

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

This paper was submitted to a another journal from BMJ but declined for publication following peer review. The authors addressed the reviewers' comments and submitted the revised paper to BMJ Open. The paper was subsequently accepted for publication at BMJ Open.

(This paper received three reviews from its previous journal but only two reviewers agreed to published their review.)

ARTICLE DETAILS

TITLE (PROVISIONAL)	Making headlines: An analysis of US government-funded cancer research mentioned in online media
AUTHORS	Maggio, Lauren; Ratcliff, Chelsea; Krakow, Melinda; Moorhead, Laura; Enkhbayar, Asura; Alperin, Juan Pablo

VERSION 1 – REVIEW

REVIEWER	Steven D. Wexner, M.D. Cleveland Clinic Florida United States of America
REVIEW RETURNED	24-Aug-2018

GENERAL COMMENTS	<p>This subject is quite fascinating and very important. However, the authors could either add one more important point or if they cannot add it at least cite it as a shortcoming. Specifically, although the authors mention some of the journals which have their own media teams and press offices they do not look at the institutions from which the studies were published. Some of these institutions may have their own press/media offices, which may increase the possibility of media coverage. Similarly, as the authors note some of the cancers are represented in the media in a disproportionate percentage to their demographic representation. One possible cause of this discrepancy might be that the types of cancers which receive more press coverage might be cancers for which professional societies promote media stories based upon the scientific publications of their members. Therefore, the authors should also assess which studies were presented at major scientific forums prior to publication as a correlation. This information should be cited within each article if a scientific publication occurred at a major meeting. The information on both the institution from which the respective studies were published as well as the scientific forums at which the results were presented would be readily available within the publications themselves and should be easily accessible to the authors. Their analysis should include not only the type of cancer and the journal in which the studies were published but also the institutions at which the studies were undertaken and the scientific forums at which they were presented. If the authors are unable to include this information they should at the very least cite the absence of presentation of this material as another shortcoming of the study.</p>
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REVIEWER	Romana Haneef Santé Publique France, France
REVIEW RETURNED	30-Aug-2018

GENERAL COMMENTS	<p>Manuscript Number: bmjopen-2018-025783 “Making headlines: An analysis of US government-funded cancer research mentioned in online media”</p> <p>Dear Dr Clark, I deeply appreciate your kind consideration of me to review this manuscript. I reviewed it with great attention and this topic is of special interest to me.</p> <p>Authors described whether journal articles on cancer funded by the US government in 2016 received online media attention using Altmetric and tried to describe their characteristics. They conclude that there is a mismatch between prevalent cancers and cancers highlighted in the media despite this was not stated in the study objectives.</p> <p>There are major flaws in the methodology section and how the results are presented despite minor issues. To address those issues is whether to modify the methodology section and then re-do the analysis of results accordingly. For that reason, I reject this study to publish in its current form.</p> <p>Here are the main reasons to reject this manuscript to publish:</p> <p>Introduction section: The objectives of the study are not described.</p> <p>Method section: Overall the method is poorly described especially following important elements: search strategy, inclusion and exclusion criteria of articles, the definition of media, and use of Altmetric.</p> <ol style="list-style-type: none"> 1. In the method section, the authors defined [a media “mention” as an instance of either a link to a journal article or a phrase referencing a journal article“]. The objective was to explore online media attention but this definition is very vague. Media is a very broad term and they did not specify which type of media, social media, news media, etc. Authors said that they consider media sources which include in Altmetric. They could have classified those sources as news media, social media, scientific citations, etc for better understanding. The description on page 7 (lines 15-38) is very unclear which is the principal part of the methodology and quality of study relied on this section. 2. The authors did not define what is their main or primary outcome of interest. 3. The authors did not mention that how they are going to measure the online media mention whether by an Altmetric score or just by the number of mentions. If by the number of mentions, how did they consider if one article is referenced in many news items or in scientific articles or on social media? 4. As authors described on page 6 (lines 51-53) and page 7 (lines 3-5), they partitioned the continuum of cancer stages into 3 categories (prevention and control, diagnosis and therapy/treatment. They could have explored the online media mentions according to these categories and could have compared which type of articles receive more attention. <p>Results section: Overall the results are not presented well and a lot of information in 6 tables makes the results more complex.</p> <ol style="list-style-type: none"> 1. If authors could have presented one table with general characteristics of selected articles with related online media
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	<p>mentions and a second table with the main outcomes of interest. With 6 tables, I am lost to see which one the main results.</p> <p>2. In table 1, 3, 4, 5 and 6, a total number of articles (N= X) should be reported which makes it easier to see what is the denominator.</p> <p>3. In table 5, the authors reported the number of media mentions, but where, in which source, was it number of news items, number of social media posts, etc. This table seems to correspond with the described objective but data is very poorly presented.</p> <p>4. In abstract results, the authors reported that "[Media mentions were disproportionate to actual.....]", this was not described in the objective neither in the method that the authors will measure the proportionality according to prevalence or incidence of cancer. The authors did not perform any test to validate this claim. Just based on numbers of mentions, it is not justified to report this.</p> <p>Conclusions: In the context of these flaws in the result section, the conclusions of this study are not valid.</p> <p>Overall, this study is not well conceived and conducted. Further, the manuscript is not well written as well.</p> <p>You may transmit these comments to the authors which may help them to improve their methodology for future study or if they intend to do it again.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer suggestions	Author response	Revision location
Reviewer 1		
<p>This subject is quite fascinating and very important. However, the authors could either add one more important point or if they cannot add it at least cite it as a shortcoming. Specifically, although the authors mention some of the journals which have their own media teams and press offices they do not look at the institutions from which the studies were published. Some of these institutions may have their own press/media offices, which may increase the possibility of media coverage. Similarly, as the authors note some of the cancers are represented in the media in a disproportionate percentage to their demographic representation. One possible cause of this discrepancy might be that the types of cancers which receive more press coverage might be cancers for which professional societies promote media stories based upon the scientific publications of their members. Therefore, the authors should also assess which studies were presented at major scientific forums prior to publication as a correlation. This information should be cited within each article if a scientific</p>	<p>Thank you for this comment. We agree that a researcher's institution and presentations of the work at professional association meetings may impact media attention. As suggested, we have added this as a limitation of the current study and noted this as a fruitful area of future research. We opted for this approach, as we feel that assessing which studies were presented at major scientific forums prior to publication as a correlation is outside the scope of our current study. Similarly, testing the effect of any media outreach used by the journals (such as press releases or contact with journalists) was also outside the scope of the study, and we have also noted this limitation in the discussion.</p>	<p>Pgs. 18-19</p>

<p>publication occurred at a major meeting. The information on both the institution from which the respective studies were published as well as the scientific forums at which the results were presented would be readily available within the publications themselves and should be easily accessible to the authors. Their analysis should include not only the type of cancer and the journal in which the studies were published but also the institutions at which the studies were undertaken and the scientific forums at which they were presented. If the authors are unable to include this information they should at the very least cite the absence of presentation of this material as another shortcoming of the study.</p>		
Reviewer 2		
Introduction section: The objectives of the study are not described.	Thank you for this suggestion; we have added our study objectives.	Pg. 5
Method section: Overall the method is poorly described	To increase the description of our methods we have added subheadings and attempted to address each of the sections highlighted below.	Pgs. 5-6
<ul style="list-style-type: none"> • Search strategy, 	We have added a subheading to call out this section. Additionally, we respectfully point out that the manuscript includes the complete search strategy in Box 1.	Pg. 6
<ul style="list-style-type: none"> • inclusion and exclusion criteria of articles, 	We have reorganized this section and added language to clarify these criteria and their relation to our objectives.	Pgs. 6-7
<ul style="list-style-type: none"> • the definition of media, and use of Altmetric 	We have clarified the definition of media and the use of Altmetric data	Pgs. 7-8
In the method section, the authors defined [a media “mention” as an instance of either a link to a journal article or a phrase referencing a journal article”.]. The objective was to explore online media attention but this definition is very vague. Media is a very broad term and they did not specify which type of media, social media, news media, etc. Authors said that they consider media sources which include in Altmetric. They could have classified those sources as news media, social media, scientific citations, etc for better understanding. The description on page 7 (lines 15-38) is very unclear which is the principal part of the methodology	We have attempted to clarify our definition of media. We have also made a note that social media metrics are outside the scope of this current study.	Pgs. 7-8

<p>and quality of study relied on this section.</p>		
<p>The authors did not define what is their main or primary outcome of interest.</p>	<p>We hope that by having made our objectives more explicit (see above), it becomes apparent that the first half of the discussion section highlights what we find of interest. Namely, as the first sentences of each paragraph in that section state:</p> <ul style="list-style-type: none"> • “While journal articles spanned all common cancer types, they were not represented in proportions mirroring estimates of cancer burden.” • “Published articles disproportionately represented the stages of the cancer continuum, with prevention and control research accounting for a smaller proportion than diagnosis or treatment research.” • “Media mentions were somewhat comparable across the 13 common cancers.” 	
<p>The authors did not mention that how they are going to measure the online media mention whether by an Altmetric score or just by the number of mentions. If by the number of mentions, how did they consider if one article is referenced in many news items or in scientific articles or on social media?</p>	<p>As part of the clearer definition of a mention, we have included the phrase: “... and count every time Altmetric LLC finds a “mention” of an article in one of these sources.” Additionally, throughout the analysis, and especially in the “Mentions in Online Media” section, we explicitly identify articles mentioned at least once, only once, or multiple times. In Table 6 we also include the average number of mentions and the range.</p>	<p>Pgs. 12-14</p>
<p>As authors described on page 6 (lines 51-53) and page 7 (lines 3-5), they partitioned the continuum of cancer stages into 3 categories (prevention and control, diagnosis and therapy/treatment). They could have explored the online media mentions according to these categories and could have compared which type of articles receive more attention.</p>	<p>We now include a paragraph that summarizes the media coverage of articles across the three stages of the cancer continuum. This information is also included in Table 4.</p>	<p>Pg. 14-15; Table 4</p>

<p>Results section: Overall the results are not presented well and a lot of information in 6 tables makes the results more complex.</p> <p>If authors could have presented one table with general characteristics of selected articles with related online media mentions and a second table with the main outcomes of interest. With 6 tables, I am lost to see which one the main results.</p>	<p>We agree that the amount of data we present creates complexity. However, we feel that this complexity is warranted, given our objective of presenting a benchmark of which types of cancer research receive media attention. Since we are not seeking to present a single measure, but a broad overview, we feel that the number of tables and data are necessary to give the reader a full picture.</p> <p>In both the Results and Discussions sections we attempt to highlight the data points we believe are of most interest.</p>	
<p>In table 1, 3, 4, 5 and 6, a total number of articles (N= X) should be reported which makes it easier to see what is the denominator.</p>	<p>To give the reader a sense of that larger N (which remains constant for all of the analysis), we have included the percentage of all articles in brackets in that first column. However, we respectfully disagree with the crux of this suggestion for the following reason: the first column of each represents the N for that row, which is the denominator for each of the other columns, and therefore the more appropriate data to present.</p>	
<p>In table 5, the authors reported the number of media mentions, but where, in which source, was it number of news items, number of social media posts, etc. This table seems to correspond with the described objective but data is very poorly presented.</p>	<p>We have indicated in the methods section that this study focuses only on news media mentions and does not include social media metrics.</p>	Pg. 8
<p>In abstract results, the authors reported that "[Media mentions were disproportionate to actual.....]", this was not described in the objective neither in the method that the authors will measure the proportionality according to prevalence or incidence of cancer. The authors did not perform any test to validate this claim. Just based on numbers of mentions, it is not justified to report this.</p>	<p>In explicitly stating our objectives we now make it clear that this was one of our goals.</p> <p>While we do not perform statistical tests as the basis of this claim, a simple comparison of the number of deaths (Table 2) and the number of mentions (Table 6) makes this apparent. While not presented directly in a table (which would unnecessarily duplicate the information of Tables 2 and 6), we draw the comparison in the discussion, pointing to examples of how this is true (e.g., "breast cancer was the most-published-on cancer type, with more than double the frequency of the second-most focused-on cancer, despite breast</p>	Pg. 5 Pg. 15

	cancer causing fewer deaths than lung, colon and rectal, and pancreatic cancer.”)	
<p>Conclusions: In the context of these flaws in the result section, the conclusions of this study are not valid.</p> <p>Overall, this study is not well conceived and conducted. Further, the manuscript is not well written as well.</p>	<p>We welcomed the opportunity to reexamine our study, especially the way in which we presented it. Although we made significant effort to write clearly, it is evident from reading this reviewer’s report that we had failed at communicating the objectives. It is our hope that by clarifying those objectives and making the other changes outlined above, future readers will draw positive conclusions about the study overall.</p> <p>We strongly believe our methods are sound, and our results are robust. The study is primarily descriptive, and we have been careful not to make any claims that over-interpret what we describe. Furthermore, we believe the methods and results address the objectives, which are, thanks to this reviewer, now more clearly expressed.</p>	

VERSION 2 – REVIEW

REVIEWER	Steven D. Wexner, M.D. Cleveland Clinic Florida United States of America
REVIEW RETURNED	16-Nov-2018
GENERAL COMMENTS	The authors have adequately addressed my queries posed in my initial review.