Author’s response to reviews

Title: Newspaper coverage before and after the HPV vaccination crisis began in Japan: A text mining analysis

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Response to reviewers

2-October-2018

Dear reviewers:

Thank you very much for your review and precious comments. The following is a summary of our revisions in response to your concerns. We have underlined the revised parts in the text below and used track changes in the revised manuscript.

We would be grateful if the manuscript would be considered for publication in the BMC Public Health.

Sincerely,

Tsuyoshi Okuhara
Dear Dr. Julia Brotherton (Reviewer 1)

Abstract: I am worried the conclusion is a little naïve. Whilst scientists may think it self-evident that journalists should strive for balanced reporting, ultimately journalists report news and work for editors whose aim is to sell newspapers. I think it would be more helpful to call for the government, scientists and medical societies to be stronger advocates in the public space for the vaccine so that there is an opposing voice for journalists to report. The authors do this appropriately in their discussion/conclusion section. It is my perception that journalists may only be reporting one side because the anti-vaccine voice is proactive, highly emotional and not being opposed by government, who in most countries would be the coordinating body for an organised and scientifically robust response to such concerns.

-->We added a sentence as follows (p2, Abstract, the end of Conclusions).

...Scientists, medical societies, and the Ministry of Health, Labour and Welfare should cooperate to continue a balanced debate about benefits and risks of the HPV vaccination in the public eye.

Results: The last sentence of the results is unusual and I would prefer to see a summary of the data presented in the results section and interpreted in the discussion as per convention for scientific manuscripts rather than the summary being given in the discussion. For example, the discussion paragraphs’ text describing the key findings outlined in each figure would be appropriate in results.

-->We revised the Results section and the Discussion section.

Please read the revised Results and Discussion section (p7-p13)
In Appendix 2, suggest only give % to one decimal place and add the % symbol in the columns for ease of reading and interpretation.

-->We revised the Appendix. Please see the revised Appendix 3.

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Dear Dr. Megan Smith (Reviewer 2).

1. The Results section and Discussion section should be restructured, as almost no results are actually reported in the Results section, but are reported for the first time in the Discussion. For example p8 lines 3-23 should all go into the Results section. Similarly lines 31-46 on the same page and on p9 lines 6-10 and the paragraph that starts on line 54. This is not intended to be an exhaustive list of everything that should be moved - this whole discussion section should be reviewed.

-->We revised the Results section and the Discussion section.

Please read the revised Results and Discussion section (p7-p13)

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2. In a couple of places statements are made about attitudes to vaccination (p4 lines 28-33; p8 lines 51-54) - are there any references specific to Japan to indicate the same is true in Japan? It doesn't necessarily need to be in relation to the HPV vaccine specifically, but is there a precedent in Japan for this sort of thing happening for other vaccines? If not, clarify that information is limited for Japan, but data from other settings suggest this is the case.

-->We revised the sentences as follows and added a reference [18].
Studies show limited knowledge about HPV infection, HPV vaccines, and cervical cancer, and concerns regarding the safety of HPV vaccines are among factors associated with parents’ and daughters’ hesitant attitudes toward HPV vaccines inside and outside Japan[18-27].


Studies outside Japan found positive media campaigns to promote immunization increased public knowledge and improved vaccine uptake rates [3,4]. In Japan as well, the positive contents about HPV vaccination may have contributed to the high vaccination rate of 70%–80% until 2012 [11].

3. More broadly, it would be helpful to understand if the issues around the HPV vaccine (adverse event reports and/or hesitancy) are unique to the HPV vaccine or if there is any previous experience with this in Japan, because it would give some context. For example, has this sort of thing occurred with other foreign-manufactured vaccines but not locally-manufactured; has it happened with childhood vaccines or only adolescent ones; do adverse events always attract this level of media attention and withdrawal of recommendation by the Ministry of Health, Labour and Welfare, or was this situation unusual? P8 lines 23-28 mention that the negative articles have decreased and the public may therefore in future forget about the HPV vaccine 'scandal': is there evidence from previous experience in Japan with vaccine hesitancy that this could be expected?

-->We added sentences as follows, about the anti-influenza vaccination campaign that Japan has experienced around 1990 (p9, the Discussion section, the first paragraph). We also added a reference [43].
…Number of articles and paragraphs decreased in 2017. This should be noted because it may reflect journalists’ decreasing interest and may indicate the general public will in the near future forget HPV vaccination as a past scandal. Japan has experienced a similar situation regarding influenza vaccination for school children. Japan is the only country in the world to have adopted mass vaccination of schoolchildren for influenza control. Under the Preventive Vaccination Law, more than 10 million schoolchildren received influenza vaccine annually from 1976 to 1987, with a peak of 16.5 million vaccines [43]. However, seasonal epidemics continued to occur, which resulted in an anti-vaccination campaign claiming that influenza vaccine was ineffective. Influenza vaccine coverage among schoolchildren declined sharply from about 80% at its peak to 18% in 1992. In 1994, the Preventive Vaccination Law was amended to exclude influenza from the list of target diseases. Influenza vaccine coverage had remained to be quite low until the Preventive Vaccination Law was amended in 2001 to again include influenza. No to make the same mistake as that of influenza vaccination, cooperation among scientists, health professionals, medical societies and the government is expected to continue to discuss about benefit and risk of the HPV vaccination in the public eye (this will be discussed later).


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4. A limitation of this analysis is that it does not take into account the role of social media and particular lobby groups, which appear to have played an important role in propagating negative messages and the loss of confidence in the HPV vaccine in Japan (and elsewhere)(1). This should be noted as a limitation.

-->We added sentences in the limitation as follows (p13, the third paragraph), and added a reference [49].

…The analysis of the present study did not include the online editions of newspaper articles. Additionally, the present study did not take into account the role of social media and particular lobby groups, which may have played an important role in propagating negative messages and the loss of confidence in the HPV vaccine in Japan [49]…. 

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5. P5 lines 13-23: When you collected articles, did this include articles in both the online editions of the newspapers or only the paper version (or are these identical for these newspapers? This is not always the case).

-->We collected only the paper version.
We revised the sentence as follows (p5, the first sentence of the Methods, Data collection).

We collected the paper version of articles from the four daily national Japanese newspapers with the highest circulation in Japan, totaling about 20 million

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6. P5 line 34: keywords are listed. Does this mean the articles had to be tagged with these as keywords, or was the full text of the article searched? Also, if the text is searched as kanji/ Japanese characters, could the specific characters searched for be included?

-->We revised a sentence as follows (p5, the end of the Data collection).

…We input the commonly used Japanese characters (kanji and katakana) that meant those keywords into the databases. We searched full text (headings and texts) of articles including those keywords. The search period was between January 2005 and September 2017.
7. P5 line 44: when you say the first author thoroughly read textual data, how much do you mean that they read? I assume not all of the articles?

--> The first author read all of the articles. It was possible because the number of articles was 1,178.

We revised a sentence as follows (p6, Coding procedure, the first sentence).

Initially, the first author thoroughly read textual data of all articles identified to grasp the ideas expressed.

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8. P6 line 59: when you say "the first author repeated these analytical procedures twice" - do you mean writing the code rules, or using the code rules to analyse the text (but why would the second of these change, and if it doesn't, what is gained by repeating this)?

The Japanese language has many synonyms. For example, “effective” can be said in Japanese as “kiku”, “kouka ga aru”, “koukateki”, “yukousei ga aru” “yukou de aru” etc. Therefore, in the procedure of creating coding rules, it is important to include possible relevant terms and synonyms, and to exclude irrelevant terms. Repeat of examining those terms with an interval is helpful for improving coding rules.

We revised sentences as follows (p7, the first paragraph).

The first author repeated these procedures (i.e., creating and revising the coding rules) twice, with a 3-week interval between analyses to ensure consistency. These procedures allowed us to examine closely all relevant terms (e.g., synonyms) and irrelevant terms, and comprehensively select relevant paragraphs and avoid irrelevant ones.

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9.  P10 lines 1-21: are you able to look at whether or not there are joint mentions of adverse events and safety/ expert advice in the same article?  For example in many settings it would be normal that if the media reported on an adverse event, they would also ask an expert to respond and they would often present the wider evidence on the safety of the vaccine, so there was some balance or official response.  Given the number of articles is very different, clearly not every story about adverse events includes reassurance via WHO statements etc - but does that mean the adverse events articles tend to be one-sided and the ones mentioning safety statements also include some negative comments about adverse events - or do articles tend to just present one view in each case (either positive or negative)?

Because the present study is a text mining analysis using a software, we could not identify whether each articles were one-sided or two-sided arguments. Examining it was beyond our scope of the study. What we found from the present study was – as we discussed in the Discussion section – the appearance of paragraphs of negative comments were much more often than positive comments after 2013, and therefore the possibility that people were exposed to those negative comments may have been high.

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10.  P11 lines 25-48 discuss cognitive dissonance as possibly explaining the bias in media coverage. I understand this point, but in that case wouldn't there have been dissonance/ disharmony when something they had previously presented in a positive light (HPV vaccine) became associated with something negative (adverse events)?  The dissonance does not seem to apply equally in both directions, so I don't think this fully explains the situation ie the media probably have some predisposition to report on 'scandal' as it might be seen as a more 'interesting' story?

We agree with your concern.

We deleted the whole sentences regarding the cognitive dissonance (p12, the second paragraph).

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MINOR COMMENTS
11. The timeline provided in Appendix 3 is really useful, and as I read the Introduction I was thinking that sort of thing would be good - but it is not referred to until the Discussion. I suggest you refer to it much earlier, in the Introduction so that people know they can go there for more detail on the sequence of events.

We added sentences in the Background section (p3-4, the 3rd-4th paragraphs).

…The Ministry of Health, Labour and Welfare of Japan approved the manufacture and sale of the vaccines Cervarix in 2009 and Gardasil in 2011. Additionally, the Ministry of Health, Labour and Welfare and municipalities began subsidizing costs of HPV vaccination in 2010 (see Appendix 1 for major events surrounding HPV vaccination in Japan).

The HPV vaccination rate for girls aged 12–16 years was as high as about 70% in 2011 and 2012 in Japan [11,12]. However, in March 2013, The Asahi Shimbun, considered one of the most authoritative newspapers in Japan, reported on a girl who had allegedly suffered from severe adverse effects attributed to the HPV vaccine. Newspapers, television, and other media followed suit, and continuously reported on adverse events of HPV vaccination, including movement disorders and memory disturbances. Although HPV vaccines became a routine prophylactic vaccine under Japan’s Preventive Vaccination Law in April 2013, the Japanese government decided to suspended its proactive recommendation of HPV vaccination in June 2013, in consideration of public concerns about those adverse events. As a result, the HPV vaccination rate fell sharply, to only a few percent by 2014 [13,14].

12. P3 line 41: when you say women in their 20s and 30s have been most affected by the increases in mortality - is this also true of incidence as well as mortality?

We revised the sentence as follows (p3, the Background, the third paragraph).

Mortality due to cervical cancer has increased, and in recent years morbidity in the 20s and 30s has increased [9].
13. P4 lines 21-26: you mention perceived credibility of media - could you provide more information about how this is measured?

We revised the sentence as follows (p4, the second paragraph).

…In a Japanese survey in 2016 that asked participants their perceived proportion of credible information in newspapers, television, internet, and magazines using a five point scale, the perceived credibility of media outlets among teens to people in their 60s was highest for newspapers, followed by television, then the internet [17].

14. P5 line 36: Could you clarify why the start date of January 2005 was selected for the search?

The dates of HPV vaccine introduction were 2006 in Australia and Canada; 2007 in France, Germany, Italy, and South Korea etc. We considered that the Japanese newspapers may have reported the events regarding HPV vaccination in those foreign countries. Therefore, we conducted our search from January 2005.

15. P7 line 38: the results refer to articles from July 2009 but the search period is specified as starting from January 2005. I assume this meant no articles were found prior to July 2009, but if so then it would be better to say this clearly, eg articles from July 2009 (the date of the earliest article found) to September 2017; or say - no articles were identified between January 2005 and June 2009.

We added a sentence as follows (p7, the beginning of the Results section).

…Figure 1 shows the number of paragraphs and articles from July 2009 to September 2017 (see Appendix 2 for data). No articles were identified between January 2005 and June 2009….
16. P9 lines 18-23 mention Japanese mothers - are there studies to support that in Japan mothers are the main decision-makers in relation to HPV vaccination for their daughters (or vaccines more generally), or do fathers or the daughters themselves play some role in the decision?

We revised the sentence and added references as follows (p10, the Discussion section, the second paragraph).

Studies have reported that Japanese mothers, who are the main decision-makers in relation to the HPV vaccination for their daughters [18,43], underestimate the morbidity and mortality associated with cervical cancer ….


17. The authors provide some suggestions for reducing in bias in newspaper coverage in Japan, mainly around public health professionals engaging more with the media, or directly with the community, for example through blogs. While these are potentially helpful, I suspect they oversimplify what is required in Japan to some extent. For example professional societies have spoken out in favour of the HPV vaccine (1), but as shown in the current study, this has attracted relatively little in the way of media attention. Dr Riko Muranaka wrote a number of media articles explaining the safety of the HPV vaccine and critical of the data presented by the anti-vaccine groups, and was subjected to substantial recriminations. A key issue appears to be that the Ministry of Health, Labour and Welfare (MHLW) still has not re-instated the proactive
recommendation for the HPV vaccine, even though their safety investigations (and international data) found no evidence of a causal link between

the HPV vaccine and the reported adverse events. This issue of a lack of strong clear support from government organisations for the HPV vaccine seems equally worthy of discussion, and it fits with the authors' description of how the city of Nagoya reacted to pressure from anti-vaccine activists. Again - is there evidence from any prior experiences in Japan (with other vaccines or with any health-related concern) that would give insight into whether or not strong support from the MHLW could allay community fears in the context of adverse media?

We added a paragraph in the end of the Discussion section as follows (p13, the second paragraph).

Additionally, the proactive recommendation of HPV vaccination by the Ministry of Health, Labour and Welfare is expected to be resumed as soon as possible, in the same way as Preventive Vaccination Law was amended to again include influenza vaccination in the 1990s after the anti-influenza vaccination movement. Scientist, health professionals, and medical societies should influence the government more strongly for the resumption of the proactive recommendation of HPV vaccination. Organizing a cross organizational team without regard to societies and departments, and appeal to the government may be effective for more influence.