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Mass media representation of suicide deaths in India: an epidemiological comparison with suicide deaths in the population

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Abstract

Objectives:
Suicide rates in India are among the highest in the world, equating to over 200,000 suicides annually. Reports of suicides are a routine feature in major newspapers in India, and reporters may selectively present "newsworthy" suicide stories. The aim of this paper was to systematically investigate whether mass media reports of suicides reflect the epidemiological data on suicide in India.

Design:
We extracted socio-demographic data on suicides reported among nine of the most highly read daily newspapers in the southern state of Tamil Nadu between June-December 2016. Five of the nine newspapers under review were in the top 20 most circulated daily newspapers in the country. A total of 1,258 newspaper articles were retrieved containing reports on 1,631 suicides. Two-tailed binomial tests on aggregate frequencies assessed whether the socio-demographic characteristics of suicides in the newspaper articles were different to the population suicide statistics for Tamil Nadu.

Results:
We identified some statistically significant discrepancies between suicide characteristics in the population and the media. Suicides involving females, those aged under 29 years, separated or widowed males, unmarried females, those using more lethal methods, and those

who were students or working in the agricultural sector were significantly over-reported relative to their occurrence in the broader population.

Conclusions:
The suicide characteristics in the print media were not entirely representative of suicides in the broader population, which may lead the general public to develop misunderstandings about suicide. The discrepancies we identified will inform tailored suicide prevention education for media professionals.

Strengths and limitations of this study

- Suicides are a routine feature in major newspapers in India, and this is the first study to examine whether these media reports of suicides reflect the epidemiological data on suicide in India.
- We followed nine major newspapers over seven months and collected a large sample of 1,631 media reports of suicides.
- We only looked at printed newspapers and further funding it would be desirable to examine media reports by other forms of mass and social media.
- A large proportion of suicides are not captured in the official suicide statistics in India, due to a sole reliance on police data and the lack of a comprehensive and reliable vital registration system. Given both the official statistics and the media reports used in this study are based on police reports of suicide, we expect that this will have a negligible effect on the comparisons made in our study.
- While our findings provide some epidemiological clues as to the decisions made by media professionals in choosing whether to report on a suicide, further qualitative research with media professionals is required to better understand the decision-making process and any biases that may be involved.

Background

Southeast Asia accounts for roughly 40% of the estimated 800,000 suicides that occur each year globally [1]. Suicide rates in India are among the highest in the world with the most recent suicide death rate estimates ranging between 18-21 deaths per 100,000 population (*c.f.* the global average of 11/100,000). This equates to an estimated 230,000-250,000 suicide deaths annually with far-reaching social, emotional and economic consequences [1 2]. A public health approach to suicide is gaining momentum in India with calls for the development of national and state-level suicide prevention strategies, including the development of media guidelines to improve mass and social media coverage of suicides [3].

One of the few recommended suicide prevention strategies at the population level is responsible media reporting of suicides [4-6], based on evidence around copycat suicides, dissemination of suicide methods and behaviours, and the imperative to deliver tailored suicide prevention messaging in media content [7-12]. Consequently, the World Health Organization (WHO) recommends that public health specialists should engage with media professionals to limit irresponsible media coverage (for example, reports that sensationalise suicide) and to promote coverage that educates the public about suicide [13].

The manner by which the mass media communicates with the Indian public on the topic of suicide in India has thus far gone without sufficient inquiry [14]. Our own recent research into print media portrayals of suicide in India observed that explicit suicide reports are a routine feature, and that potentially harmful reporting practices are common [15]. For example, a detailed suicide method was reported in 43.3% of articles. Given that there are few alternative sources of publicly-disseminated information on suicide in India, as the suicide prevention sector is relatively under-resourced, these mass media portrayals of suicide are quite possibly playing a critical role in shaping and reflecting public attitudes and behaviours in relation to suicide.

Researchers have long recognised the disparity between the epidemiological data on suicide in the population and the stories selectively presented for mass media reports [16]. In suicide prevention, there is a major focus on disseminating knowledge on the risk factors and the complex multilayered context for suicide [6]. This can be at odds with media preferences for newsworthy stories that are atypical or that play to broader social narratives of interest to readers. Hence, one important area of enquiry for suicide prevention is to better understand what kinds of suicides media broadcast to the public, to shed light on possible misunderstandings of the epidemiological realities that can inform media training and engagement strategies. Very few studies have examined which suicides tend to feature in the media. Those that have, found that the mass media selectively present newsworthy suicide stories that do not reflect the broader array of suicides in the population [17-20], which can carry profound implications for the social and political responses to suicide.

This phenomenon is yet to be studied in India. This paper seeks to address this gap in the literature by comparing the characteristics of suicides in print media reports in India against the characteristics of suicides in the population. We elected to undertake a comprehensive study of newspaper reporting in one state, the southern state of Tamil Nadu (population = 72 million), which consistently has one of the highest suicide rates in India (22.8/100,000) equating to 15,777 recorded suicides in 2015, over 40 suicides per day[21]. The approach of

focusing on one state allows us to comprehensively track changes in media reporting in this state following upcoming efforts to engage with the media on this topic.

Methods

As part of the Suicide in the Indian Media (SIM) project [15], we undertook a content analysis study of articles reporting suicide-related news in nine of the ten most highly read vernacular and English-language daily newspapers in Tamil Nadu over the 7-month period between 1st June and 31st December 2016. The nine newspapers collectively have an estimated average daily readership of over 16,000,000 people in Tamil Nadu alone [22]. Five of the nine newspapers under review are in the top 20 most circulated daily newspapers in the country [23], giving the findings relevance beyond Tamil Nadu. We previously published research from this content analysis study where we assessed the quality of newspaper reporting of suicide-related news against World Health Organization suicide reporting guidelines [13 15].

To source the articles, the hardcopies of all 1,926 (9 newspapers x 214 days) editions of the nine newspapers during the study period were hand searched by three trained research assistants (psychologists), allowing us to include several newspapers that did not have a strong online presence. Our search yielded 1,258 articles containing reports on 1,631 suicides. We excluded articles where suicide was only mentioned briefly (i.e. <50% of the article) and articles with a focus on terrorist-related suicide bombings or euthanasia.

A bi-lingual psychologist and researcher (MPsych, MPhil) extracted data on gender, age, marital status, suicide method and occupational status for each suicide. We compared the data extracted from the newspaper articles with the characteristics of suicides in the Tamil Nadu population suicide statistics found in the Accidental Death & Suicides in India report for 2015 published by the National Crime Records Bureau (NCRB) [21].

Comparing occupational status between the two data sets was complicated by the use of broad category descriptors in the NCRB data (for example, 'professionals/salaried persons') that were not possible to reproduce. However, there were two occupational categories that were distinct enough to legitimately reproduce and examine; 'students' and 'persons engaged in the farming sector'. Both are occupational groups that have been of significant interest to suicide prevention in India and would resonate strongly with the public when discussing the topic of suicide [24 25].

We disaggregated the data by gender, and in doing so we excluded suicides of *Hijra* and transgender people due to the very small numbers of such cases; there were 13 reports of suicide deceased who were Hijra/transgender in the newspaper articles and 2 such suicide deceased in the official suicide records for Tamil Nadu.

Two-tailed binomial tests on aggregate frequencies were used in Stata (command "prtesti") to assess whether the distribution of the characteristics of suicides in the newspaper articles was different to their distribution in the population suicide statistics for Tamil Nadu. This analysis approach has been used previously by a similar media study in Austria [17]. Not all media reports contained data on all the variables we analysed, so percentages were calculated based on data for those individuals for whom these characteristics were reported in the article.

Results

Binomial tests showed that female suicides were over-reported relative to their occurrence in the broader population of suicides, comprising 45.3% (729/1610) of suicides in newspaper

reports compared to 32.0% (n=5041/15775) of suicides in the official suicide statistics ($p<0.001$) (see Figure 1). While newspapers covered a significantly higher percentage of female suicides, this was not the case across all age groups. There was no statistically significant difference in the <18 years age group, and we observed the reverse pattern in the 60+ years age group, such that female suicides were significantly under-reported.

Binomial tests showed that the suicides of those aged less than 29 years were over-reported relative to their occurrence in the broader population (see Table 1). Conversely, the suicides of those aged 30 years or older were under-reported. The suicides of those who were unmarried, separated and widowed were over-reported, while the suicides of those who were married were under-reported. The gender stratification of these marital status results highlighted a significant gender-based difference. Suicides among separated males were over-reported while the suicides of separated females were under-reported. For females, it was the suicides of those who were unmarried that were over-reported, while such deaths were not significantly over-reported among males.

The suicides of students and those engaged in the farming sector were over-reported relative to their occurrence in the broader population (see Figure 2). Students comprised 15.6% (255/1631) of all suicides in newspaper reports compared to 6.1% (955/15775) of suicides in the official suicide statistics ($p<0.001$). People engaged in the farming sector comprised 6.3% (102/1631) of all suicides in newspaper reports compared to 3.8% (606/15775) of suicides in the official suicide statistics ($p<0.001$). Conversely, the suicides of females in the agricultural sector were under-represented in media reports.

Deaths involving hanging, coming under vehicle/train, jumping off building/structure and self-inflicted injury such as a knife wound were over-reported, while suicides by poisoning were under-reported (see Table 1).

Discussion

The present study identified substantial disparities between suicide characteristics in the population and the media. Suicides involving females, those aged under 29 years, separated or widowed males, unmarried females, and those using lethal methods (other than pesticides) were significantly over-reported relative to their occurrence in the broader population. The suicides of people from the occupational groups of students or persons engaged in the agricultural sector were also over-reported.

An important finding was that female suicides were significantly over-represented, relative to their occurrence in the population. This finding appears to be unique to India and is in stark contrast to what has been observed elsewhere. No under or over-reporting was observed in Australia [19] or Austria [17] based on gender. However, in the Chinese settings of Guangzhou and Taiwan, female suicides have been observed to be under-reported [20], the opposite pattern to our findings. The authors posited that, in traditional Chinese societies, women can be stereotyped as being more emotional or hysterical, and more prone to suicide. Such that, they felt media professionals may perceive the suicide deaths of men to be more unusual and thus newsworthy.

In India, the female suicide rate is among the highest in the world, and is nearly three times higher than the rate expected globally for countries at similar levels of Socio-Demographic Index [2]. This well-documented fact about suicide in India could possibly permeate the minds of media professionals, who may then give greater emphasis to the plight of females who

take their lives. Notwithstanding this, it is also likely that there are some other reasons media professionals decide that the suicides of females are more newsworthy. Based on our anecdotal conversations with media professionals, we speculate that female suicides may also be perceived by media professionals to generate a greater empathic response among readers of newspapers in India. Stories of the suicides of females may align with paternalistic narratives about the risks to women in Indian society and the family and collective responsibility to protect them [26].

We also observed an under-reporting of suicides of married males and females. Moreover, we observed that, among female suicides, there was an over-reporting of suicides among those who were unmarried. This was quite distinct from what was observed among male suicides, where suicides by separated or widowed males were over-reported in the newspapers. It is unclear why there is an apparent media preference for stories of unmarried females and separated or widowed males, nor what cultural scripts or narratives this may align with. Marriage and family are at the core of the social fabric in India [27], and family is the main source of welfare protections. We speculate that risks associated with being outside of the institution of marriage may be being emphasised by media professionals through their selection of suicide stories pertaining to people whose marriage has been lost or who are yet to enter marriage. Through this under-reporting of suicides of married people, these media reports may actually be giving an incorrect signal to the population with regard to any suicide prevention protections that may be assumed to be gained from being married. It is important to that that while marriage is typically understood to protect against suicide, particularly for men, based on findings from studies in Western settings [28], this is not the case in India. Research undertaken in India yields mixed findings regarding the relationship between marital status and suicide for both men and women, suggesting that either marriage is not a protective factor for suicide, or indeed that the risk of suicide is higher among those who are married [29 30]. This epidemiological reality regarding marriage and suicide may conflict with narratives in India that locate 'the family' as the main source of social protections. Clearly this is speculation, and so qualitative research with media professionals is required to better understand the phenomenon of the influential role of gender and marital status in the perceived newsworthiness of suicide deaths. We note though, that even such qualitative interviews may find it hard to unravel what may be unconscious and deeply culturally embedded biases among media professionals.

Our findings suggest that the suicides of younger persons aged <29 years were considered to be more newsworthy than the suicide deaths of persons aged 30 years and older. This finding is largely consistent with research from Australia [19], Austria [17] and China [20]. It has been posited that youth suicides may be considered more newsworthy; that is, the death of a youth with their life ahead of them carries a sensational undertone that may grab the reader's attention [20]. Suicide is also the leading cause of death among youth in India aged 15-29 years, and greater than 70% of female suicide deaths and 50% of male suicide deaths are in this age group [2]. Thus, it is possible that media professionals may be attempting to give such suicide deaths greater emphasis without being aware that they may in turn be overlooking the issue of suicide among older aged people, also a high-risk period for both males and females in India [2].

Our findings also revealed that the suicides of students and people engaged in the agricultural sector were significantly over-represented, relative to their occurrence in the population. This finding was not surprising, given that both occupational groups are of significant interest to the public discourse and narratives around suicide in India [24 25]. Media houses would be

aware that reports on such deaths would resonate strongly with readers. Student suicides are a major and topical policy issue in India, frequently located within discussions around the fierce competition for student places and an accompanying intensity of exam pressure [31]. Reporting on this issue will likely be of great interest to parents, who may carry a level of fear around this happening to their own children. Farmer suicides are highly politicised in India, and have been the subject of numerous government commissions and policy dialogues. This has largely been with a focus on issues around the high levels of indebtedness among farmers, a decline in secure institutional credit, water scarcity, trade liberalisation, and a considerable vulnerability to "crop failure" [32]. Farmer suicide deaths have been described as "public deaths", due to the perception that they receive sensational coverage by the mass media [33].

Finally, suicides by particular methods also appeared to attract more media attention. Deaths involving hanging, jumping, and coming under vehicle/train were over-represented in media reports, while suicides by poisoning were under-represented. One interpretation of this finding is that media may be attracted to reporting on suicides using methods with a higher degree of lethality, given that these have been observed to have a high case fatality rate [34]. Deaths involving self-inflicted injuries (e.g. knife wound) were also over-reported, even though this method does not have a high case fatality rate, indicating that newspaper reporters may also have an interest in particular suicide methods where it is easy for them to construct a graphic visual that may attract the attention of the reader. The under-reporting of poisoning suicide deaths is also an interesting finding. While the ingestion of medical drugs typically has a low case fatality rate [34], the ingestion of pesticides, a common suicide method in India and elsewhere in South Asia [35], has a high case fatality rate and is a major contributor to high suicide rates in this region [36 37].

These findings have important implications for suicide prevention. While the mass media are a powerful resource for educating the public about suicide, the general public may develop misunderstandings about suicide that are caused by media misrepresentations. For example, Till et al observed that the consumption of tabloid newspapers in Austria for daily information appeared to be an independent factor in the endorsement of misconceptions and myths about suicide [38]. While we didn't assess the articles for suicide myths, we did observe substantial disparities between suicide characteristics in the population and the media. Strong biases towards reporting particular types of suicide deaths may result in social and political responses to suicide that are not based on the epidemiological data. For instance, if media reports are overly biased towards the coverage of female suicides, youth suicides, suicides among particular occupational groups, or particularly graphic or more lethal suicide methods, this may inadvertently affect suicide prevention funding allocations, public perceptions about who is most at risk of suicide and the method they may use, among other possible consequences.

The study has several limitations that are worth noting. Firstly, we compared data from media reports collected in 2016 against the official suicide statistics for 2015. While these are two different time periods, it is the most recently available suicide statistics for India and it is unlikely there is substantial variation between 2015 and 2016. Secondly, there is a high level of under-reporting of suicide in India. Given both the official statistics and the media reports are based on police reports of suicide, we expect that this will have a negligible effect on the comparisons made in our study. Thirdly, while our findings provide some clues as to the decisions made by media professionals in choosing whether to report on a suicide, we cannot speak definitively about the decision-making process and any biases that may be involved.

We are currently undertaking qualitative research with media professionals to better understand this phenomenon [39]. Fourthly, we were only able to examine the over or under-representation of two occupational categories that we could meaningfully reproduce. Finally, we only looked at printed newspapers and it would have been desirable to examine reports by other forms of mass and social media.

Conclusion

The suicide characteristics in the print media were not representative of suicides in the broader population, indicating that a skewed picture of reality is being presented to the community. The discrepancies we identified will inform tailored suicide prevention education for media professionals.

Contributors

GA designed the study, supervised the data collection, undertook the data analyses and wrote the first draft of the manuscript. LV and TN supported the design of the study. MJ implemented data collection. All authors read and improved the final manuscript and assisted in interpreting the findings.

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Competing interests

None declared.

Patient and public involvement

This study did not involve patients.

Ethics approval

The data used in this study are from publicly available documents. Nonetheless, we obtained ethics approvals from the Human Ethics Advisory Group at The University of Melbourne in Australia (ID: 1646245.1).

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Data sharing

The data used in this study are publicly available media reports and publicly available official reports on suicides in India. Anyone interested in accessing our database on media reports of suicides may contact the corresponding author.

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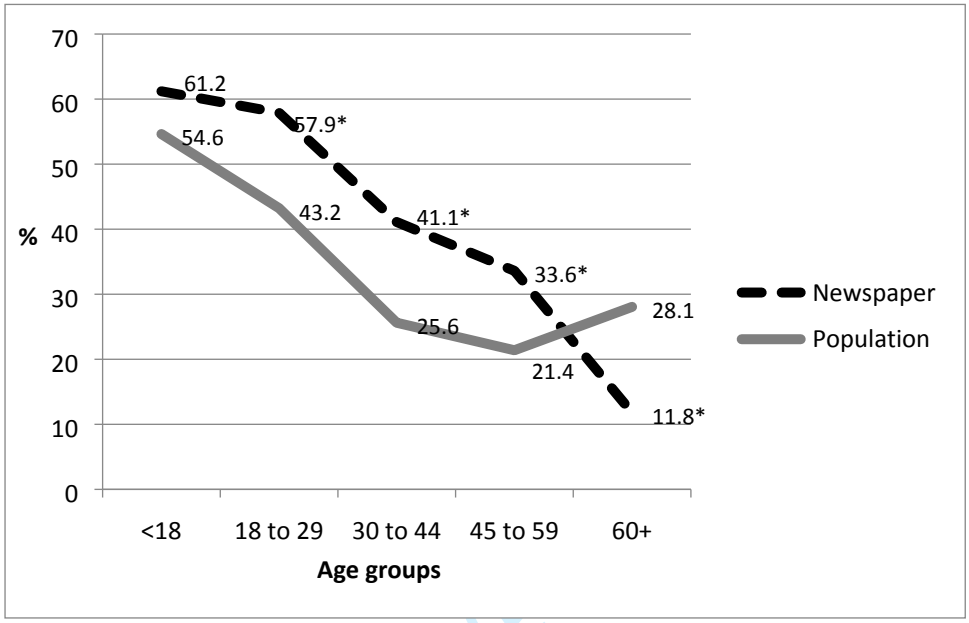
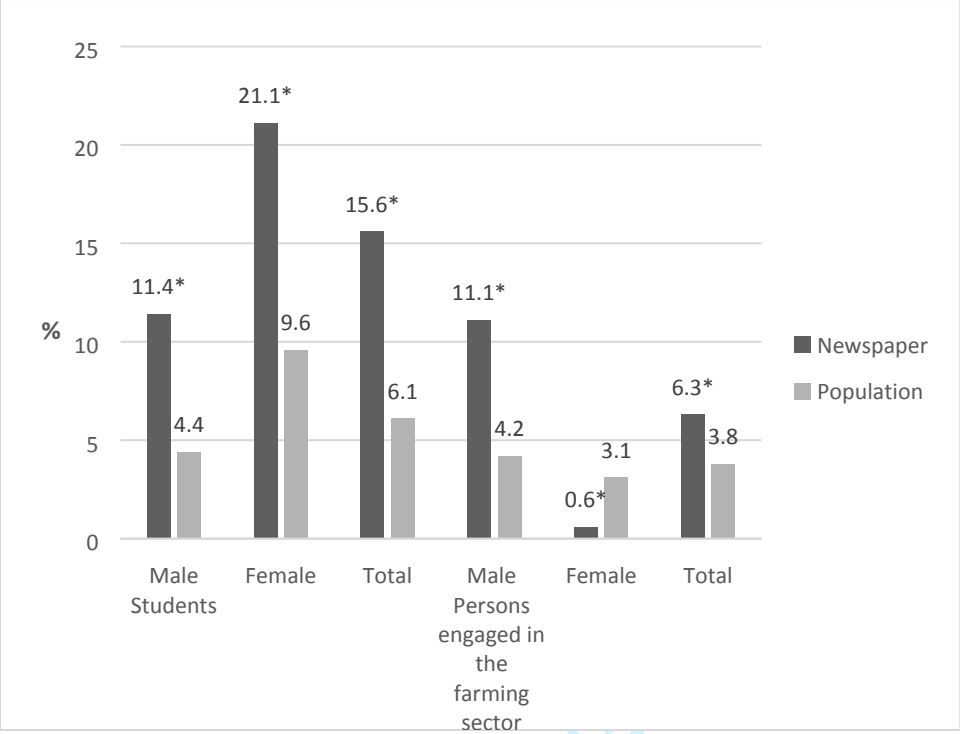
Figures

Figure 1: Comparing the proportion of female decedents in newspaper suicide reports vs. the population suicide statistics for Tamil Nadu



* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

Figure 2: Comparing the proportions of selected occupational groups of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu



Note: The occupational categories of 'student' and 'persons engaged in the farming sector' were the only categories in the official statistics that were distinct enough to compare to the data we extracted from newspaper reports. Other occupational categories in the official suicide statistics (e.g. 'professionals/salaried persons') were too broad to be reproduced.
* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

Tables

Table 1: Binomial tests comparing the demographic characteristics of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu

	Male			Female			Total		
Characteristics	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**
Age									
<18 years	7.1% (54)	4.2% (446)	<0.001	13.0% (85)	10.7% (537)	0.071	9.8% (139)	6.2% (983)	<0.001
18-29 years	31.5% (239)	24.7% (2656)	<0.001	50.2% (328)	40.1% (2022)	<0.001	40.1% (567)	29.7% (4678)	<0.001
30-44 years	26.2% (199)	34.9% (3749)	<0.001	21.3% (139)	25.6% (1291)	0.016	23.9% (338)	31.9% (5040)	<0.001
45-59 years	23.4% (178)	25.5% (2742)	0.194	13.8% (90)	14.8% (746)	0.481	19.0% (268)	22.1% (3488)	0.006
60+ years	11.8% (90)	10.6% (1141)	0.296	1.8% (12)	8.8% (445)	<0.001	7.2% (102)	10.1% (1586)	0.001
Total	100.0% (760)	100.0% (10734)		100.0% (654)	100.0% (5041)		100.0% (1,414)	100.0% (15775)	
Marital status[b]									
Unmarried	26.8% (125)	23.5% (2459)	0.096	34.5% (180)	22.3% (1100)	<0.001	30.9% (305)	23.1% (3559)	<0.001
Married	63.6% (297)	73.4% (7682)	<0.001	60.8% (317)	72.1% (3556)	<0.001	62.1% (614)	73.0% (11238)	<0.001
Separated	5.6% (26)	1.2% (128)	<0.001	1.2% (6)	3.1% (155)	<0.001	3.2% (32)	1.8% (283)	<0.001
Divorced	0.0% (0)	0.3% (21)	0.236	0.4% (2)	0.8% (38)	0.286	0.2% (2)	0.4% (69)	0.325
Widowed	4.1% (19)	1.6% (164)	<0.001	3.1% (16)	1.6% (80)	0.008	3.5% (35)	1.6% (244)	<0.001
Total	100.0% (467)	100.0% (10464)		100.0% (521)	100.0% (4929)		100.0% (988)	100.0% (15393)	
Suicide method									
Hanging	52.7% (436)	42.5% (4555)	<0.001	51.2% (349)	38.0% (1916)	<0.001	52.1% (785)	41.0% (6471)	<0.001
Poisoning	20.3% (168)	39.7% (4260)	<0.001	19.8% (135)	35.2% (1775)	<0.001	20.1% (303)	38.3% (6035)	<0.001
Fire/self-immolation	9.3% (77)	6.0% (643)	0.001	12.0% (82)	19.2% (967)	<0.001	10.5% (159)	10.2% (1610)	0.659
Under vehicle/train	4.5% (37)	2.9% (309)	0.007	3.8% (26)	0.9% (45)	<0.001	4.2% (63)	2.2% (354)	<0.001
Drowning	3.0% (25)	3.3% (357)	0.656	4.7% (32)	3.4% (171)	0.061	3.8% (57)	3.3% (528)	0.297
Jumping (off structure)	2.5% (21)	0.6% (60)	<0.001	4.1% (28)	0.1% (7)	<0.001	3.2% (49)	0.4% (67)	<0.001
Self-inflicted injury	0.7% (6)	0.6% (68)	0.642	2.3% (16)	0.4% (18)	<0.001	1.5% (22)	0.5% (86)	<0.001
Other	6.9% (57)	4.5% (482)	0.001	1.9% (13)	2.8% (142)	0.159	4.6% (70)	4.0% (624)	0.203
Total	100.0% (827)	100.0% (10734)		100.0% (681)	100.0% (5041)		100.0% (1508)	100.0% (15775)	

[a] Two-tailed binomial test on difference between two proportions using the "prtesti" command in Stata

[b] Excludes those listed as 'unknown' and 'other' in the NCRB data

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Mass media representation of suicide in a high suicide state in India: an epidemiological comparison with suicide deaths in the population

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Mass media representation of suicide in a high suicide state in India: an epidemiological comparison with suicide deaths in the population

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Abstract

Objectives:
Suicide rates in India are among the highest in the world, equating to over 200,000 suicides annually. Reports of suicides are a routine feature in major newspapers in India, and reporters may selectively present "newsworthy" suicide stories. The aim of this paper was to systematically investigate whether mass media reports of suicides reflect the epidemiological data on suicide in a high suicide state in India.

Design:
We undertook a content analysis study to extract socio-demographic data on suicides reported among nine of the most highly read daily newspapers in the high suicide southern state of Tamil Nadu between June-December 2016. A total of 1,258 newspaper articles were retrieved containing reports on 1,631 suicides. Two-tailed binomial tests on aggregate frequencies assessed whether the socio-demographic characteristics of suicides in the newspaper articles were different to the population suicide statistics for Tamil Nadu.

Results:
We identified some statistically significant discrepancies between suicide characteristics in the population and the media. Suicides involving females, those aged under 29 years, separated or widowed males, unmarried females, those using methods with a higher case-

fatality rate, and those who were students or working in the agricultural sector were significantly over-reported relative to their occurrence in the broader population.

Conclusions:
The suicide characteristics in the print media were not entirely representative of suicides in the broader Tamil Nadu population, which may lead the general public to develop misunderstandings about suicide in their state. The discrepancies we identified will inform tailored suicide prevention education for media professionals.

Strengths and limitations of this study

- Suicides are a routine feature in major newspapers in India, and this is the first study to examine whether these media reports of suicides reflect the epidemiological data on suicide in India.
- We followed nine major newspapers over seven months and collected a large sample of 1,631 media reports of suicides.
- We only looked at printed newspapers and further funding it would be desirable to examine media reports by other forms of mass and social media.
- A large proportion of suicides are not captured in the official suicide statistics in India, due to a sole reliance on police data and the lack of a comprehensive and reliable vital registration system. Given both the official statistics and the media reports used in this study are based on police reports of suicide, we expect that this will have a negligible effect on the comparisons made in our study.
- While our findings provide some epidemiological clues as to the decisions made by media professionals in choosing whether to report on a suicide, further qualitative research with media professionals is required to better understand the decision-making process and any biases that may be involved.

Background

Southeast Asia accounts for roughly 40% of the estimated 800,000 suicides that occur each year globally [1]. Suicide rates in India are among the highest in the world with the most recent suicide death rate estimates ranging between 18-21 deaths per 100,000 population (*c.f.* the global average of 11/100,000). This equates to an estimated 230,000-250,000 suicide deaths annually with far-reaching social, emotional and economic consequences [1 2]. A public health approach to suicide is gaining momentum in India with calls for the development of national and state-level suicide prevention strategies, including the development of media guidelines to improve mass and social media coverage of suicides [3].

One of the few recommended suicide prevention strategies at the population level is responsible media reporting of suicides [4-6], based on evidence around copycat suicides, dissemination of suicide methods and behaviours, and the imperative to deliver tailored suicide prevention messaging in media content [7-12]. Consequently, the World Health Organization (WHO) recommends that public health specialists should engage with media professionals to limit irresponsible media coverage (for example, reports that sensationalise suicide) and to promote coverage that educates the public about suicide [13].

The manner by which the mass media communicates with the Indian public on the topic of suicide in India has thus far gone without sufficient inquiry [14]. Our own recent research into print media portrayals of suicide in India observed that explicit suicide reports are a routine feature, and that potentially harmful reporting practices are common [15]. For example, a detailed suicide method was reported in 43.3% of articles. Given that there are few alternative sources of publicly-disseminated information on suicide in India, as the suicide prevention sector is relatively under-resourced, these mass media portrayals of suicide are quite possibly playing a critical role in shaping and reflecting public attitudes and behaviours in relation to suicide.

Researchers have long recognised the disparity between the epidemiological data on suicide in the population and the stories selectively presented for mass media reports [16]. In suicide prevention, there is a major focus on disseminating knowledge on the risk factors and the complex multilayered context for suicide [6]. This can be at odds with media preferences for newsworthy stories that are atypical or that play to broader social narratives of interest to readers. Hence, one important area of enquiry for suicide prevention is to better understand what kinds of suicides media broadcast to the public, to shed light on possible misunderstandings of the epidemiological realities that can inform media training and engagement strategies. Very few studies have examined which suicides tend to feature in the media. Those that have, found that the mass media selectively present newsworthy suicide stories that do not reflect the broader array of suicides in the population [17-20], which can carry profound implications for the social and political responses to suicide.

This phenomenon is yet to be studied in India. This paper seeks to address this gap in the literature by comparing the characteristics of suicides in print media reports in India against the characteristics of suicides in the population. Due to the large number of languages across India and the prohibitive level of resources required to fund a study with a broad national spread of newspapers published in a range of languages, we elected to undertake a comprehensive study of newspaper reporting in one state. We chose the southern state of Tamil Nadu (population = 72 million), which consistently has one of the highest suicide rates

in India (22.8/100,000) equating to 15,777 recorded suicides in 2015, over 40 suicides per day[21]. The approach of focusing on one state allows us to comprehensively track changes in media reporting in this state following upcoming efforts to engage with the media on this topic.

Methods

As part of the Suicide in the Indian Media (SIM) project [15], we undertook a content analysis study of articles reporting suicide-related news in nine of the ten most highly read vernacular and English-language daily newspapers in Tamil Nadu over the 7-month period between 1st June and 31st December 2016. The nine newspapers collectively have an estimated average daily readership of over 16,000,000 people in Tamil Nadu alone [22]. Five of the nine newspapers under review are in the top 20 most circulated daily newspapers in the country [23], giving the findings relevance beyond Tamil Nadu. We previously published research from this content analysis study where we assessed the quality of newspaper reporting of suicide-related news against World Health Organization suicide reporting guidelines [13 15].

To source the articles, the hardcopies of all 1,926 (9 newspapers x 214 days) editions of the nine newspapers during the study period were hand searched by three trained research assistants (psychologists), allowing us to include several newspapers that did not have a strong online presence. Our search yielded 1,258 articles containing reports on 1,631 suicides; the vast majority of these suicides were of people from Tamil Nadu (84.0%, n=1371), while the remainder were largely of people from elsewhere in India (14.5%, n=236) or from other countries (1.1%, n=18), with location unable to be determined in 0.4% (n=6) of the media reports. We elected to retain all suicides in our primary analyses, regardless of the location of the deceased, as these reports will still influence the public's impressions of who is affected by suicide; secondary analyses will exclusively examine suicides of people from Tamil Nadu.We excluded articles where suicide was only mentioned briefly (i.e. <50% of the article) and articles with a focus on terrorist-related suicide bombings or euthanasia.

A bi-lingual psychologist and researcher (MPsych, MPhil) extracted data on gender, age, marital status, suicide method and occupational status for each suicide. We compared the data extracted from the newspaper articles with the characteristics of suicides in the Tamil Nadu population suicide statistics found in the Accidental Death & Suicides in India report for 2015 published by the National Crime Records Bureau (NCRB) [21].

Comparing occupational status between the two data sets was complicated by the use of broad category descriptors in the NCRB data (for example, 'professionals/salaried persons') that were not possible to reproduce. However, there were two occupational categories that were distinct enough to legitimately reproduce and examine; 'students' and 'persons engaged in the farming sector'. Both are occupational groups that have been of significant interest to suicide prevention in India and would resonate strongly with the public when discussing the topic of suicide [24 25].

We disaggregated the data by gender, and in doing so we excluded suicides of *Hijra* and transgender people due to the very small numbers of such cases; there were 13 reports of suicide deceased who were Hijra/transgender in the newspaper articles and 2 such suicide deceased in the official suicide records for Tamil Nadu.

Two-tailed binomial tests on aggregate frequencies were used in Stata (command "prtesti") to assess whether the distribution of the characteristics of suicides in the newspaper articles was

different to their distribution in the population suicide statistics for Tamil Nadu. This analysis approach has been used previously by a similar media study in Austria [17]. Not all media reports contained data on all the variables we analysed, so percentages were calculated based on data for those individuals for whom these characteristics were reported in the article.

Results

Binomial tests showed that female suicides were over-reported relative to their occurrence in the broader population of suicides, comprising 45.3% (729/1610) of suicides in newspaper reports compared to 32.0% (n=5041/15775) of suicides in the official suicide statistics ($p<0.001$) (see Figure 1). While newspapers covered a significantly higher percentage of female suicides, this was not the case across all age groups. There was no statistically significant difference in the <18 years age group, and we observed the reverse pattern in the 60+ years age group, such that female suicides were significantly under-reported.

Binomial tests showed that the suicides of those aged less than 29 years were over-reported relative to their occurrence in the broader population (see Table 1). Conversely, the suicides of those aged 30 years or older were under-reported. The suicides of those who were unmarried, separated and widowed were over-reported, while the suicides of those who were married were under-reported. The gender stratification of these marital status results highlighted a gender-based difference. Suicides among separated and widowed males were over-reported while it was the suicides of unmarried females that were over-reported; the suicides of those who were married were under-reported in both males and females.

The suicides of students and those engaged in the farming sector were over-reported relative to their occurrence in the broader population (see Figure 2). Students comprised 15.6% (255/1631) of all suicides in newspaper reports compared to 6.1% (955/15775) of suicides in the official suicide statistics ($p<0.001$). People engaged in the farming sector comprised 6.3% (102/1631) of all suicides in newspaper reports compared to 3.8% (606/15775) of suicides in the official suicide statistics ($p<0.001$). Conversely, the suicides of females in the agricultural sector were under-represented in media reports.

Deaths involving hanging, coming under vehicle/train, jumping off building/structure and self-inflicted injury such as a knife wound were over-reported, while suicides by poisoning were under-reported (see Table 1).

Secondary analyses were undertaken, only including media reports of suicides of people from Tamil Nadu, to examine if our findings were confounded by media reports of suicides of people from outside Tamil Nadu. The results are consistent with the primary analyses (See Supplementary File 1).

Discussion

The present study identified substantial disparities between suicide characteristics in the population and the media. Suicides involving females, those aged under 29 years, separated or widowed males, unmarried females, and those using lethal methods (other than pesticides) were significantly over-reported relative to their occurrence in the broader population. The suicides of people from the occupational groups of students or persons engaged in the agricultural sector were also over-reported.

An important finding was that female suicides were significantly over-represented, relative to their occurrence in the population. This finding appears to be unique to India and is in stark

contrast to what has been observed elsewhere. No under or over-reporting was observed in Australia [19] or Austria [17] based on gender. However, in the Chinese settings of Guangzhou and Taiwan, female suicides have been observed to be under-reported [20], the opposite pattern to our findings. The authors posited that, in traditional Chinese societies, women can be stereotyped as being more emotional or hysterical, and more prone to suicide. Such that, they felt media professionals may perceive the suicide deaths of men to be more unusual and thus newsworthy.

In India, the female suicide rate is among the highest in the world, and is nearly three times higher than the rate expected globally for countries at similar levels of Socio-Demographic Index [2]. This well-documented fact about suicide in India could possibly permeate the minds of media professionals, who may then give greater emphasis to the plight of females who take their lives. Notwithstanding this, it is also likely that there are some other reasons media professionals decide that the suicides of females are more newsworthy. Based on our anecdotal conversations with media professionals, we speculate that female suicides may also be perceived by media professionals to generate a greater empathic response among readers of newspapers in India. Stories of the suicides of females may align with paternalistic narratives about the risks to women in Indian society and the family and collective responsibility to protect them [26].

We also observed an under-reporting of suicides of married males and females. Moreover, we observed that, among female suicides, there was an over-reporting of suicides among those who were unmarried. This was quite distinct from what was observed among male suicides, where suicides by separated or widowed males were over-reported in the newspapers. It is unclear why there is an apparent media preference for stories of unmarried females and separated or widowed males, nor what cultural scripts or narratives this may align with. Marriage and family are at the core of the social fabric in India [27], and family is the main source of welfare protections. We speculate that risks associated with being outside of the institution of marriage may be being emphasised by media professionals through their selection of suicide stories pertaining to people whose marriage has been lost or who are yet to enter marriage. Through this under-reporting of suicides of married people, these media reports may actually be giving an incorrect signal to the population with regard to any suicide prevention protections that may be assumed to be gained from being married. It is important to note that while marriage is typically understood to protect against suicide, particularly for men, based on findings from studies in Western settings [28], this is not the case in India. Research undertaken in India yields mixed findings regarding the relationship between marital status and suicide for both men and women, suggesting that either marriage is not a protective factor for suicide, or indeed that the risk of suicide is higher among those who are married [29 30]. This epidemiological reality regarding marriage and suicide may conflict with narratives in India that locate 'the family' as the main source of social protections. Clearly this is speculation, and so qualitative research with media professionals is required to better understand the phenomenon of the influential role of gender and marital status in the perceived newsworthiness of suicide deaths. We note though, that even such qualitative interviews may find it hard to unravel what may be unconscious and deeply culturally embedded biases among media professionals.

Our findings suggest that the suicides of younger persons aged <29 years were considered to be more newsworthy than the suicide deaths of persons aged 30 years and older. This finding is largely consistent with research from Australia [19], Austria [17] and China [20]. It has been posited that youth suicides may be considered more newsworthy; that is, the death of a youth

with their life ahead of them carries a sensational undertone that may grab the reader's attention [20]. Suicide is also the leading cause of death among youth in India aged 15-29 years, and greater than 70% of female suicide deaths and 50% of male suicide deaths are in this age group [2]. Thus, it is possible that media professionals may be attempting to give such suicide deaths greater emphasis without being aware that they may in turn be overlooking the issue of suicide among older aged people, also a high-risk period for both males and females in India [2].

Our findings also revealed that the suicides of students and people engaged in the agricultural sector were significantly over-represented, relative to their occurrence in the population. This finding was not surprising, given that both occupational groups are of significant interest to the public discourse and narratives around suicide in India [24 25]. Media houses would be aware that reports on such deaths would resonate strongly with readers. Student suicides are a major and topical policy issue in India, frequently located within discussions around the fierce competition for student places and an accompanying intensity of exam pressure [31]. Reporting on this issue will likely be of great interest to parents, who may carry a level of fear around this happening to their own children. Farmer suicides are highly politicised in India, and have been the subject of numerous government commissions and policy dialogues. This has largely been with a focus on issues around the high levels of indebtedness among farmers, a decline in secure institutional credit, water scarcity, trade liberalisation, and a considerable vulnerability to "crop failure" [32]. Farmer suicide deaths have been described as "public deaths", due to the perception that they receive sensational coverage by the mass media [33].

Finally, suicides by particular methods also appeared to attract more media attention. Deaths involving hanging, jumping, and coming under vehicle/train were over-represented in media reports, while suicides by poisoning were under-represented. One interpretation of this finding is that media may be attracted to reporting on suicides using methods with a higher degree of lethality, given that these have been observed to have a high case fatality rate [34]. Deaths involving self-inflicted injuries (e.g. knife wound) were also over-reported, even though this method does not have a high case fatality rate, indicating that newspaper reporters may also have an interest in particular suicide methods where it is easy for them to construct a graphic visual that may attract the attention of the reader. The under-reporting of poisoning suicide deaths is also an interesting finding. While the ingestion of medical drugs typically has a low case fatality rate [34], the ingestion of pesticides, a common suicide method in India and elsewhere in South Asia [35], has a high case fatality rate and is a major contributor to high suicide rates in this region [36 37].

These findings have important implications for suicide prevention. While the mass media are a powerful resource for educating the public about suicide, the general public may develop misunderstandings about suicide that are caused by media misrepresentations. For example, Till et al observed that the consumption of tabloid newspapers in Austria for daily information appeared to be an independent factor in the endorsement of misconceptions and myths about suicide [38]. While we didn't assess the articles for suicide myths, we did observe substantial disparities between suicide characteristics in the population and the media. Strong biases towards reporting particular types of suicide deaths may result in social and political responses to suicide that are not based on the epidemiological data. For instance, if media reports are overly biased towards the coverage of female suicides, youth suicides, suicides among particular occupational groups, or particularly graphic or more lethal suicide methods, this may inadvertently affect suicide prevention funding allocations, public perceptions about

who is most at risk of suicide and the method they may use, among other possible consequences.

The study has several limitations that are worth noting. Firstly, we compared data from media reports collected in 2016 against the official suicide statistics for 2015. While these are two different time periods, it is the most recently available suicide statistics for India and we expect a high degree of stability between the 2015 and 2016 data. We compared the official suicide statistics for 2015 against that for 2014 and 2013 and we observed a high degree of stability in the data; for example, the suicide rate for Tamil Nadu was 22.8 in 2015 and 23.4 in 2014, and 29.7% and 30.7% of suicide deaths were people aged 18-29 in 2015 and 2013 respectively. Secondly, there is a high level of under-reporting of suicide in India. Given both the official statistics and the media reports are based on police reports of suicide, we expect that this will have a negligible effect on the comparisons made in our study. Thirdly, while our findings provide some clues as to the decisions made by media professionals in choosing whether to report on a suicide, we cannot speak definitively about the decision-making process and any biases that may be involved. We are currently undertaking qualitative research with media professionals to better understand this phenomenon [39]. Fourthly, we were only able to examine the over or under-representation of two occupational categories that we could meaningfully reproduce. There are several additional occupational categories that would have been interesting to examine; for example, "housewives" comprised 53% of female suicide deaths in the 2015 official suicide statistics, yet this occupational information or the specific term was rarely communicated in media reports. Finally, we only examined newspaper reports in one southern state of India, and it would have been desirable to examine reports in other states and reports in other forms of mass and social media.

Conclusion

The suicide characteristics in the print media in Tamil Nadu were not representative of suicides in the broader population, indicating that a skewed picture of reality is being presented to the community. In particular, suicides involving females, those aged under 29 years, separated or widowed males, unmarried females, those using methods with a higher case-fatality rate, and those who were students or working in the agricultural sector were significantly over-reported relative to their occurrence in the broader population. The discrepancies we identified will inform tailored suicide prevention education for media professionals.

Contributors

GA designed the study, supervised the data collection, and led the data analyses and drafting of the manuscript. LV and TN supported the design of the study. MJ implemented data collection. LV, JP, MJ, AC, JBS, VA and TN all contributed to the data analysis plan, interpretation of the results and the development of the final manuscript.

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Competing interests

None declared.

Patient and public involvement

This study did not involve patients.

Ethics approval

The data used in this study are from publicly available documents. Nonetheless, we obtained ethics approvals from the Human Ethics Advisory Group at The University of Melbourne in Australia (ID: 1646245.1).

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Data sharing

The data used in this study are publicly available media reports and publicly available official reports on suicides in India. Anyone interested in accessing our database on media reports of suicides may contact the corresponding author.

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Tables

Table 1: Binomial tests comparing the demographic characteristics of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu

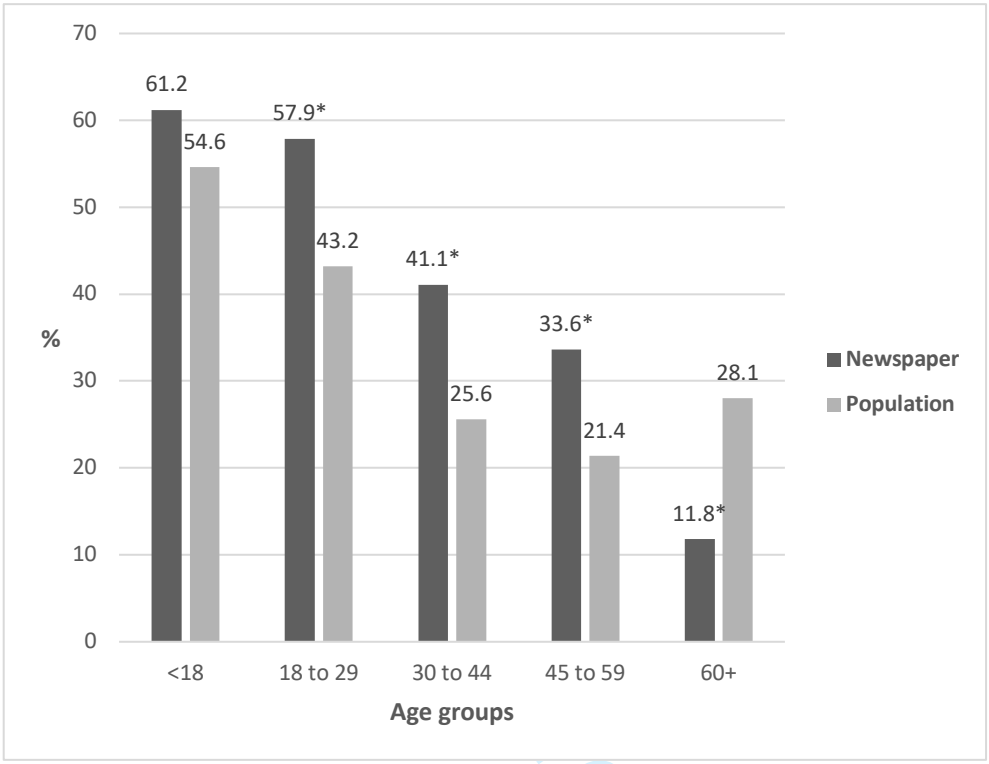
	Male			Female			Total		
Characteristics	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**
Age									
<18 years	7.1% (54)	4.2% (446)	<0.001	13.0% (85)	10.7% (537)	0.071	9.8% (139)	6.2% (983)	<0.001
18-29 years	31.5% (239)	24.7% (2656)	<0.001	50.2% (328)	40.1% (2022)	<0.001	40.1% (567)	29.7% (4678)	<0.001
30-44 years	26.2% (199)	34.9% (3749)	<0.001	21.3% (139)	25.6% (1291)	0.016	23.9% (338)	31.9% (5040)	<0.001
45-59 years	23.4% (178)	25.5% (2742)	0.194	13.8% (90)	14.8% (746)	0.481	19.0% (268)	22.1% (3488)	0.006
60+ years	11.8% (90)	10.6% (1141)	0.296	1.8% (12)	8.8% (445)	<0.001	7.2% (102)	10.1% (1586)	0.001
Total	100.0% (760)	100.0% (10734)		100.0% (654)	100.0% (5041)		100.0% (1,414)	100.0% (15775)	
Marital status[b]									
Unmarried	26.8% (125)	23.5% (2459)	0.096	34.5% (180)	22.3% (1100)	<0.001	30.9% (305)	23.1% (3559)	<0.001
Married	63.6% (297)	73.4% (7682)	<0.001	60.8% (317)	72.1% (3556)	<0.001	62.1% (614)	73.0% (11238)	<0.001
Separated	4.1% (19)	1.2% (128)	<0.001	3.1% (16)	3.1% (155)	1.000	3.5% (35)	1.8% (283)	<0.001
Divorced	0.0% (0)	0.3% (21)	0.236	0.4% (2)	0.8% (38)	0.286	0.2% (2)	0.4% (69)	0.325
Widowed	5.6% (26)	1.6% (164)	<0.001	1.2% (6)	1.6% (80)	0.484	3.2% (32)	1.6% (244)	<0.001
Total	100.0% (467)	100.0% (10464)		100.0% (521)	100.0% (4929)		100.0% (988)	100.0% (15393)	
Suicide method									
Hanging	52.7% (436)	42.5% (4555)	<0.001	51.2% (349)	38.0% (1916)	<0.001	52.1% (785)	41.0% (6471)	<0.001
Poisoning	20.3% (168)	39.7% (4260)	<0.001	19.8% (135)	35.2% (1775)	<0.001	20.1% (303)	38.3% (6035)	<0.001
Fire/self-immolation	9.3% (77)	6.0% (643)	0.001	12.0% (82)	19.2% (967)	<0.001	10.5% (159)	10.2% (1610)	0.659
Under vehicle/train	4.5% (37)	2.9% (309)	0.007	3.8% (26)	0.9% (45)	<0.001	4.2% (63)	2.2% (354)	<0.001
Drowning	3.0% (25)	3.3% (357)	0.656	4.7% (32)	3.4% (171)	0.061	3.8% (57)	3.3% (528)	0.297
Jumping (off structure)	2.5% (21)	0.6% (60)	<0.001	4.1% (28)	0.1% (7)	<0.001	3.2% (49)	0.4% (67)	<0.001
Self-inflicted injury	0.7% (6)	0.6% (68)	0.642	2.3% (16)	0.4% (18)	<0.001	1.5% (22)	0.5% (86)	<0.001
Other	6.9% (57)	4.5% (482)	0.001	1.9% (13)	2.8% (142)	0.159	4.6% (70)	4.0% (624)	0.203
Total	100.0% (827)	100.0% (10734)		100.0% (681)	100.0% (5041)		100.0% (1508)	100.0% (15775)	

[a] Two-tailed binomial test on difference between two proportions using the "prtesti" command in Stata
[b] Excludes those listed as 'unknown' and 'other' in the NCRB data

Figure 1: Comparing the proportion of female decedents in newspaper suicide reports vs. the population suicide statistics for Tamil Nadu

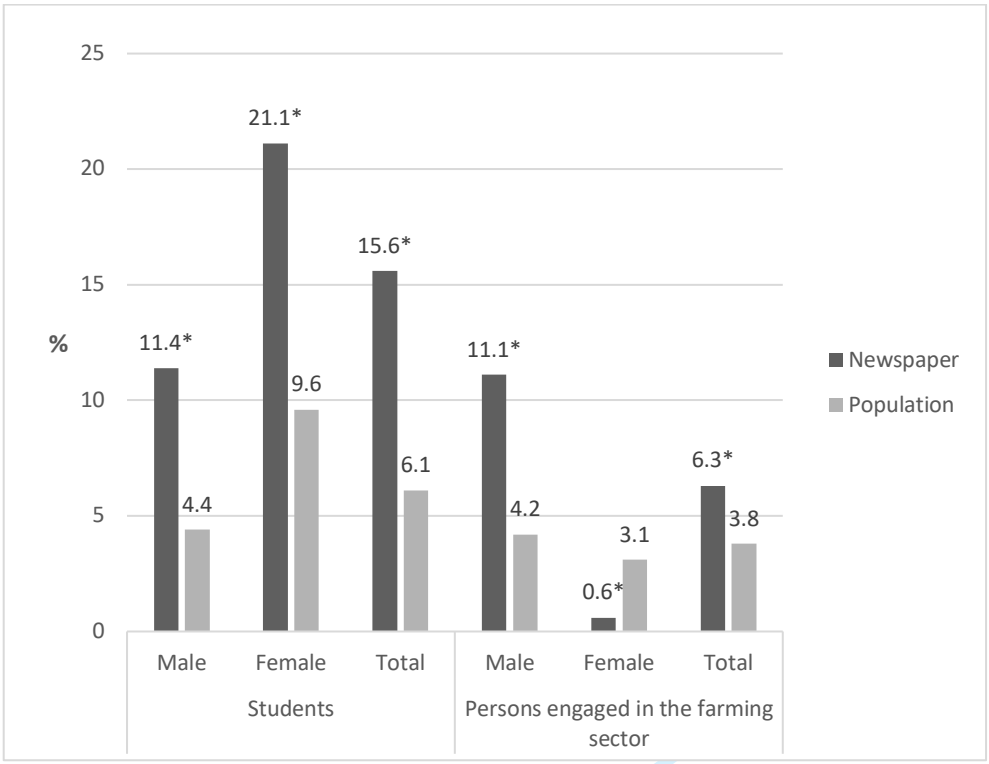
Figure 2: Comparing the proportions of selected occupational groups of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu

Figure 1: Comparing the proportion of female decedents in newspaper suicide reports vs. the population suicide statistics for Tamil Nadu



* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

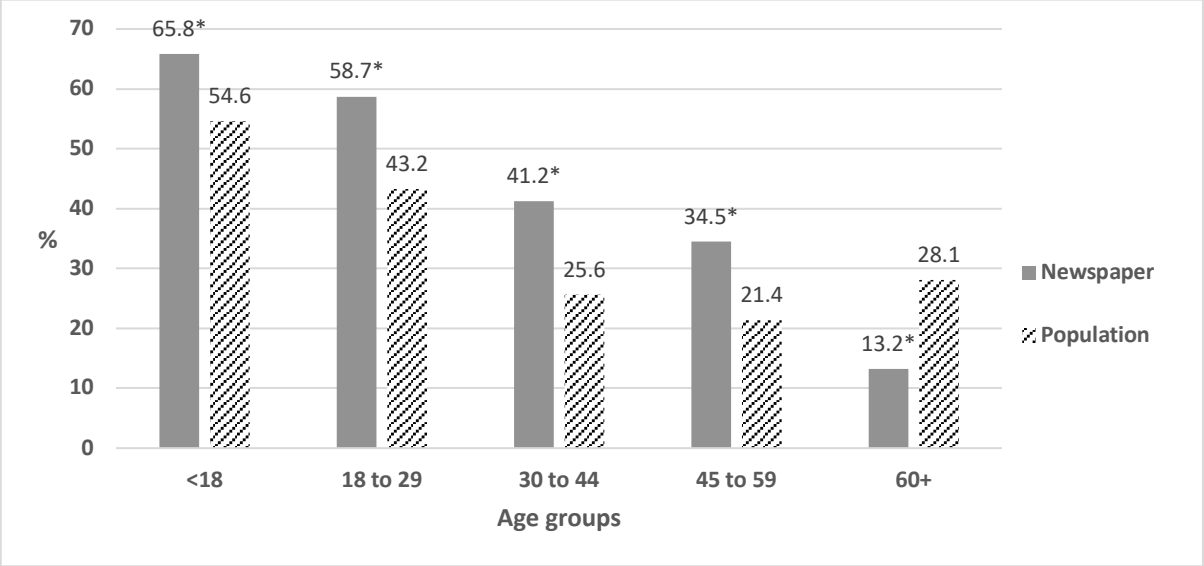
Figure 2: Comparing the proportions of selected occupational groups of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu



Note: The occupational categories of 'student' and 'persons engaged in the farming sector' were the only categories in the official statistics that were distinct enough to compare to the data we extracted from newspaper reports. Other occupational categories in the official suicide statistics (e.g. 'professionals/salaried persons') were too broad to be reproduced.
* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

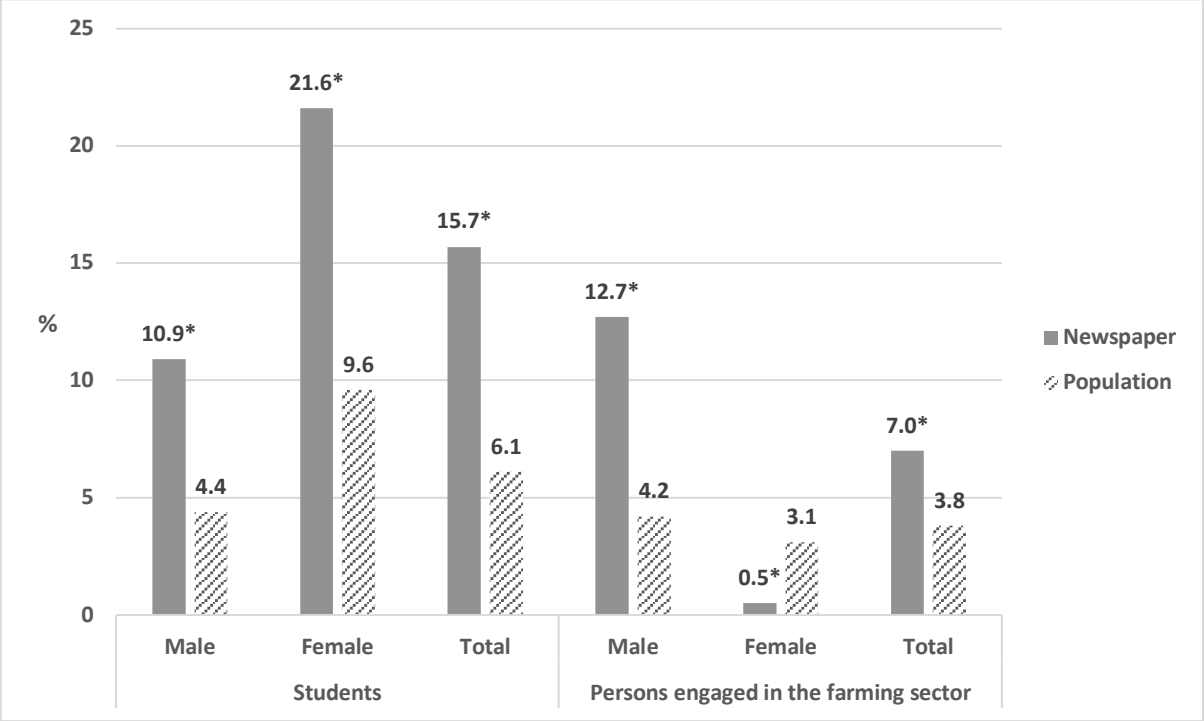
Supplementary File 1: Secondary analyses only including media reports of suicides of people from Tamil Nadu

Figure 1: Comparing the proportion of female decedents in newspaper suicide reports vs. the population suicide statistics for Tamil Nadu



Note: Only includes newspaper reports of suicides of people residing in Tamil Nadu
* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

Figure 2: Comparing the proportions of selected occupational groups of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu



Note 1: Only includes newspaper reports of suicides of people residing in Tamil Nadu
Note 2: The occupational categories of 'student' and 'persons engaged in the farming sector' were the only categories in the official statistics that were distinct enough to compare to the data we extracted from newspaper reports. Other occupational categories in the official suicide statistics (e.g. 'professionals/salaried persons') were too broad to be reproduced.
* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

Table 1: Binomial tests comparing the demographic characteristics of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu

	Male			Female			Total		
Characteristics	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**
Age									
<18 years	6.3% (41)	4.2% (446)	0.012	13.5% (79)	10.7% (537)	0.040	9.7% (120)	6.2% (983)	<0.001
18-29 years	32.2% (209)	24.7% (2656)	<0.001	50.6% (297)	40.1% (2022)	<0.001	40.9% (506)	29.7% (4678)	<0.001
30-44 years	26.6% (173)	34.9% (3749)	<0.001	20.6% (121)	25.6% (1291)	0.008	23.8% (294)	31.9% (5040)	<0.001
45-59 years	22.8% (148)	25.5% (2742)	0.124	13.3% (78)	14.8% (746)	0.331	18.3% (226)	22.1% (3488)	0.002
60+ years	12.2% (79)	10.6% (1141)	0.200	2.0% (12)	8.8% (445)	<0.001	7.4% (91)	10.1% (1586)	0.002
Total	100.0% (650)	100.0% (10734)		100.0% (587)	100.0% (5041)		100.0% (1237)	100.0% (15775)	
Marital status[b]									
Unmarried	26.3% (105)	23.5% (2459)	0.196	34.8% (162)	22.3% (1100)	<0.001	30.9% (267)	23.1% (3559)	<0.001
Married	64.3% (257)	73.4% (7682)	<0.001	60.4% (281)	72.1% (3556)	<0.001	62.2% (534)	73.0% (11238)	<0.001
Separated	4.5% (18)	1.2% (128)	<0.001	3.2% (15)	3.1% (155)	0.906	3.8% (33)	1.8% (283)	<0.001
Divorced	0.0% (0)	0.3% (21)	0.273	0.2% (1)	0.8% (38)	0.151	0.1% (1)	0.4% (69)	0.167
Widowed	5.0% (20)	1.6% (164)	<0.001	1.3% (6)	1.6% (80)	0.619	3.0% (26)	1.6% (244)	<0.001
Total	100.0% (400)	100.0% (10464)		100.0% (465)	100.0% (4929)		100.0% (988)	100.0% (15393)	
Suicide method									
Hanging	52.9% (358)	42.5% (4555)	<0.001	52.4% (313)	38.0% (1916)	<0.001	52.7% (671)	41.0% (6471)	<0.001
Poisoning	21.4% (145)	39.7% (4260)	<0.001	20.1% (120)	35.2% (1775)	<0.001	20.8% (265)	38.3% (6035)	<0.001
Fire/self-immolation	11.2% (76)	6.0% (643)	<0.001	12.1% (72)	19.2% (967)	<0.001	11.6% (148)	10.2% (1610)	0.114
Under vehicle/train	4.7% (32)	2.9% (309)	0.008	4.4% (26)	0.9% (45)	<0.001	4.6% (58)	2.2% (354)	<0.001
Drowning	3.3% (22)	3.3% (357)	1.000	4.0% (24)	3.4% (171)	0.448	3.6% (46)	3.3% (528)	0.566
Jumping (off structure)	1.9% (13)	0.6% (60)	<0.001	3.5% (21)	0.1% (7)	<0.001	2.7% (34)	0.4% (67)	<0.001
Self-inflicted injury	0.9% (6)	0.6% (68)	0.334	2.2% (13)	0.4% (18)	<0.001	1.5% (19)	0.5% (86)	<0.001
Other	3.7% (25)	4.5% (482)	0.328	1.3% (8)	2.8% (142)	0.031	2.6% (33)	4.0% (624)	0.013
Total	100.0% (677)	100.0% (10734)		100.0% (597)	100.0% (5041)		100.0% (1274)	100.0% (15775)	

Note: Only includes newspaper reports of suicides of people residing in Tamil Nadu

[a] Two-tailed binomial test on difference between two proportions using the "prtesti" command in Stata

[b] Excludes those listed as 'unknown' and 'other' in the NCRB data

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Mass media representation of suicide in a high suicide state in India: an epidemiological comparison with suicide deaths in the population

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Mass media representation of suicide in a high suicide state in India: an epidemiological comparison with suicide deaths in the population

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Abstract

Objectives:
Suicide rates in India are among the highest in the world, equating to over 200,000 suicides annually. Reports of suicides are a routine feature in major newspapers in India, and reporters may selectively present "newsworthy" suicide stories. The aim of this paper was to systematically investigate whether mass media reports of suicides reflect the epidemiological data on suicide in a high suicide state in India.

Design:
We undertook a content analysis study to extract socio-demographic data on suicides reported among nine of the most highly read daily newspapers in the high suicide southern state of Tamil Nadu between June-December 2016. A total of 1,258 newspaper articles were retrieved containing reports on 1,631 suicides. Two-tailed binomial tests on aggregate frequencies assessed whether the socio-demographic characteristics of suicides in the newspaper articles were different to the population suicide statistics for Tamil Nadu.

Results:
We identified some statistically significant discrepancies between suicide characteristics in the population and the media. Suicides involving females ($p<0.001$), those aged under 30 years ($p<0.001$), separated or widowed males ($p<0.001$), unmarried females ($p<0.001$), those using methods with a higher case-fatality rate (i.e. hanging ($p<0.001$), jumping off high

structures (p<0.001) and coming under vehicles p<0.001), and those who were students (p<0.001) or working in the agricultural sector (p<0.001) were significantly over-reported relative to their occurrence in the broader population. Suicides involving males (p<0.001), those aged over 30 years and above (p<0.001), those who were married, and suicides by poisoning (p<0.001) were significantly under-reported relative to their occurrence in the broader population.

Conclusions:
The suicide characteristics in the print media were not entirely representative of suicides in the broader Tamil Nadu population, which may lead the general public to develop misunderstandings about suicide in their state. The discrepancies we identified will inform tailored suicide prevention education for media professionals.

Strengths and limitations of this study

- Suicides are a routine feature in major newspapers in India, and this is the first study to examine whether these media reports of suicides reflect the epidemiological data on suicide in India.
- We followed nine major newspapers over seven months and collected a large sample of 1,631 media reports of suicides.
- We only looked at printed newspapers in one state with a high suicide rate; with further funding it would be desirable to examine media reports by other forms of mass and social media across a broader range of states.
- A large proportion of suicides are not captured in the official suicide statistics in India, due to a sole reliance on police data and the lack of a comprehensive and reliable vital registration system. Given both the official statistics and the media reports used in this study are based on police reports of suicide, we expect that this will have a negligible effect on the comparisons made in our study.
- While our findings provide some epidemiological clues as to the decisions made by media professionals in choosing whether to report on a suicide, further qualitative research with media professionals is required to better understand the decision-making process and any biases that may be involved.

Background

Southeast Asia accounts for roughly 40% of the estimated 800,000 suicides that occur each year globally [1]. Suicide rates in India are among the highest in the world with the most recent suicide death rate estimates ranging between 18-21 deaths per 100,000 population (*c.f.* the global average of 11/100,000). This equates to an estimated 230,000-250,000 suicide deaths annually with far-reaching social, emotional and economic consequences [1 2]. A public health approach to suicide is gaining momentum in India with calls for the development of national and state-level suicide prevention strategies, including the development of media guidelines to improve mass and social media coverage of suicides [3].

One of the few recommended suicide prevention strategies at the population level is responsible media reporting of suicides [4-6], based on evidence around copycat suicides, dissemination of suicide methods and behaviours, and the imperative to deliver tailored suicide prevention messaging in media content [7-12]. Consequently, the World Health Organization (WHO) recommends that public health specialists should engage with media professionals to limit irresponsible media coverage (for example, reports that sensationalise suicide) and to promote coverage that educates the public about suicide [13].

The manner by which the mass media communicates with the Indian public on the topic of suicide in India has thus far gone without sufficient inquiry [14]. Our own recent research into print media portrayals of suicide in India observed that explicit suicide reports are a routine feature, and that potentially harmful reporting practices are common [15]. For example, a detailed suicide method was reported in 43.3% of articles. Given that there are few alternative sources of publicly-disseminated information on suicide in India, as the suicide prevention sector is relatively under-resourced, these mass media portrayals of suicide are quite possibly playing a critical role in shaping and reflecting public attitudes and behaviours in relation to suicide.

Researchers have long recognised the disparity between the epidemiological data on suicide in the population and the stories selectively presented for mass media reports [16]. In suicide prevention, there is a major focus on disseminating knowledge on the risk factors and the complex multilayered context for suicide [6]. This can be at odds with media preferences for newsworthy stories that are atypical or that play to broader social narratives of interest to readers. Hence, one important area of enquiry for suicide prevention is to better understand what kinds of suicides media broadcast to the public, to shed light on possible misunderstandings of the epidemiological realities that can inform media training and engagement strategies. Very few studies have examined which suicides tend to feature in the media. Those that have, found that the mass media selectively present newsworthy suicide stories that do not reflect the broader array of suicides in the population [17-20], which can carry profound implications for the social and political responses to suicide.

This phenomenon is yet to be studied in India. This paper seeks to address this gap in the literature by comparing the characteristics of suicides in print media reports in India against the characteristics of suicides in the population. Due to the large number of languages across India and the prohibitive level of resources required to fund a study with a broad national spread of newspapers published in a range of languages, we elected to undertake a comprehensive study of newspaper reporting in one state. We chose the southern state of Tamil Nadu (population = 72 million), which consistently has one of the highest suicide rates

in India (22.8/100,000) equating to 15,777 recorded suicides in 2015, over 40 suicides per day[21]. The approach of focusing on one state allows us to comprehensively track changes in media reporting in this state following upcoming efforts to engage with the media on this topic.

Methods

As part of the Suicide in the Indian Media (SIM) project [15], we undertook a content analysis study of articles reporting suicide-related news in nine of the ten most highly read vernacular and English-language daily newspapers in Tamil Nadu over the 7-month period between 1st June and 31st December 2016. The nine newspapers collectively have an estimated average daily readership of over 16,000,000 people in Tamil Nadu alone [22]. Five of the nine newspapers under review are in the top 20 most circulated daily newspapers in the country [23], giving the findings relevance beyond Tamil Nadu. We previously published research from this content analysis study where we assessed the quality of newspaper reporting of suicide-related news against World Health Organization suicide reporting guidelines [13 15].

To source the articles, the hardcopies of all 1,926 (9 newspapers x 214 days) editions of the nine newspapers during the study period were hand searched by three trained research assistants (psychologists), allowing us to include several newspapers that did not have a strong online presence. Our search yielded 1,258 articles containing reports on 1,631 suicides; the vast majority of these suicides were of people from Tamil Nadu (84.0%, n=1371), while the remainder were largely of people from elsewhere in India (14.5%, n=236) or from other countries (1.1%, n=18), with location unable to be determined in 0.4% (n=6) of the media reports. We elected to retain all suicides in our primary analyses, regardless of the location of the deceased, as these reports will still influence the public's impressions of who is affected by suicide; secondary analyses will exclusively examine suicides of people from Tamil Nadu.We excluded articles where suicide was only mentioned briefly (i.e. <50% of the article) and articles with a focus on terrorist-related suicide bombings or euthanasia.

A bi-lingual psychologist and researcher (MPsych, MPhil) extracted data on gender, age, marital status, suicide method and occupational status for each suicide. We compared the data extracted from the newspaper articles with the characteristics of suicides in the Tamil Nadu population suicide statistics found in the Accidental Death & Suicides in India report for 2015 published by the National Crime Records Bureau (NCRB) [21].

Comparing occupational status between the two data sets was complicated by the use of broad category descriptors in the NCRB data (for example, 'professionals/salaried persons') that were not possible to reproduce. However, there were two occupational categories that were distinct enough to legitimately reproduce and examine; 'students' and 'persons engaged in the farming sector'. Both are occupational groups that have been of significant interest to suicide prevention in India and would resonate strongly with the public when discussing the topic of suicide [24 25].

We disaggregated the data by gender, and in doing so we excluded suicides of *Hijra* and transgender people due to the very small numbers of such cases; there were 13 reports of suicide deceased who were Hijra/transgender in the newspaper articles and 2 such suicide deceased in the official suicide records for Tamil Nadu.

Two-tailed binomial tests on aggregate frequencies were used in Stata (command "prtesti") to assess whether the distribution of the characteristics of suicides in the newspaper articles was

different to their distribution in the population suicide statistics for Tamil Nadu. This analysis approach has been used previously by a similar media study in Austria [17]. Not all media reports contained data on all the variables we analysed, so percentages were calculated based on data for those individuals for whom these characteristics were reported in the article.

Patient and public involvement

Patients and the public were not involved in the design or planning of this study.

Results

Binomial tests showed that female suicides were over-reported relative to their occurrence in the broader population of suicides, comprising 45.3% (729/1610) of suicides in newspaper reports compared to 32.0% (n=5041/15775) of suicides in the official suicide statistics ($p<0.001$) (see Figure 1). While newspapers covered a significantly higher percentage of female suicides, this was not the case across all age groups. There was no statistically significant difference in the <18 years age group, and we observed the reverse pattern in the 60+ years age group, such that female suicides were significantly under-reported.

Binomial tests showed that the suicides of those aged less than 30 years were over-reported relative to their occurrence in the broader population (see Table 1). Conversely, the suicides of those aged 30 years or older were under-reported. The suicides of those who were unmarried, separated and widowed were over-reported, while the suicides of those who were married were under-reported. The gender stratification of these marital status results highlighted a gender-based difference. Suicides among separated and widowed males were over-reported while it was the suicides of unmarried females that were over-reported; the suicides of those who were married were under-reported in both males and females.

The suicides of students and those engaged in the farming sector were over-reported relative to their occurrence in the broader population (see Figure 2). Students comprised 15.6% (255/1631) of all suicides in newspaper reports compared to 6.1% (955/15775) of suicides in the official suicide statistics ($p<0.001$). People engaged in the farming sector comprised 6.3% (102/1631) of all suicides in newspaper reports compared to 3.8% (606/15775) of suicides in the official suicide statistics ($p<0.001$). Conversely, the suicides of females in the agricultural sector were under-represented in media reports.

Deaths involving hanging, coming under vehicle/train, jumping off building/structure and self-inflicted injury such as a knife wound were over-reported, while suicides by poisoning were under-reported (see Table 1).

Secondary analyses were undertaken, only including media reports of suicides of people from Tamil Nadu, to examine if our findings were confounded by media reports of suicides of people from outside Tamil Nadu. The results are consistent with the primary analyses (See Supplementary File 1).

Discussion

The present study identified substantial disparities between suicide characteristics in the population and the media. Suicides involving females, those aged under 30 years, separated or widowed males, unmarried females, and those using lethal methods (other than pesticides) were significantly over-reported relative to their occurrence in the broader population. The suicides of people from the occupational groups of students or persons engaged in the agricultural sector were also over-reported.

An important finding was that female suicides were significantly over-represented, relative to their occurrence in the population. This finding appears to be unique to India and is in stark contrast to what has been observed elsewhere. No under or over-reporting was observed in Australia [19] or Austria [17] based on gender. However, in the Chinese settings of Guangzhou and Taiwan, female suicides have been observed to be under-reported [20], the opposite pattern to our findings. The authors posited that, in traditional Chinese societies, women can be stereotyped as being more emotional or hysterical, and more prone to suicide. Such that, they felt media professionals may perceive the suicide deaths of men to be more unusual and thus newsworthy.

In India, the female suicide rate is among the highest in the world, and is nearly three times higher than the rate expected globally for countries at similar levels of Socio-Demographic Index [2]. This well-documented fact about suicide in India could possibly permeate the minds of media professionals, who may then give greater emphasis to the plight of females who take their lives. Notwithstanding this, it is also likely that there are some other reasons media professionals decide that the suicides of females are more newsworthy. Based on our anecdotal conversations with media professionals, we speculate that female suicides may also be perceived by media professionals to generate a greater empathic response among readers of newspapers in India. Stories of the suicides of females may align with paternalistic narratives about the risks to women in Indian society and the family and collective responsibility to protect them [26].

We also observed an under-reporting of suicides of married males and females. Moreover, we observed that, among female suicides, there was an over-reporting of suicides among those who were unmarried. This was quite distinct from what was observed among male suicides, where suicides by separated or widowed males were over-reported in the newspapers. It is unclear why there is an apparent media preference for stories of unmarried females and separated or widowed males, nor what cultural scripts or narratives this may align with. Marriage and family are at the core of the social fabric in India [27], and family is the main source of welfare protections. We speculate that risks associated with being outside of the institution of marriage may be being emphasised by media professionals through their selection of suicide stories pertaining to people whose marriage has been lost or who are yet to enter marriage. Through this under-reporting of suicides of married people, these media reports may actually be giving an incorrect signal to the population with regard to any suicide prevention protections that may be assumed to be gained from being married. It is important to note that while marriage is typically understood to protect against suicide, particularly for men, based on findings from studies in Western settings [28], this is not the case in India. Research undertaken in India yields mixed findings regarding the relationship between marital status and suicide for both men and women, suggesting that either marriage is not a protective factor for suicide, or indeed that the risk of suicide is higher among those who are married [29 30]. This epidemiological reality regarding marriage and suicide may conflict with narratives in India that locate 'the family' as the main source of social protections. Clearly this is speculation, and so qualitative research with media professionals is required to better understand the phenomenon of the influential role of gender and marital status in the perceived newsworthiness of suicide deaths. We note though, that even such qualitative interviews may find it hard to unravel what may be unconscious and deeply culturally embedded biases among media professionals.

Our findings suggest that the suicides of younger persons aged <30 years were considered to be more newsworthy than the suicide deaths of persons aged 30 years and older. This finding is largely consistent with research from Australia [19], Austria [17] and China [20]. It has been posited that youth suicides may be considered more newsworthy; that is, the death of a youth with their life ahead of them carries a sensational undertone that may grab the reader's attention [20]. Suicide is also the leading cause of death among youth in India aged 15-29 years, and greater than 70% of female suicide deaths and 50% of male suicide deaths are in this age group [2]. Thus, it is possible that media professionals may be attempting to give such suicide deaths greater emphasis without being aware that they may in turn be overlooking the issue of suicide among older aged people, also a high-risk period for both males and females in India [2].

Our findings also revealed that the suicides of students and people engaged in the agricultural sector were significantly over-represented, relative to their occurrence in the population. This finding was not surprising, given that both occupational groups are of significant interest to the public discourse and narratives around suicide in India [24 25]. Media houses would be aware that reports on such deaths would resonate strongly with readers. Student suicides are a major and topical policy issue in India, frequently located within discussions around the fierce competition for student places and an accompanying intensity of exam pressure [31]. Reporting on this issue will likely be of great interest to parents, who may carry a level of fear around this happening to their own children. Farmer suicides are highly politicised in India, and have been the subject of numerous government commissions and policy dialogues. This has largely been with a focus on issues around the high levels of indebtedness among farmers, a decline in secure institutional credit, water scarcity, trade liberalisation, and a considerable vulnerability to "crop failure" [32]. Farmer suicide deaths have been described as "public deaths", due to the perception that they receive sensational coverage by the mass media [33].

Finally, suicides by particular methods also appeared to attract more media attention. Deaths involving hanging, jumping, and coming under vehicle/train were over-represented in media reports, while suicides by poisoning were under-represented. One interpretation of this finding is that media may be attracted to reporting on suicides using methods with a higher degree of lethality, given that these have been observed to have a high case fatality rate [34]. Deaths involving self-inflicted injuries (e.g. knife wound) were also over-reported, even though this method does not have a high case fatality rate, indicating that newspaper reporters may also have an interest in particular suicide methods where it is easy for them to construct a graphic visual that may attract the attention of the reader. The under-reporting of poisoning suicide deaths is also an interesting finding. While the ingestion of medical drugs typically has a low case fatality rate [34], the ingestion of pesticides, a common suicide method in India and elsewhere in South Asia [35], has a high case fatality rate and is a major contributor to high suicide rates in this region [36 37].

These findings have important implications for suicide prevention. While the mass media are a powerful resource for educating the public about suicide, the general public may develop misunderstandings about suicide that are caused by media misrepresentations. For example, Till et al observed that the consumption of tabloid newspapers in Austria for daily information appeared to be an independent factor in the endorsement of misconceptions and myths about suicide [38]. While we didn't assess the articles for suicide myths, we did observe substantial disparities between suicide characteristics in the population and the media. Strong biases towards reporting particular types of suicide deaths may result in social and political

responses to suicide that are not based on the epidemiological data. For instance, if media reports are overly biased towards the coverage of female suicides, youth suicides, suicides among particular occupational groups, or particularly graphic or more lethal suicide methods, this may inadvertently affect suicide prevention funding allocations, public perceptions about who is most at risk of suicide and the method they may use, among other possible consequences.

The study has several limitations that are worth noting. Firstly, we compared data from media reports collected in 2016 against the official suicide statistics for 2015. While these are two different time periods, it is the most recently available suicide statistics for India and we expect a high degree of stability between the 2015 and 2016 data. We compared the official suicide statistics for 2015 against that for 2014 and 2013 and we observed a high degree of stability in the data; for example, the suicide rate for Tamil Nadu was 22.8 in 2015 and 23.4 in 2014, and 29.7% and 30.7% of suicide deaths were people aged 18-29 in 2015 and 2013 respectively. Secondly, there is a high level of under-reporting of suicide in India. Given both the official statistics and the media reports are based on police reports of suicide, we expect that this will have a negligible effect on the comparisons made in our study. Thirdly, while our findings provide some clues as to the decisions made by media professionals in choosing whether to report on a suicide, we cannot speak definitively about the decision-making process and any biases that may be involved. We are currently undertaking qualitative research with media professionals to better understand this phenomenon [39]. Fourthly, we were only able to examine the over or under-representation of two occupational categories that we could meaningfully reproduce. There are several additional occupational categories that would have been interesting to examine; for example, “housewives” comprised 53% of female suicide deaths in the 2015 official suicide statistics, yet this occupational information or the specific term was rarely communicated in media reports. Finally, we only examined newspaper reports in one southern state of India where the suicide rate is substantially higher than the national average. It is possible that our findings do not reflect newspaper coverage of suicide in other states of India, particularly those with a lower suicide rate where mass media reports of suicides may be less common. Future research should examine reports in other states as well as reports in other forms of mass and social media.

Conclusion

The suicide characteristics in the print media in Tamil Nadu were not entirely representative of suicides in the broader population. A moderately skewed picture of reality is being presented to the community, which may lead the general public to develop misunderstandings about suicide in their state. In particular, suicides involving females, those aged under 29 years, separated or widowed males, unmarried females, those using methods with a higher case-fatality rate, and those who were students or working in the agricultural sector were significantly over-reported relative to their occurrence in the broader population. Conversely, suicides involving males, those aged over 30 years and above, those who were married, and suicides by poisoning were significantly under-reported relative to their occurrence in the broader population. The discrepancies we identified will inform tailored suicide prevention education for media professionals.

Contributors

GA designed the study, supervised the data collection, and led the data analyses and drafting of the manuscript. LV and TN supported the design of the study. MJ implemented data collection. LV, JP, MJ, AC, JBS, VA and TN all contributed to the data analysis plan, interpretation of the results and the development of the final manuscript.

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Competing interests
None declared.

Ethics approval
The data used in this study are from publicly available documents. Nonetheless, we obtained ethics approvals from the Human Ethics Advisory Group at The University of Melbourne in Australia (ID: 1646245.1).

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Data sharing
The data used in this study are publicly available media reports and publicly available official reports on suicides in India. Anyone interested in accessing our database on media reports of suicides may contact the corresponding author.

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Tables

Table 1: Binomial tests comparing the demographic characteristics of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu

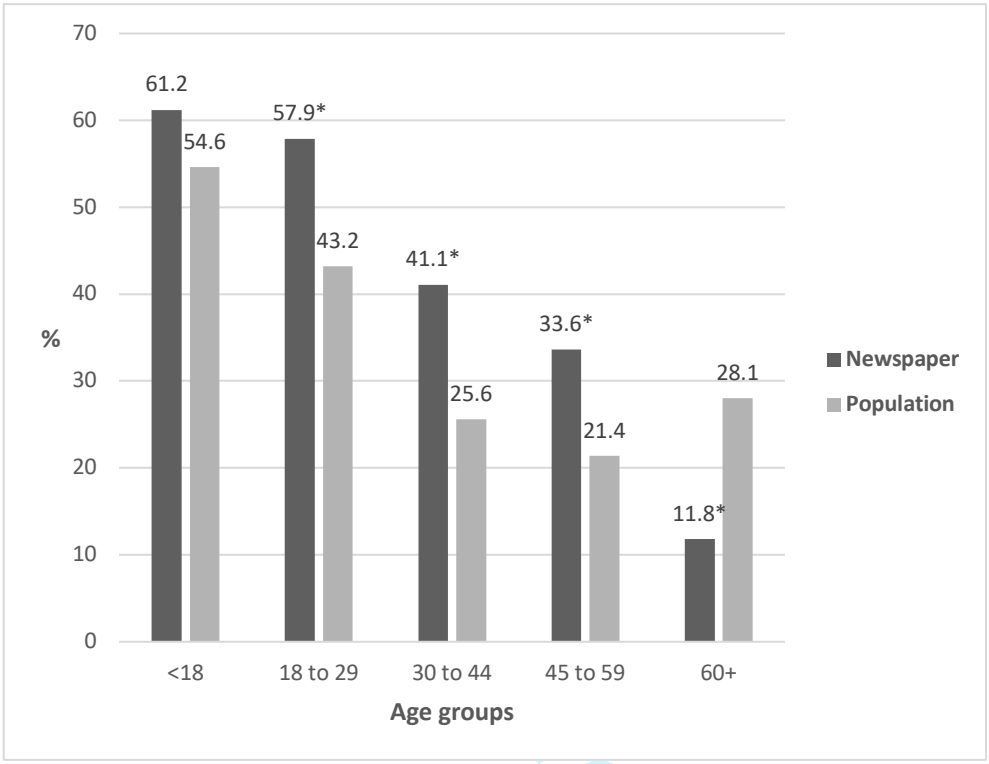
	Male			Female			Total		
Characteristics	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**
Age									
<18 years	7.1% (54)	4.2% (446)	<0.001	13.0% (85)	10.7% (537)	0.071	9.8% (139)	6.2% (983)	<0.001
18-29 years	31.5% (239)	24.7% (2656)	<0.001	50.2% (328)	40.1% (2022)	<0.001	40.1% (567)	29.7% (4678)	<0.001
30-44 years	26.2% (199)	34.9% (3749)	<0.001	21.3% (139)	25.6% (1291)	0.016	23.9% (338)	31.9% (5040)	<0.001
45-59 years	23.4% (178)	25.5% (2742)	0.194	13.8% (90)	14.8% (746)	0.481	19.0% (268)	22.1% (3488)	0.006
60+ years	11.8% (90)	10.6% (1141)	0.296	1.8% (12)	8.8% (445)	<0.001	7.2% (102)	10.1% (1586)	0.001
Total	100.0% (760)	100.0% (10734)		100.0% (654)	100.0% (5041)		100.0% (1,414)	100.0% (15775)	
Marital status[b]									
Unmarried	26.8% (125)	23.5% (2459)	0.096	34.5% (180)	22.3% (1100)	<0.001	30.9% (305)	23.1% (3559)	<0.001
Married	63.6% (297)	73.4% (7682)	<0.001	60.8% (317)	72.1% (3556)	<0.001	62.1% (614)	73.0% (11238)	<0.001
Separated	4.1% (19)	1.2% (128)	<0.001	3.1% (16)	3.1% (155)	1.000	3.5% (35)	1.8% (283)	<0.001
Divorced	0.0% (0)	0.3% (21)	0.236	0.4% (2)	0.8% (38)	0.286	0.2% (2)	0.4% (69)	0.325
Widowed	5.6% (26)	1.6% (164)	<0.001	1.2% (6)	1.6% (80)	0.484	3.2% (32)	1.6% (244)	<0.001
Total	100.0% (467)	100.0% (10464)		100.0% (521)	100.0% (4929)		100.0% (988)	100.0% (15393)	
Suicide method									
Hanging	52.7% (436)	42.5% (4555)	<0.001	51.2% (349)	38.0% (1916)	<0.001	52.1% (785)	41.0% (6471)	<0.001
Poisoning	20.3% (168)	39.7% (4260)	<0.001	19.8% (135)	35.2% (1775)	<0.001	20.1% (303)	38.3% (6035)	<0.001
Fire/self-immolation	9.3% (77)	6.0% (643)	0.001	12.0% (82)	19.2% (967)	<0.001	10.5% (159)	10.2% (1610)	0.659
Under vehicle/train	4.5% (37)	2.9% (309)	0.007	3.8% (26)	0.9% (45)	<0.001	4.2% (63)	2.2% (354)	<0.001
Drowning	3.0% (25)	3.3% (357)	0.656	4.7% (32)	3.4% (171)	0.061	3.8% (57)	3.3% (528)	0.297
Jumping (off structure)	2.5% (21)	0.6% (60)	<0.001	4.1% (28)	0.1% (7)	<0.001	3.2% (49)	0.4% (67)	<0.001
Self-inflicted injury	0.7% (6)	0.6% (68)	0.642	2.3% (16)	0.4% (18)	<0.001	1.5% (22)	0.5% (86)	<0.001
Other	6.9% (57)	4.5% (482)	0.001	1.9% (13)	2.8% (142)	0.159	4.6% (70)	4.0% (624)	0.203
Total	100.0% (827)	100.0% (10734)		100.0% (681)	100.0% (5041)		100.0% (1508)	100.0% (15775)	

[a] Two-tailed binomial test on difference between two proportions using the "prtesti" command in Stata
[b] Excludes those listed as 'unknown' and 'other' in the NCRB data

Figure 1: Comparing the proportion of female decedents in newspaper suicide reports vs. the population suicide statistics for Tamil Nadu

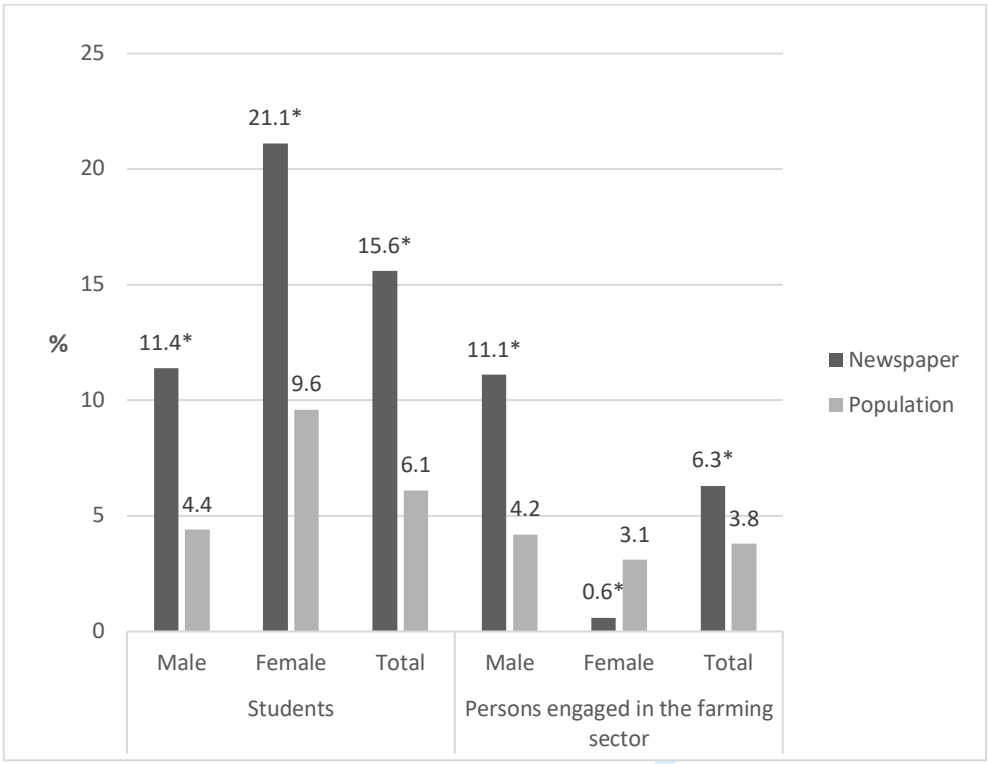
Figure 2: Comparing the proportions of selected occupational groups of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu

Figure 1: Comparing the proportion of female decedents in newspaper suicide reports vs. the population suicide statistics for Tamil Nadu



* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

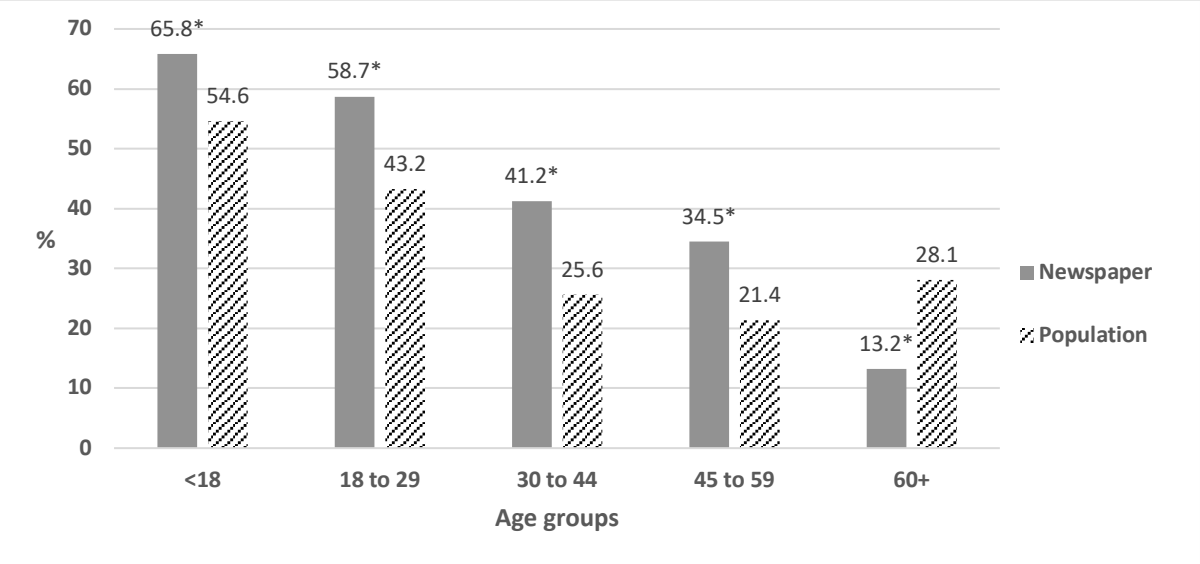
Figure 2: Comparing the proportions of selected occupational groups of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu



Note: The occupational categories of 'student' and 'persons engaged in the farming sector' were the only categories in the official statistics that were distinct enough to compare to the data we extracted from newspaper reports. Other occupational categories in the official suicide statistics (e.g. 'professionals/salaried persons') were too broad to be reproduced.
* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

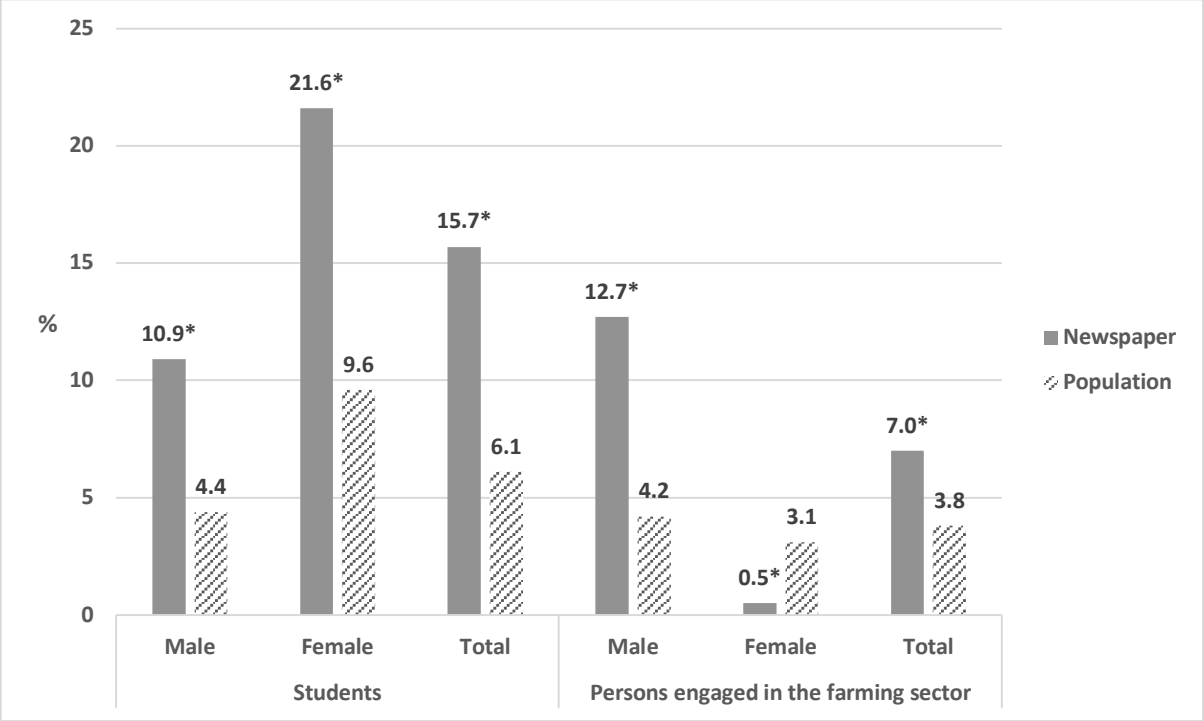
Supplementary File 1: Secondary analyses only including media reports of suicides of people from Tamil Nadu

Figure 1: Comparing the proportion of female decedents in newspaper suicide reports vs. the population suicide statistics for Tamil Nadu



Note: Only includes newspaper reports of suicides of people residing in Tamil Nadu
* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

Figure 2: Comparing the proportions of selected occupational groups of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu



Note 1: Only includes newspaper reports of suicides of people residing in Tamil Nadu
Note 2: The occupational categories of 'student' and 'persons engaged in the farming sector' were the only categories in the official statistics that were distinct enough to compare to the data we extracted from newspaper reports. Other occupational categories in the official suicide statistics (e.g. 'professionals/salaried persons') were too broad to be reproduced.
* <0.05, based on two-sided binomial tests within each age group to calculate if the proportion of suicide deceased in the newspaper articles that were female was different to that in the official suicide statistics

Table 1: Binomial tests comparing the demographic characteristics of suicide decedents in newspaper reports vs. the population suicide statistics for Tamil Nadu

	Male			Female			Total		
Characteristics	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**	**Newspaper % (n)**	**Population % (n)**	**p-value[a]**
Age									
<18 years	6.3% (41)	4.2% (446)	0.012	13.5% (79)	10.7% (537)	0.040	9.7% (120)	6.2% (983)	<0.001
18-29 years	32.2% (209)	24.7% (2656)	<0.001	50.6% (297)	40.1% (2022)	<0.001	40.9% (506)	29.7% (4678)	<0.001
30-44 years	26.6% (173)	34.9% (3749)	<0.001	20.6% (121)	25.6% (1291)	0.008	23.8% (294)	31.9% (5040)	<0.001
45-59 years	22.8% (148)	25.5% (2742)	0.124	13.3% (78)	14.8% (746)	0.331	18.3% (226)	22.1% (3488)	0.002
60+ years	12.2% (79)	10.6% (1141)	0.200	2.0% (12)	8.8% (445)	<0.001	7.4% (91)	10.1% (1586)	0.002
Total	100.0% (650)	100.0% (10734)		100.0% (587)	100.0% (5041)		100.0% (1237)	100.0% (15775)	
Marital status[b]									
Unmarried	26.3% (105)	23.5% (2459)	0.196	34.8% (162)	22.3% (1100)	<0.001	30.9% (267)	23.1% (3559)	<0.001
Married	64.3% (257)	73.4% (7682)	<0.001	60.4% (281)	72.1% (3556)	<0.001	62.2% (534)	73.0% (11238)	<0.001
Separated	4.5% (18)	1.2% (128)	<0.001	3.2% (15)	3.1% (155)	0.906	3.8% (33)	1.8% (283)	<0.001
Divorced	0.0% (0)	0.3% (21)	0.273	0.2% (1)	0.8% (38)	0.151	0.1% (1)	0.4% (69)	0.167
Widowed	5.0% (20)	1.6% (164)	<0.001	1.3% (6)	1.6% (80)	0.619	3.0% (26)	1.6% (244)	<0.001
Total	100.0% (400)	100.0% (10464)		100.0% (465)	100.0% (4929)		100.0% (988)	100.0% (15393)	
Suicide method									
Hanging	52.9% (358)	42.5% (4555)	<0.001	52.4% (313)	38.0% (1916)	<0.001	52.7% (671)	41.0% (6471)	<0.001
Poisoning	21.4% (145)	39.7% (4260)	<0.001	20.1% (120)	35.2% (1775)	<0.001	20.8% (265)	38.3% (6035)	<0.001
Fire/self-immolation	11.2% (76)	6.0% (643)	<0.001	12.1% (72)	19.2% (967)	<0.001	11.6% (148)	10.2% (1610)	0.114
Under vehicle/train	4.7% (32)	2.9% (309)	0.008	4.4% (26)	0.9% (45)	<0.001	4.6% (58)	2.2% (354)	<0.001
Drowning	3.3% (22)	3.3% (357)	1.000	4.0% (24)	3.4% (171)	0.448	3.6% (46)	3.3% (528)	0.566
Jumping (off structure)	1.9% (13)	0.6% (60)	<0.001	3.5% (21)	0.1% (7)	<0.001	2.7% (34)	0.4% (67)	<0.001
Self-inflicted injury	0.9% (6)	0.6% (68)	0.334	2.2% (13)	0.4% (18)	<0.001	1.5% (19)	0.5% (86)	<0.001
Other	3.7% (25)	4.5% (482)	0.328	1.3% (8)	2.8% (142)	0.031	2.6% (33)	4.0% (624)	0.013
Total	100.0% (677)	100.0% (10734)		100.0% (597)	100.0% (5041)		100.0% (1274)	100.0% (15775)	

Note: Only includes newspaper reports of suicides of people residing in Tamil Nadu

[a] Two-tailed binomial test on difference between two proportions using the "prtesti" command in Stata

[b] Excludes those listed as 'unknown' and 'other' in the NCRB data

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1-2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4
Bias	9	Describe any efforts to address potential sources of bias	4-5
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4-5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	4-5
		(*b*) Describe any methods used to examine subgroups and interactions	4-5
		(*c*) Explain how missing data were addressed	4-5
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	N/A
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	N/A
		(b) Indicate number of participants with missing data for each variable of interest	N/A
Outcome data	15*	Report numbers of outcome events or summary measures	N/A

Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	6 (and tables /figures)
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	6
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	8
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	6-7
Generalisability	21	Discuss the generalisability (external validity) of the study results	8
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	9

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.