), and identification (I, They), and a four-item identification scale. Structural equation modelling was used to compare groups.
Key findings	There were indications of a protective effect on suicidal cognition for those exposed to the suicide material but only among those who did not identify with the protagonist on the Identification Scale. There was no effect of social similarity.
Interpretation	No evidence to suggest negative influence of media.

Investigators	Ashton and Donnan (1979, 1981)
Study type	Analytical study: Ecological
Country	United Kingdom
Dependent variable	Suicide
Method	Surveillance of suicide statistics from October 1978 until October 1979, after newspaper
	report of suicide by burning at beginning of period.
Key findings	Unusually high incidence of suicides by burning.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Barraclough, Shepherd and Jennings (1977)
Study type	Analytical study: Ecological
Country	United Kingdom
Dependent variable	Suicide

Method	Identified all suicides in Portsmouth, and considered all newspaper reports on suicide in the
	local newspaper (1970-72). Calculated the likelihood of a day on which a suicide occurred
	being preceded by a newspaper report of suicide and compared this with the likelihood of the
	day on which no suicide occurred being preceded by same.
Key findings	Day on which suicide of male <45 occurred significantly more likely to have been preceded by
	newspaper report on suicide. No effect for other age and sexgroups.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Blumenthal and Bergner (1973)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Replication of Motto (1967, 1970). Determined suicide rates in New York during newspaper strike of 140 days (1966) and compared with mean rates for previous three years and two subsequent years.
Key findings	Newspaper strike associated with a decrease in suicide rates for females aged under 35 only.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Bollen and Phillips (1981)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Replication of Phillips (1977, 1979). Determined the number of metropolitan Detroit motor vehicle fatalities in weeks in which a front-page suicide article appeared in the Detroit press (1973–76) and compared this with the number in corresponding week in preceding and subsequent years. Complemented quasi-experimental analysis with time-series regression analysis.
Key findings	Overall increase in number of motor vehicle fatalities in weeks of front-page suicide articles, with peak on day three.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Calhoun, Selby and Faulstich (1980)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Attitudes to suicide
Method	Presented 148 members of the public with a newspaper account of a child's death. Varied
	cause of death: (a) suicide; or (b) illness. Asked about attitudes towards parents.
Key findings	Participants were more likely to view the parents negatively when the child's death was by
	suicide than when it was by illness.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Calhoun, Selby and Faulstich (1982)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Attitudes to suicide
Method	Presented 119 city residents with a newspaper account of a child's death. Varied cause of death: (a) suicide; or (b) illness. Asked about attitudes towardsparents.
Key findings	Participants were more likely to view the parents negatively when the child's death was by suicide than when it was by illness.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Chen YY, Chen T, Chen PH et al. (2010)
Study type	Analytical Study: Individual
Country	Taiwan
Dependent variable	Attempted suicide
Method	Interviews were conducted with 63 individuals who have made an attempt on their life who had presented at a hospital soon after media reporting of the suicide of the young female

	singing star Ivy Li. Those who had been influenced by newspaper reports were compared to those who had not, adjusting for age, gender, depression and past suicidal behaviour as appropriate.
Key findings	68% reported having seen newspaper reports of Ms Li's suicide and 37% reported being influenced by the reporting. Those who reported being influenced by the news reports were similar to Li – under 30 years of age and more likely to have loss in love, however they were more likely to be men. There was a higher use of charcoal burning (the same method as used by Ms Li) among those who reported being influenced newspaper reports.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Chen YY, Liao SF, Teng PR et al. (2012)
Study type	Analytical Study: Ecological
Country	Taiwan
Dependent variable	Suicide
Method	Poisson time series autoregression was used to see if there was an increase in suicide counts in the two-week period after start of reporting of suicide of the celebrity Ivy Li compared to suicides in remaining weeks between 2006 and 2008. Adjusted for weather, employment, and season.
Key findings	In adjusted analysis, there was a significant increase in risk for suicide in the two weeks following the news reports, with the estimated excess number of suicides attributable to media effect was 25. Risk was increased for those under 35 years for both men and women, and middle age women. Risk was higher for suicides by charcoal burning (the method used by Ms Lee) than other methods in under-35s and among women.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Chen YY, Yip PSF, Chan CH, et al. (2014)
Study type	Analytical Study: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Compared suicides by charcoal burning counts in the 12 months before and 14 months after (Sept 2007 - Dec 2009) the widely reported suicide of the celebrity Mr Ahn by charcoal burning in his car in Sept 2008.
Key findings	There was an increase in use of charcoal burning from 0.85% of suicides to 4.8% of suicides during that period. 75% of charcoal burning suicides were younger than 45 compared to 41% who used other methods and 63% male. The overall suicide rate by non-charcoal burning methods increased 38.4% over the period, while suicides by charcoal burning increased by 704%. Prior to reports of Ahn's death, 6% of charcoal burning suicides took place in cars while after this increased to 16%. That increase was sustained over the following 12 months.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Chen, YY, Tsai CW, Biddle LA, et al. (2016)
Study type	Analytical Study: Ecological
Country	Taiwan
Dependent variable	Suicide
Method	Examined reporting and suicides by charcoal burning between 1998 and 2002. This period covers a time of initial emergence of the method (Jan 1998 – May 2001) and a period rapid increase (June 2001 – July 2002). Examined pre-publication (days -14 to -8), post-publication period (days 0 to 6) of newspaper reports about charcoal burning suicide. Days -7 to 0 not used because other media (TV or internet) might have reported the event earlier than the newspapers. Qualitative analysis of news reports content. Point-biserial or Pearson correlation coefficients used to examine at characteristics of reporting and charcoal burning suicide rates before and after the appearance of the news report.
Key findings	Correlation coefficients for news reporting patterns and post-reporting increase show that news items that described details of the method were positively and significantly correlated with post-publication increase in charcoal burning suicide rates. Other characteristics such as significance of the news item and glamorisation of the method were not related to post reporting increase in suicide rates.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Cheng Q, Chen F and Yip PSF (2017)
Study type	Analytical study: Ecological
Country	Hong Kong
Dependent variable	Suicide
Method	Suicide data from Sept 1998 (before first charcoal burning [CB]suicide case reported) and Dec 2005 (when charcoal burning has been the second most used method in HK for 4 years). Controlled for divorce, unemployment and property price. Time varying rates of suicide by CB and non-CB methods and reporting intensities by different newspapers on CB and non-CB suicides estimated. Poisson and negative binomial regression models.
Key findings	19.8% of suicides in study period were CB and 23.1% of suicide news articles were CB. CB suicide news reporting intensity rapidly went up in the onset stage (1998-2001) and peaked in 2003, while non-CB reporting intensity shows fluctuations. Non-CB news reporting intensity was always greater than CB suicide reporting. Across whole period suicide news showed significant effects on subsequent suicide incidence in a method-specific manner. On average one CB news article excited 0.563 CB suicides sequentially, while 1 non-CB article excited 0.504 non-CB suicides.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Chung and Leung (2001)
Study type	Analytical study: Ecological
Country	Hong Kong
Dependent variable	Suicide
Method	Collected reports of suicide by charcoal burning during 1998 and 1999 from sixmajor national newspapers, and examined their relationship to actual suicides by this method occurring in the same two-year period. Prior to November 1998, there were no suicides by this method and no reports relating to it. In November 1998, a 35-year old woman used this method to end her life, and her death was widely and graphically reported.
Key findings	Fifty-six reported suicides by charcoal burning followed, 22 (39%) of which occurred in the nine weeks after the first reported incident.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Etzersdorfer (2001); Etzersdorfer, Voracek and Sonneck (2004)
Study type	Analytical study: Ecological
Country	Austria
Dependent variable	Suicide
Method	Examined rates of suicide in the three weeks before and the three weeks after Austria's leading tabloid newspaper, <i>Neue Kronezeitung (NKZ)</i> , ran a story about suicide of the owner of a famous Viennese hotel.
Key findings	Increase in firearm suicides in the three weeks after <i>NKZ</i> ran the story. Evidence of a dose- response effect, whereby the increase was greatest in the regions of the highest distribution of NKZ.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Etzersdorfer, Sonneck and Nagel Kuess (1992); Sonneck, Etzersdorfer and Nagel Kuess (1994); Etzersdorfer and Sonneck (1998); Niederkrontenthaler and Sonneck
Study type	Analytical study: Ecological
Country	Austria
Dependent variable	Attempted suicide and suicide
Method	Determined six-month frequencies of subway suicides and suicide attempts in Vienna. Examined effect of introduction of media guidelines in June 1987.
Key findings	Drop in number of subway and overall suicides and suicide attempts after the introduction of media guidelines. Effect most prominent in regions with high coverage of collaborating newspapers.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Frei, Schenker and Finzen et al (2003)
Study type	Analytical study: Ecological
Country	Switzerland
Dependent variable	Suicide
Method	Examined suicides assisted by the Swiss right-to-die society, EXIT, in the two years before and the two years after wide local and national press coverage of the double suicide of a well-known and respected couple in the Basle region. Also examined the quality of reporting, as assessed against Centers for Disease Control and Prevention (CDC) guidelines
Key findings	Significant increase in the number of EXIT-assisted suicides in that region after the newspaper reports, particularly among women aged over 65. Much of the reportage sensationalised suicide, glorifying the couple and describing their deaths in detail.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Gibson and Range (1991)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Suicidal thoughts
Method	Presented 128 high school students with a written report of a teenager with problems. Half were told (a) the teenager had a friend with similar problems who had taken his or her own life; the other half were told (b) the teenager had a friend with similar problems who had sought professional help. Asked to predict response of the teenager.
Key findings	Those who had been told that the teenager had a friend with similar problems who had died by suicide were more likely to indicate that his response would be suicide (particularly males). Those who had been told that the teenager had a friend with similar problems who had sought professional help were more likely to indicate that his response would be help- seeking (particularly females).
Interpretation	Some evidence to suggest negative influence of media

Investigators	Ginn, Range and Hailey (1988)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Attitudes to suicide
Method	Presented 120 shoppers with a newspaper article about a 10-yearold child who: (a) attempted suicide; (b) completed suicide; (c) completed suicide after having made a previous attempt; (d) died of a viral illness; or (e) died in an accident. Asked about attitudes towards the family of the child.
Key findings	Participants were equally likely to respond negatively towards the family when the child had attempted suicide or died by suicide, but tended to be sympathetic towards the family when the child had died by illness or accident.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Gould MS, Kleinman MH, Lake AM et al. (2014)
Study type	Analytical study: Ecological
Country	USA
Dependent variable	Suicide
Method	Case-control study of point (temporal+geographic) suicide clusters in young people (13-20 years) from 1988-1996 identified using time-space Scan statistic. Each cluster community was matched with two non-cluster control communities where suicides of similarly aged youth occurred. Examined newspapers for suicide articles in days between first and second suicides in the cluster. In non-cluster communities examined a matched length of time after the matched control suicide. Compared using mixed-effect regression analyses.
Key findings	48 point-clusters were identified and matched with 95 match control communities. The mean number of news study about suicidal individuals published after an index cluster suicide was significantly greater than the mean number published after a non-cluster suicide. Also, a cluster suicide was more likely to have at least one (25% vs 14%) and more likely to have two or more (13% vs 1%) reports. Several story characteristics including front-page placement, headline containing the word suicide of a description of the method and

	detailed description of decedent appeared more often after index cluster suicide than a matched non-cluster suicide. Controlling for the number of stories, two types of story characteristics were associated with cluster status: an accompanying sad picture, and celebrity status.
	celebrity status.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Hagihara A, Abe T, Omagari M et al. (2014)
Study type	Analytical study: Ecological
Country	Japan
Dependent variable	Suicide and attempted suicide
Method	In February 2008, newspapers reported on three young people who met on the internet and then committed suicide as a group in a hotel room using a novel method - hydrogen sulphide poisoning. Ambulance dispatches for suicide attempts using hydrogen sulphide from March 2008 - May 2008 (56 days) were examined. Box-Jenkins regression model analysed daily variations in newspaper articles about hydrogen sulphide suicides using and number of attempts involving hydrogen sulphide per day in study period. Content analysis of articles for conformity to media reporting guidelines was also done.
Key findings	There were 220 hydrogen sulfide-related dispatches in the study period, 202 of which were fatal. The number of articles about suicide using hydrogen sulphide was related to hydrogen sulphide suicide attempts and the time lag between reports and attempts was 1 or 3 days. An increase of 10 newspaper articles about suicide using in national and local papers associated with increases of 1.1 and 1.3 respectively in number of suicide attempts 1 day after the report. A front-page article had an effect four times as strong as the magnitude of impact of newspaper articles overall. The magnitude of impact of the articles or 'copy-cat' suicide increased according to the number of violations of media suicide reporting recommendations with violating 5, 6, or 7 recommendations lead to increase in hydrogen sulfide attempts (on days 1 or 3 post reporting) of 2.3, 1.4 and 14.4 attempts respectively.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Hassan (1995)
Study type	Analytical study: Ecological
Country	Australia
Dependent variable	Suicide
Method	Calculated national daily suicide rates for 'high impact' periods (days on which suicide stories published in the <i>Age</i> and the <i>Sydney Morning Herald</i> and subsequent two days) and 'low impact' periods (periods of three months, 14 days before and 14 days after suicide stories) (1981–90).
Key findings	Significant increase in suicide rate during 'high impact' periods for males but not for females.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Higgins and Range (1996)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Suicidal thoughts
Method	Presented 306 university students with a newspaper report of the suicide of a 16-year-old called Pat. Varied circumstances surrounding Pat's death: (a) parents' plan for divorce; (b) recently ended relationship; (c) history of alcohol abuse; (d) history of psychiatric disturbance; (e) honours student; (f) university athlete; or (g) no conditions described. Asked to predict likelihood of own imitative behaviour.
Key findings	Participants unlikely to report that they would imitate the suicide of Pat, regardless of how his circumstances were presented.
Interpretation	No evidence to suggest negative influence of media

Investigators	Hills (1995)
Study type	Descriptive study
Country	Australia
Dependent variable	Attempted suicide
Method	Case report

Key findings	Local newspaper published a front-page picture of a suicide incident. Following day psychiatric patient threatened same action.
Interpretation	Some evidence to suggest negative influence of media
Investigators	Hittner (2005)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Re-analysed Phillips' (1974) original data, arguing that the initial analysis did not control for the positive correlation between the expected and observed suicide rates before examining the impact of media publicity on the observed number of suicides. Used a five-step statistical procedure which took this into account (but excluded some observations that did not meet certain statistical assumptions).
Key findings	Found no association between heightened levels of media exposure and increases in the observed numbers of suicides.
Interpretation	No evidence to suggest negative influence of media

Investigators	Ishii (1991)
Study type	Analytical study: Ecological
Country	Japan
Dependent variable	Suicide
Method	Calculated monthly amount of suicide news in two national Japanese newspapers (1954– 86) by multiplying number of suicide headlines in each by circulation of each, and adding totals. Correlated each monthly figure with national monthly suicide rate for males and females, and with combined rate for Tokyo area. Applied Grainger's causality to data to estimate multivariate autoregressive models.
Key findings	Suicide news had a causal effect on actual suicides (and not vice versa) for both males and females at the national level. More complex two-way relationship at local level.
Interpretation	Some evidence to suggest negative influence of media

Investigators	John A, Hawton K, Gunnell D et al. (2017)
Study type	Analytical Study: Ecological
Country	UK
Dependent variable	Suicide
Method	Examined a cluster suicides of young people in Bridgend, South Wales, between December 2007 and March 2008. Counted the daily frequency of published newspaper reports sixmonths before and after (June 2007 to September 2008) and plotted against incidence of possible cluster suicides. For each day of the study they calculated the number of reports in preceding 2 and 7 days highlighting days when possible cluster deaths occurred.
Key findings	Despite large increases in the volume of reporting about the suicides, that there was no clear relationship between the frequency of newspaper reports and deaths when examining 2- and 7-day rolling periods preceding each suicide.
Interpretation	No evidence to suggest negative influence of media.

Investigators	Jonas (1992)
Study type	Analytical study: Ecological
Country	Germany
Dependent variable	Suicide
	Determined daily suicide frequencies of Baden-Württemberg (1968–80) and identified days on which suicide stories appeared in major German newspapers and magazines. Two separate analyses: quasi-experimental analysis based on Phillips (1974), in which the number of suicides in weeks in which a suicide article was published was compared with the number in the corresponding week in preceding and subsequent years; and time- series regression analysis was used in which the dependent variable was daily suicide frequency, and the main independent variable was story period.
Key findings	Significant increase in suicide rate in weeks following a suicide story according to both analysis methods, but the effect was greater in quasi-experimental analysis.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Kim JH, Park EC, Nam JM et al. (2013)
Study type	Analytical study: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Examined suicide numbers for two years before and after the deaths of two celebrities (Ms Choi - actress - Oct 2008, Mr Roh - ex prime minister May 2009). Poisson time-series autoregression model controlled for season, weather, and unemployment. Identified 'Werther effect period' associated with each suicide. Estimated relative risk for suicide deaths, and suicide by the same method for the three weeks following and in the Werther effect period.
Key findings	Comparing 3 weeks before and after there was a 62% and 5% increase in overall suicide rates for Ms Choi and Mr Roh respectively and a 31% increase in hanging (used by Ms Choi) and a 61% increase in suicide from falling (Roh). In adjusted models, the Werther period of significant increase was 6 weeks for Ms Choi and 4 weeks for Mr Roh. Adjusted relative risks for suicide for the 6 weeks following Ms Choi's death were increased for both genders and for ages between 20 and 69, with the greatest increases for people in their 20s and 30s. For Mr Roh, the overall suicide relative risk in the subsequent 4 weeks increased for both genders and across all age groups with a range between 1.40 and 1.66 (95% Cis between 1.12-2.26). The risk for those using the same suicide method during the Werther effect periods was 1.89 (95% CI 1.74-2.10) for Ms Choi, and 1.5 (95% CI 1.20-1.96) for Mr Roh.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Littman (1985)
Study type	Analytical study: Ecological
Country	Canada
Dependent variable	Suicide
Method	Examined subway suicides in Toronto (1966-77) and observed 'epidemic' in 1971. Calculated the frequency of suicide news items in Toronto's major newspaper for varying intervals before and after each suicide, and then calculated the annual 'before' and 'after' averages.
Key findings	Suicide news items were just as likely to be found before and after a suicide in both 'epidemic' and 'non-epidemic' years.
Interpretation	No evidence to suggest negative influence of media

Investigators	McDonald and Range (1990)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Suicidal thoughts
Method	Presented 66 high school students with a newspaper report of a high school student called John who had many problems. Varied conditions such that John knew someone who had died: (a) by suicide that had received a sympathetic response; (b) by suicide that had received an unsympathetic response; (c) by viral illness that had received a sympathetic response; or (d) by viral illness that had received an unsympathetic response. Asked to predict likelihood of own imitative behaviour, and likelihood of imitative behaviour by
Key findings	 Majority of participants saw themselves as unlikely to be influenced to engage in suicidal behaviour, regardless of circumstances of death. Participants likely to predict that John would attempt suicide if: 1. his friend had died by suicide and he observed the response to this death to be sympathetic, and 2. his friend had died by viral illness and he observed the response to this death to be unsympathetic.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Motto (1967)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Determined suicide rates in seven cities during periods of newspaper blackouts
	ranging from 25 to 135 days (1945–65) and compared with mean rates for previous

Key findings	No impact of newspaper blackout on suicide rates.
Interpretation	No evidence to suggest negative influence of media

Investigators	Motto (1970)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Determined suicide rates in Detroit during newspaper blackout of 268 days (1967–68) and compared with mean rates for previous five years.
Key findings	Newspaper blackout associated with a decrease in suicide rates for females only (particularly those aged under 35).
Interpretation	Some evidence to suggest negative influence of media

Investigators	Niederkrontenthaler, Till and Kapusta et al (2009)
Study type	Analytical study: Ecological
Country	Austria
Dependent variable	Suicide
Method	Investigated whether the impact of suicide stories varies as a function of the social characteristics of the individual who is the focus of the media report, and their similarity to particular population groups. Identified newspaper stories on all 179 individual suicides named in the 13 largest Austrian newspapers between 1996 and 2006, and conducted logistic regression analyses to determine whether there was a relationship between the reported suicides and (a) actual suicides by similar individuals (same sex, same age group, same suicide method); (b) actual suicides by different individuals (different sex, different age group, different suicide method); and (c) actual suicides by the total population, in the 28 days after the report.
Key findings	Found that if the report concerned an individual who had celebrity status, who was aged 30-64, and whose death was definitively determined as a suicide, then this was heightened the risk of an increase in suicide rates among similar individuals; if the report concerned an individual suspected of criminal activity, then this was associated with a lower risk of post- report suicides among similar individuals. Social characteristics of the individual described in the report had no association with an increase in dissimilar suicides, and that celebrity status of the individual was the only factor that was predictive of an increase in total suicides.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Niederkrotenthaler T, Voracek M, Herberth A et al. (2010)
Study type	Analytical study: Ecological
Country	Austria
Dependent variable	Suicide
Method	Content analysis and latent class analysis of 497 suicide-related articles published from 1 Jan to 30 June 2005 to identify associations between article content and changes from the week two weeks prior (days -8 to -14) and the week following publication (days 0 to 7).
Key findings	Positive association of suicide rates with repetitive reporting, reports on suicide from falling, items reporting that societal problems related to suicide are increasing, items reporting several independent suicidal acts, language referring to suicide epidemic, reporting of public myths and the amount of dichotomous thinking. Articles reporting overcoming of suicidal ideation were associated with a decrease in suicide rates. Changes are more pronounced in regions where a higher proportion of the population was exposed to news reports than in regions with lower exposure.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Park J, Chi N, Kim SJ et al. (2016)
Study type	Analytical study: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Compared suicide counts in the 30 days before, the first 30 days after and the second 30 days after nine celebrity suicides that occurred between. Autoregressive moving average models with intervention analysis, controlled for season.

Key findings	Six of the nine celebrity suicides had significant impacts on overall suicide rates in first 30 days after, four of which continued to have influence in second 30 days. The magnitudes of those impacts greater in the gender corresponding to the celebrity except in one instance where it changed between the first 30 days (more suicides in the same gender) and second 30 days (more suicides in the opposite gender).
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Phillips (1974)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Determined the national number of suicides in months in which a front-page suicide article appeared in the national press (1947–68) and compared this with the number in the corresponding month in preceding and subsequent years.
Key findings	Overall increase in number of suicides in months of front-page suicide articles.
Interpretation	Some evidence to suggest negative influence of media

nvestigators	Phillips (1977, 1979)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Determined the number of Californian motor vehicle fatalities in the weeks in which a front-page suicide article appeared in the Californian press (1966-73) and compared this with the number in the corresponding week in preceding and subsequent years
Key findings	Overall increase in number of motor vehicle fatalities in weeks of front-page suicide articles, with peak on day three.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Phillips (1978, 1980)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Determined the national number of aeroplane fatalities in the weeks in which a front- page murder-suicide article appeared in the national press or on national television network evening programs (1968–73) and compared this with the number in the corresponding week in preceding and subsequent years.
Key findings	Overall increase in number of fatal aeroplane crashes in weeks of front-page murder- suicide articles.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Range, Bright and Ginn (1985)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Attitudes to suicide
Method	Presented 180 shoppers with a newspaper article about a male child's suicide. First varied age of child: (a) 10; (b) 13; or (c) 17. Then varied method of suicide. Asked about attitudes towards the family of the child.
Key findings	The younger the child, the more likely participants were to respond negatively towards the family. The method of suicide had no impact on the response of participants to the
Interpretation	Some evidence to suggest negative influence of media

Investigators	Range and Kastner (1988)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Attitudes to suicide
Method	Presented 180 shoppers with a newspaper article about a 10-yearold child who: (a) attempted suicide; (b) completed suicide; (c) completed suicide after having made a previous attempt; (d) was admitted to a psychiatric hospital (e) died of a viral illness; or (f) died in an accident. Asked about attitudes towards the family of the child.

Key findings	Participants were equally likely to respond negatively towards the family when the child had attempted suicide or died by suicide, but tended to be sympathetic towards the family when the child had died by illness or accident, or had been admitted to a
	psychiatric hospital.
Interpretation	Some evidence to suggest negative influence of media

nvestigators	Range and Martin (1990)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Attitudes to suicide
Method	Presented 180 university students with newspaper article about a 35-year-old man who suicided in response to: (a) psychological pain; (b) physical pain; or (c) terminal illness. A control group received no information on the circumstances surrounding the man's death. Asked about attitudes towards the man and his family.
Key findings	Victims of terminal illness and their families were viewed in the most favourable light.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Romer, Jamieson and Jamieson (2006)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified stories in newspaper sources in each of six United States cities in four months of 1993 and examined their association with suicide rates in these cities, while controlling for the effect of a number of confounders (including other news and information media and entertainment media sources of suicide stories).
Key findings	Local newspaper reports of suicide were independently associated with increases in local suicide rates.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Stack (1987a)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Replication of Wasserman (1984). Determined national suicide rates for all months (1948– 80) and compared those in which a front-page celebrity suicide story (broken down by subgroup) appeared in the national press with those in which no such story appeared, using time-series regression techniques.
Key findings	Significant increase in suicide rate in months in which front-page articles were published on suicides by subgroups of celebrities only (entertainers and politicians).
Interpretation	Some evidence to suggest negative influence of media

nvestigators	Stack (1988)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Determined national suicide rates for all months (1910–20) by extrapolating from yearly figures.
	Compared suicide rates in months in which a front-page suicide story appeared in the <i>New York Times</i> , the <i>Washington Post</i> , or the <i>Charleston News-Courier</i> with those in which no such story appeared, using time-series regression techniques.
Key findings	Significant increase in suicide rate in months in which front-page suicide articles were published in peacetime only (not in wartime).
Interpretation	Some evidence to suggest negative influence of media

Investigators	Stack (1990b)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide

Method	Determined national suicide rates for those aged over 16 for all months (1948–80) and compared those in which front-page suicide stories involving divorced or maritally distressed individuals appeared in the <i>New York Times</i> with those in which no such story appeared, using time-series regression techniques.
Key findings	Significant increase in suicide rate in months in which front-page articles were published on suicides by divorced or maritally distressed individuals.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Stack (1990c)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Replication of Wasserman (1984). Determined national suicide rates for all months (1948– 80) and compared those in which a front-page celebrity suicide story (broken down by subgroup) appeared in the national press with those in which no such story appeared, using time-series regression techniques.
Key findings	Significant increase in suicide rate in months in which front-page articles were published on suicides by non-celebrities, but the effect was less than for celebrity suicides.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Stack (1996)
Study type	Analytical study: Ecological
Country	Japan
Dependent variable	Suicide
Method	Determined national suicide rates for all months (1955–85) and compared those in which a suicide story appeared in the front three pages of the Japan Times with those in which no such story appeared using time-series regression techniques.
Key findings	Significant increase in suicide rate in months in which articles about the suicide of a Japanese person were published.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Stack (1992)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Determined national suicide rates for all months (1933–39). Compared suicide rates
	in months in which a front-page suicide story appeared in at least five of seven
	national newspapers.
Key findings	Only stories concerning political leaders were significantly associated with suicide.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Tousignant, Mishara and Cailaud et al (2005)
Study type	Analytical study: Ecological
Country	Canada
Dependent variable	Suicide and calls to suicide prevention centres
Method	Examined the impact of the media coverage of the suicide of a popular male television reporter in Quebec, Canada, on 15 January 1999. Analysed stories published in 10 daily newspapers for the subsequent year. Examined overall suicide rates and suicide rates for men aged 20-49 (the age group of the reporter) for the months of 1999 compared with the corresponding months in 1998. Analysed coroners' records of a sub-set of deaths for evidence of influence. Analysed calls to five suicide prevention centres in Quebec for the first three months of 1998 and 1999.

Key findings	Identified 98 articles, one third of which were published in the two days after the reporter's death, and another third of which were published within three days to a week. Significant numbers of these articles had strong emotional overtones, included pictures of the deceased and his family, described the method, presented simplistic explanations that made no reference to underlying psychological problems, and/or glorified the death. Overall suicide rates and suicide rates for men aged 20-49 (the age group of the reporter) in Quebec were significantly higher in most months of 1999 than the corresponding months of 1988. Ten out of 79 coroners' records from January 15 and February 6, 1999 showed somedirect evidence of influence by the reporter's death. There was an increase of 46% in calls to five Quebec suicide prevention centres in January 1999 compared with January 1998, with the rise being 200% in the four days following the reporter's suicide. The increase was 15% in February and March 1999.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Ueda M, Mori K and Matsubayashi T. (2015)
Study type	Analytical study: Ecological
Country	Japan
Dependent variable	Suicide
Method	Poisson regression models, controlled for season, examining 109 celebrity suicides reported in the largest circulation newspaper in Japan and daily suicide counts from 1989- 2010. Secondary analysis of group of more frequently reported celebrity suicides (those with more than one news report, 40% of cases) and less reported celebrity suicides.
Key findings	A sharp increase in suicide was observed on days following reporting of the celebrity death with 4.6% increase on the day of the first report. Suicides remains approximately 6% higher for about 9 subsequent day, with an average 5.5% increase over the 10-days post reporting. More widely reported celebrity suicides were followed by larger increases in suicide; day 0: 7% increase, 3 days later 11.8% increase, and average over 10-days post-reporting 6.3%.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Veysey, Kamanyire and Volans (1999)
Study type	Analytical study: Ecological
Country	United Kingdom
Dependent variable	Attempted suicide
Method	Surveillance of suicide attempts reported to National Poisons Information Service in April 1995, the month of the newspaper report of the inquest into an antifreeze
Key findings	Unusually high incidence of suicides by poisoning.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Wasserman (1984)
Study type	Analytical study: Ecological
Country	United States
Dependent	Suicide
Method	Replication of Phillips (1974). Determined the national suicide rates for all months (1947– 77) and compared those in which a front-page suicide story (celebrity and non- celebrity) appeared in the national press with those in which no such story appeared using time- series regression techniques.
Key findings	Significant increase in suicide rate in months in which front-page articles were published on celebrity suicides only.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Wasserman (1992)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Replication of Stack (1988). Determined national suicide rates for all months (1910–20) by extrapolating from yearly figures. Used Stack's definition of months in which front- page suicide stories appeared. Compared suicide rates in front-page suicide story months with those in non-front-page suicide story months, using time-series regression

Key findings	Significant increase in suicide rate in months in which front-page suicide articles
	were published in peacetime only (not in wartime)
Interpretation	Some evidence to suggest negative influence of media

Investigators	Williams CL and Witte TK (2017)
Study type	Analytical study: Individual
Country	USA
Dependent variable	Affect, attitudes toward suicide, knowledge about suicide and suicide warning signs, attitudes toward help seeking, fearlessness about death
Method	296 undergraduates were randomised to three groups: group one read a suicide article with preventative resources and psychoeducational information; group two read the original suicide article only; and group three read a non-suicide article (control). The suicide article only adhered to one guideline (no photo). Groups completed a battery of assessments and anova and chi squared analysis were conducted to investigate group differences.
Key findings	Overall there was no effect of exposure to a suicide news article, regardless of the inclusion of preventative resources and psychoeducational information, on a range of outcome variable with a few minor exceptions. Individuals in group one (suicide+resources) had higher scores on the Inevitability subscale i.e. can't stop suicide. compared to the other two groups and was less likely to identify an incorrect warning sign. The control group more likely than the experimental groups to identify acting reckless/risky behaviour as warning sign.
Interpretation	No evidence to suggest negative influence of media.

Investigators	Yip, Fu and Yang et al (2006)
Study type	Analytical study: Ecological
Country	Hong Kong
Dependent variable	Suicide
Method	Examined the press coverage of the suicide of Leslie Cheung, a local singer and actor, who fell from a height on 1 April 2003. Considered the monthly suicide rates for January- June 2003, and compared these with the average rates for the equivalent months from 1998-2002. Examined coroners for evidence records that Cheung's death had played arole in subsequent suicides.
Key findings	Identified 1243 newspaper articles about Cheung's death published in the following eight days, and on six of these eight days there was at least one front-page newspaper report. Found that there was a significant increase in suicides in the 2003 months, and that this was particularly marked for males and for suicides by similar method. Found evidence from coroners' records that Cheung's death had played a role in subsequent suicides; there were 13 cases in 2003 which his death was mentioned in a suicide note or in the records of the police investigation.
Interpretation	Some evidence to suggest negative influence of media

Appendix 2: Summary of television

studies

Investigators	Bollen and Phillips (1982)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified suicide stories about individuals carried on national network news programs (1972–76) and examined their association with national suicide trends, using quasi- experimental approach and regression analysis.
Key findings	Significant increase in national suicide rate in period after televised news story about suicide. Effect did not extend beyond 10 days.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Hittner (2005)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Re-analysed Phillips and Carstensen's (1986) original data, arguing that the initial analysis did not control for the positive correlation between the expected and observed suicide rates before examining the impact of media publicity on the observed number of suicides. Used a five-step statistical procedure which took this into account (but excluded some observations that did not meet certain statistical assumptions).
Key findings	Found partial support for an association between media reporting of suicide and actual suicides in some, but not all, of the pairwise comparisons.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Horton and Stack (1984)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified suicide stories carried on national network 6.00 pm news programs, calculated the number of seconds of coverage, and examined the association with national suicide trends.
Key findings	No relationship between amount of television reporting of suicide and actual suicide.
Interpretation	No evidence to suggest negative influence of media

Investigators	Jeong J, Shin SD, Kim H et al. (2012)
Study type	Analytical study: Ecological
Country	South Korea
Dependent variable	Attempted suicide
Method	Individuals who have made an attempt on their life were identified from a national Emergency Department database for the period of January 2005 and December 2008. 5 celebrity suicides during this period that had been reported by three national TV news during their news sections for a minimum of one week following their death were included. Suicides in the reference week (7 days before a celebrity suicide) were compared with suicides from the two weeks prior to the reference week and 4 weeks after. Excess visits (EV) and an excess visit ratio (EVR) were calculated and mean EV and EVRs were compared between the reference week and observation weeks using repeated measures ANOVA.
Key findings	There was a significant increase in excess visits between the reference week and post-event weeks 1 to 3 (0.526, 0.696 and 0.495 excess visits). The excess visit ratio significantly larger in

	second post-week (0.215) compared to reference week.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Kessler, Downey and Milavsky et al (1988); Kessler, Downey and Stipp et al (1989)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Replication of Phillips and Carstensen (1986). Extended analysis period to 1973–84, searched additional indexes for stories, adjusted for the fact that some stories are updated over a period of days, and refined the analysis to include a variable that defined the level of exposure to broadcasts about suicide on a given day.
Key findings	Number of suicides increased as a function of news stories about suicide in 1973–80, but not in 1981–84.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Phillips and Carstensen (1986)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified suicide stories carried on national network news programs (1973–79) and
	examined their association with national youth suicide trends, using regression analysis.
Key findings	Significant increase in number of teenage suicides in seven days following broadcast.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Phillips and Carstensen (1988)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified suicide stories shown on television in California (1968–85) and examined their association with national suicide trends for various demographic subgroups, using regression analysis.
Key findings	Significant association between suicide stories and actual suicides for all demographic groups, but particularly strong for teenagers.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Romer, Jamieson and Jamieson (2006)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified stories on television news in each of six United States cities in four months of 1993 and examined their association with suicide rates in these cities, while controlling for the effect of a number of confounders (including other news and information media and entertainment media sources of suicide stories).
Key findings	Local television news reports of suicide were independently associated with increases in local suicide rates.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Stack (1989)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified mass murder-suicide and mass-murder stories carried on national network news programs (1968–80) and examined their association with national suicide and homicide trends, using regression analysis.
Key findings	Significant association between publicised mass murder-suicides and actual suicides, and between publicised gangland mass-murder stories and actual suicides. No effect for homicides.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Stack (1990a)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified suicide stories carried on national network news programs, and a subgroup of stories about elderly suicides (1968–80). Examined their association with national elderly suicide trends, using regression analysis.
Key findings	Significant increase in elderly suicides in months in which a publicised suicide story occurred. Effect was even more sizeable when the analysis was restricted to stories about elderly suicides.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Stack (1993)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Identified suicide stories carried on national network news programs (1968–80) and examined their interaction with unemployment levels and the combined influence of these factors on suicide trends, using regression analysis.
Key findings	Interaction between media stories and the rate of unemployment, but together they were no more powerful a predictor of suicide rates than media coverage alone.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Shoval, Zalsman and Pokkevitch et al (2005)
Study type	Analytical study: Ecological
Country	Israel
Dependent variable	Suicide and attempted suicide
Method	Examined the impact of a television documentary screened in Israel in 2001, in which an adolescent girl was interviewed about her suicide plan and ultimately died. Compared the numbers of completed and attempted suicides in Israel in the eight weeks prior to the screening of the documentary and in the four weeks subsequent to it. Examined data for the equivalent periods in the preceding year, in order to control for seasonaleffects.
Key findings	No significant increase in the rates of completed or attempted suicide following the
	program, although there was some evidence of shifts in age and method which corresponded to the subject of the documentary.
Interpretation	Some evidence to suggest negative influence of media

Appendix 3: Summary of studies of books

Investigators	Land and Gutheil (1995)
Study type	Descriptive study
Country	United States
Dependent variable	Suicidal thoughts
Method	Anecdotal report concerning influence of <i>FinalExit</i> .
Key findings	A 54-year-old black man in forensic psychiatric facility who attempted to order <i>Final Exit</i> from the facility's library. The librarian alerted clinical staff, who found the man to be
	depressed and suicidal.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Lavin, Martin and Roy (1992)
Study type	Descriptive study
Country	United States
Dependent variable	Attempted suicide
Method	Case report concerning influence of <i>Final Exit</i> , a bestselling book advocating euthanasia by poisoning and suffocation for those who are terminally ill.
Key findings	Thirty-year-old single black woman who was admitted to an emergency department after self-harming. She had tried to follow the instructions in <i>Final Exit</i> , but had been thwarted by being unable to obtain the materials described.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Marzuk, Tardiff and Hirsch et al (1993)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Considered suicides occurring in New York in the year prior to publication of <i>Final Exit</i> (on 1 March 1991) and the year subsequent to it. Suicides classified by method. Examined the exposure to <i>Final Exit</i> of all suicides by asphyxiation and/or poisoning.
Key findings	Significant increase in the number of suicides by asphyxiation after the publication of <i>Final</i> <i>Exit</i> . No increase in suicide by any other method, and no increase in the total number of suicides. Fifteen of 144 who suicided by asphyxiation and/or poisoning had been exposed to the book, as evidenced by it being present at the site of the suicide, or suicidenotes modelled on an example given in the book. Six of the 15 showed no evidence of serious medical illness, based on clinical notes and autopsy results.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Marzuk, Tardiff and Leon (1994)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Considered national US suicide rates in years prior and subsequent to publication of Final
	<i>Exit</i> . Suicides classified by method.

Key findings	Significant increase in number of suicides by asphyxiation and poisoning after publication of
	Final Exit. No increase in suicides by any other method, and no increase in total number of
	suicides.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Sacks and Kemperman (1992)
Study type	Descriptive study
Country	United States
Dependent variable	Attempted suicide
Method	Case report concerning influence of Final Exit.
Key findings	Two cases: 47-year-old man and 31-year-old woman. Both attempted suicide after reading
	Final Exit.
Interpretation	Some evidence to suggest negative influence of media

Investigators	van den Hondel KE, Buster M, Reijnders UJL (2016)
Study type	Analytical: Ecological
Country	Netherlands
Dependent variable	Suicide
Method	Examined 'exit bag' suicides with and without helium in the period before (20014-2012) and after (2013-2014) the publication of Final Exit, and a Dutch film that includes suicide using helium gas.
Key findings	Over the time period there was a rising trend in use of helium and decreasing trend in the use of other gasses. Helium was used in 25% of cases in 2005-2012 and in 100% of cases in 2013-14. In 39% of helium suicides information about the method was found at the scene compared to 11% of non-helium exit bag asphyxiations.
Interpretation	Some evidence of a negative effect of media

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Appendix 4: Summary of studies of the

<u>Internet</u>

Investigators	Aiba M, Matsui Y, Takehiko K et al. (2011)
Study type	Analytical: Individual
Country	Japan
Dependent variable	Suicide ideation
Method	Random sample of 1808 adults. Examined suicidal ideation and access to suicide sites, controlling for stress, depression, social support, and demographics.
Key findings	In PATH analysis, for men in their 20's to 50s, accessing suicide websites influenced suicidal ideation via depression. Those with past year suicidal ideation were more likely to access suicide websites than those without.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Alao and Yolles (1999)
Study type	Descriptive study
Country	United States
Dependent variable	Attempted suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	Two cases: 16-year-old African American adolescent and 34-year-old woman with borderline personality disorder. Both had sought information from websites. Both survived.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Athanaselis, Stefanidou, Karakoukis and Koutselinis (2002)
Study type	Descriptive study
Country	Greece
Dependent variable	Suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	42-year-old male who died by suffocation. His wife indicated that during the previous 10 days he searched the Internet for hours for ways to take his own life, and had saved a site giving such advice to his 'favourites' list.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Arora VS, Stuckler DS and McKell M. (2016)
Study type	Analytical: Ecological
Country	UK
Dependent variable	Suicide
Method	Correlations between suicide and other search term volumes and suicide rates.
Key findings	Suicide search activity cyclical with peaks in autumn winter, trough in summer. Non- significant positive association in suicide rates in general working age population (15-64 years), significant association in younger age groups particularly 25-34 years.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Baume, Cantor and Rolfe (1997)
Study type	Descriptive study
Country	Australia
Dependent variable	Attempted and completed suicide
Method	Observational study of interactions on alt.suicide.holiday
Key findings	A number of examples of people posting messages on the site indicating their intention to take their own lives. Most cases involved online discussion about the perceived benefits of particular methods, and encouragement from other online users to complete the act.

Interpretation Some evidence to suggest negative influence of media		
	Interpretation	Some evidence to suggest negative influence of media

Investigators	Beatson, Hosty and Smith (2000)
Study type	Descriptive study
Country	United Kingdom
Dependent variable	Attempted suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	34-year-old male who took medications after seeking information from an overseas
	pharmacy website which sold prescription-only drugs without the need for a prescription.
	He survived, but died after a second overdose on discharge.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Becker and Schmidt (2004); Becker, Mayer and Nagenborg et al (2004)
Study type	Descriptive study
Country	Germany
Dependent variable	Attempted suicide
Method	Case report concerning influence of pro-suicide websites and chat rooms
Key findings	Two cases: 17-year-old female who ingested prescription medications following visits to pro- suicide websites to discuss her suicidal thoughts and seek information on methods; and 15- year-old female who was inspired to view suicide as a problem-solving strategy by Internet sites (although she also found the address of a clinic). Both survived.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Biddle L, Gunnell D, Owen-Smith A et al. (2012)
Study type	Descriptive study
Country	UK
Dependent variable	Attempted suicide
Method	Semi-structured interviews on details of the attempt conducted with 22 participants who survived near fatal suicide attempts.
Key findings	Thirteen (59%) used the internet as a source of information on suicide, and eight (36%) had used information found there to conduct their attempt - these latter accessed professional information resources, general knowledge sites and news websites, rather than suicide- specific websites.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Bruckner TA, McClure C and Kim Y. (2014)
Study type	Analytical: Ecological
Country	UK
Dependent variable	Suicide
Method	Compared monthly suicide incidence with monthly internet-based queries for terms relating to suicide, suicide methods and depression and suicide help.
Key findings	There was positive relation between internet search volume for 'suicide and depression' and suicide deaths in the same month.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Cantrell FL and Minns A. (2011)
Study type	Descriptive study
Country	USA
Dependent variable	Suicide
Method	Case report on finding method information online.
Key findings	A 30-year-old female consulted online suicide manual and died by ingesting "homemade Valium".
Interpretation	Some evidence to suggest negative influence of media

Investigators	Chodorowski and Sein (2002)
Study type	Descriptive study
Country	Poland
Dependent variable	Attempted suicide
Method	Case report concerning influence of chatrooms.

Key findings	25-year old female with depression and anorexia nervosa who was persuaded by someone
	on a chat room to ingest prescription medications. She survived, and the case was sent to
	the public prosecutor's office.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Corkery JM, Button J, Vento AE and Schifano F. (2010)
Study type	Descriptive study
Country	UK
Dependent variable	Suicide
Method	Case report on finding method information online.
Key findings	A 19-year-old male obtained instructions on how to extract nicotine from tobacco as a method for suicide from the internet. A 32-year-old male appeared to have obtained the recipe for the nicotine extract from the internet.
Interpretation	Some evidence to suggest negative influence of media

Investigators	D'Hulster and van Heeringen (2006)
Study type	Descriptive study
Country	Belgium
Dependent variable	Attempted suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	Two cases where individuals prepared and carried out suicide attempts with the help of information from the Internet.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Dunlop SM, More E and Romer D. (2011)
Study type	Analytical: Individual
Country	USA
Dependent variable	Suicide ideation
Method	719 participants aged 14-24 were re-interviewed one year after participation in a national survey. Examined exposure to suicide-related material online (and from personal sources) and changes in ideation as function of exposure to different sources controlling for prior hopelessness and ideation.
Key findings	Online sources of information were quite common (reported by 59% of participants) but less so than 'traditional sources' i.e. newspapers, family, friends (79%). The only source of suicide stories associated with suicidal ideation at follow-up was online forums.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Eichenberg C. (2008)
Study type	Analytical: Individual
Country	Germany
Dependent variable	Suicide ideation
Method	164 participants in and online survey in the most-frequented German language suicide forum. Asked to rate suicidal thoughts from time period before using the forum, to time of survey.
Key findings	Significant reduction in the extent of suicidal thoughts from the period before joining the forum to the time of the survey.
Interpretation	No evidence to suggest a negative influence of the media

nvestigators	Forsthoff, Hummel, Moller and Grunze (2006)
Study type	Descriptive study
Country	Germany
Dependent variable	Attempted suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	18-year-old female who learned about methods of suicide from the Internet and then
	ordered medication. She survived.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Fu, KW, Cheng Q, Wong PWC and Yip PSF (2013)
Study type	Descriptive study
Country	China

Dependent variable	Attitudes towards suicide
Method	Following micro-blog post of wrist-cutting picture that circulated widely in China in 211, analysed content of 5971 microblogs which responded.
Key findings	23% of responses expressed negative (pro-suicide) views and 37% of written responses offered peer-support or help.
Interpretation	Some evidence to suggest negative influence of media
nvestigators	Gallagher, Smith and Mellen (2003)
Study type	Descriptive study
Country	United States
Dependent variable	Suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	19-year-old female who died by asphyxiating herself after seeking information about the method from the Internet.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Gosselink MJ, Siegel AM and Suk E. (2012)
Study type	Descriptive study
Country	Netherlands
Dependent variable	Attempted suicide
Method	Case report on finding method information online.
Key findings	20-year-old male attempted suicide by chloroform inhalation. He searched the internet to find a 'dignified way to die' and ordered chloroform online from a laboratory website using a reason for the purchase he found on a pro-suicide forum.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Gunnell D, Bennewith O, Kapur N et al . (2012)
Study type	Descriptive study
Country	UK
Dependent variable	Suicide
Method	Analysis of coroners reports from 593 suicides in 2005 for evidence of internet involvement
Key findings	Nine suicides identified as having moderate to strong links to the internet. They involved searching online for particular methods, accessing websites containing information on methods and visiting euthanasia websites. None were related to pacts.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Hagihara A, Miyazaki S and Abe T. (2012)
Study type	Analytical: Ecological
Country	Japan
Dependent variable	Suicide
Method	Examined monthly time-series data from Jan 2004 to May 2010 for the top 10 internet suicide-related searches and suicide incidence among 20 to 30-year-olds.
Key findings	Three search terms "hydrogen sulphide", "hydrogen sulphide suicide" and "suicide hydrogen sulphide" were related the number of suicides in 20-29 years and 30-39 years with a time shift of 11 months.
Interpretation	Some evidence to suggest negative influence of media

nvestigators	Janson, Alessandrini and Strunjas et al (2001).
Study type	Descriptive study
Country	United States
Dependent variable	Attempted suicide
Method	Case report concerning influence of chat rooms.
Key findings	Two cases: 38-year old female who threatened to overdose on prescription medications while on a chat room site, but another user notified customer services who contacted the police and she was subsequently hospitalised and treated; and 42-year old male who threatened to kill himself while on a chat room site, but friends using the same chatroom notified the police and he was brought to the emergency department and treated.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Jashinsky J, Burton SH, Hanson CL et al. (2014)
Study type	Analytical: Ecological

Country	USA
Dependent variable	Suicide
Method	At-risk tweets were filtered from the Twitter stream using keywords for suicide risk factors
	for a 3-month period, then grouped by states and compared to national suicide data.
Key findings	There was a strong correlation between state Twitter-derived data and actual state age-
	adjusted suicide data.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Koburger N, Mergl R, Rummel-Kluge C et al. (2015)
Study type	Analytical: Ecological
Country	Germany, Netherlands, Austria, Hungry and Slovakia
Dependent variable	Suicide
Method	Suicides in two weeks before and eight weeks after, and two years before and after suicide of Enke (Nov 2008 - German footballer) in Germany, Netherlands, Austria, Slovakia and Hungry. Weekly numbers of Google Trend searches for 'Enke' and "Suicide" as separate terms. Spearman-Brown correlation coefficients for Google searches and weekly railway suicides in the 10 weeks post-Enke's death.
Key findings	In Germany there was a significant correlation between frequency of google searches for term 'Enke' and frequency of railway suicides in last 10 weeks on 2009 (which include day of Enke's death) but searches for 'suicide' not significantly associated. Searches for 'Enke' were not significantly associated with railway suicides in other countries, but in Netherlands alone was a significant association between increase railway suicides and Google searches on 'suicide'.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Laberke PJ, Bock H, Dittmann V and Hausmann R. (2011)
Study type	Descriptive study
Country	Not specified
Dependent variable	Suicide
Method	Case report on influence of online suicide forums
Key findings	A 23-year-old woman and a 30-year-old man used the internet to form suicide pact and subsequently died together by carbon monoxide poisoning.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Lee JS, Lee WY, Hwang JS et and Stack SJ. (2014)
Study type	Analytical: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Compared weekly suicide data from 2007-2011 and weekly media information (number of online articles and posts and number of searches) for the same 261-week period. Used cross-correlation analysis to investigate correlation between exposure to information in media and charcoal burning (CB) suicide.
Key findings	There was a sharp increase in CB suicide in September 2008, and no corresponding rise in suicide by other methods. CB suicide continue to rise with highest number in Nov 2011. Amount of media coverage of CB suicide rapidly increased in Sept 2008. Greatest increase in reports/posts in first week then gradual decrease, for internet searches was in week 2. There was a positive linear relationship between posts on internet community services or internet news articles and suicide by charcoal burning. There was also a strong positive linear relationship also for internet searches. For both online activity preceded the rise in CB suicide only in the first week of September, and after that rest either followed or coincided with suicides.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Le Garff E, Delannoy Y, Mesli V et al. (2016)
Study type	Descriptive study
Country	Not specified
Dependent variable	Suicide
Method	Case report on finding method information online.
Key findings	A young man died after self-poisoning with cyanide ordered in the 'deep web' where he probably obtained a complex suicide kit including the cyanide and a sedative/anxiolytic.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Ma J, Zhang W, Harris K, et al. (2016)
Study type	Descriptive study
Country	China
Dependent variable	Suicide, attempted suicide
Method	Six cases of live-broadcast suicide by young adults aged 18-25 examined.
Key findings	Two individuals died and four were rescued. Five stages of blog cast suicides were identified: signaling, initial reactions, live blog cast of suicide attempts, crisis responses and final outcomes. Blog cast participants made various attempts to prevent the suicides, though there were incidents of participants trying to suicide the suicidal behaviours. Other participants expressed concern, sought out information required for a rescue and reported the event to the police.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Melhum (2000)
Study type	Descriptive study
Country	Austria and Norway
Dependent variable	Suicide
Method	Case report concerning suicide pact made over the Internet.
Key findings	17-year-old Austrian female and 20-year-old Norwegian male who met on the Internet and arranged a suicide pact. Both died.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Mishara and Weisstub (2007)
Study type	Descriptive study
Country	United States, United Kingdom, Japan, South Korea, Austria
Dependent variable	Suicide
Method	Collation of widely reported case studies of suicides where the Internet appeared to have played a role
Key findings	 Five widely-reported incidents: Case of 21-year-old male from Arizona who took a lethal overdose while chatting online with friends who encouraged him to go through with the act. Case of two males, one from Scotland and one from England, who met on a suicide chat room site, arranged a suicide pact where only one person died. The first was charged with aiding and abetting a suicide, and took his own life before the case went to trial. Case of 20 suicide pacts in Japan where all those who died did so with companions they had met online, many by the same method. Case of three suicide pacts in Korea where all those who died did so with companions they had met online. Case of Austrian teenager and 40-year-old Italian male who met online and arrangeda suicide pact near Vienna. Both died. The Italian man had also made contact with two Germans online, but police intervened and alerted their families before they could go through with their pacts.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Musshoff F, Kirschbaum KM and Madea B.(2010)
Study type	Descriptive study
Country	Not specified
Dependent variable	Suicide
Method	Case report on finding method information online.
Key findings	A 48-year-old man obtained information from internet on inhalation of hydrogen cyanide, which is a rarely seen method.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Naito (2004)
Study type	Descriptive study
Country	Japan
Dependent variable	Suicide
Method	Case report concerning the influence of pro-suicide website.

Key findings	Four cases, each involving people from different parts of Japan:
	• Three people (a male aged 26 and two females aged 22 and 24) found dead from poisoning in vacant flat. Identified by a 17-year-old girl who had met them on Internet site and arranged pact with them, but had then lost contact with the organiser. She died by suicide herself two months later;
	• Six people (three males aged 20, 22 and 25, and three females aged 21, 30 and 41) found dead. The 22-year-old male had previously been interviewed by a news reporter and identified himself as seeking suicide companions over the Internet;
	• Three people (a male aged 14, a female aged 17 and a female in her mid-20s) found attempting to take their own lives. They had met on a suicide <i>prevention</i> website, and the incident was prevented because the mother of the 14-year-old found evidence of the planned pact on his computer and the police intervened.
	• Three people (a male aged 30, and two females aged 18 and 21) found dead. They had planned the pact over the Internet, and the male and the 18-year-old female had attempted suicide together in the past.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Nordt, Kelly, Williams and Clark (1998)
Study type	Descriptive study
Country	United States
Dependent variable	Attempted suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	24-year-old male who ingested prescription medication after seeking information from a website. He survived.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Prior (2004)
Study type	Descriptive study
Country	Canada
Dependent variable	Attempted suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	20-year-old male with depression and narcissistic personality disorder who ingested medication and purchased equipment for asphyxiation, after identifying these methods on the Internet. He survived.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Rajagopal (2004)
Study type	Descriptive study
Country	Japan
Dependent variable	Suicide
Method	Case report concerning the influence of pro-suicide website.
Key findings	Nine deaths in Japan, apparently in two suicide pacts. Pacts appeared to have been arranged by
Interpretation	Some evidence to suggest negative influence of media

Investigators	Rudder TD, Hatch GM, Ampanozi G et al. (2011)
Study type	Descriptive study
Country	Switzerland
Dependent variable	Suicide
Method	Case report based on forensic investigation.
Key findings	A 28-year-old male with no prior history of psychiatric illness, drug abuse, suicide attempt or ideation posted his intention to suicide on his Facebook profile as a status update. Included the location from which he intended to fall. A friend went to the site to intervene but was too late.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Schneider S, Diederich N, Appenzeller B, et al. (2010)
Study type	Descriptive study
Country	Not specified
Dependent variable	Attempted suicide
Method	Case report on finding method information online.

Key findings	A 67-year-old man used instructions found on the internet to poison himself with tobacco.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Sisask, Varnik and Wasserman (2005)
Study type	Descriptive study
Country	Estonia
Dependent variable	Attitudes towards suicide
Method	Identified seven Internet portrayals of a suicide pact involving a 14-year-old girl and a 15- year-old boy who attempted suicide (and survived), sourced from the sites of three of the most widely-read daily newspapers in Estonia, <i>Eesti Paevaleht (Estonian Daily Paper),</i> <i>Potimees (Postman)</i> and <i>SL Ohtuleht (Evening Paper)</i> . Conducted a content analysis of the 188 spontaneous comments on these portrayals posted on the newspapers' websites by readers.
Key findings	Articles with photographs attracted the greatest number of comments. More than half of the comments expressed negative attitudes towards suicide.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Song TM, Song JY, An JY et al. (2014)
Study type	Analytical: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Multi-level model analysing monthly data on suicide and Google search trends for the words "suicide' and "stress, exercise and drinking' between 2004 and 2010.
Key findings	The suicide rate and the volume of suicide-related searches on Google showed similar trends. More stress-related searches were associated with more-suicide related searches.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Sueki H. (2013)
Study type	Analytical: Individual
Country	Japan
Dependent variable	Suicide ideation
Method	Surveyed 850 internet users in February and again in May 2011. Rated frequency of 4 types of suicide-related internet use (consulting with an anonymous other about mental health, sharing suicidal ideation, searching suicide methods, viewing suicide methods). Structural equation modelling was used to examine relationship between suicide related internet use and suicidal ideation.
Key findings	Suicide ideation increased significantly with more frequent suicide-related internet use for all except 'sharing suicidal ideation". Suicide-related internet usage increased significantly with increased suicidal ideation, depression and anxiety.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Sueki H (2015)
Study type	Analytical: Individual
Country	Japan
Dependent variable	Attempted suicide, suicide ideation, suicide plan
Method	Examined Twitter use and history of suicidal behaviour in 14,529 young people in their 20's.
	Controlled for sex, age, sociodemographics, depression, alcohol use and anxiety.
Key findings	In adjusted analysis tweeting 'want to die' was associated with lifetime history of suicidal ideation, suicide plan and suicide attempt. Tweeting 'want to commit suicide' was associated with lifetime suicide attempt. Having a twitter account and tweeting daily was not associated with suicidal behaviour.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Sueki H and Eichenberg C. (2012)
Study type	Analytical: Individual
Country	Japan, Germany
Dependent variable	Suicide ideation
Method	Online survey 301 suicide bulletin board users from Germany and Japan. Motivations for using
	suicide BBS scale. Indicated strength of suicidal thoughts before their first visit to a suicide BBS and their current suicidal thoughts.

Key findings	Suicidal thoughts did not worsen with suicide BBS usage and there was a greater reduction in
	suicidal thoughts of users who were using the boards for self-help compared to other users.
Interpretation	No evidence of a negative influence of media

Investigators	Sueki H, Yonemoto N, Takeshima T et al. (2014)
Study type	Analytical: Individual
Country	Japan
Dependent variable	Suicide ideation
Method	Prospective study - baseline, 1 weeks, 7 weeks. Compared internet users 20-49 years who used internet for suicide-related or mental health consultation related reasons and internet users who did not.
Key findings	Suicide-related users had significant increase in Suicide ideation from W1 to W7 compared to non-SR users. Those who disclosed suicidal ideation and browsing online for information about suicide methods also had increased Suicide ideation at 7 weeks.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Tran US, Andel R, Niederkrontenthaler T et al. (2017)
Study type	Analytical: Ecological
Country	USA, Switzerland, Germany Austria
Dependent variable	Suicide
Method	Volume of suicide-related searches via Google Trends for 2004-2010 for US, Switzerland, and
	2004-2012 Germany and Austria. Time-series analyses.
Key findings	Google trends volume of internet searches on suicide does not predict national suicide rates.
Interpretation	No evidence to suggest negative influence of media

Investigators	Wehner and Gawatz (2003)
Study type	Descriptive study
Country	Germany
Dependent variable	Suicide
Method	Case report concerning influence of pro-suicide websites.
Key findings	14-year-old boy who died from ingesting a plant after investigating methods of suicide on various websites.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Westerlund M, Hadlaczky G and Wasserman D. (2015)
Study type	Descriptive study
Country	Sweden
Dependent variable	Attitudes toward suicide
Method	Content analysis of 30 messages posted in a suicide thread on a Swedish discussion forum after an individual, who then streamed images of his suicide as it occurred to the site, posted his intentions to hang himself. Combined qualitative/quantitative analysis of the 608 messages posted during and after the suicide.
Key findings	Nearly half the posted messages before the suicide encouraged the man to complete the suicidal act. During and after, approximately 10% of posts questioned the authenticity (despite the streaming), of those expressing a view on the suicide 49% thought it was tragic, however 24% posts said it was exciting, interesting or funny. 62% of posts that mentioned prevention expressed the opinion the suicide could have been prevented.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Won HH, Myung WJ, Song GY et al (2013)
Study type	Analytical: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Examined social media (suicide and dysphoria weblog count (daily documents referring to either) and national suicide rates in general from Jan 2008 to Dec 2010, including an examination of effects following celebrity suicides (6 in the time period). Controlled for economic and meteorological variables.
Key findings	Social media was significantly associated with nation-wide suicide numbers. Long- and short- term association of social media variables with national suicide rate (controlling for celebrity suicides). Suicide weblog more responsive to celebrity suicide, and short-term activity increase associated with concurrent spiking in suicide.

Investigators	Wong PWC, Wong GKH, Li TMH (2017)
Study type	Descriptive study
Country	Hong Kong
Dependent variable	Suicide
Method	Case report on influence of online suicide group
Key findings	Twenty-two-year-old woman with a history of psychosis from age 13 died by suicide by hanging. Deceased had expressed suicide ideation in her offline diary and left two offline suicide notes. Was a member of Facebook group named "Suicide Group" and posted a few messages expressing suicidal ideation, and inviting group members to join her. She also visited YouTube for suicide information.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Yang AC, Tsai SJ, Huang NE and Peng CK. (2011)
Study type	Analytical study: Ecological
Country	Taiwan
Dependent variable	Suicide
Method	Examined association between internet search trends for 37 suicide-related terms and suicide rates.
Key findings	Searches for major depression and divorce together accounted for 30.2% of variance in suicide rates. Major depression and divorce searches only associated with adult and male suicides, anxiety searches only associated with female suicide.
Interpretation	No evidence to suggest negative influence of media

Investigators	Zorro AR. (2014)
Study type	Descriptive study
Country	Not specified
Dependent variable	Suicide
Method	Case report on finding method information online.
Key findings	Two males, aged 23 and 28 used chloroform and then asphyxia method. Both has previously searched the web for instruction on methods.
Interpretation	Some evidence to suggest negative influence of media

Appendix 5: Summary of studies of mixed media

nvestigators	Bhugra (1991)
Study type	Descriptive study
Country	India
Dependent variable	Attempted suicide and completed suicide
Method	Described the self-immolation of 20-year-old male student (19 September 1990) who was protesting against a policy to reserve a greater proportion of jobs for the lower castes, potentially jeopardising his own job prospects and those of his peers. Notes that death was widely reported in newspapers and on television.
Key findings	Epidemic of completed and attempted suicides in response to media coverage.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Biddle L, Gunnell D, Owen-Smith A et al. (2012)
Study type	Descriptive study
Country	UK
Dependent variable	Attempted suicide
Method	Semi-structured interviews with 22 individuals who have made a near-fatal attempt on their life between 2006-2009.
Key findings	Six (27%) reported that TV and film as sources, five (23%) identified news stories, while the remainder reported non-media sources including their own previous attempts or attempts by others they knew. Five (23%) participants also reported using the internet to find out about methods, to search for possible methods, for accessing necessary materials (poisons) and to look at how to implement methods effectively. Those using the internet generally did not visit suicide-specific sites but sites containing professional information i.e. online chemists, general knowledge sites 'Wikipedia, or news sites.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Bras, Loncar and Boban et al (2007)
Study type	Descriptive study
Country	Croatia
Dependent variable	Attempted suicide
Method	Case series of suicide attempts among patients with chronic combat-related post-traumatic stress disorder.
Key findings	All cases employed the same method (self-immolation), and there was significant media coverage of several of them. The implication was that media reporting of the earlier attempts influenced the later attempts, but the investigators did not explicitly test this.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Brener, Simon and Anderson et al (2002)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Suicidal thoughts
Method	Used data from the 1999 wave of the longitudinal Youth Risk Behavior Survey to examine the relationship between adolescents' suicidal thoughts and the widely-covered incident at Columbine High School in Colorado, where two teenagers killed themselves after murdering 12 students and a teacher.
Key findings	The incident occurred part-way through the data collection period, and students who were surveyed after it were significantly less likely to report considering or planning suicide than those who were surveyed before it.
Interpretation	No evidence to suggest negative influence of media

nvestigators	Cantor, Tucker and Burnett (1991)
Study type	Analytical study: Ecological
Country	Australia
Dependent variable	Suicide
Method	Considered the annual suicide rates in two regions of north Queensland during the 1980s in the light of two media events in 1987 and 1988.
Key findings	Significant peak in suicide rate in 1988, the year of extensive negative publicity about patients' suicides in the psychiatric ward of a local general hospital. Nonsignificant peak in 1987, the year of widely reported cluster of Aboriginal deaths in custody.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Chan, Yip, Au and Lee (2005)
Study type	Descriptive study
Country	Hong Kong
Dependent variable	Attempted suicide
Method	Interviewed 25 survivors of attempted suicide by charcoal burning and sought information
	about the extent to which the media had influenced their decision.
Key findings	The majority indicated that they had learnt of the method from the media.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Chang SS, Kwok SSM, Cheng Q et al (2015)
Study type	Descriptive study
Country	Taiwan
Dependent variable	Suicide
Method	Newspaper reports in four major newspapers and number of Google searches on charcoal burning and suicides by other methods between 2008 and 2011 were counted. Regression models were used to estimate the association between frequency in reporting on weekly suicides by charcoal burning and by other methods.
Key findings	For charcoal burning suicides, they found that every 10% increase in Google searches (for charcoal burning) was associated with a 4.3% increase in charcoal burning suicide incidence in the same week and a 3.8% increase in the following week. For newspapers, they found that a one (charcoal burning) article increase in one major newspaper was associated with a 3.6% increase in charcoal burning suicide in the same week. When both newspapers and Google searches were included in the same analysis, only Google searches were still significantly associated in both the same and following week. For non-charcoal burning suicides and media reports, there was no association for Google search volume, but there was an increase in the following week after reporting in one newspaper.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Cheng Q, Chen F, Yip PSF (2011)
Study type	Descriptive study
Country	China, Hong Kong and Taiwan
Dependent variable	Suicide and attempted suicide
Method	In 2010 a temporal cluster of 13 suicides and 4 attempts took place at Foxconn company facilities located in different cities. Counts of news reports in newspapers (Beijing, Shenzhen, Guangzhou, Hong Kong and Taiwan) and search trends in the main Chinese language search engine (Baidu) which covers 70% of the market were made. Potential mutual interactions between the Foxconn suicides and their media prominence were examined using logistic and Poisson regression methods.
Key findings	Only reports in the Beijing newspapers were associated with the occurrence of a subsequent Foxconn suicide/attempt. Each suicide/attempt made a significant contribution to a subsequent suicide event three days later and prompted an increase in Baidu searching.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Cheng, Hawton and Chen et al (2007)
Study type	Analytical study: Ecological
Country	Taiwan
Dependent variable	Attempted suicide

Method	Also explored the influence of widespread media coverage of the suicide of Taiwanese actor, MJ Nee, but this time considered suicide attempts in the three weeks after the media coverage began as the outcome of interest. Again, controlled for seasonal variation, calendar year, temperature, humidity and unemployment. Interviewed 124 individuals who have made an attempt on their life from two Taiwanese counties who indicated that they had seen the media reports.
Key findings	Significant increase in the number of suicide attempts in the three weeks after the media reporting began, particularly for males and those who had made a previous attempt. One quarter of those interviewed who had seen the media reports said they were influenced by them.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Cheng, Hawton and Chen et al (2007)
Study type	Analytical study: Individual-level
Country	Taiwan
Dependent variable	Suicide attempts and suicidal thoughts
Method	Explored the influence of extensive media coverage the suicide of a celebrated Taiwanese actor, MJ Nee, on the suicidal behaviour of 461 depressed patients. The treating psychiatrists of these patients recorded clinical data (including data on suicidal thoughts and suicide attempts) occurring after the first media report of the celebrity's death. They also interviewed the patients about their exposure to the media reports, their history of suicidal thoughts and behaviours, and their perceptions of the influence of the media reports on these behaviours.
Key findings	Four hundred and thirty-eight patients had been exposed to the media coverage, and 38% of these claimed it had influenced subsequent suicidal behaviours. Those with severe depression and/or a recent history of suicide attempts were most susceptible to influence.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Cheng, Hawton, Lee and Chen (2007)
Study type	Analytical study: Ecological
Country	Taiwan
Dependent variable	Suicide
Method	Explored the influence of widespread media coverage of the suicide of a celebrated Taiwanese actor, MJ Nee. Nee died sometime in late April 2005, and the media coverage began on 2 May and lasted for about 17 days. Examined completed suicide rates infour weeks after the media coverage began, controlling for seasonal variation, calendar year, temperature, humidity and unemployment.
Key findings	Marked increase in completed suicides in Taiwan in the four weeks after the media coverage began (with the increase being most apparent in men and among individuals who chose the same method as Nee).
Interpretation	Some evidence to suggest negative influence of media

Investigators	Choi YJ and Oh H. (2016)
Study type	Analytical study: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Examined 15 Korean and 7 international celebrity suicides occurring between 1997 and 2009. Monthly totals of numbers of news articles on each celebrity death were obtained from a news database, and monthly suicide data from the national mortality database. Fixed effect regression models were used to estimate the effect of celebrity suicide and the effects of volume of media coverage on suicide rates. Models were controlled for population level economic and demographic variables.
Key findings	A Korean celebrity suicide was associated with a 20.5% increase in suicide rates, while a non- Korean celebrity suicide has little impact on suicide rates. Media exposure significantly influences suicide rates - one article increases rate by 0.02%. Based on average media exposure for a Korean celebrity suicide, one celebrity suicide is associated with a 41.5% increase in suicide rates.
Interpretation	Some evidence to suggest negative influence of media.

Investigators

Chowdhury, Brahma, Banerjee and Biswas (2007)

Study type	Descriptive study
Country	India
Dependent variable	Suicide
Method	Examined media coverage of a judicial hanging and copycat events that followed it.
Key findings	Identified 18 cases of copycat suicide among children following media reports of the initial
	event, one suicide and 17 other imitation acts (five of which ended in death).
Interpretation	Some evidence to suggest negative influence of media

Investigators	Chiu, Ko and Wu (2007)
Study type	Analytical study: Individual-level
Country	Taiwan
Dependent variable	Suicide attempts and suicidal thoughts
Method	Examined the relationship between exposure to suicide news in general over the past year and levels of suicidality in the past week in 2602 college students, using a self-report survey.
Key findings	Exposure to suicide news only predicted levels of suicidality for individuals with severe levels of depression.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Church and Phillips (1984)
Study type	Analytical study: Ecological
Country	United Kingdom
Dependent variable	Suicide
Method	Identified suicides by asphyxiation between 1 February 1971 and 31 January 1981. Divided
	10-year period into two-month segments, and considered segments in which there was a
	suicide by asphyxiation and segments in which there was no such suicide.
Key findings	Suicide by asphyxiation in one segment significantly increased the probability of another in
	the next segment. Suggested that this provided evidence for the media playing a role.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Fu KW and Chan CH (2013)
Study type	Analytical study: Ecological
Country	South Korea
Dependent variable	Suicide
Method	11 incidents of celebrity suicide (8 individual deaths, and one group of three which occurred close together) between Jan 2003 and Dec 2009 were identified via media reports. Media stories (television and newspapers) in week before or after the celebrity suicides were counted. Box-Jenkins autoregressive integrated moving average (ARIMA) models were used to examine effect of celebrity suicides on weekly suicide counts following each death. Models were controlled for unemployment, secular trends and seasonality.
Key findings	Of the 11 incidents, only three (Ms Lee, Ms Jong, and Choi/Jang and Kim grouped together) were associated with increases in overall suicide rates. All three incidents had received extensive media coverage. There was also evidence of greater effects among age and gender groups similar to the celebrities.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Fu and Yip (2007)
Study type	Analytical study: Individual-level
Country	Hong Kong
Dependent variable	Suicidal thoughts
Method	Conducted a population-based study in Hong Kong, interviewing 2016 respondents (aged 20-59) 8-15 months after the much-publicised suicide of a famous local male singer, Leslie Cheung.
Key findings	Those who indicated that the celebrity's suicide had affected them were significantly more likely to have severe levels of current suicidal ideation than those who had not been.
Interpretation	Some evidence to suggest negative influence of media
Investigators	Fu and Yip (2009)

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Study type	Analytical study: Ecological
Country	Hong Kong, Taiwan and South Korea
Dependent variable	Suicide
Method	Examined the impact of media reports of the suicides of three celebrities on subsequent suicides: one from Hong Kong (Leslie Cheung, male singer and artist, aged 46, who died by suicide); one from Taiwan (MJ Nee, male television actor, aged 59, who died by suicide; and one from South Korea (female actor, Eun-ju Lee, aged 25, who died by suicide). Aggregated suicide data from the three countries from before and after the reports, and controlled for a range of potential confounders (secular trends, seasonality, economic situation, temporal autocorrelation).
Key findings	Found that the combined risk for suicide was 1.43 in the first week after the reports, 1.29 in the second week, and 1.25 in the third week. They continued to observe a moderate increase in suicides up to the 24th week. The impacts were greater for same-gender suicides and same-method suicides, and greater still for same-gender-and-same-method suicides.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Hamilton S, Metcalfe C, and Gunnell D (2011)
Study type	Descriptive study
Country	UK
Dependent variable	Suicide
Method	Examined all 206- suicides from 1974 - 2007 at the Clifton suspension bridge which is a known hotspot and looked at media reporting within three days of the death or inquest in the 'local media' area and an expanded wider media area. A parametric survival model was fitted to look at media effects on subsequent suicide. Analysis was stratified to account for barriers installed 1998.
Key findings	Prior to the installation of barriers there was no evidence of an increased risk of suicide from the bridge following local or wider media reports. Following installation of the barriers there was a reduced rate of suicide from the bridge in the period after both local and media reports. Media reports of suicides from the bridge were not prominent.
Interpretation	No evidence to suggest negative influence of media.

Investigators	Hegerl U, Koburger N, Rummel-Kluge C et al. (2013)
Study type	Analytical study: Ecological
Country	Germany
Dependent variable	Suicide
Method	Compared the number of railway suicides in two years before and after the suicide of Robert Enke, a German football star, in Nov 2009 to examine how long the imitation effect lasts, and in the 2-week before and after periods in 2009, 2010 and 2011 for anniversary effects.
Key findings	There was a significant increase in number of railway suicides for the two years following Enke's suicide for both genders compared to the two years prior. The effect was greater for men (31% increase) than women (18% increase). There was no anniversary effect. The increase in railway suicides not explained by general increase in suicide rates.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Huh, Jo and Kim (2009)
Study type	Descriptive study
Country	Korea
Dependent variable	Suicide
Method	Examined the impact of media reporting of two deaths involving charcoal burning, this time in Korea in 2007. The individuals who died were a 32-year-old male and a 45-year-old female, and considerable news time was devoted to the deaths, because of their novelty.
Key findings	Following the media reporting, there were three further cases in the same region of Korea in 2007, and an additional four in the same season in 2008.
Interpretation	Some evidence to suggest negative influence of media

Investigators	Ji NJ, Lee WY, Noh MS and Yip PSF (2014)
Study type	Analytical study: Ecological
Country	South Korea

Dependent variable	Suicide
Method	Suicide deaths in the four weeks after the death by hanging of Ms Lee (actress) in Feb 2005, were compared to weekly counts of suicide from rest of 2003 - 2005. Poisson time series auto-regression, controlled for season, weather, and unemployment rates.
Key findings	There was substantial reporting of Ms Lee's suicide with an average of 50 articles per day in the four weeks following. There was a 146% increase in number of suicides in four weeks following Ms Lee's suicide compared to the four weeks before. Based on which the estimated excess number of suicides resulting from the media effect was 331 in that four-week period. Risk increased for both genders and all age groups, but more so for those <30 years of age, and for women with younger women at highest risk. By method, there was significant increase by age and gender only among those who used hanging but not for other methods. Overall the most prominent increase young female group using hanging.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Kim WJ, Song YJ, Namkoong L et al. (2013)
Study type	Analytical study: Individual
Country	South Korea
Dependent variable	Suicide and attempted suicide
Method	Emergency department records of 319 suicide attempts presenting at two general hospitals were reviewed for a period of 6 months before (158 cases) and 6 months after (161 cases) the suicide by hanging of the actress Ms Choi. There was substantial media coverage including details of the type of ligature used. Demographics of individuals who have made an attempt on their life and methods of attempt were compared between the 'before' and 'after' groups using chi-square analysis.
Key findings	20% and 24% of attempts were fatal in the before and after groups respectively. Hanging increased significantly after the event and the after group also had more use of multiple methods and more lethal methods. Being 21-40 was also associated with suicide attempt after Ms Choi's death.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Kunrath S, Baumert J and Ladwig KH (2011)
Study type	Analytical study: Ecological
Country	Germany
Dependent variable	Suicide and attempted suicide
Method	 Examined railway suicides attempts (from National Accident Register) in relation to media coverage of accident in December 2006 where train hit police investigation team who were trying to retrieve a body of a 'presumed suicide' from the tracks and killed three. Estimated railway suicide/attempt incidence ratios by Poisson regression, adjusting for weekday, season, month temperature and unemployment rate, for the 2 months following the accident (predefined index period) and control periods (preceding 2 years of the same period and 1 month before/after the index period).
Key findings	The mean number of railway suicides/attempts per day in the index period increased significantly to 2.66 compared to 1.94 during both control periods. Fully adjusted Poisson regression showed a 44% daily increase in railway suicides/attempts in the index period compared to the control periods.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Ladwig KH, Kunrath S, Lukaschek K and Baumert J (2012)
Study type	Analytical study: Ecological
Country	Germany
Dependent variable	Suicide
Method	Robert Enke, a German football star, died by railway suicide in Nov 2009. The authors compared railway suicides in an index period (the day after event 11/11 to 31/12 that year) with same time period in previous three years. They also examined 28 days before and after, and number of incident railway suicide cases in Jan-March 2010 compared with same period in previous three years. Poisson regression adjusted for temperature. Interaction models with time, features of station
Key findings	During the index period compared to combined control periods, there was an 81% increase in the incidence of railway deaths. Comparing the 28 days before and after Enke's death, there was a 117% increase. In the third model, no difference between in the first quarter of 2010 (post Enke) and the same period in previous years, indicating that there was no compensatory deficit in post-acute phase, that is, suicides that were going to happen just brought forward by

	coverage of Enke's death.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Lee, Chan and Lee et al (2002); Chan, Lee and Yip (2003)
Study type	Descriptive study
Country	Hong Kong
Dependent variable	Suicide
Method	Examined the rate of suicide by charcoal burning following the first case (a 35-year-old
	woman) in 1998, whose death was widely and graphically reported in the media.
Key findings	In the subsequent month, there were nine more deaths by this method, and within a year
	charcoal burning had become the most common method of suicide in Hong Kong
Interpretation	Some evidence to suggest negative influence of media

Investigators	Lee JS, Lee WY, Hwang JS et and Stack SJ. (2014)
Study type	Analytical study: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Examining effect of media reports of suicide of Ms Choi in 2008. Content analysis of suicide related media reports on television and newspapers including their online sites for 2008 was undertaken to assess compliance with guidelines. Suicide frequencies in the 4 weeks after Ms Choi's suicide (October 2008) were compared, with the four weeks before, and that same four-week period in 2006 and 207. Poisson time-series auto-regression model, adjusted for season, weather and unemployment was used to compare suicide frequency before and after Ms Choi's death.
Key findings	In 2008 there was a 63.6% increase in suicides in the four weeks post compared to the four weeks pre-Ms Choi's suicide. In the two prior years, the incidence of suicide was slightly lower in the period comparable with the 4 weeks prior to Ms Choi's death in 2008 (-2.6% and -8.1%). The increase in suicides was much higher in women (116%) and young people <29 years (110%). The number of deaths by hanging (same method) increased by 151.9%. The regression model also found a significant increase in suicides, with a relative risk of 1.35 (95% Cl 1.25–1.46) in the following four weeks, resulting in an estimated 429.6 excess number of suicides. There was a high level of non-compliance with reporting guidelines.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Ma-Kellams C, Baek JH, Or F. (2016)
Study type	Analytical study: Individual
Country	USA/Canada
Dependent variable	Death thoughts accessibility and attitudes to suicide
Method	300 participants were recruited for an online study 7 and 11 days following the suicide of Robin Williams. Participants were randomly assigned to 6 groups - 3 (suicide, accidental, natural death) by 2 (type of reflection life vs. death). Groups were given a reflection prompt corresponding to their assigned group. Word association task to assess death thoughts accessibility (DTA) and the Suicide Opinion Questionnaire to assess attitudes toward suicide. Depression was assessed using the PHQ9 and then ANOVA used to compare depressed and non-depressed within groups.
Key findings	There was greater DTA in those allocated to the 'death' reflection, but no pairwise difference in DTA between types of death group. Comparing depressed and non-depressed groups, pairwise comparison showed for depressed individuals, thinking about Robin Williams' life led to lower DTA relative to thinking about his death. Depressed individuals more likely to endorse the attitude that suicide is acceptable. Pairwise comparison showed an interaction whereby depressed individuals had more positive attitudes toward suicide toward suicide after thinking about Robin Williams' suicide and after thinking about an individual who died accidentally.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Martin and Koo (1997)
Study type	Analytical study: Ecological
Country	Australia
Dependent variable	Suicide

Method	Considered the relationship between the widespread reporting of Kurt Cobain's death (5 April
	1994) and the number of suicides in Australia by people aged 15–24 in the following month
	(comparing these figures with those from the corresponding period in the previous

Investigators	Ma-Kellams C, Baek JH, Or F. (2016)
Study type	Analytical study: Individual
Country	USA/Canada
Dependent variable	Death thoughts accessibility and attitudes to suicide
Method	300 participants were recruited for an online study between 7 and 11 days following the suicide of Robin Williams. Participants were randomly assigned to 6 groups - 3 (suicide, accidental, natural death) by 2 (type of reflection life vs. death). Groups were given a reflection prompt corresponding to their assigned group. Word association task to assess death thoughts accessibility (DTA) and the Suicide Opinion Questionnaire to assess attitudes toward suicide. Depression was assessed using the PHQ9 and then ANOVA used to compare depressed and non-depressed within groups.
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Interpretation	Some evidence to suggest negative influence of media.

Investigators	Mercy, Kresnow and O'Carrol et al (2001)
Study type	Analytical study: Individual-level
Country	United States
Dependent variable	Attempted suicide
Method	Case-control study in which investigators interviewed 153 people aged 13-34 who had made nearly-lethal suicide attempts and a random sample of 513 controls about a range of exposures.
Key findings	Cases were significantly less likely than controls to have been exposed to accounts of suicidal behaviour in the media.
Interpretation	No evidence to suggest negative influence of media

Investigators	Nakamura M, Yasunaga H, Toda AA et al (2012)
Study type	Analytical study: Ecological
Country	Japan
Dependent variable	Suicide (Hydrogen Sulphide)
Method	Examined newspaper reports and internet searches related to hydrogen sulphide suicide and hydrogen sulphide suicides from the first week in Feb to the end of Sept 2008 – before and after an 'outbreak' in April-May 2008.
Key findings	An increase in the number of newspaper articles was significantly associated with increasing numbers of hydrogen sulphide suicides, but internet searches were not related.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Pirkis, Burgess and Francis et al (2006)
Study type	Analytical study: Ecological
Country	Australia
Dependent variable	Suicide
Method	Constructed a dataset of 4635 suicide-related items appearing in Australian newspapers and on radio and television news and current affairs shows between March 2000 and February 2001. Linked this to national data on completed suicides occurring during the same 12 months, by a process that involved identifying the date and geographical reach of the media items and determining the number of suicides occurring in the same location in selected weeks pre- and post- each item.

Key findings	39% of media items were followed by an increase in male suicides, and that 31% were followed by an increase in female suicides (but that similar proportions were followed by no change or decreases in male and female suicides). Media items were more likely to be associated with increases in both male and female suicides if they occurred alongside multiple other reports on suicide (rather than occurring in isolation), if they appeared on television (instead of than on radio or in newspapers), and if they were about completed suicide (as opposed to attempted suicide or suicidal ideation).
Interpretation	Some evidence to suggest negative influence of media

Investigators	Queinec R, Beitz C, Contrand B et al (2011)
Study type	Analytical study: Ecological
Country	France
Dependent variable	Suicide
Method	Daily suicide counts for 30 days following the announcement of the death for six celebrity suicides and six celebrity deaths from other methods were examined.
Key findings	For two of the six celebrities, there was increase in overall suicides in the 30 days after their death: Kurt Cobain (+11.7%) and Pierre Beregovoy (a prominent politician) (+17.6%). Both men died by firearms and there was an increase in suicides by that method following their deaths (34% and 26% respectively). By age the increases were greater among under 45-year-olds following Cobain's death and over 45-year-olds following Beregovoy. None of the accidental deaths had an effect. There had been strong media coverage of Beregovy and one other French celebrity, moderate coverage of Cobain and minimal coverage of the others.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Schafer M and Quiring O. (2014)
Study type	Analytical study: Ecological
Country	Germany
Dependent variable	Suicide
Method	Six celebrity suicides occurring between 1994 and 2009 were selected and content analysis of media reports (newspapers and magazines) undertaken to rate conformity to suicide reporting guidelines. Analysed daily suicide data from 1992 to 2009 to investigate frequencies of all suicides and suicides with similar methods in the week before and the 4 weeks after the celebrity suicides compared to average of identical weeks in the year before and the year after the celebrity suicides.
Key findings	During the four weeks following a celebrity suicide there was more suicide deaths than expected, with the largest increase in week 1 and week 4. There was also an increase in suicides using a similar method in five of the 6 cases, which occurred in the first two weeks after but was not discernible thereafter. The number of published suicide articles and the changes in overall suicide frequencies in a respective week of analysis were significantly correlated, as was the case for suicides with a similar method.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Stack (1983)
Study type	Analytical study: Ecological
Country	United States
Dependent variable	Suicide
Method	Examined the monthly suicide rate in the United States between January 1977 and June 1980, the period around the Jonestown mass suicide in Guyana (November–December 1978). Controlled for unemployment and divorce in regression model.
Key findings	No significant increase in national suicide rate in months of reporting of Jonestown event.
Interpretation	No evidence to suggest negative influence of media

Investigators	Suh S, Chang Y, and Kim N (2015)
Study type	Analytical study: Ecological
Country	South Korea
Dependent variable	Suicide
Method	Of 30 celebrity suicides that occurred between 1991 and 2010, the 15 that had the most media (television and newspaper) coverage in the week following their death were included. Correlations were examined between the number of reports and national suicide rates from the day the suicide was publicly known until the day when 'copycat suicides' no longer appeared to follow a single exponential model, with a maximum of 20 days. Exponential curve

	fit and correlation analyses were used.
Key findings	There was a significant positive correlation between the number of media (newspaper and
	television combined) reports in the 30 days following a celebrity suicide and suicide incidence
	for the 14 celebrities included in the analysis. By media type, there was a significant positive
	correlation with suicide incidence and number of newspaper reports for five celebrities, and
	number of television reports for five of the fifteen celebrities.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Ueda M, Mori K, Matsubayashi T and Sawada Y. (2017)
Study type	Analytical study: Ecological
Country	Japan
Dependent variable	Suicide
Method	For 26 celebrity suicides that occurred between 2010 and 2014, the number of Tweets 7 days before and 15 days after first report in national newspaper, and the number of newspaper and television reports 14 days after first report were counted. Correlation coefficients were used to examine if the number of tweets on a suicide corresponded to amount of coverage in newspapers and television. Poisson regression models were used to investigate if greater attention within each media type, and comparing twitter to traditional media was associated with increases in suicide.
Key findings	Overall there was an increase in number of suicides during post-reporting period from day 4 onward that remained elevated for several weeks. Comparing celebrities with a high volume and a low volume of coverage on twitter, there was statistically significant increase in total suicides for those that generated large reactions on twitter, but no such increase for those with a relatively small number of tweets after their deaths. For newspapers, in analysis of group with highest number of newspaper articles there was no increase observed after media reports of their death, and for television among group with most coverage there was an increase that commenced on day 0. Twitter activity was highest for young entertainers, while newspapers focused on older entertainers, businessmen and politicians, and television was somewhat similar to twitter.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Yang AC, Tsai SJ, Yang CH et al. (2013)
Study type	Analytical study: Ecological
Country	Taiwan
Dependent variable	Suicide
Method	Suicide numbers and number of news items retrieved from Google news (includes all available news media in Taiwan) from 2003-2010 were gathered. Time dependent intrinsic correlation was used to quantify the temporal correlation between suicide deaths and suicide news. Method specific news reports and correlations with method, age, gender of suicides were also examined.
Key findings	Three major suicide events - including two celebrity deaths (2003, 2005) and a cluster of suicides from falling at Foxconn demonstrated in-phase correlation with peaks of suicide deaths and media reports. Outside those events peaks in suicide news exhibited an out-phase pattern with a one-month lag behind a peak of suicide deaths. By method, suicide news significantly correlated to most types of suicide deaths - except among the under 20-year-olds. Reports on charcoal burning suicides correlated to charcoal burning suicide deaths, nonviolent and male suicides also. Reports on suicides from falling correlated with nonviolent, male, female, elderly and suicide from falling.
Interpretation	Some evidence to suggest negative influence of media.

Investigators	Zahl and Hawton (2004)
Study type	Descriptive study
Country	United Kingdom
Dependent variable	Attempted suicide
Method	Interviewed 12 young people (aged 17-25) who had recently engaged in an episode of self- harm about the influence of media stories (both news reports and fictional depictions) on their actions.
Key findings	The majority reported some effect of at least one story presented in the media, and four reported that the story had been a catalyst in their ownself-harm.
Interpretation	Some evidence to suggest negative influence of media.

Appendix S1: Suicide-related internet

<u>user characteristicsⁱ</u>

Investigators	Harris KM, McLean JP and Sheffield J. (2009)
Study type	Analytical study: Individual
Country	Australia
Dependent variable	Suicide ideation
Method	290 college students classified as being at suicide-risk using the SBQ-R. Compared students at suicide risk who went online for suicidal purposes (165) and those who did not (125).
Key findings	Suicide-related online users spent significantly more weekly time online, and had significantly greater suicidal and depressive symptoms. Re help-seeking, online suicide users significantly less likely to anticipate going to friends, and more likely not to seek help for suicidal ideation. Main reasons SR online users went online were information (64.4%), support (22.1%), communication (9.1%), seeking information about methods (1.8%). 72.7% visited forums, 61.8% visited suicide prevention sites, 52.1% pro-suicide sites, and 27.3% suicide pact sites.

Investigators	Masuda, N, Kurahasi I and Onari H. (2013)
Study type	Descriptive study
Country	Japan
Dependent variable	Suicide ideation
Method	Data from dominant social networking service in Japan. Logistic regression to
	identify user characteristics which contribute to suicide ideation.
Key findings	Bering female, membership of one online community, having at least one online
	friend, and having more friends in the suicide group increase the likelihood that
	the person will be in the suicidal ideation group.

Investigators	Niederkrontenthaler T, Haider A, Till B et al. (2017)
Study type	Analytical study: Individual
Country	Austria
Dependent variable	Suicide ideation
Method	Compared 53 suicidal individuals abed 18-24 who did and did not go online for
	suicide related purposes. SBQ-R used to assess suicidal behaviour.
Key findings	Individuals who went online for suicide-related purposes had higher scores on
	past-year suicidal ideation and disclosure of suicidal ideation and expressed a
	higher likelihood of future suicide and were more depressed than suicidal
	individuals who did not use the internet for suicide-related purposes.

Investigators	Mars B, Heron J, Biddle L, et al. (2015)
Study type	Analytical study: Individual
Country	UK
Dependent variable	Attempted suicide, suicide ideation, suicide plan
Method	3946 participants in Avon longitudinal study who were 21 years old. Examined self-
	harm/suicide related internet use and suicidal behaviour.
Key findings	Suicide/self-harm related internet use was prevalent among those who had self- harmed with suicide intent (70%), and was strongly associated with the presence
	of suicidal thoughts, suicidal plans and history of self-harm. Lots of descriptive stuff about proportions who had used and what kinds of sites.

Investigators	Cheng Q, Kwok CL, Zhu T, et al. (2015)
Study type	Analytical study: Individual
Country	China
Dependent variable	Suicide ideation
Method	Online survey of Weibo users comparing those who discussed suicide (WSC) and those who did not.
Key findings	The WSC group younger, less educated, preferred using blogs and online forums for expressing themselves and reported significantly greater suicidal ideation than non-WSC. Structural equation modelling showed that greater negative affect and/or suicidal ideation and using blogs/forums more were more likely to be in the WSC group.

Investigators	Sueki H. (2012)
Study type	Analytical study: Individual
Country	Japan
Dependent variable	Attempted suicide, suicide ideation, suicide plan
Method	1000 young adults, compared participants who had and had not searched target
	DSH words (self-injury, wrist-cutting, overdose).
Key findings	There was a significantly higher rate of suicidal ideation, suicide plans and previous attempted suicide in the DSH-search group compared to the non-DSH-search
	group.

Investigators	Mitchell KJ, Wells M, Priebe G, and Ybarra ML. (2014)
Study type	Analytical study: Individual
Country	USA
Dependent variable	Suicide ideation
Method	Telephone survey of 1560 internet using 10 to 17-year-olds. Examined 12-month prevalence of visiting suicide/self-harm website, and suicidal ideation in the past 30 days.
Key findings	Only 1% of sample visited a self-harm/suicide website. Those who visited a website were seven times more likely to have had Suicide ideation after adjusting for other risk factors.

Appendix S2: General internet use and

suicidal behaviourⁱ

Investigators	Jun HJ and Kim MY (2017)
Study type	Analytical study: Individual
Country	South Korea
Dependent variable	Suicide ideation
Method	National sample of adults 50 years and over. Examined the relationship between
	Internet use and suicidal ideation and looked at mediation effects of social
	relationship satisfaction and depression.
Key findings	Internet use directly and indirectly linked to lower suicidal ideation.

Investigators	Harris KM, McLean JP and Sheffield J. (2014)
Study type	Analytical study: Individual
Country	Australia
Dependent variable	Suicide risk
Method	Participants grouped into 'suicide-risk' (SR) or not based on four high-risk dimensions of suicidality: lifetime suicidal behaviour, past-year suicidal ideation, disclosing suicidal plans, and perceived likelihood of future suicide (SBQ -R). Compared groups in terms of hours of internet use for 11 different online activities per week.
Key findings	Suicidal-risk men and suicidal-risk women both reported greater forum use than non-suicidal counterparts. SR women engaged in more surfing browsing the internet social networking, online banking and gaming than non-SR women. SR men significantly engaged in more online pornography and sex uses than non-SR men. SR women had significantly higher online relationship development behaviours than SR men. Both SR women and SR men reported more searching for and making friends and romantic/sexual partners online and were significantly less likely to seek help from most sources and to not seek help at all.

Investigators	Tseng FY and Yang HJ. (2015)
Study type	Analytical study: Individual
Country	Taiwan
Dependent variable	Suicide ideation, suicide plan
Method	Recruited 2494 high school students aged 13-19. Examined the relationship between internet use (problem internet use, time online, web communication network - a 16 item scale assessing importance placed on web communications), social support and forms of self-injurious behaviour controlling for depression and sociodemographics.
Key findings	Higher web communication associated with increased risk for suicidal ideation in boys but not girls. Internet usage in general was not associated with suicidal behaviours.

Investigators	Park S, Hong KE, Park EJ et al. (2013)
Study type	Analytical study: Ecological
Country	South Korea
Dependent variable	Attempted suicide, suicide ideation
Method	Recruited 795 middle and high school students and compared frequencies of
	suicide ideation, depression and BD in those with and without problematic

	internet use.
Key findings	The presence of problematic internet use significantly associated with suicidal ideation, depression and showed a trend for bipolar disorder. In Path models, problematic internet use directly predicted suicide ideation, and conversely suicidal ideation was found to predict problematic internet use, indicating a complex transactional relationship.

Investigators	Kim JY. (2012)
Study type	Analytical study: Individual
Country	South Korea
Dependent variable	Attempted suicide, suicide ideation
Method	Examined non-educational internet use in adolescents. Compared health outcomes between non-users (NIU), occasional users (OIU), moderate users (MIU) and heavy users (HIU).
Key findings	Suicide ideation was significantly higher in heavy-users compared to non-, and occasional users for both females (HIU = 43.4%; NIU 25.8%; OIU 21.8%) and males (HIU 26.4%; NIU 16.7%; OIU 13.6%). The rate of attempted suicide showed the same pattern (females: HIU 13.9%; NIU 7.3%; OIU 5.2% and males: HIU 10%; NIU 4.9%; OIU 2.4%).

Investigators	Messias E, Castro J, Saini A et al. (2011)
Study type	Analytical study: Individual
Country	USA
Dependent variable	Suicide ideation, suicide plan
Method	Data on internet use and suicidal ideation and plans from the 2007 and 2009 Youth Risk Behaviour Surveys for students aged 14-18 years. Controlled for age, gender, ethnicity and smoking. Cross-sectional analysis only.
Key findings	Teens who reported more than 5 hours a day of video game/internet use in 2009 survey had a significantly higher risk of suicidal ideation and suicide planning. Results were similar in the 2007 survey. There was a potential protective influence of low video game use compared with no use.

Investigators	Kim D,J, Kim K, Lee HW et al. (2017)
Study type	Analytical study: Individual
Country	South Korea
Dependent variable	Attempted suicide, suicide ideation
Method	Compared 1401 adults aged 18-74 with and without Internet Gaming Addiction adjusting for age, sex, education, marital status, income and employment.
Key findings	In adjusted analysis, the internet gaming addiction group were younger and had higher rates of ideation, plan and attempt than non-internet gaming addiction group, but not in adjusted analysis where depression was the only significantly different characteristic.

Investigators	Lin IH, Ko CH, Chang YP et al. (2104)
Study type	Analytical study: Individual
Country	Taiwan
Dependent variable	Attempted suicide, suicide ideation
Method	In southern Taiwan, 9501, 12 to 18-year-olds selected using stratified random sampling. Administered the Kiddie SADS, internet addiction Scale, questions about internet activates. Factors associated with suicidal ideation identified using logistic regression controlling for demographics, depression, family support and self-esteem.
Key findings	Internet addiction significantly associated with suicidal ideation and attempt. Online gaming, MSN, online searching for information, and online studying associated with increased risk of suicidal ideation. Online gaming, chatting, watching movies, shopping and gambling associated with increased risk of suicide

attempt. Watching online news decreased risk of suicide attempt.

Investigators	Fu KW, Chan WSC, Wong PWC and Yip PSF. (2010)
Study type	Analytical study: Individual
Country	Hong Kong
Dependent variable	Internet addiction
Method	Two wave panel survey of 208 15 to 19-year-olds. Self-report internet
	usage, Suicide ideation and other psychiatric and psychosocial conditions
Key findings	There was a positive dose-response relationship between symptoms of
	internet addiction and 1-year changes in scores for suicidal ideation.

Investigators	Ryu, Choi and Seo et al (2004); Kim, Ryu and Chon et al (2006)
Study type	Analytical study: Individual-level
Country	Korea
Dependent variable	Suicidal thoughts
Method	Administered questionnaire to Korean high school students.
Key findings	Those who qualified as being addicted to the Internet according to a standardised scale were significantly more likely to be suicidal and/or depressed than their non-addicted peers.

Investigators	Wu CY, Lee MB, Liao SC and Chang LR. (2015)
Study type	Analytical study: Individual
Country	Taiwan
Dependent variable	Attempted suicide, suicide ideation
Method	Multiple regression used to examine independent psychosocial predictors of
	internet addiction in 1100 respondents to an online survey.
Key findings	A greater proportion of participants with internet addiction had suicide ideation in
	the past week (47% vs 22.1%), and suicide attempt in the past year (5.1% vs 2.3%)
	and in their lifetimes (23.1% vs 14.1%) than those with no internet addiction.

ⁱ As these studies do not provide data on the influence of suicide-related internet activity on suicidal behaviour no interpretation is included.