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# Does a research article's country of origin affect perception of its quality and relevance? A national trial of US public health researchers.

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Complete List of Authors:	Harris, Matthew; Imperial College London, Department of Primary Care and Public Health Macinko, James; UCLA, Fielding School of Public Health Jimenez, Geronimo; New York University, Nutrition, Food Studies and Public Health Mahfoud, Maen; Imperial College, Dept Primary Care and Public Health Anderson, Chloe; Commonwealth Fund,
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4	Harris M MBBS DPhil <sup>1,6</sup> , Macinko J PhD <sup>2</sup> , Jimenez G MA <sup>3</sup> , Mahfoud M MPH <sup>4</sup> ,
5	Anderson C MSW <sup>5</sup>
6	
7	<sup>1</sup> Corresponding author: Hon Clinical Senior Lecturer, Department of Primary Care
8	and Public Health, Imperial College London, Reynolds Building, St Dunstans Road,
9	London W6 8RP, UK. Email m.harris@imperial.ac.uk phone: 07890614005
10	<sup>2</sup> Professor, UCLA Fielding School of Public Health, 650 Charles E. Young Dr. South,
11	Room 31-235B, Center for Health Sciences, Los Angeles, CA 90095-1772, USA
12	jmacinko@g.ucla.edu
13	<sup>3</sup> Assistant Research Scientist, Dept Nutrition, Food Studies and Public Health, New
14	York University, 411 Lafayette Street, New York, 10003, USA
15	geronimo.jimenez@gmail.com
16	<sup>4</sup> Postgraduate student, Department of Primary Care and Public Health, Imperial
17	College London, Reynolds Building, St Dunstans Road, London W6 8RP, UK
18	mahfoud.maen@gmail.com
19	<sup>5</sup> Research Associate, Commonwealth Fund, 1 East 75 <sup>th</sup> Street, New York 10021, USA
20	chloe.c.anderson@gmail.com
21	<sup>6</sup> Commonwealth Fund Harkness Fellow in Healthcare Policy and Practice, New York
22	University
23	

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Abstract
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- 3 Objectives: The source of research may influence one's interpretation of it in either
- 4 negative or positive ways however there are no robust experiments to determine
- 5 the extent to which source impacts on one's judgment of the research article. We
- 6 determine the impact of source (country and institution) on respondents'
- 7 assessment of the quality and relevance of selected research abstracts.

8

- 9 Design: Web-based survey design consisting of four healthcare research abstracts
- 10 previously published and included in Cochrane Reviews randomized to have
- 11 fictionalized high- or low-income sources.

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- 13 Setting: All Council on the Education of Public Health-accredited Schools and
- 14 Programmes of Public Health in the United States.

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Participants: 899 core faculty members (full, associate and assistant professors)

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- 18 Intervention: Participants each reviewed the same four abstracts with half
- 19 randomized to receive abstracts with high-income country sources (country and
- institution), and half randomized to receive low-income country sources.

- 22 Primary outcome measures: Participants rated each abstract on two measures -
- 23 strength of the evidence, and likelihood of referral to a peer (1 to 10 rating scale).

1	Incident Rate Ratio was calculated using Poisson regression adjusting for socio-
2	demographic covariates.
3	
4	Results - Participants that received high-income country source abstracts were

equal in all known characteristics to the participants that received the abstracts with low-income country sources. For one of the four abstracts (a randomized, controlled trial of a pharmaceutical intervention) likelihood of referral to a peer was greater if the source was a high-income country (IRR 1.06, 1.01 to 1.12, p<0.05).

Conclusions: All things being equal, the respondents were influenced by a highincome country source in their rating of research abstracts in certain cases. More research may be needed to explore how the origin of a research article may lead to stereotype activation and application in research evaluation.

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#### Article summary

Strengths and limitations of this study

- First study at national level in the US to determine the impact of country-of-origin on the rating of healthcare research abstracts.
- All core faculty members (full, associate and assistant professors) of every CEPHaccredited Schools and Programmes of Public Health in the United States were invited to participate in the study.
- Subjects blinded to the purpose of the study and randomised to receive high- or lowincome source abstracts.
- Abstracts were rated on strength of the evidence and likelihood of referral to a peer.
- Although 899 full, associate and assistant professors participated in the study this corresponded to a 9.8% response rate.

#### **Background**

Ideally, research findings ought to be judged on the strength of the evidence and their relevance. However, there is subjectivity involved in interpreting research.<sup>1</sup> Research certainly does not 'speak for itself' – we give it a voice, and how we judge whether one piece of research constitutes evidence or not is complex and messy. Common standards for assessing the internal validity of research do not account for the potential cognitive biases in the consumption and interpretation of research post-publication and each of us may reach a different conclusion as to whether the research presents strong evidence and whether we consider the research useful. In practice, we see many idiosyncracies. A rigorous RCT may convince a surgeon to change a certain practice, but may not have the same effect on a primary care physician.<sup>2</sup> Government regulators consider the reliability of an innovation more positively than industrial scientists.<sup>3</sup> Clinicians are more likely to adopt an innovation if they believe it has come from current users with similar professional, cultural and socioeconomic backgrounds.<sup>4</sup> A legitimate source is important for innovation diffusion<sup>5,6</sup> but little is known about how legitimacy is defined or perceived. From the marketing literature, Bilkey and Nes (1982) showed that consumers tend to rate products from their own countries more favorably and that consumer preferences are positively correlated with the degree of economic development of the source country, probably evoked by the lower price cue of lowincome country products. 7 Up to 30% of the variance of consumer product ratings can be attributed to the product's country-of-origin.8

In healthcare research, typically one of the first pieces of information that is provided in a research article is the author's name, the institution and country of the research. Understanding anchoring to be a feature of heuristic thought, 9-13 it follows that we should examine the extent to which the source affects our interpretation of that research. If one possesses a prior-held belief or attitude towards the source,

8 equal, would research conducted in Ethiopia be viewed in the same way as identical

how does this influence one's subsequent view of the research? All things being

9 research conducted in the United States?<sup>14</sup>

The income and development level of the source country certainly seems to determine whether a manuscript is selected for publication. The number of publications from low-income countries is significantly lower than the number from developed countries in various research fields. 15,16 In psychiatry, only 6% of literature is published from regions that represent 90% of the global population.<sup>17</sup> Similar underrepresentation exists in cardiology, HIV research epidemiology. 18,19 One argument for this is that research from Low-Income Countries lacks the quality to meet publication criteria.<sup>20</sup> Others argue that there are systematic selection biases. Editorial board members of international biomedical journals are more likely to come from High-Income Countries.<sup>21-23</sup> Reviewers from OECD countries view articles from their own country more favourably than from other countries.<sup>22,24</sup> Studies recruiting participants from the US are more likely to be published.<sup>21,23</sup> In Peters and Ceci's controversial experiment, only one of the nine

articles that were initially published in a highly regarded American journal was 

accepted upon resubmission to the same journal after fabricating the name of the

original institutions.<sup>25</sup> Kleiwer et al demonstrated that articles from outside of North

America were less likely to be accepted for publication.<sup>26</sup> It seems that source

matters.

The major obstacle to this research question is that there are no controlled studies

to ascertain the impact of the source of the research *post*-publication. To fill this

research gap, we present here a randomized trial of Public Health research faculty in

the United States. This national survey invites respondents, most of who are

experienced healthcare researchers and peer reviewers, to rate identical, typical

healthcare research abstracts. To ascertain the impact of the source (institution and

country) of the abstracts, we ensured that the abstracts that the respondents

received were identical in every respect except we fictionalized the sources into

either high- or low-income countries and randomized the respondents to receive

either type. We then compared their responses to two simple questions for each

abstract – whether they think the evidence in the abstract is strong, and whether

they would recommend the abstract to a peer. Under the null hypothesis, there

should be no difference in the distribution of responses to the two types of abstract.

#### Methods

Survey design likely). The time taken to read and respond to each abstract was measured by the

survey platform. Each question was forced response to avoid the problem of

missing data. Recipients were randomly allocated to one of two possible surveys. In

the first, abstracts 1 and 4 were fictionalized to high-income country sources (UK

and Germany) and Abstracts 2 and 3 were fictionalized to low-income country

sources (Malawi and Ethiopia). These sources were reversed in the second survey.

Therefore, each survey (Survey A and Survey B) had two abstracts from low-income

In order to ensure that the abstracts were of a sufficient quality and internal

validity, we purposively selected abstracts of papers that had been included in

Cochrane Reviews and that were also likely to be of at least some interest to most

public health academics and health service researchers. Each abstract had therefore

already been vetted for sources of bias prior to publication, using the Cochrane risk

of bias tool, and we only selected abstracts that had a high internal validity for the

country sources and two from high-income country sources (Figure 1).

We used a web-based survey using a Qualtrics survey platform. The survey was

divided into two sections, the first to collect demographic and professional data and

the second for the respondent to read and respond to four research abstracts. Each

abstract was followed by the same two questions – first, how strong is the evidence

presented in this abstract? And second, how likely are you to recommend this

abstract to a colleague? Responses were on a scale (1 to 10) with 1 as the least (i.e.

not at all strong, not at all likely) and 10 as the most (extremely strong, extremely

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type of study that it was describing. There is a trade off between choosing abstracts of interest to all potential respondents and the length of the survey. We decided to choose four abstracts - one randomized controlled pharmaceutical trial, one randomized controlled service intervention, one pharmaceutical intervention of cross-sectional design and one service intervention of cross-sectional design - to give a balance in terms of content and design. All four abstracts were of similar length and complexity. The abstracts were presented as found in their PubMed format, with all technical content preserved and in a format familiar to any healthcare researcher, however for each abstract the institution and country of origin was fictionalized to one of four different high- or low-income sources. For one abstract, the trial acronym was removed to avoid the possibility that some respondents would recognize the research. High-income source countries were selected from the top ten countries by GDP per capita (>\$36000 per capita), and OECD membership. Low-income source countries were selected from the bottom ten countries by GDP per capita (<\$1046 per capita). The institutional affiliation was fictionalized to one of the top-five universities that also had a medical or healthcare faculty, in the respective countries. We used the 2014 Times Higher Education World (http://www.timeshighereducation.co.uk/worldrankings university-rankings/2014-15/world-ranking) for the high-income country sources, and the http://www.4icu.org website for international rankings of institutions for the low-income sources.

We ensured that the source of the abstract was equally visible in each abstract and was mentioned in at least three locations throughout the abstract - the title, under the title and in the abstract itself. To avoid a possible order effect, the order in which the abstracts were presented in the survey was randomized for each participant. Neither the original nor fictionalized journals were included in the source in order to avoid respondents reacting to the reputation of the publication type. Furthermore, in order to not influence the responses, the survey was described as a Speed Reading survey, designed to examine whether the time taken to read an abstract influences the interpretation of the information within it. The survey platform enabled us to measure the time taken to respond to the entire survey, and each abstract, and this information was provided to the respondent at the end of the survey to heighten the 'psychological realism' of the survey. The survey was pilot-tested with Masters in Public Health students at Imperial College London and some faculty members at New York University to ensure face validity of the questions and that the design and flow of the survey was straightforward.

Participants and survey management

We included all core faculty members of Schools and Programs of Public Health located in a US State that had publically available contact information and that were accredited by Council on the Education of Public Health (CEPH - <a href="http://ceph.org/accredited">http://ceph.org/accredited</a>) (159 institutions) (see Appendix 1 for full listing). We excluded administrators, managers, adjunct faculty members and visiting faculty

members, and faculty members from our own institution. From this universe of potential respondents (n=9421 once duplicates were removed), we randomized them to receive either Survey A or Survey B and sent them an invite to take the survey. Block randomization within respective institutions was used, with 4, 6 and 8 sequences, from a web-based randomization service (www.sealedenvelope.com,

seed 137526655595533).

The survey was designed so that only the email recipient could open the link to the survey and that it could be taken only one time. The survey could not be sent anonymously, and was inaccessible to search engines. The survey was active only within the specified time frame (20th January to 4th February 2015, chosen so that faculty members were highly likely to be present at their institution) and two email reminders were sent on day 7 and day 14 following the first email invite (20th January 2015). Panel members did not receive prior invitation to participate in the survey however our email invite indicated clearly that all responses were to be deidentified, and analyzed in aggregate form only and only for the purposes of this research. It also indicated that there was no obligation to participate but by choosing to participate consent to use the response for research is implied. We offered participants entry into a lottery draw for a \$500 Amazon voucher as an incentive to complete the survey. The study protocol, including the non-harmful deception around the ulterior motive of the study, was reviewed by the New York University Committee on Activities Involving Human Subjects and deemed exempt from full ethical review (#14-10332).

1 Statistical analysis and power calculation

3 Data was retrieved via Qualtrics in CSV format and analyzed using Stata/SE 13

4 (Statacorp, College Station, Texas). We used demographic covariates (age, sex),

professional experience covariates (research exposure, peer review experience,

educational attainment) and institutional covariates (region, CEPH accreditation

type, and Ivy league status) to explain variation in the outcomes of interest. We

group respondent age into categories based on a presumed mid-year birth and

survey completion date of 31st January 2015. Educational attainment was

categorized into two groups Academic and Clinical Academic based on the

completed qualifications provided in the survey responses. We used Poisson

regression models for the multivariable analysis and two-tailed t-tests to compare

the differences in mean responses as well as for the descriptive characteristics of

the survey samples. We also explored high and low cut points for the outcome

variables in bivariate analysis and illustrate the distribution of scores as

proportions of respondents at the high ( $\geq 8$ ) and low ( $\leq 3$ ) ends of the distribution.

We calculated that sample sizes of 400 respondents for each survey would provide

enough power (80%) to detect a statistically significant (95% confidence level)

difference of 0.35 in mean scores between the two groups [54].

#### **Results**

After randomization, 4711 potential respondents received email-invites for Survey A, and 4710 received email-invites for Survey B. 51 and 61 invitations bounced respectively. 567 started Survey A and 594 started Survey B. Of these, 433 completed Survey A and 466 completed Survey B. This corresponds to a response rate of 9.2% for Survey A and 9.9% for Survey B. Institutional characteristics (region and Ivy league representation) of responders and invitees were not significantly different, although there was a small over-representation of responders from CEPH accredited Programs in Public Health. The demographic characteristics of the respondents of both surveys were equal suggesting that randomization performed as was expected (Table 1). 90% of respondents of both survey types serve as peer reviewers for academic journals.

On average, respondents spent between 72.5-109.9 seconds on each abstract with no significant differences between the groups. Table 2 shows the mean (SD) ratings for strength and referral for the four abstracts by the type of source. Referral to a peer for Abstract 3 (Randomized controlled trial of a pharmaceutical intervention) was significantly more likely if the source was from a high-income country. There were no other significant differences between the abstracts based on the source. The findings were unchanged when using the proportion rating higher than 8 or lower than 3. As might be expected, strength rating for abstracts that described a more robust research design, specifically Randomized Controlled Trials (Abstract 1

and 3) scored higher for strength than Abstracts 2 and 4 that were of a cross-

sectional design. Also, as might be expected, the disposal of these abstracts also correlated well with respondents' view of the strength of the evidence contained

within them. Correlation between the scores given for strength of evidence and

subsequent referral was high (Spearman correlation coefficients varied between

0.71 - 0.85).

Tables 3 and 4 show the results of the multivariable analysis. Controlling for

individual and institutional covariates, high-income source was a significant

predictor of referral for Abstract 3 only (IRR 1.06, 1.01-1.12). For three of the four

abstracts, the time spent reviewing the abstract was negatively associated with the

rating given to it (Abstract 1 IRR 0.84, 0.76-0.92; Abstract 2 IRR 0.87, 0.80-0.95);

Abstract 3 IRR 0.91, 0.84-0.99). However, rating for Abstract 4 (both strength of

evidence (IRR 1.16, 1.03-1.30) and referral to a peer (IRR 1.16, 1.03-1.30))

improved when more time was spent on it; individuals affiliated to CEPH Programs

of Public Health were significantly more likely to rate the strength of the evidence

for this abstract higher (IRR 1.09, 1.02-1.17) and to refer it to colleagues (IRR 1.17,

1.09-1.26) than individuals affiliated to Schools of Public Health; and finally,

individuals that had earned a clinical or professional qualification were significantly

less likely to refer the abstract to a peer (IRR 0.09, 0.82-1.00) than those with purely

academic qualifications.

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Two sinister issues may be occurring if the source of the research affects one's judgement of it. First, poor research may be given undue significance in part because of the perceived legitimacy of its source. The MMR scandal in the UK may have been a painful example of this.<sup>28</sup> Secondly, good research from an unexpected source may be discounted early on, resulting in missed opportunities to learn from important innovations.

Low-Income Countries (LICs) have developed novel innovations and there are multiple opportunities to learn from LICs, for example around improved surgical procedures,<sup>29</sup> improved long-term outcomes in mental illness<sup>30-34</sup> improved skill mix with scaled use of community health workers.<sup>35-37</sup> However, there are strikingly few examples where these innovations have been adopted in High Income Countries (HICs).<sup>38</sup> Even in Health Links, where HICs and LICs collaborate explicitly and reciprocally, there are surprisingly few examples of attempts to adopt LIC innovations in high-income settings – HIC volunteers learn a lot personally and professionally however this does not translate into changes in their own health care systems and the learning and exchange of expertise is predominantly directed from the HICs towards the LICs.<sup>39-42</sup> The Reverse Innovation 'movement' sets out to unpack the barriers to adopting LIC innovations in HIC contexts. It is motivated in part by the rapidly changing global health landscape and has gained interest in the

1 US and UK because the unsustainable growth in healthcare expenditure means that

there is likely to be a genuine need to learn from LICs.<sup>43</sup>

We know already from the Diffusion of Innovation literature that healthcare professionals perform poorly when it comes to adopting innovations or evidence from 'elsewhere.'2,44 The not-invented-here culture prevails. However we also know that innovations are more likely to diffuse if actors perceive the source to be similar to their own. Health professionals are homophilus.<sup>4</sup> We might ask therefore whether health professionals are even more discriminating when presented with research from very 'unlikely' sources? Do they discriminate against sources that they might perceive to be so different from their own, or perceive to be so unlikely

to produce good research, that the evidence is discounted early on?

We were motivated to conduct this study due to a strong expectation that there would be a bias against low-income country abstracts, or at least that source would make a difference to how the respondents viewed the strength of evidence in the abstract and whether they would chose to refer the abstract to a peer. Although we found no difference in three of the four abstracts, a high-income source did make a difference to participants' view of the relevance of one of the abstracts. This result was less dramatic than we expected and it suggests that explicit biases are small and difficult to detect across a relatively small group of abstracts. Alternatively, it suggests that an implicit bias, if it exists, does not manifest particularly strongly in explicit terms through research evaluation in this group of respondents.

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For the former, this study provides an empirical baseline against which to compare future research into the effect of source on abstract evaluation. For the latter, we took several steps to ensure that if explicit biases were occurring we would capture them. We randomised the survey abstracts to control for known and unknown confounders and this was performed well as evidenced by the balanced characteristics of the two survey groups. We framed the research as a Speed Reading survey to encourage respondents to spend the minimum time assessing the abstract and allow anchoring to specific pieces of information in the abstract to occur and we made no reference to the hypothesis that we were testing to not influence the responses. We achieved a large sample size to be able to detect small, but meaningful differences in the distribution of the responses - the completedsurvey response rate of nearly 10% is within the range expected for a timeconsuming, internet-based survey with no pre-invitation recruitment.<sup>45</sup> The fact that the survey was presented as a Speed Reading test may also have reduced selection bias, in that its stated purpose would not necessarily appeal to one type of researcher, such as those with more global health experience.

In our study, respondents spent on average between 70-100 seconds per abstract. Rapid responders tended to rate abstracts higher, so it is possible that if less time is spent on the abstracts then anchoring to particular triggers might be having a greater effect. We did find that in Abstract 4, if more time is taken to respond to the abstract then opinion of it improves (for both strength of evidence and referral),

however this is equal between both high and low income sources. We also found, as would be expected, that respondents tended to rate the randomised controlled trial abstracts higher for strength of evidence compared to the abstracts that were of a cross-sectional design.

If implicit bias exists but is not manifesting explicitly, then the implications of this study are encouraging for the population that participated. It suggests that even when the source of the abstract matters to the individual in either a positive or negative way, overall this bias does not seem to manifest explicitly. The two groups of survey respondents treated three of the four abstracts almost identically irrespective of the source. For those interested in exploring the barriers to Reverse Innovation, or types of publication bias, this finding may be encouraging. Public health faculty in the US seem to be doing what is expected of them. Research is being assessed, by and large, according to its content rather than its origin. Nonetheless, the significant difference in referral for Abstract 3 does suggest that source might still matter in some instances. All things being equal, our sample population considered the Randomised Controlled Trial of the pharmaceutical intervention to be significantly more relevant to their peer group if its source was from the UK rather than from Malawi.

 We also note that the wide standard deviations in the outcomes indicate that, despite the large sample size, there is considerable variation in how readers view and consume research.  $GRADE^{46}$  and  $Jadad^{47}$  scores are widely used but usually to

assess entire research articles against judgement of research quality, risk of bias, inconsistency, indirectness, imprecision and publication bias.<sup>48-54</sup> Our study, designed purposefully to be a rapid appraisal only of the research abstract, demonstrated extremely wide variation in the assessment of the limited information provided in the abstracts. This finding may have implications for systematic reviews, meta-analyses and for reviewers of abstracts submitted for conferences.

We cannot speculate as to the triggers individuals identify with when reading each individual abstract under relatively rapid, timed conditions but it is encouraging that, despite the wide variation in scores given to the abstracts, that overall there were few differences between the two survey groups. As highly trained researchers in public health we could expect an explicit bias to be extremely small if present at all. It is possible that in other population groups this survey would present different findings. Policy-makers, clinicians, journalists, health service managers are all important actors in innovation diffusion processes, and may also be involved in peer-review processes for academic publication. Our strategy to include academic public health professionals in this survey is based on a best-case assessment of likely bias. Future research ought to modify the approach we have chosen in accordance with the target population, using other abstracts or developing a research design that allows respondents to serve as their own controls. The 8th International conference on peer review in biomedical research sets the stage for a detailed examination of cognitive biases in healthcare interpretation.55

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#### **Author Contributions**

MH conceived and designed the research, collected and cleaned the data, helped to analyze the data, wrote the first draft and revised subsequent drafts for important intellectual content. JM analyzed the data and helped to design the research, and revised the drafts for important intellectual content. MM conducted an initial pilot of the survey, helped to collect data, contributed to the first draft and revised subsequent drafts for important intellectual content. GJ helped to collect data, design the research and revised subsequent drafts for important intellectual content. CA helped to clean the data and analyze it, and revised subsequent drafts for important intellectual content.

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7	www.icmje.org/coi disclosure.pdf (available on request from the corresponding
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#### References

- 2 1. Kaptchuk, T. Effect of interpretive bias on research evidence. *BMJ*, 326, 1453-
- 3 5.

- 4 2. Ferlie, E. Fitzgerald L, Wood M and Hawkins C. The nonspread of
- 5 innovations: the mediating role of professionals. *Academy of Management*
- *Journal,* 2005 48, 117-134
- 7 3. Dearing J, Meyer G and Kazmierczak J. Portraying the New: communication
- 8 between university innovators and potential users. *Science Communication*
- 9 1994:16(1) 11-42
- 4. Fitzgerald, L., E. Ferlie, M.Wood, and C. Hawkins. 2002. Interlocking
- 11 Interactions, the Diffusion of Innovations in Health Care. *Human Relations*
- 12 55(12):1429–49.
- 13 5. Bilkey, W. and Nes, E. Country-of-Origin Effects on Product Evaluations.
- Journal of International Business Studies. 1982; Vol. 13, Issue 1, pp. 89-100, 1982
- 15 6. Peterson, Robert A. and Jolibert A. A Meta-Analysis of Country-of-Origin
- Effects. Journal of International Business Studies. 1995; 26 (4), 883-900
- 7. Greenhalgh T, Robert G, Macfarlane F, Bate P and Kyriakidou O. Diffusion of
- 18 Innovations in Service Organizations: Systematic Review and
- recommendations. *Milbank Quarterly* vol. 82, No. 4, 2004 (pp. 581–629)
- 20 8. Damschroder L, Aron D, Keith R, Kirsch S, Alexander J and Lowery. Fostering
- 21 implementation of health services research findings into practice: a
- consolidated framework for advancing implementation science.
- 23 Implementation Science 2009, 4:50

2 Choice. Science 1981 211:453-58

- 3 10. Bargh J, Chen M and Burrows L. Automaticity of Social Behaviour: Direct
- 4 effects of Trait Construct and Stereotype Activation on Action. *Journal of*
- 5 Personality and Social Psychology 1996 vol 71:2 230-44
- 6 11. Lord C and Lepper M. Biased Assimilation and Attitude Polarization: The Effects
- of Prior Theories on Subsequently Considered Evidence. *Journal of Personality*
- *and Social Psychology,* **37,** 2098-2109
- 9 12. Maccoun RJ. Biases in the interpretation and use of research results. Annual
- 10 Reviews Psychol, 1998 49, 259--87.
- 11 13. Tversky, A and Kahneman, D. Judgment under uncertainty: Heuristics and biases.
- 12 Science, 185 (1974), 1124-1131.
- 13 14. Harris M. Research papers should omit their authors' affiliations. *British Medical*
- *Journal*. Personal View. 2014;349:g6439
- 15 15. Yousefi-Nooraie R, Shakiba B and Mortaz-Hejri S. 2006. Country development and
- manuscript selection bias: a review of published studies. BMC Med Res Methodol,
- 17 2006: 6, 37.
- 18 16. Horton, R. 2000. North and South: bridging the information gap. *Lancet*, 355,
- 19 2231-6
- 20 17. Patel V and Sumathipala A. PATEL, V. International representation in psychiatric
- 21 literature: survey of six leading journals. *Br J Psychiatry*, 2001:178, 406-9.
- 22 18. Mendis S, Yach D, Bengoa R, Narvaez D and Zhang X. Research gap in
- cardiovascular disease in developing countries. *Lancet* 2003:361, 2246-7

- 1 19. Yach D and Kenya P. Assessment of epidemiological and HIV/AIDS publications in
- 2 Africa. *Int J Epidemiol*, 1992:21, 557-60
- 3 20. Singh D. Publication bias- a reason for the decreased research output in
- 4 developing countries *S Afr Psychiatry Rev*, 2006:153-155
- 5 21. Keiser J, Utzinger J, Tanner M and Singer B. Representation of authors and editors
- 6 from countries with different human development indexes in the leading
- 7 literature on tropical medicine: survey of current evidence. *BMJ*, 2004:328, 1229-
- 8 32
- 9 22. Opthofa T, Coronel R and Jansed M. The significance of the peer review process
- against the background of bias: priority ratings of reviewers and editors and the
- prediction of citation, the role of geographical bias. Cardiovascular Research,
- 12 2002:339–346.
- 13 23. Link AM. US and non-US submissions. An analysis of reviewer bias. JAMA 1998;
- 14 280: 246-7
- 15 24. Tutarel O. Composition of the editorial boards of leading medical education
- journals. BMC Med Res Methodol, 2004:4, 3
- 17 25. Peters DP and Ceci SJ. Peer-review practices of psychological journals: the fate of
- published articles, submitted again. *The Behavioural and Brain Sciences* 1982;
- 19 5:187-255
- 20 26. Kliewer M, DeLong D, Freed K, Jenkins C, Paulson E and Provenzale J. Peer
- Review at the American Journal of Roentgenology: How Reviewer and Manuscript
- Characteristics Affected Editorial Decisions on 196 Major Papers. *American*
- *Journal of Roentgenology* 2004:183:6, 1545-1550

- 28. Wakefield A, Murch S, Anthony A, Linnell J, Casson D et al. RETRACTED: Ileal-
- lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental
- disorder in children. *Lancet* 1998: 351(9103) p637-641
- 29. Abeygunasekera A. Effective surgery can be cheap and innovative. BMJ 2004;
- 329:1185
- 30. Dogra N and Omigbodun O. Partnerships in mental heatlh are possible without
- multidisciplinary teams. BMJ 2004; 329: 1184
- 31. McKenzie K, Patel V and Araya R. Learning from low income countries: mental
- health. BMJ 2004; 329:1138
- 32. Swartz HA and Rollman BL. Managing the global burden of depression: lessons
- from the developing world. *World Psychiatry* 2003; 2:3
- 33. Susser E, Collins P, Schanzer B, Varma V and Gittelman M. Topics for our times:
- can we learn from the care of persons with mental illness in developing
- countries? American Journal of Public Health 1996; 86:7
- 34. Rosen A. Destigmatizing day-to-day practices: what developed countries can
- learn from developing countries. World Psychiatry 2006; 5:1
- 35. Haines A, Sanders D, Lehmann U, Rowe A, Lawn J, Jan S, Walker D and Bhutta Z.
- Achieving child survival goals: potential contribution of community health
- workers. Lancet 2007; 369: 2121-31

- - 1 36. Haider R, Ashworth A, Kabir I, Huttly SR. Effect of community based peer
  - 2 counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a
  - 3 randomised controlled trial. *Lancet* 2000;356(9242):1643–7.
  - 4 37. Kumar V, Mohanty S, Kumar A, Misra RP, Santosham M, Awasthi S, et al. Effect of
  - 5 community-based behaviour change management on neonatal mortality in
  - 6 Shivgarh, Uttar Pradesh, India: a cluster randomised controlled trial. *Lancet*
  - 7 2008;372(9644):1151-62
  - 8 38. Syed S, Dadwal V and Martin G. Reverse innovation in global health systems:
  - 9 towards global innovation flow. *Globalization and Health* 2013, 9:36 (30 August
  - 10 2013)
  - 11 39. Wright J, Walley J, Philip A, Petros H and Ford H. Research into practice: 10 years
  - of international public health partnership between the UK and Swaziland. *Journal*
  - 13 of Public Health 2010;32(2):277-282
  - 14 40. Baguley D, Killeen T and Wright J. International health links: an evaluation of
  - partnerships between healthcare organizations and developing countries.
  - *Tropical Doctor* 2006; 36:149
  - 17 41. Lam CLK. Knowledge can flow from developing to developed countries. BMJ 2000;
  - 18 321:830
  - 19 42. Berwick D Lessons from developing countries on improving health care *BMJ*
  - 20 2004;328:1124-9
  - 21 43. Crisp N. Turning the World Upside Down. RSM books. Jan 2010

BMJ Open: first published as 10.1136/bmjopen-2015-008993 on 30 December 2015. Downloaded from http://bmjopen.bmj.com/ on June 13, 2025 at Agence Bibliographique de Enseignement Superieur (ABES) .

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- 2 Innovations in Service Organizations: systematic review and recommendations.
- 3 The Milbank Quarterly. 2004;82(4):581-629
- 4 45. Cook C, Heath F and Thompson R. A meta-analysis of response rates in web- or
- 5 internet-based surveys. *Educational and Psychological Measurement*, Vol. 60 No.
- 6 6, December 2000 821-836
- 7 46. Malmivaara A. Methodological considerations of the GRADE method. *Annals of*
- *Medicine.* 2015; 47:1-5
- 9 47. Jadad AR, Moore RA, Carroll D, et al. Assessing the quality of reports of
- randomized clinical trials: is blinding necessary? *Control Clin Trials* 1996;**17**:1–
- 11 12.
- 12 48. Balshem H, Helfand M, Schunemann HJ, Oxman AD, Kunz R, Brozek J, et al.
- GRADE guidelines: 3. Rating the quality of evidence. *J Clin Epidemiol*. 2011; 644:
- 14 401–6.
- 49. Guyatt GH, Oxman AD, Vist G, Kunz R, Brozek J, Alonso-Coello P, et al. GRADE
- guidelines: 4. Rating the quality of evidence—study limitations (risk of bias). *J*
- *Clin Epidemiol.* 2011; 644: 407–15.
- 18 50. Guyatt GH, Oxman AD, Kunz R, Woodcock J, Brozek J, Helfand M, et al. GRADE
- guidelines: 7. Rating the quality of evidence—inconsistency. *J Clin Epidemiol*.
- 20 2011; 6412: 1294– 302.
- 21 51. Guyatt GH, Oxman AD, Kunz R, Woodcock J, Brozek J, Helfand M, et al. GRADE
- guidelines: 8. Rating the quality of evidence—indirectness. *J Clin Epidemiol*. 2011;
- 23 6412: 1303 10.

- guidelines 6. Rating the quality of evidence—imprecision. *J Clin Epidemiol*. 2011;
- 6412: 1283 - 93.
- 53. Guyatt GH, Oxman AD, Montori V, Vist G, Kunz R, Brozek J, et al. GRADE
- guidelines: 5. Rating the quality of evidence—publication bias. *J Clin Epidemiol*.
- 2011; 6412: 1277-82.
- 54. Guyatt GH, Oxman AD, Sultan S, Glasziou P, Akl EA, Alonso-Coello P, et al . GRADE
- guidelines: 9. Rating up the quality of evidence. J Clin Epidemiol. 2011; 6412:
- 1311-16.
- 55. Rennie D, Flanagin A, Godlee F and Bloom T. Eight international congress on peer
- review in biomedical publication. BMJ 2015;350:h2411 doi: 10.1136/bmj.h2411
- (Published 26 May 2015)

<sup>&</sup>lt;sup>a</sup> e.g. BSc, BA, MSc, MPH, PhD

cversus non-US born

dversus reads research less than daily

eversus CEPH School of Public Health

fversus non-Ivy league institution

Table 2: Abstract rating for strength and referral

		Abstract 1			Abstract 2			Abstract 3				Abstract 4		
	Source	High	Low	All	Hi		Low	All	 High	Low	All	High	Low	All
		Income	Income		Inco	me	Income		Income	Income		Income	Income	
	Mean	5.77	5.78	5.77	4.9	2	4.90	4.91	6.92	6.76	6.84	3.95	4.05	4.00
gth	(SD)	(2.30)	(2.11)	(2.20)	(1.9	5)	(2.04)	(1.99)	(2.02)	(2.03)	(2.02)	(2.14)	(2.06)	(2.10)
Strength	≥8 (%)	27.61	24.78	26.15	10.	13	12.06	11.06	47.63	43.16	45.47	6.96	4.74	5.81
0,	≤3 (%)	22.04	18.10	20.00	27.	59	30.63	29.05	8.19	9.05	8.60	48.49	45.91	47.15
	Mean	5.14	5.38	5.27	4.5	0	4.56	4.53	6.05*	5.68	5.87	3.79	3.96	3.88
<u>.a</u>	(SD)	(2.54)	(2.36)	(2.45)	(2.2	1)	(2.26)	(2.23)	(2.40)	(2.45)	(2.43)	(2.23)	(2.21)	(2.22)
Referral	≥8 (%)	21.58	23.71	22.68	10.	34	11.60	10.95	32.97	27.61	30.39	7.66	7.33	7.49
ш	≤3 (%)	30.63	24.78	27.60	36.	64	37.35	36.98	17.46	21.81	19.55	51.74	46.77	49.16
	Mean time (s)	87.4	87.4	87.4	109	9.9	103.0	106.2	109.8	97.3	103.8	72.5	79.4	76.0
*	p<0.05													
A	bstract 1=RC	T/Service												
A	bstract 2=Cro	oss-section	al/Service											
A	Abstract 3=RCT/Pharmaceutical													
Abstract 2=Cross-sectional/Service Abstract 3=RCT/Pharmaceutical Abstract 4=Cross-sectional/Pharmaceutical														

<sup>\*</sup>p<0.05

Table 3: Predictors of abstract strength ratings <sup>a</sup>

	Abstract 1	Abstract 2	Abstract 3	Abstract 4
	IRR	IRR	IRR	IRR
	95% CI	95% CI	95% CI	95% CI
High v low country origin	1.00	1.00	1.02	0.99
	0.95,1.06	0.94,1.06	0.97,1.08	0.92,1.05
Male (v female)	1.00	0.97	1.01	0.95
	0.94,1.05	0.91,1.03	0.96,1.06	0.89,1.02
41-50 years (vs 21-40)	0.96	0.93	1.00	0.95
	0.89,1.04	0.85,1.01	0.93,1.07	0.87,1.04
51-60 years (vs 21-40)	0.96	0.93	1.01	0.92
	0.89,1.03	0.86,1.01	0.94,1.09	0.84,1.01
61+ years (vs 21-40)	0.94	0.97	1.02	0.95
	0.87,1.02	0.89,1.05	0.95,1.10	0.87,1.05
Clinical academic credentials (vs academic only)	0.96	0.9*	0.98	0.91
	0.89,1.04	0.83,0.98	0.91,1.05	0.83,1.00
US born (vs not)	1.02	0.95	0.99	0.97
	0.95,1.10	0.88,1.03	0.93,1.06	0.89,1.06
Reads research daily (vs < daily)	1.01	0.98	0.98	1.03
	0.95,1.06	0.92,1.04	0.93,1.03	0.96,1.10
CEPH program (vs school)	1.02	1.01	1.00	1.09*
	0.96,1.08	0.95,1.08	0.94,1.05	1.02,1.17
Ivy league institution (vs others)	0.97	0.92	1.01	1.03
	0.87,1.07	0.82,1.04	0.92,1.12	0.91,1.17
South region (vs Northeast)	0.94	1.03	0.97	1.01
	0.87,1.02	0.94,1.12	0.90,1.05	0.92,1.12
Midwest region (vs Northeast)	0.97	1.05	1.01	1.02
	0.89,1.07	0.95,1.16	0.93,1.10	0.91,1.14
West region (vs Northeast)	1.01	1.03	1.01	0.97
	0.91,1.12	0.92,1.16	0.91,1.11	0.85,1.10
60-<120 seconds spent reading (vs <60s)	0.92**	0.97	0.99	1.09*
	0.86,0.98	0.90,1.04	0.93,1.05	1.02,1.17
120+ seconds spent reading (vs <60s)	0.86***	0.94	0.92*	1.16*
	0.79,0.94	0.87,1.02	0.86,1.00	1.03,1.30
$N^{\mathrm{b}}$	895	895	895	895

<sup>&</sup>lt;sup>a</sup> Poisson models controlling for all variables in each column.

 $Abstract\ 1=RCT/Service;\ Abstract\ 2=Cross-sectional/Service;\ Abstract\ 3=RCT/Pharmaceutical;\ Abstract\ 4=Cross-sectional/Service;\ Abstract\$ sectional/Pharmaceutical

<sup>&</sup>lt;sup>b</sup> Only survey responses with no missing data included in the multivariate analysis

Table 4: Predictors of abstract referral ratings <sup>a</sup>

IRR   95% CI   95%		Abstract 1	Abstract 2	Abstract 3	Abstract 4
High v low country origin   1.05   0.98   1.06*   0.97   0.99,1.11   0.92,1.04   1.01,1.12   0.90,1.03   0.99,1.15   0.99,1.05   0.88,1.00   0.96,1.07   0.87,1.00   0.93,1.05   0.88,1.00   0.96,1.07   0.87,1.00   0.93,1.08   0.88,1.04   0.94,1.10   0.87,1.04   0.93,1.08   0.88,1.04   0.94,1.10   0.87,1.04   0.93,1.08   0.94   1.03   0.93   0.90,1.06   0.86,1.03   0.95,1.11   0.85,1.02   0.93,1.10   0.94,1.13   0.95,1.12   0.87,1.06   0.93,1.10   0.94,1.13   0.95,1.12   0.87,1.06   0.93,1.10   0.94,1.13   0.95,1.12   0.87,1.06   0.90,1.06   0.85,1.02   0.90,1.05   0.82,1.00   0.99,1.06   0.85,1.02   0.90,1.05   0.82,1.00   0.99,1.06   0.86,1.01   0.90,1.04   0.92,1.10   0.92,1.06   0.86,1.01   0.90,1.04   0.92,1.10   0.94,1.05   0.94,1.05   0.96,1.10   0.94,1.05   0.96,1.10   0.94,1.05   0.96,1.10   0.99,1.12   0.96,1.10   0.99,1.12   0.96,1.10   0.99,1.12   0.96,1.10   0.99,1.12   0.96,1.10   0.99,1.12   0.99,1.12   0.96,1.10   0.99,1.06   0.84,1.05   0.79,1.02   0.87,1.08   0.87,1.13   0.99,1.13   0.99,1.05   0.94,1.13   0.99,1.13   0.99,1.14   0.90,1.06   0.91,1.11   0.90,1.07   0.94,1.14   0.90,1.06   0.91,1.11   0.90,1.07   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.13   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.13   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.13   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.10   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.13   0.94,1.17   0.94,1.17   0.93,1.19		IRR	IRR	IRR	IRR
Male (v female)       0.99,1.11       0.92,1.04       1.01,1.12       0.90,103         Male (v female)       0.99       0.94*       1.01       0.93         0.93,1.05       0.88,1.00       0.96,1.07       0.87,1.00         41-50 years (vs 21-40)       1.00       0.96       1.02       0.95         0.93,1.08       0.88,1.04       0.94,1.10       0.87,1.04         51-60 years (vs 21-40)       0.98       0.94       1.03       0.93         61+ years (vs 21-40)       1.01       1.03       1.03       0.96         0.93,1.10       0.94,1.13       0.95,1.12       0.87,1.06         0.98       0.93       0.97       1.01         0.99       0.93       0.97       1.01         0.92,1.06       0.86,1.01       0.90,1.04       0.92,1.01         0.94,1.05       0.93,1.05       0.94,1.05       0.94,1.05		95% CI	95% CI	95% CI	95% CI
Male (v female)       0.99       0.94*       1.01       0.93,1.05         41-50 years (vs 21-40)       1.00       0.96       1.02       0.95         41-50 years (vs 21-40)       0.98       0.88,1.04       0.94,1.10       0.87,1.04         51-60 years (vs 21-40)       0.98       0.94       1.03       0.93         61+ years (vs 21-40)       1.01       1.03       0.95,1.11       0.85,1.02         61+ years (vs 21-40)       1.01       1.03       1.03       0.96         61+ years (vs 21-40)       0.98       0.93       0.95,1.12       0.87,1.06         Clinical academic credentials (vs academic only)       0.99       0.93       0.97       0.9*         US born (vs not)       0.99       0.93       0.97       1.01         0.92,1.06       0.86,1.01       0.90,1.05       0.86,1.00         0.94,1.07       0.94,1.05       0.93,1.05	High v low country origin	1.05	0.98	1.06*	0.97
0.93,1.05   0.88,1.00   0.96,1.07   0.87,1.00     0.90		0.99,1.11	0.92,1.04	1.01,1.12	0.90,1.03
A1-50 years (vs 21-40)   1.00   0.96   1.02   0.95   0.93,1.08   0.98,1.04   0.94,1.10   0.87,1.04   0.90,1.06   0.90,1.06   0.96,1.03   0.93   0.93   0.90   0.90,1.06   0.96,1.03   0.95,1.11   0.85,1.02   0.93,1.10   0.94,1.13   0.95,1.12   0.87,1.06   0.93,1.10   0.94,1.13   0.95,1.12   0.87,1.06   0.90,1.06   0.85,1.02   0.90,1.05   0.82,1.00   0.90,1.06   0.85,1.02   0.90,1.05   0.82,1.00   0.90,1.06   0.85,1.02   0.90,1.05   0.82,1.00   0.92,1.06   0.86,1.01   0.90,1.04   0.92,1.10   0.94,1.05   0.93,1.05   0.94,1.05   0.96,1.10   0.90,1.04   0.92,1.10   0.94,1.05   0.93,1.05   0.94,1.05   0.96,1.10   0.96,1.08   1.09,1.26   0.94,1.05   0.99,1.12   0.96,1.10   0.96,1.08   1.09,1.26   0.84,1.05   0.99,1.12   0.96,1.10   0.96,1.08   1.09,1.26   0.94,1.05   0.99,1.12   0.94,1.14   0.90,1.06   0.91,1.11   0.90,1.04   0.91,1.11   0.90,1.06   0.91,1.11   0.90,1.06   0.91,1.11   0.90,1.06   0.91,1.11   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0.94,1.17   0	Male (v female)	0.99	0.94*	1.01	0.93
0.93,1.08   0.88,1.04   0.94,1.10   0.87,1.04     0.98   0.94   1.03   0.93     0.90,1.06   0.86,1.03   0.95,1.11   0.85,1.02     0.99,1.10   0.94,1.13   0.95,1.12   0.87,1.06     0.93,1.10   0.94,1.13   0.95,1.12   0.87,1.06     0.93,1.10   0.94,1.13   0.95,1.12   0.87,1.06     0.90,1.06   0.85,1.02   0.90,1.05   0.82,1.00     0.90,1.06   0.85,1.02   0.90,1.05   0.82,1.00     0.92,1.06   0.86,1.01   0.90,1.04   0.92,1.10     0.92,1.06   0.86,1.01   0.90,1.04   0.92,1.10     0.92,1.06   0.86,1.01   0.90,1.04   0.92,1.10     0.94,1.05   0.93,1.05   0.94,1.05   0.96,1.10     0.99,1.12   0.96,1.10   0.96,1.08   1.09,1.26     0.99,1.12   0.96,1.10   0.96,1.08   1.09,1.26     1.09,1.26   0.94   0.9   0.97   0.99     0.84,1.05   0.79,1.02   0.87,1.08   0.87,1.13     South region (vs Northeast)   0.98   1.04   0.98   1.00     0.90,1.07   0.94,1.14   0.90,1.06   0.91,1.11     Midwest region (vs Northeast)   1.03   1.1   1.01   1.06     0.93,1.13   0.99,1.22   0.92,1.10   0.95,1.19     West region (vs Northeast)   1.04   1.05   0.95   0.98     0.94,1.17   0.93,1.19   0.86,1.06   0.86,1.12     60-<120 seconds spent reading (vs <60s)   0.9**   0.92*   1.00   1.1*     1.06   0.85,0.96   0.86,0.99   0.93,1.06   1.02,1.18     120+ seconds spent reading (vs <60s)   0.84***   0.87**   0.91*   1.16*     0.76,0.92   0.80,0.95   0.84,0.99   1.03,1.31,1.3     0.93,1.31   0.90,0.95   0.84,0.99   1.03,1.31     0.85,0.96   0.86,0.95   0.84,0.99   1.03,1.31     0.85,0.96   0.86,0.95   0.84,0.99   1.03,1.31     0.91   0.91   0.91   0.91   0.91     0.91   0.91   0.91   0.91   0.91   0.91     0.91   0.91   0.91   0.91   0.91   0.91     0.91   0.91   0.91   0.91   0.91   0.91     0.92   0.93   0.91   0.91   0.91   0.91   0.91     0.93   0.91   0.91   0.91   0.91   0.91   0.91     0.94   0.95   0.91   0.91   0.91   0.91   0.91   0.91     0.95   0.95   0.98   0.91   0.91   0.91   0.91   0.91   0.91   0.91     0.95   0.95   0.98   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91   0.91		0.93,1.05	0.88,1.00	0.96,1.07	0.87,1.00
51-60 years (vs 21-40)       0.98       0.94       1.03       0.93         61+ years (vs 21-40)       1.01       1.03       1.03       0.96         61+ years (vs 21-40)       1.01       1.03       1.03       0.96         0.93,1.10       0.94,1.13       0.95,1.12       0.87,1.06         0.98       0.93       0.97       0.9*         0.99,1.06       0.85,1.02       0.90,1.05       0.82,1.00         0.99       0.93       0.97       1.01         0.92,1.06       0.86,1.01       0.90,1.04       0.92,1.10         0.99       0.99       0.99       1.00       1.02         1.02       0.94,1.05       0.93,1.05       0.94,1.05       0.96,1.10         0.99,1.12       0.90,1.07       0.94,1.05       0.96,1.08       1.09,1.26         1.04       0.9       0.97       0.99       0.99       0.99       0.99       0.99       0.99       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91       0.90       0.91	41-50 years (vs 21-40)	1.00	0.96	1.02	0.95
Clinical academic credentials (vs academic only       0.90,1.06       0.86,1.03       0.95,1.11       0.85,1.02         Clinical academic credentials (vs academic only)       0.98       0.93       0.97       0.9*         0.90,1.06       0.85,1.02       0.90,1.05       0.82,1.00         0.99,1.06       0.85,1.02       0.90,1.05       0.82,1.00         0.99,1.06       0.85,1.02       0.90,1.05       0.82,1.00         0.99,1.06       0.86,1.01       0.90,1.04       0.92,1.10         Reads research daily (vs < daily)		0.93,1.08	0.88,1.04	0.94,1.10	0.87,1.04
Clinical academic credentials (vs academic only)       1.01       1.03       1.03       0.96         Clinical academic credentials (vs academic only)       0.98       0.93       0.97       0.9*         0.90,1.06       0.85,1.02       0.90,1.05       0.82,1.00         US born (vs not)       0.99       0.93       0.97       1.01         Reads research daily (vs < daily)	51-60 years (vs 21-40)	0.98	0.94	1.03	0.93
Clinical academic credentials (vs academic only)		0.90,1.06	0.86,1.03	0.95,1.11	0.85,1.02
Clinical academic credentials (vs academic only)       0.98       0.93       0.97       0.9*         US born (vs not)       0.99       0.93       0.97       1.01         0.92,1.06       0.86,1.01       0.90,1.04       0.92,1.10         Reads research daily (vs < daily)	61+ years (vs 21-40)	1.01	1.03	1.03	0.96
US born (vs not) 0.90,1.06 0.85,1.02 0.90,1.05 0.82,1.00 0.99 0.93 0.97 1.01 0.92,1.06 0.86,1.01 0.90,1.04 0.92,1.10 0.92,1.06 0.86,1.01 0.90,1.04 0.92,1.10 0.94,1.05 0.93,1.05 0.94,1.05 0.96,1.10 0.94,1.05 0.93,1.05 0.94,1.05 0.96,1.10 0.99,1.12 0.96,1.10 0.96,1.08 1.09,1.26 0.99,1.12 0.96,1.10 0.96,1.08 1.09,1.26 0.99,1.12 0.96,1.10 0.96,1.08 1.09,1.26 0.84,1.05 0.79,1.02 0.87,1.08 0.87,1.13 0.94 0.9 0.97 0.99 0.84,1.05 0.94 0.9 0.97 0.99 0.84,1.05 0.94,1.04 0.98 1.00 0.90,1.07 0.94,1.14 0.90,1.06 0.91,1.11 0.06 0.93,1.13 0.99,1.22 0.92,1.10 0.95,1.19 0.93,1.13 0.99,1.22 0.92,1.10 0.95,1.19 0.93,1.13 0.99,1.22 0.92,1.10 0.95,1.19 0.94,1.17 0.93,1.19 0.86,1.06 0.86,1.12 0.94,1.17 0.93,1.19 0.86,1.06 0.86,1.12 0.95,0.96 0.84,0.99 0.93,1.06 1.02,1.18 120+ seconds spent reading (vs <60s) 0.84*** 0.87** 0.91* 1.16* 1.16* 0.76,0.92 0.80,0.95 0.84,0.99 1.03,1.30		0.93,1.10	0.94,1.13	0.95,1.12	0.87,1.06
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Clinical academic credentials (vs academic only)	0.98	0.93	0.97	0.9*
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		0.90,1.06	0.85,1.02	0.90,1.05	0.82,1.00
Reads research daily (vs < daily)       0.99       0.99       1.00       1.02         0.94,1.05       0.93,1.05       0.94,1.05       0.96,1.10         CEPH program (vs school)       1.06       1.03       1.02       1.17***         0.99,1.12       0.96,1.10       0.96,1.08       1.09,1.26         Ivy league institution (vs others)       0.94       0.9       0.97       0.99         0.84,1.05       0.79,1.02       0.87,1.08       0.87,1.13         South region (vs Northeast)       0.98       1.04       0.98       1.00         Midwest region (vs Northeast)       1.03       1.1       1.01       1.06         0.93,1.13       0.99,1.22       0.92,1.10       0.95,1.19         West region (vs Northeast)       1.04       1.05       0.95       0.98         0.94,1.17       0.93,1.19       0.86,1.06       0.86,1.12         60-<120 seconds spent reading (vs <60s)	US born (vs not)	0.99	0.93	0.97	1.01
CEPH program (vs school) $1.06$ $1.03$ $1.02$ $1.17^{***}$ $0.99,1.12$ $0.96,1.10$ $0.96,1.08$ $0.99,1.12$ $0.96,1.10$ $0.96,1.08$ $0.99,1.26$ Ivy league institution (vs others) $0.94$ $0.9$ $0.97$ $0.99$ $0.84,1.05$ $0.79,1.02$ $0.87,1.08$ $0.87,1.13$ South region (vs Northeast) $0.98$ $1.04$ $0.98$ $1.00$ $0.90,1.07$ $0.94,1.14$ $0.90,1.06$ $0.91,1.11$ Midwest region (vs Northeast) $1.03$ $1.1$ $1.01$ $1.06$ $0.93,1.13$ $0.99,1.22$ $0.92,1.10$ $0.95,1.19$ West region (vs Northeast) $1.04$ $1.05$ $0.95$ $0.98$ $0.94,1.17$ $0.93,1.19$ $0.86,1.06$ $0.86,1.12$ $0.95,0.96$ $0.98,0.99$ $0.93,1.06$ $0.11*$ $0.1$		0.92,1.06	0.86,1.01	0.90,1.04	0.92,1.10
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Reads research daily (vs < daily)	0.99	0.99	1.00	1.02
$\begin{array}{c} 0.99,1.12 \\ \text{Ivy league institution (vs others)} \\ \text{O.94} \\ \text{O.9} \\ \text{O.97} \\ \text{O.99} \\ \text{O.97} \\ \text{O.99} \\ \text{O.99} \\ \text{O.84,1.05} \\ \text{O.79,1.02} \\ \text{O.87,1.08} \\ \text{O.87,1.08} \\ \text{O.87,1.13} \\ \text{O.90,1.07} \\ \text{O.90,1.07} \\ \text{O.94,1.14} \\ \text{O.90,1.06} \\ \text{O.90,1.07} \\ \text{O.91,1.11} \\ \text{Midwest region (vs Northeast)} \\ \text{I.03} \\ \text{I.1} \\ \text{I.01} \\ \text{I.01} \\ \text{I.06} \\ \text{O.93,1.13} \\ \text{O.99,1.22} \\ \text{O.92,1.10} \\ \text{O.95,1.19} \\ \text{West region (vs Northeast)} \\ \text{I.04} \\ \text{I.05} \\ \text{O.94,1.17} \\ \text{O.93,1.19} \\ \text{O.86,1.06} \\ \text{O.86,1.12} \\ \text{O.86,1.06} \\ \text{O.86,1.12} \\ \text{O.85,0.96} \\ \text{O.86,0.99} \\ \text{O.93,1.06} \\ \text{I.02,1.18} \\ \text{1.06} \\ \text{O.76,0.92} \\ \text{O.80,0.95} \\ \text{O.84,0.99} \\ \text{I.03,1.30} \\ \end{array}$		0.94,1.05	0.93,1.05	0.94,1.05	0.96,1.10
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CEPH program (vs school)	1.06	1.03	1.02	1.17***
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		0.99,1.12	0.96,1.10	0.96,1.08	1.09,1.26
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Ivy league institution (vs others)	0.94	0.9	0.97	0.99
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		0.84,1.05	0.79,1.02	0.87,1.08	0.87,1.13
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	South region (vs Northeast)	0.98	1.04	0.98	1.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		0.90,1.07	0.94,1.14	0.90,1.06	0.91,1.11
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Midwest region (vs Northeast)	1.03	1.1	1.01	1.06
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		0.93,1.13	0.99,1.22	0.92,1.10	0.95,1.19
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	West region (vs Northeast)	1.04	1.05	0.95	0.98
0.85,0.96 0.86,0.99 0.93,1.06 1.02,1.18 120+ seconds spent reading (vs <60s) 0.84*** 0.87** 0.91* 1.16* 0.76,0.92 0.80,0.95 0.84,0.99 1.03,1.30		0.94,1.17	0.93,1.19	0.86,1.06	0.86,1.12
120+ seconds spent reading (vs <60s)	60-<120 seconds spent reading (vs <60s)	0.9**	0.92*	1.00	1.1*
0.76,0.92		0.85,0.96	0.86,0.99	0.93,1.06	1.02,1.18
	120+ seconds spent reading (vs <60s)	0.84***	0.87**	0.91*	1.16*
N <sup>b</sup> 895 895 895 895		0.76,0.92	0.80,0.95	0.84,0.99	1.03,1.30
	$N^{\mathrm{b}}$	895	895	895	895

<sup>&</sup>lt;sup>a</sup> Poisson models controlling for all variables in each column.

Abstract 1=RCT/Service; Abstract 2=Cross-sectional/Service; Abstract 3=RCT/Pharmaceutical; Abstract 4=Cross-sectional/Service; Abstract 4=Cross-sec sectional/Pharmaceutical

<sup>&</sup>lt;sup>b</sup> Only survey responses with no missing data included in the multivariate analysis

Figure 1: List of abstracts used in the survey and the fictionalized sources and institutions

	Abstract 1	Abstract 2	Abstract 3	Abstract 4
Original article title  Lay health worker intervention with choice of DOT superior to standard TB care for farm dwellers in South Africa: a cluster randomized control trial.		The use of routine monitoring and evaluation systems to assess a referral model of family planning and HIV service integration in Nigeria.	C-reactive protein lowering with rosuvastatin in the METEOR study.	Profiles of self-reported HIV-risk behaviors among injection drug users in methadone maintenance treatment, detoxification, and needle exchange programs.
Original first author	Clarke M	Chabikuli NO	Peters SA	Mark HD
Original journal	International Journal of Tuberculosis and Lung Disease	AIDS	Journal of Internal Medicine	Public Health Nursing
Original source	Sweden	Nigeria	The Netherlands	USA
Source Cochrane Review	Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases	unity health care for maternal, neonatal and child health, and child health and the nutrition, and family planning services		Oral substitution treatment of injecting opioid users for prevention of HIV infection
Year	2005	2009	2010	2006
Degree of internal validity from Cochrane Review	++++	++++	*****	++++
Fictional Source Survey A	Faculty of Medicine, University of Freiburg, Freiburg, Germany	College of Health Sciences, Addis Ababa University, Addis Ababa, Ethiopia	Faculty of Health Sciences, Mzuzu University, Mzuzu, Malawi	Department of Public Health and Primary Care, Oxford University, Oxford, United Kingdom
	RSH	XSL	RPL	ХРН
Fictional Source Survey B	College of Health Sciences, Addis Ababa University, Addis Ababa, Ethiopia	Faculty of Medicine, University of Freiburg, Freiburg, Germany	Department of Public Health and Primary Care, Oxford University, Oxford, United Kingdom	Faculty of Health Sciences, Mzuzu University, Mzuzu, Malawi
	RSL	XSH	RPH	XPL

<sup>\*</sup>R=Randomized Controlled Trial; X=Cross-sectional design; S=Service delivery; P=Pharmaceutical; H=High Income; L=Low Income

### Appendix 1: CEPH accredited Institutions

Appendix 1: CEPH accredited Institutions	BMJ Open	/bmjopen-2015-008993 on 3
Institution	Department/Division	CEPH School or Program
Johns Hopkins Bloomberg School of Public Health	Health Policy and Management	School O
	International Health	School 💆 🎞 💆
	Health Behaviour and Society	School ses re
	Population Family and Reproductive Health	301001 <u>P</u> @ ¬
	Epidemiology	School atec
	Environmental Health Sciences	301001 = 8.5
	Molecular Microbiology	School of T
	Biostatistics Mental Health	School School School
Harriand Cake of af Dublic Health	Biostatistics	School taper
Harvard School of Public Health	Environmental Health	School nd c
	Epidemiology	School da C
	Genetics	School = BO
	Global Health	School B. M. B.
	Health Policy	School School
	Immunology	School 🛴
	Nutrition	School 🚄 🥞
	Social and Behavioural	School 💁 😽
Columbia Mailman School of Public Health	Biostatistics	School <b>a</b> i. School <b>b</b> i.
	Environmental Health Science	School 🤦 🚦
	Epidemiology	School and School
	Health Policy and Management	
	Population Health and Family Health	School <b>B</b>
D . W	Sociomedical Sciences	School School School School
Boston University - School of Public Health	Biostatistics	School or tec
	Community Health sciences	School ec
	Environmental Health	
	Epidemiology	201001 - 3
	Global Health	School Gie
	Health Law, Bioethics and Human Rights Health Policy and Management	School School
	Dept. Family Medicine	School
	Dept. Paediatrics*	School at A ge School School School School
	Dept. Psychiatry and Human Behaviour	School
		50,100,
Colorado School of Public Health	Biostatistics	School School

	BMJ Open	
	Environmental and Occupational Health	School
	Epidemiology	School School School
	Health Systems Management	School
UNY School of Public Health		School
eisel School of Medicine, Dartmouth	Institute for Health Policy and Clinical Practice	Program
rexel School of public health	Epidemiology and Biostatistics	School
	Health Management and Policy	School
	Environmental and Occupational Health	School
	Community Health and Prevention	School
ast Tennessee State University College of Public Health	Biostatistics	School
	Community and Behavioural Health	School
	Environmental Health	School
	Health sciences	School
	Health Services Management and Policy	School
mory Rollins School of Public Health	Behavioural Science	School
	Biostatistics	School
	Environmental Health	School
	Epidemiology	School
	Health Policy and Management	School
	Global Health	School
orida A and M University Institute of Public Health		Program
orida International University Rob Stempel College of Public Health and	Biostatistics	School
	Dietetics and nutrition	School
	Environmental and occupational health	School
	Epidemiology	School
	Health policy and management	School
	Health promotion and disease prevention	School
	Social work	School
eorge Washington university Milken Institute School of Public Health	Environmental and occupational health	School
	Epidemiology and Biostatistics	School
	Global Health	School
	Exercise and nutrition sciences	School
	Health policy	School
	Health services management and leadership	School
	Prevention and Community Health	School
eorgia Regents University Institute of Public and Preventative Health	Biostatistics and Epidemiology	Program
Georgia Southern University Jiann-Ping Hsu College of Public Health	Biostatistics	School
	Dept. Community Health	School
	Environmental Health	School

	BMJ Open	
	Dept. of Epidemiology	Schoo
	Dept. Health Policy and Management	Schoo
Georgia State University MPH program		Progran
cahn School of Medicine at Mount Sinai Grad program in Public Health		Prograr
ndiana University Richard M Fairbanks School of Public Health	Epidemiology	Schoo
	Behavioural Sciences	Schoo
	Health Policy and Management	Schoo
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## **BMJ Open**

# Does a research article's country of origin affect perception of its quality and relevance? A national trial of US public health researchers.

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Article Type:	Research
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<b>Primary Subject Heading</b> :	Medical publishing and peer review
Secondary Subject Heading:	Evidence based practice, Global health, Public health
Keywords:	Peer Review, Evidence based medicine, Bias, Diffusion of Innovation

SCHOLARONE" Manuscripts

Does a research article's country of origin affect perception of its quality and relevance? A national trial of US public health researchers.

<u>Harris M MBBS DPhil1</u>, Macinko J PhD2, Jimenez G MA3, Mahfoud M MPH4,
Anderson C MSW5

<sup>1</sup>Corresponding author: Senior Policy Fellow in Public Health, Institute of Global Health Innovation, Department of Surgery and Cancer, Division of Surgery, Imperial College London, 10<sup>th</sup> Floor, QEQM Building, St Mary's Hospital, Praed Street, London W2 1NY Email m.harris@imperial.ac.uk

<sup>2</sup>Professor, UCLA Fielding School of Public Health, 650 Charles E. Young Dr. South, Room 31-235B, Center for Health Sciences, Los Angeles, CA 90095-1772, USA <a href="mainto@g.ucla.edu">jmacinko@g.ucla.edu</a>

<sup>3</sup> Research Associate, Health Services and Outcomes Research, Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore geronimo.jimenez@gmail.com

<sup>4</sup>Postgraduate student, Department of Primary Care and Public Health, Imperial College London, Reynolds Building, St Dunstans Road, London W6 8RP, UK <a href="mailto:mahfoud.maen@gmail.com">mahfoud.maen@gmail.com</a>

<sup>5</sup>Research Analyst, MDRC, 16 E 34th St, New York, NY 10016, USA chloe.c.anderson@gmail.com

Total words: 3700



Abstract

Objectives: The source of research may influence one's interpretation of it in either

negative or positive ways however there are no robust experiments to determine

how source impacts on one's judgment of the research article. We determine the

impact of source on respondents' assessment of the quality and relevance of

selected research abstracts.

Design: Web-based survey design using four healthcare research abstracts

previously published and included in Cochrane Reviews.

Setting: All Council on the Education of Public Health-accredited Schools and

Programmes of Public Health in the United States.

Participants: 899 core faculty members (full, associate and assistant professors)

Intervention: Each of the four abstracts appeared with high-income source half of

the time, and low-income source half of the time. Participants each reviewed the

same four abstracts, but were randomly allocated to receive two abstracts with

high-income source, and two abstracts with low-income source allowing for within-

abstract comparison of quality and relevance

Primary outcome measures: Within-abstract comparison of participants rating score on two measures - strength of the evidence, and likelihood of referral to a peer (1 to 10 rating scale). Odds Ratio was calculated using a generalized ordered logit model adjusting for socio-demographic covariates.

Results - Participants that received high-income country source abstracts were equal in all known characteristics to the participants that received the abstracts with low-income country sources. For one of the four abstracts (a randomized, controlled trial of a pharmaceutical intervention) likelihood of referral to a peer was greater if the source was a high-income country (OR 1.28, 1.02 to 1.62, p<0.05).

Conclusions: All things being equal, the respondents were influenced by a highincome country source in their rating of research abstracts in certain cases. More research may be needed to explore how the origin of a research article may lead to stereotype activation and application in research evaluation.

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#### Article summary

Strengths and limitations of this study

- First study at national level in the US to determine the impact of country-of-origin on the rating of healthcare research abstracts.
- All core faculty members (full, associate and assistant professors) of every CEPHaccredited Schools and Programmes of Public Health in the United States were invited to participate in the study.
- Subjects blinded to the purpose of the study and randomised to receive high- or lowincome source abstracts.
- Abstracts were rated on strength of the evidence and likelihood of referral to a peer.
- Although 899 full, associate and assistant professors participated in the study this corresponded to a 9.8% response rate.

#### **Background**

Ideally, research findings ought to be judged on the strength of the evidence and their relevance. However, there is subjectivity involved in interpreting research.<sup>1</sup> Research certainly does not 'speak for itself' - we give it a voice, and how we judge whether one piece of research constitutes evidence or not is complex and messy. Common standards for assessing the internal validity of research do not account for the potential cognitive biases in the consumption and interpretation of research post-publication and each of us may reach a different conclusion as to whether the research presents strong evidence and whether we consider the research useful. In practice, we see many idiosyncracies. A rigorous RCT may convince a surgeon to change a certain practice, but may not have the same effect on a primary care physician.<sup>2</sup> Government regulators consider the reliability of an innovation more positively than industrial scientists.3 Clinicians are more likely to adopt an innovation if they believe it has come from current users with similar professional, cultural and socioeconomic backgrounds.<sup>4</sup> A legitimate source is important for innovation diffusion<sup>5,6</sup> but little is known about how legitimacy is defined or perceived. From the marketing literature, Bilkey and Nes (1982) showed that consumers tend to rate products from their own countries more favorably and that consumer preferences are positively correlated with the degree of economic development of the source country, probably evoked by the lower price cue of lowincome country products. 7 Up to 30% of the variance of consumer product ratings can be attributed to the product's country-of-origin.8

 In healthcare research, typically one of the first pieces of information that is provided in a research article is the author's name, the institution and country of the research. Understanding anchoring to be a feature of heuristic thought, 9-13 it follows that we should examine the extent to which the source affects our interpretation of that research. If one possesses a prior-held belief or attitude towards the source, how does this influence one's subsequent view of the research? All things being equal, would research conducted in Ethiopia be viewed in the same way as identical research conducted in the United States? 14

The income and development level of the source country certainly seems to determine whether a manuscript is selected for publication. 15 The number of publications from low-income countries is significantly lower than the number from developed countries in various research fields. 15,16 In psychiatry, only 6% of literature is published from regions that represent 90% of the global population.<sup>17</sup> underrepresentation cardiology, exists in HIV epidemiology. 18,19 One argument for this is that research from Low-Income Countries lacks the quality to meet publication criteria.<sup>20</sup> Others argue that there are systematic selection biases. Editorial board members of international biomedical journals are more likely to come from High-Income Countries.<sup>21-23</sup> Reviewers from OECD (Organization for Economic Cooperation and Development) countries view articles from their own country more favourably than from other countries.<sup>22,24,25</sup> Studies recruiting participants from the US are more likely to be published.<sup>21,23</sup> In

Peters and Ceci's controversial experiment, only one of the nine articles that were initially published in a highly regarded American journal was accepted upon resubmission to the same journal after fabricating the name of the original institutions.<sup>26</sup> Kleiwer et al demonstrated that articles from outside of North America were less likely to be accepted for publication.<sup>27</sup> It seems that source matters.

The major obstacle to this research question is that there are no controlled studies to ascertain the impact of the source of the research *post*-publication. To fill this research gap, we present here a randomized trial of Public Health research faculty in the United States. This national survey invites respondents, most of who are experienced healthcare researchers and peer reviewers, to rate identical, typical healthcare research abstracts. To ascertain the impact of the source (institution and country) of the abstracts, we ensured that the abstracts that the respondents received were identical in every respect except we fictionalized the sources into either high- or low-income countries and randomized the respondents to receive either type. We then compared their responses to two simple questions for each abstract - whether they think the evidence in the abstract is strong, and whether they would recommend the abstract to a peer. Under the null hypothesis, there should be no difference in the distribution of responses to the two types of abstract.

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#### Methods

Survey design

We used a web-based survey using a Qualtrics survey platform. The survey was divided into two sections, the first to collect demographic and professional data and the second for the respondent to read and respond to four research abstracts. Each abstract was followed by the same two questions - first, how strong is the evidence presented in this abstract? And second, how likely are you to recommend this abstract to a colleague? Responses were on a scale (1 to 10) with 1 as the least (i.e. not at all strong, not at all likely) and 10 as the most (extremely strong, extremely likely). The time taken to read and respond to each abstract was measured by the survey platform. Each question was forced response to avoid the problem of missing data. Recipients were randomly allocated to one of two possible surveys. In the first, abstracts 1 and 4 were fictionalized to high-income country sources (UK and Germany) and Abstracts 2 and 3 were fictionalized to low-income country sources (Malawi and Ethiopia). These sources were reversed in the second survey. Therefore, each survey (Survey A and Survey B) had two abstracts from low-income country sources and two from high-income country sources (Figure 1).

In order to ensure that the abstracts were of a sufficient quality and internal validity, we purposively selected abstracts of papers that had been included in Cochrane Reviews and that were also likely to be of at least some interest to most

public health academics and health service researchers. Each abstract had therefore already been vetted for sources of bias prior to publication, using the Cochrane risk of bias tool, and we only selected abstracts that had a high internal validity for the type of study that it was describing. There is a trade off between choosing abstracts of interest to all potential respondents and the length of the survey. We decided to choose four abstracts - one randomized controlled pharmaceutical trial, one randomized controlled service intervention, one pharmaceutical intervention of cross-sectional design and one service intervention of cross-sectional design - to give a balance in terms of content and design. All four abstracts were of similar length and complexity. The abstracts were presented as found in their PubMed format, with all technical content preserved and in a format familiar to any healthcare researcher, however for each abstract the institution and country of origin was fictionalized to one of four different high- or low-income sources. For one abstract, the trial acronym was removed to avoid the possibility that some respondents would recognize the research. High-income source countries were selected from the top ten countries by GDP per capita (>\$36000 per capita), and OECD membership. Low-income source countries were selected from the bottom ten countries by GDP per capita (<\$1046 per capita). The institutional affiliation was fictionalized to one of the top-five universities that also had a medical or healthcare faculty, in the respective countries. We used the 2014 Times Higher Education World rankings (http://www.timeshighereducation.co.uk/worlduniversity-rankings/2014-15/world-ranking) for the high-income country sources,

and the http://www.4icu.org website for international rankings of institutions for the low-income sources.

We ensured that the source of the abstract was equally visible in each abstract and was mentioned in at least three locations throughout the abstract - the title, under the title and in the abstract itself. To avoid a possible order effect, the order in which the abstracts were presented in the survey was randomized for each participant. Neither the original nor fictionalized journals were included in the source in order to avoid respondents reacting to the reputation of the publication type. Furthermore, in order to not influence the responses, the survey was described as a Speed Reading survey, designed to examine whether the time taken to read an abstract influences the interpretation of the information within it. The survey platform enabled us to measure the time taken to respond to the entire survey, and each abstract, and this information was provided to the respondent at the end of the survey to heighten the 'psychological realism' of the survey. The survey was pilot-tested with Masters in Public Health students at Imperial College London and some faculty members at New York University to ensure face validity of the questions and that the design and flow of the survey was straightforward.

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Participants and survey management

We included all core faculty members of Schools and Programs of Public Health located in a US State that had publically available contact information and that were accredited by Council on the Education of Public Health (CEPH - <a href="http://ceph.org/accredited">http://ceph.org/accredited</a>) (159 institutions) (see Appendix 1 for full listing). We excluded administrators, managers, adjunct faculty members and visiting faculty members, and faculty members from our own institution. From this universe of potential respondents (n=9421 once duplicates were removed), we randomized them to receive either Survey A or Survey B and sent them an invite to take the survey. Block randomization within respective institutions was used, with 4, 6 and 8 sequences, from a web-based randomization service (<a href="www.sealedenvelope.com">www.sealedenvelope.com</a>, seed 137526655595533).

The survey was designed so that only the email recipient could open the link to the survey and that it could be taken only one time. The survey could not be sent anonymously, and was inaccessible to search engines. The survey was active only within the specified time frame (20th January to 4th February 2015, chosen so that faculty members were highly likely to be present at their institution) and two email reminders were sent on day 7 and day 14 following the first email invite (20th January 2015). Panel members did not receive prior invitation to participate in the survey however our email invite indicated clearly that all responses were to be deidentified, and analyzed in aggregate form only and only for the purposes of this research. It also indicated that there was no obligation to participate but by choosing to participate consent to use the response for research is implied. We offered participants entry into a lottery draw for a \$500 Amazon voucher as an incentive to complete the survey. The study protocol, including the non-harmful

deception around the ulterior motive of the study, was reviewed by the New York University Committee on Activities Involving Human Subjects and deemed exempt from full ethical review (#14-10332).

Statistical analysis and power calculation

Data was retrieved via Qualtrics in CSV format and analyzed using Stata/SE 13 (Statacorp, College Station, Texas). We used demographic covariates (age, sex), professional experience covariates (research exposure, peer review experience, educational attainment) and institutional covariates (region, CEPH accreditation type, and Ivy league status) to explain variation in the outcomes of interest. We grouped respondent age into categories based on a presumed mid-year birth and survey completion date of 31st January 2015. Educational attainment was categorized into two groups Academic and Clinical Academic based on the completed qualifications provided in the survey responses. We used a generalized ordered logit model for the multivariable analysis and two-tailed t-tests to compare the differences in mean responses as well as for the descriptive characteristics of the survey samples. We also explored high and low cut points for the outcome variables in bivariate analysis and illustrate the distribution of scores as proportions of respondents at the high (≥8) and low (≤3) ends of the distribution.

Table 1. Respondent characteristics for Survey A and Survey B

	All respondents	Survey A	Survey B
	(n=899)	(n=433)	(n=466)
Males, %	42.05	42.49	41.63
Age, mean	50.26	50.35	50.17
Academic credentials only <sup>a</sup> %	84.58	84.69	84.48
Clinical credentials b %	15.42	15.31	15.52
US born c, %	81.65	82.68	80.69
Reads research daily d, %	60.07	61.20	59.01
CEPH Program of Public Health e, %	35.48	34.64	36.27
Ivy league university f, %	12.46	12.93	12.02
Region Northeast %	28.03	26.79	29.18
South %	42.05	43.42	40.77
Midwest %	18.24	17.32	19.1
West %	11.68	12.47	10.94
<sup>a</sup> e.g. BSc, BA, MSc, MPH, PhD			
<sup>b</sup> e.g. MD, MBBS, MBChB			
<sup>c</sup> versus non-US born			
<sup>d</sup> versus reads research less than daily			
eversus CEPH School of Public Health			
fversus non-lvy league institution			

<sup>&</sup>lt;sup>a</sup> e.g. BSc, BA, MSc, MPH, PhD

<sup>&</sup>lt;sup>b</sup> e.g. MD, MBBS, MBChB

cversus non-US born

dversus reads research less than daily

eversus CEPH School of Public Health

fversus non-Ivy league institution

On average, respondents spent between 72.5-109.9 seconds on each abstract with no significant differences between the groups. Table 2 shows the mean (SD) ratings for strength and referral for the four abstracts by the type of source. Referral to a peer for Abstract 3 (Randomized controlled trial of a pharmaceutical intervention) was significantly more likely if the source was from a high-income country. There were no other significant differences between the abstracts based on the source. The findings were unchanged when using the proportion rating higher than 8 or lower than 3. As might be expected, strength rating for abstracts that described a more robust research design, specifically Randomized Controlled Trials (Abstract 1 and 3) scored higher for strength than Abstracts 2 and 4 that were of a crosssectional design. Also, as might be expected, the disposal of these abstracts also correlated well with respondents' view of the strength of the evidence contained within them. Correlation between the scores given for strength of evidence and subsequent referral was high (Spearman correlation coefficients varied between 0.71 - 0.85).

Table 2: Abstract rating for strength and referral

			Abstract 1			Abstract 2			Abstract 3			Abstract 4	
	Source	High Income	Low Income	All									
	Mean	5.77	5.78	5.77	4.92	4.90	4.91	6.92	6.76	6.84	3.95	4.05	4.00
Strength	(SD)	(2.30)	(2.11)	(2.20)	(1.95)	(2.04)	(1.99)	(2.02)	(2.03)	(2.02)	(2.14)	(2.06)	(2.10)
	≥8 (%)	27.61	24.78	26.15	10.13	12.06	11.06	47.63	43.16	45.47	6.96	4.74	5.81
	≤3 (%)	22.04	18.10	20.00	27.59	30.63	29.05	8.19	9.05	8.60	48.49	45.91	47.15
	Mean	5.14	5.38	5.27	4.50	4.56	4.53	6.05*	5.68	5.87	3.79	3.96	3.88
Referral	(SD)	(2.54)	(2.36)	(2.45)	(2.21)	(2.26)	(2.23)	(2.40)	(2.45)	(2.43)	(2.23)	(2.21)	(2.22)
	≥8 (%)	21.58	23.71	22.68	10.34	11.60	10.95	32.97	27.61	30.39	7.66	7.33	7.49
	≤3 (%)	30.63	24.78	27.60	36.64	37.35	36.98	17.46	21.81	19.55	51.74	46.77	49.16
	Mean time(s)	87.4	87.4	87.4	109.9	103.0	106.2	109.8	97.3	103.8	72.5	79.4	76.0
	(SD)	(68.4)	(118)	(97.3)	(169)	(200)	(186)	(131)	(304)	(237)	(56.4)	(146)	(112)
*p<0.05 Abstract 1=RCT/Service Abstract 2=Cross-sectional/Service Abstract 3=RCT/Pharmaceutical Abstract 4=Cross-sectional/Pharmaceutical								0	2/	•			

<sup>\*</sup>p<0.05

Tables 3 and 4 show the results of the multivariable analysis. Controlling for individual and institutional covariates, high-income source was a significant predictor of referral for Abstract 3 only (OR 1.28, 1.02-1.62). For some abstracts, the time spent reviewing the abstract was negatively associated with the rating given to it for strength of evidence (Abstract 1 OR 0.49, 0.34-0.71; Abstract 3 OR 0.65, 0.46-0.92) or referral to a peer (Abstract 1 OR 0.50, 0.35-0.72; Abstract 2 OR 0.61, 0.44-0.84; Abstract 3 OR 0.66, 0.44-0.84). However, rating for Abstract 4 (both strength of evidence (OR 1.63, 1.06-2.51) and referral to a peer (OR 1.55, 1.01-2.38) improved when more time was spent on it. Individuals affiliated to CEPH Programs of Public Health were significantly more likely to rate the strength of the evidence for this abstract higher (OR 1.38, 1.07-1.78) and to refer it to colleagues (OR 1.67, 1.30-2.15) than individuals affiliated to Schools of Public Health.

Table 3: Predictors of abstract strength ratings <sup>a</sup>

	Abstract 1	Abstract 2	Abstract 3	Abstract 4
	OR	OR	OR	OR
	95% CI	95% CI	95% CI	95% CI
High v low country origin	1.03	1	1.16	0.94
	0.82,1.30	0.80,1.26	0.92,1.46	0.74,1.18
Male (v female)	0.93	0.87	0.97	0.87
	0.73,1.18	0.68,1.10	0.76,1.23	0.68,1.10
41-50 years (vs 21-40)	0.81	0.71*	1.01	0.87
	0.59,1.12	0.52,0.97	0.73,1.39	0.64,1.20
51-60 years (vs 21-40)	0.79	0.74	1.14	0.77
	0.57,1.09	0.54,1.03	0.82,1.58	0.56,1.06
61+ years (vs 21-40)	0.76	0.85	1.12	0.82
	0.54,1.06	0.60,1.19	0.80,1.57	0.58,1.15
Clinical academic credentials (vs academic only)	0.83	0.65**	0.95	0.78
	0.60,1.14	0.47,0.89	0.68,1.32	0.57,1.08
US born (vs not)	1.06	0.83	0.94	0.89
	0.78,1.44	0.62,1.13	0.69,1.28	0.66,1.21
Reads research daily (vs < daily)	1.03	0.94	0.85	1.14
	0.81,1.31	0.74,1.20	0.67,1.08	0.89,1.45
CEPH program (vs school)	1.12	1.06	1.03	1.38*
	0.87,1.45	0.82,1.36	0.80,1.32	1.07,1.78
Ivy league institution (vs others)	0.78	0.67	1.14	1.08
	0.50,1.21	0.43,1.06	0.73,1.78	0.69,1.68
South region (vs Northeast)	0.71	1.08	0.84	1.05
	0.50,1.00	0.77,1.52	0.59,1.18	0.74,1.47
Midwest region (vs Northeast)	0.82	1.17	1.14	1.07
	0.55,1.23	0.78,1.74	0.76,1.71	0.72,1.59
West region (vs Northeast)	0.93	1.11	1.05	0.89
	0.59,1.46	0.72,1.74	0.66,1.67	0.56,1.40
60-<120 seconds spent reading (vs <60s)	0.67**	0.87	0.98	1.33*
	0.51,0.87	0.66,1.15	0.74,1.28	1.04,1.70
120+ seconds spent reading (vs <60s)	0.49***	0.77	0.65*	1.63*
	0.34,0.71	0.56,1.07	0.46,0.92	1.06,2.51
N <sup>b</sup>	895	895	895	895

<sup>&</sup>lt;sup>a</sup> Generalised ordered logit model controlling for all variables in each column.

 $Abstract\ 1=RCT/Service;\ Abstract\ 2=Cross-sectional/Service;\ Abstract\ 3=RCT/Pharmaceutical;\ Abstract\ 4=Cross-sectional/Pharmaceutical$ 

<sup>&</sup>lt;sup>b</sup> Only survey responses with no missing data included in the multivariate analysis

<sup>\*</sup>p<0.05

Table 4: Predictors of abstract referral ratings <sup>a</sup>

	Abstract 1	Abstract 1	Abstract 3	Abstract 4
	OR	OR	OR	OR
	95% CI	95% CI	95% CI	95% CI
High v low country origin	0.85	0.94	1.28*	0.9
	0.67,1.07	0.75,1.19	1.02,1.62	0.71,1.13
Male (v female)	0.95	0.78*	0.98	0.84
	0.75,1.20	0.61,0.99	0.78,1.25	0.66,1.06
41-50 years (vs 21-40)	0.98	0.85	1.06	0.83
	0.72,1.34	0.62,1.16	0.77,1.46	0.61,1.15
51-60 years (vs 21-40)	0.92	0.83	1.15	0.8
	0.67,1.28	0.60,1.15	0.83,1.60	0.58,1.11
61+ years (vs 21-40)	1.07	1.09	1.16	0.84
	0.77,1.50	0.77,1.54	0.83,1.63	0.60,1.18
Clinical academic credentials (vs academic only)	0.92	0.75	0.92	0.79
	0.67,1.26	0.54,1.04	0.66,1.28	0.57,1.08
US born (vs not)	0.91	0.8	0.84	1.01
	0.67,1.23	0.59,1.09	0.61,1.14	0.74,1.38
Reads research daily (vs < daily)	0.95	0.97	0.93	1.1
	0.75,1.21	0.76,1.23	0.74,1.19	0.86,1.39
CEPH program (vs school)	1.26	1.12	1.11	1.67***
	0.98,1.62	0.87,1.43	0.86,1.43	1.30,2.15
Ivy league institution (vs others)	0.8	0.71	0.92	0.96
	0.52,1.24	0.46,1.11	0.59,1.43	0.62,1.49
South region (vs Northeast)	0.91	1.14	0.93	1.01
	0.65,1.29	0.80,1.61	0.66,1.30	0.72,1.43
Midwest region (vs Northeast)	1.09	1.39	1.04	1.23
	0.73,1.63	0.93,2.07	0.70,1.55	0.83,1.84
West region (vs Northeast)	1.16	1.2	0.88	0.97
	0.74,1.82	0.77,1.89	0.56,1.39	0.62,1.52
60-<120 seconds spent reading (vs <60s)	0.65**	0.73*	0.97	1.31*
	0.50,0.84	0.55,0.96	0.74,1.28	1.02,1.67
120+ seconds spent reading (vs <60s)	0.5***	0.61**	0.66*	1.55*
	0.35,0.72	0.44,0.84	0.47,0.93	1.01,2.38
N <sub>p</sub>	895	895	895	895

<sup>&</sup>lt;sup>a</sup> Generalised ordered logit models controlling for all variables in each column.

Abstract 1=RCT/Service; Abstract 2=Cross-sectional/Service; Abstract 3=RCT/Pharmaceutical; Abstract 4=Cross-sectional/Service; Abstract 4=Cross-sec sectional/Pharmaceutical

 $<sup>^{\</sup>mathrm{b}}$  Only survey responses with no missing data included in the multivariate analysis

<sup>\*</sup>p<0.05

#### **Discussion**

Two sinister issues may be occurring if the source of the research affects one's judgement of it. First, poor research may be given undue significance in part because of the perceived legitimacy of its source. The MMR scandal in the UK may have been a painful example of this. In this case, vaccination rates for the MMR immunisation plummeted when a study published by a high profile research group in a prestigious journal claimed a tenuous (and later discredited) connection between the immunisation and rates of autism.<sup>29</sup>

 Secondly, good research from an unexpected source may be discounted early on, resulting in missed opportunities to learn from important innovations. Low-Income Countries (LICs) have developed novel innovations and there are multiple opportunities to learn from LICs, for example around improved surgical procedures,<sup>30</sup> improved long-term outcomes in mental illness<sup>31-35</sup> improved skill mix with scaled use of community health workers.<sup>36-38</sup> However, there are strikingly few examples where these innovations have been adopted in High Income Countries (HICs).<sup>39</sup> Even in Health Links, where HICs and LICs collaborate explicitly and reciprocally, there are surprisingly few examples of attempts to adopt LIC innovations in high-income settings – HIC volunteers learn a lot personally and professionally however this does not translate into changes in their own health care systems and the learning and exchange of expertise is predominantly directed from the HICs towards the LICs.<sup>40-43</sup> The Reverse Innovation 'movement' sets out to

unpack the barriers to adopting LIC innovations in HIC contexts. It is motivated in

part by the rapidly changing global health landscape and has gained interest in the

US and UK because the unsustainable growth in healthcare expenditure means that

there is likely to be a genuine need to learn from LICs.44

We know already from the Diffusion of Innovation literature that healthcare

professionals perform poorly when it comes to adopting innovations or evidence

from 'elsewhere.'<sup>2,45</sup> The not-invented-here culture prevails. However we also know

that innovations are more likely to diffuse if actors perceive the source to be similar

to their own. Health professionals are homophilus.4 We might ask therefore

whether health professionals are even more discriminating when presented with

research from very 'unlikely' sources? Do they discriminate against sources that

they might perceive to be so different from their own, or perceive to be so unlikely

to produce good research, that the evidence is discounted early on?

We were motivated to conduct this study due to a strong expectation that there would be a bias against low-income country abstracts, or at least that source would make a difference to how the respondents viewed the strength of evidence in the abstract and whether they would chose to refer the abstract to a peer. Although we found no difference in three of the four abstracts, a high-income source did make a difference to participants' view of the relevance of one of the abstracts. This result was less dramatic than we expected and it suggests that explicit biases are small and

difficult to detect across a relatively small group of abstracts. Alternatively, it

suggests that an implicit bias, if it exists, does not manifest particularly strongly in explicit terms through research evaluation in this group of respondents.

For the former, this study provides an empirical baseline against which to compare future research into the effect of source on abstract evaluation. For the latter, we

took several steps to ensure that if explicit biases were occurring we would capture

7 them. We randomised the survey abstracts to control for known and unknown

confounders and this was performed well as evidenced by the balanced

characteristics of the two survey groups. We framed the research as a Speed

Reading survey to encourage respondents to spend the minimum time assessing the

abstract and allow anchoring to specific pieces of information in the abstract to

occur and we made no reference to the hypothesis that we were testing to not

influence the responses. We achieved a large sample size to be able to detect small,

but meaningful differences in the distribution of the responses - the completed-

15 survey response rate of nearly 10% is within the range expected for a time-

consuming, internet-based survey with no pre-invitation recruitment.<sup>46</sup> The fact

that the survey was presented as a Speed Reading test may also have reduced

selection bias, in that its stated purpose would not necessarily appeal to one type of

researcher, such as those with more global health experience.

21 In our study, respondents spent on average between 70-100 seconds per abstract.

Rapid responders tended to rate abstracts higher, so it is possible that if less time is

spent on the abstracts then anchoring to particular triggers might be having a

We also note that the wide standard deviations in the outcomes indicate that,

despite the large sample size, there is considerable variation in how readers view

and consume research. The wide standard deviations might have reduced our ability

to detect differences and further work should be conducted to validate

measurement constructs in this context. GRADE<sup>47</sup> and Jadad<sup>48</sup> scores are widely

used but usually to assess entire research articles against judgement of research

quality, risk of bias, inconsistency, indirectness, imprecision and publication bias.<sup>49-</sup>

<sup>55</sup> Our study, designed purposefully to be a rapid appraisal only of the research

abstract, demonstrated extremely wide variation in the assessment of the limited

information provided in the abstracts. This finding may have implications for

systematic reviews, meta-analyses and for reviewers of abstracts submitted for

conferences.

We cannot speculate as to the triggers individuals identify with when reading each

individual abstract under relatively rapid, timed conditions but it is encouraging

that overall there were few differences between the two survey groups. As highly

trained researchers in public health we could expect an explicit bias to be extremely small if present at all. It is possible that in other population groups this survey

would present different findings. Policy-makers, clinicians, journalists, health

service managers are all important actors in innovation diffusion processes, and

may also be involved in peer-review processes for academic publication. Our

strategy to include academic public health professionals in this survey is based on a

best-case assessment of likely bias. Future research ought to modify the approach we have chosen in accordance with the target population, using other abstracts or developing a research design that allows respondents to serve as their own controls. Although we found only one of the four abstracts to elicit a small (yet statistically significant) difference in rating, it is unclear whether this proportion would hold across the population level in practice. It certainly raises the question of whether abstracts and articles submitted for peer-review should be masked to country-oforigin.<sup>56</sup> The 8<sup>th</sup> International conference on peer review in biomedical research sets the stage for a more detailed examination of cognitive biases in healthcare evidence interpretation.<sup>57,</sup>

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### **Author Contributions**

MH conceived and designed the research, collected and cleaned the data, helped to analyze the data, wrote the first draft and revised subsequent drafts for important intellectual content. JM analyzed the data and helped to design the research, and

1	revised the drafts for important intellectual content. MM conducted an initial pilot of
2	the survey, helped to collect data, contributed to the first draft and revised
3	subsequent drafts for important intellectual content. GJ helped to collect data,
4	design the research and revised subsequent drafts for important intellectual
5	content. CA helped to clean the data and analyze it, and revised subsequent drafts
6	for important intellectual content.
7	
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- **Conflict of Interests**
- No, there are no competing interests

- **Data sharing**
- No additional data available.

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## References

- 1. Kaptchuk, T. Effect of interpretive bias on research evidence. BMJ, 326, 1453-
- 2. Ferlie, E. Fitzgerald L, Wood M and Hawkins C. The nonspread of
- innovations: the mediating role of professionals. *Academy of Management*
- Journal, 2005 48, 117-134
- 3. Dearing J, Meyer G and Kazmierczak J. Portraying the New: communication
- between university innovators and potential users. Science Communication
- 1994:16(1) 11-42
- Fitzgerald, L., E. Ferlie, M.Wood, and C. Hawkins. 2002. Interlocking 4.
- Interactions, the Diffusion of Innovations in Health Care. Human Relations
- 55(12):1429-49.
- 5. Bilkey, W. and Nes, E. Country-of-Origin Effects on Product Evaluations.
- Journal of International Business Studies. 1982; Vol. 13, Issue 1, pp. 89-100, 1982
- 6. Peterson, Robert A. and Jolibert A. A Meta-Analysis of Country-of-Origin
- Effects. Journal of International Business Studies. 1995; 26 (4), 883-900
- 7. Greenhalgh T, Robert G, Macfarlane F, Bate P and Kyriakidou O. Diffusion of
- Innovations in Service Organizations: Systematic Review and
- recommendations. *Milbank Quarterly* vol. 82, No. 4, 2004 (pp. 581–629)
- 8. Damschroder L, Aron D, Keith R, Kirsch S, Alexander I and Lowery. Fostering
- implementation of health services research findings into practice: a

- 1 consolidated framework for advancing implementation science.
- *Implementation Science* 2009, 4:50
- 3 9. Tversky A and Kahneman D. The Framing of Decisions and the Psychology of
- 4 Choice. Science 1981 211:453-58
- 5 10. Bargh J, Chen M and Burrows L. Automaticity of Social Behaviour: Direct
- 6 effects of Trait Construct and Stereotype Activation on Action. *Journal of*
- 7 Personality and Social Psychology 1996 vol 71:2 230-44
- 8 11. Lord C and Lepper M. Biased Assimilation and Attitude Polarization: The Effects
- 9 of Prior Theories on Subsequently Considered Evidence. *Journal of Personality*
- 10 and Social Psychology, 37, 2098-2109
- 12. Maccoun RJ. Biases in the interpretation and use of research results. *Annual*
- *Reviews Psychol,* 1998 49, 259--87.
- 13. Tversky, A and Kahneman, D. Judgment under uncertainty: Heuristics and biases.
- *Science*, 185 (1974), 1124-1131.
- 15 14. Harris M. Research papers should omit their authors' affiliations. *British Medical*
- *Journal*. Personal View. 2014;349:g6439
- 17 15. Yousefi-Nooraie R, Shakiba B and Mortaz-Hejri S. 2006. Country development and
- manuscript selection bias: a review of published studies. BMC Med Res Methodol,
- 19 2006: 6**,** 37.
- 20 16. Horton, R. 2000. North and South: bridging the information gap. Lancet, 355,
- 21 2231-6
- 22 17. Patel V and Sumathipala A. PATEL, V. International representation in psychiatric
- literature: survey of six leading journals. *Br J Psychiatry*, 2001:178, 406-9.

- 2 cardiovascular disease in developing countries. *Lancet* 2003:361, 2246-7
- 3 19. Yach D and Kenya P. Assessment of epidemiological and HIV/AIDS publications in
- 4 Africa. *Int J Epidemiol*, 1992:21, 557-60
- 5 20. Singh D. Publication bias- a reason for the decreased research output in
- 6 developing countries *S Afr Psychiatry Rev*, 2006:153-155
- 7 21. Keiser J, Utzinger J, Tanner M and Singer B. Representation of authors and editors
- 8 from countries with different human development indexes in the leading
- 9 literature on tropical medicine: survey of current evidence. *BMJ*, 2004:328, 1229-
- 10 32

- 11 22. Opthofa T, Coronel R and Jansed M. The significance of the peer review process
- against the background of bias: priority ratings of reviewers and editors and the
- prediction of citation, the role of geographical bias. Cardiovascular Research,
- 14 2002:339-346.
- 15 23. Link AM. US and non-US submissions. An analysis of reviewer bias. *JAMA* 1998;
- 16 280: 246-7
- 17 24. Tutarel O. Composition of the editorial boards of leading medical education
- journals. BMC Med Res Methodol, 2004:4, 3
- 19 25. Winnick S, SPeer T, Raptis D, Walker J, Hasun M, Clavien P-A et a. The wealth of
- 20 nations and the dissemination of cardiovascular research. *Int J Cardiology* 169:3;
- 21 190-195

- 1 26. Peters DP and Ceci SJ. Peer-review practices of psychological journals: the fate of
- 2 published articles, submitted again. *The Behavioural and Brain Sciences* 1982;
- 3 5:187-255
- 4 27. Kliewer M, DeLong D, Freed K, Jenkins C, Paulson E and Provenzale J. Peer
- 5 Review at the American Journal of Roentgenology: How Reviewer and Manuscript
- 6 Characteristics Affected Editorial Decisions on 196 Major Papers. *American*
- *Journal of Roentgenology* 2004:183:6, 1545-1550
- 8 28. Kirkwood B and Sterne J. Essentials of Medical Statistics. Blackwell Science,
- 9 Oxford. 2003
- 10 29. Wakefield A, Murch S, Anthony A, Linnell J, Casson D et al. RETRACTED: Ileal-
- 11 lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental
- disorder in children. *Lancet* 1998: 351(9103) p637–641
- 13 30. Abeygunasekera A. Effective surgery can be cheap and innovative. BMJ 2004;
- 14 329:1185
- 15 31. Dogra N and Omigbodun O. Partnerships in mental heatlh are possible without
- multidisciplinary teams. *BMJ* 2004; 329: 1184
- 17 32. McKenzie K, Patel V and Araya R. Learning from low income countries: mental
- health. *BMJ* 2004; 329:1138
- 19 33. Swartz HA and Rollman BL. Managing the global burden of depression: lessons
- from the developing world. *World Psychiatry* 2003; 2:3
- 34. Susser E, Collins P, Schanzer B, Varma V and Gittelman M. Topics for our times:
- can we learn from the care of persons with mental illness in developing
- countries? *American Journal of Public Health* 1996; 86:7

- 1 35. Rosen A. Destigmatizing day-to-day practices: what developed countries can
- learn from developing countries. *World Psychiatry* 2006; 5:1
- 3 36. Haines A, Sanders D, Lehmann U, Rowe A, Lawn J, Jan S, Walker D and Bhutta Z.
- 4 Achieving child survival goals: potential contribution of community health
- 5 workers. *Lancet* 2007; 369: 2121–31
- 6 37. Haider R, Ashworth A, Kabir I, Huttly SR. Effect of community based peer
- 7 counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a
- 8 randomised controlled trial. *Lancet* 2000;356(9242):1643–7.
- 9 38. Kumar V, Mohanty S, Kumar A, Misra RP, Santosham M, Awasthi S, et al. Effect of
- community-based behaviour change management on neonatal mortality in
- 11 Shivgarh, Uttar Pradesh, India: a cluster randomised controlled trial. *Lancet*
- 12 2008;372(9644):1151–62
- 13 39. Syed S, Dadwal V and Martin G. Reverse innovation in global health systems:
- towards global innovation flow. *Globalization and Health* 2013, 9:36 (30 August
- 15 2013)
- 16 40. Wright J, Walley J, Philip A, Petros H and Ford H. Research into practice: 10 years
- of international public health partnership between the UK and Swaziland. *Journal*
- 18 of Public Health 2010;32(2):277-282
- 19 41. Baguley D, Killeen T and Wright J. International health links: an evaluation of
- partnerships between healthcare organizations and developing countries.
- *Tropical Doctor* 2006; 36:149
- 42. Lam CLK. Knowledge can flow from developing to developed countries. *BMJ* 2000;
- 23 321:830

- 43. Berwick D Lessons from developing countries on improving health care *BMJ* 2004;328:1124-9
- 3 44. Crisp N. *Turning the World Upside Down*. RSM books. Jan 2010
- 4 45. Greenhalgh T, Robert G, Macfarlane F, Bate P and Kyriakidou O. Diffusion of
- 5 Innovations in Service Organizations: systematic review and recommendations.
- 6 The Milbank Quarterly. 2004;82(4):581-629
- 7 46. Cook C, Heath F and Thompson R. A meta-analysis of response rates in web- or
- 8 internet-based surveys. *Educational and Psychological Measurement*, Vol. 60 No.
- 9 6, December 2000 821-836
- 10 47. Malmivaara A. Methodological considerations of the GRADE method. *Annals of*
- *Medicine.* 2015; 47:1-5
- 12 48. Jadad AR, Moore RA, Carroll D, et al. Assessing the quality of reports of
- randomized clinical trials: is blinding necessary? *Control Clin Trials* 1996;**17**:1–
- 14 12.
- 49. Balshem H, Helfand M, Schunemann HJ, Oxman AD, Kunz R, Brozek J, et al.
- GRADE guidelines: 3. Rating the quality of evidence. *J Clin Epidemiol*. 2011; 644:
- 17 401–6.
- 18 50. Guyatt GH, Oxman AD, Vist G, Kunz R, Brozek J, Alonso-Coello P, et al. GRADE
- guidelines: 4. Rating the quality of evidence—study limitations (risk of bias). *J*
- *Clin Epidemiol*. 2011; 644: 407–15.
- 21 51. Guyatt GH, Oxman AD, Kunz R, Woodcock J, Brozek J, Helfand M, et al. GRADE
- guidelines: 7. Rating the quality of evidence—inconsistency. *J Clin Epidemiol*.
- 23 2011; 6412: 1294– 302.

- 1 52. Guyatt GH, Oxman AD, Kunz R, Woodcock J, Brozek J, Helfand M, et al. GRADE
- 2 guidelines: 8. Rating the quality of evidence—indirectness. J Clin Epidemiol. 2011;
- 3 6412: 1303–10.
- 4 53. Guyatt GH, Oxman AD, Kunz R, Brozek J, Alonso-Coello P, Rind D, et al . GRADE
- 5 guidelines 6. Rating the quality of evidence—imprecision. *J Clin Epidemiol*. 2011;
- 6 6412: 1283 93.
- 7 54. Guyatt GH, Oxman AD, Montori V, Vist G, Kunz R, Brozek J, et al. GRADE
- 8 guidelines: 5 . Rating the quality of evidence—publication bias. *J Clin Epidemiol*.
- 9 2011; 6412: 1277–82.
- 10 55. Guyatt GH, Oxman AD, Sultan S, Glasziou P, Akl EA, Alonso-Coello P, et al . GRADE
- guidelines: 9. Rating up the quality of evidence. *J Clin Epidemiol*. 2011; 6412:
- 12 1311–16.
- 13 56. Harris M, Weisberger E, Silver D and Macinko J. 'They hear "Africa" and they think that there can't
- be any good services' perceived context in cross-national learning: a qualitative study of the barriers
- to Reverse Innovation. Globalization and Health 2015 (in press)
- 16 57. Rennie D, Flanagin A, Godlee F and Bloom T. Eight international congress on peer
- review in biomedical publication. BMJ 2015;350:h2411 doi: 10.1136/bmj.h2411
- 18 (Published 26 May 2015)

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Figure 1: List of abstracts used in the survey and the fictionalized sources and institutions

	Abstract 1	Abstract 2	Abstract 3	Abstract 4
Original article title	Lay health worker intervention	The use of routine monitoring and	C-reactive protein lowering with	Profiles of self-reported HIV-risk
_	with choice of DOT superior to	evaluation systems to assess a referral	rosuvastatin in the METEOR	behaviors among injection drug
	standard TB care for farm dwellers in South Africa: a cluster randomized control trial.	model of family planning and HIV service integration in Nigeria.	study.	users in methadone maintenance treatment, detoxification, and needle exchange programs.
Original first author	Clarke M	Chabikuli NO	Peters SA	Mark HD
Original journal	International Journal of Tuberculosis and Lung Disease	AIDS	Journal of Internal Medicine	Public Health Nursing
Original source	Sweden	Nigeria	The Netherlands	USA
Source Cochrane Review	Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases	Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services	Statins for the primary prevention of cardiovascular disease	Oral substitution treatment of injecting opioid users for prevention of HIV infection
Year	2005	2009	2010	2006
Degree of internal validity from Cochrane Review	****	****	*****	****
	Faculty of Medicine, University of	College of Health Sciences, Addis	Faculty of Health Sciences, Mzuzu	Department of Public Health and
Fictional Source Survey A	Freiburg, Freiburg, Germany	Ababa University, Addis Ababa, Ethiopia	University, Mzuzu, Malawi	Primary Care, Oxford University, Oxford, United Kingdom
Survey A	RSH	XSL	RPL	XPH
	College of Health Sciences, Addis	Faculty of Medicine, University of	Department of Public Health and	Faculty of Health Sciences,
Fictional Source Survey B	Ababa University, Addis Ababa, Ethiopia	Freiburg, Freiburg, Germany	Primary Care, Oxford University, Oxford, United Kingdom	Mzuzu University, Mzuzu, Malawi

\*R=Randomized Controlled Trial; X=Cross-sectional design; S=Service delivery; P=Pharmaceutical; H=High Income; L=Low Income

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# Appendix 1: CEPH accredited Institutions

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	Epidemiology	School 5
	Global Health	School ©
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	Health Policy and Management	School
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	Dept. Paediatrics*	School
	Dept. Psychiatry and Human Behaviour	School
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	Environmental and Occupational Health	School
	Community Health and Prevention	School
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	Community and Behavioural Health	School
	Environmental Health	School
	Health sciences	School
	Health Services Management and Policy	School
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George Washington university Milken Institute School of Public Health	Environmental and occupational health	School
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	Global Health	School
	Exercise and nutrition sciences	School
	Health policy	School
	Health services management and leadership	School
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eorgia Regents University Institute of Public and Preventative Health	Biostatistics and Epidemiology	Program
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Oregon State University College of Public Health and Human Sciences*		School
Pennsylvania State University MPH Program	Biostatistics and bioinformatics	Program
	Epidemiology	Program
	Health services and behavioural research	Program
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	Healthcare organization and behaviour	School

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	Public health policy and management	School
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	Environmental and global health	School
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	Physical therapy	School
	Rehabilitation science	School

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	Preventative medicine and environmental health	School
niversity of Louisville School of Public Health and Information Sciences	Biostatistics and bioinformatics	School
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Virginia Tech Public Health Program
Wayne State University MPH program
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<sup>\*</sup>No directory available or accessible

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# **BMJ Open**

# Does a research article's country of origin affect perception of its quality and relevance? A national trial of US public health researchers.

Journal:	BMJ Open
Manuscript ID	bmjopen-2015-008993.R2
Article Type:	Research
Date Submitted by the Author:	05-Nov-2015
Complete List of Authors:	Harris, Matthew; Imperial College London, Institute of Global Health Innovation Macinko, James; UCLA Fielding School of Public Health, Departments of Health Policy and Management and Community Health Sciences Jimenez, Geronimo; Nanyang Technological University, Lee Kong Chian School of Medicine Mahfoud, Maen; Imperial College, Dept Primary Care and Public Health Anderson, Chloe; Manpower Demonstration Research Corporation (MDRC)
<b>Primary Subject Heading</b> :	Medical publishing and peer review
Secondary Subject Heading:	Evidence based practice, Global health, Public health
Keywords:	Peer Review, Evidence based medicine, Bias, Diffusion of Innovation

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Does a research article's country of origin affect perception of its quality and relevance? A national trial of US public health researchers.

<u>Harris M MBBS DPhil<sup>1</sup></u>, Macinko J PhD<sup>2</sup>, Jimenez G MA<sup>3</sup>, Mahfoud M MPH<sup>4</sup>, Anderson C MSW<sup>5</sup>

<sup>1</sup>Corresponding author: Senior Policy Fellow in Public Health, Institute of Global Health Innovation, Department of Surgery and Cancer, Division of Surgery, Imperial College London, 10<sup>th</sup> Floor, QEQM Building, St Mary's Hospital, Praed Street, London W2 1NY Email m.harris@imperial.ac.uk

<sup>2</sup>Professor, Departments of Health Policy and Management and Community Health Sciences, UCLA Fielding School of Public Health, 650 Charles E. Young Dr. South, Room 31-235B, Center for Health Sciences, Los Angeles, CA 90095-1772, USA <a href="mainto@g.ucla.edu">jmacinko@g.ucla.edu</a>

<sup>3</sup> Research Associate, Department of Health Services and Outcomes Research, Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore <a href="mailto:geronimo.jimenez@gmail.com">geronimo.jimenez@gmail.com</a>

<sup>4</sup>Postgraduate student, Department of Primary Care and Public Health, Imperial College London, Reynolds Building, St Dunstans Road, London W6 8RP, UK mahfoud.maen@gmail.com

<sup>5</sup>Research Analyst, Manpower Demonstration Research Corporation (MDRC), 16 E 34th St, New York, NY 10016, USA <a href="mailto:chloe.c.anderson@gmail.com">chloe.c.anderson@gmail.com</a>

Total words: 3700

Key MeSH terms: Peer review; Bias; Diffusion of Innovation; Evidence Based

Medicine



### Abstract

Objectives: The source of research may influence one's interpretation of it in either negative or positive ways however there are no robust experiments to determine how source impacts on one's judgment of the research article. We determine the impact of source on respondents' assessment of the quality and relevance of selected research abstracts.

Design: Web-based survey design using four healthcare research abstracts previously published and included in Cochrane Reviews.

Setting: All Council on the Education of Public Health-accredited Schools and Programmes of Public Health in the United States.

Participants: 899 core faculty members (full, associate and assistant professors)

Intervention: Each of the four abstracts appeared with high-income source half of the time, and low-income source half of the time. Participants each reviewed the same four abstracts, but were randomly allocated to receive two abstracts with high-income source, and two abstracts with low-income source allowing for within-abstract comparison of quality and relevance

Primary outcome measures: Within-abstract comparison of participants rating score on two measures – strength of the evidence, and likelihood of referral to a peer (1 to 10 rating scale). Odds Ratio was calculated using a generalized ordered logit model adjusting for socio-demographic covariates.

Results – Participants that received high-income country source abstracts were equal in all known characteristics to the participants that received the abstracts with low-income country sources. For one of the four abstracts (a randomized, controlled trial of a pharmaceutical intervention) likelihood of referral to a peer was greater if the source was a high-income country (OR 1.28, 1.02 to 1.62, p<0.05).

Conclusions: All things being equal, in one out of the four abstracts, the respondents were influenced by a high-income source in their rating of research abstracts. More research may be needed to explore how the origin of a research article may lead to stereotype activation and application in research evaluation. More research may be needed to explore how the origin of a research article may lead to stereotype activation and application in research evaluation.

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Strengths and limitations of this study

- First study at national level in the US to determine the impact of country-of-origin on the rating of healthcare research abstracts.
- All core faculty members (full, associate and assistant professors) of every CEPHaccredited Schools and Programmes of Public Health in the United States were invited to participate in the study.
- Subjects blinded to the purpose of the study and randomised to receive high- or lowincome source abstracts.
- Abstracts were rated on strength of the evidence and likelihood of referral to a peer.
- Although 899 full, associate and assistant professors participated in the study this corresponded to a 9.8% response rate.

### **Background**

Ideally, research findings ought to be judged on the strength of the evidence and their relevance. However, there is subjectivity involved in interpreting research.<sup>1</sup> Research certainly does not 'speak for itself' - we give it a voice, and how we judge whether one piece of research constitutes evidence or not is complex and messy. Common standards for assessing the internal validity of research do not account for the potential cognitive biases in the consumption and interpretation of research post-publication and each of us may reach a different conclusion as to whether the research presents strong evidence and whether we consider the research useful. In practice, we see many idiosyncracies. A rigorous RCT may convince a surgeon to change a certain practice, but may not have the same effect on a primary care physician.<sup>2</sup> Government regulators consider the reliability (the degree to which an innovation is communicated as being consistent in its results) of an innovation more positively than industrial scientists.<sup>3</sup> Clinicians are more likely to adopt an innovation if they believe it has come from current users with similar professional, cultural and socioeconomic backgrounds.<sup>4</sup> A legitimate source is important for innovation diffusion<sup>5,6</sup> but little is known about how legitimacy is defined or perceived. From the marketing literature, Bilkey and Nes (1982) showed that consumers tend to rate products from their own countries more favorably and that consumer preferences are positively correlated with the degree of economic development of the source country, probably evoked by the lower price cue of low-

income country products. <sup>7</sup> Up to 30% of the variance of consumer product ratings can be attributed to the product's country-of-origin. <sup>8</sup>

In healthcare research, typically one of the first pieces of information that is provided in a research article is the author's name, the institution and country of the research. Understanding anchoring to be a feature of heuristic thought, 9-13 it follows that we should examine the extent to which the source affects our interpretation of that research. If one possesses a prior-held belief or attitude towards the source, how does this influence one's subsequent view of the research? All things being equal, would research conducted in Ethiopia be viewed in the same way as identical research conducted in the United States? 14

The income and development level of the source country certainly seems to determine whether a manuscript is selected for publication.<sup>15</sup> The number of publications from low-income countries is significantly lower than the number from developed countries in various research fields. 15,16 In psychiatry, only 6% of literature is published from regions that represent 90% of the global population.<sup>17</sup> Similar underrepresentation cardiology, exists in HIV research and epidemiology. 18,19 One argument for this is that research from Low-Income Countries lacks the quality to meet publication criteria.<sup>20</sup> Others argue that there are systematic selection biases. Editorial board members of international biomedical journals are more likely to come from High-Income Countries.<sup>21-23</sup> Reviewers from OECD (Organization for Economic Cooperation and Development) countries view

articles from their own country more favourably than from other countries.<sup>22,24,25</sup> Studies recruiting participants from the US are more likely to be published. 21,23 In Peters and Ceci's controversial experiment, only one of the nine articles that were initially published in a highly regarded American journal was accepted upon resubmission to the same journal after fabricating the name of the original institutions.<sup>26</sup> Kleiwer et al demonstrated that articles from outside of North America were less likely to be accepted for publication.<sup>27</sup> It seems that source matters.

The major obstacle to this research question is that there are no controlled studies to ascertain the impact of the source of the research *post*-publication. To fill this research gap, we present here a randomized trial of Public Health research faculty in the United States. This national survey invites respondents, most of who are experienced healthcare researchers and peer reviewers, to rate identical, typical healthcare research abstracts. To ascertain the impact of the source (institution and country) of the abstracts, we ensured that the abstracts that the respondents received were identical in every respect except we fictionalized the sources into either high- or low-income countries and randomized the respondents to receive either type. We then compared their responses to two simple questions for each abstract - whether they think the evidence in the abstract is strong, and whether they would recommend the abstract to a peer. Under the null hypothesis, there should be no difference in the distribution of responses to the two types of abstract.

Survey design

We used a web-based survey using a Qualtrics survey platform. The survey was divided into two sections, the first to collect demographic and professional data and the second for the respondent to read and respond to four research abstracts. Each abstract was followed by the same two questions - first, how strong is the evidence presented in this abstract? And second, how likely are you to recommend this abstract to a colleague? Responses were on a scale (1 to 10) with 1 as the least (i.e. not at all strong, not at all likely) and 10 as the most (extremely strong, extremely likely). The time taken to read and respond to each abstract was measured by the survey platform. Each question was forced response to avoid the problem of missing data. Recipients were randomly allocated to one of two possible surveys. In the first, abstracts 1 and 4 were fictionalized to high-income country sources (UK and Germany) and Abstracts 2 and 3 were fictionalized to low-income country sources (Malawi and Ethiopia). These sources were reversed in the second survey. Therefore, each survey (Survey A and Survey B) had two abstracts from low-income country sources and two from high-income country sources (Figure 1).

In order to ensure that the abstracts were of a sufficient quality and internal validity, we purposively selected abstracts of papers that had been included in Cochrane Reviews and that were also likely to be of at least some interest to most

public health academics and health service researchers. Each abstract had therefore already been vetted for sources of bias prior to publication, using the Cochrane risk of bias tool, and we only selected abstracts that had a high internal validity for the type of study that it was describing. There is a trade off between choosing abstracts of interest to all potential respondents and the length of the survey. We decided to choose four abstracts - one randomized controlled pharmaceutical trial, one randomized controlled service intervention, one pharmaceutical intervention of cross-sectional design and one service intervention of cross-sectional design - to give a balance in terms of content and design. All four abstracts were of similar length and complexity. The abstracts were presented as found in their PubMed format, with all technical content preserved and in a format familiar to any healthcare researcher, however for each abstract the institution and country of origin was fictionalized to one of four different high- or low-income sources. For one abstract, the trial acronym was removed to avoid the possibility that some respondents would recognize the research. High-income source countries were selected from the top ten countries by GDP per capita (>\$36000 per capita), and OECD membership. Low-income source countries were selected from the bottom ten countries by GDP per capita (<\$1046 per capita). The institutional affiliation was fictionalized to one of the top-five universities that also had a medical or healthcare faculty, in the respective countries. We used the 2014 Times Higher Education World rankings (http://www.timeshighereducation.co.uk/worlduniversity-rankings/2014-15/world-ranking) for the high-income country sources,

and the <a href="http://www.4icu.org">http://www.4icu.org</a> website for international rankings of institutions for the low-income sources.

We ensured that the source of the abstract was equally visible in each abstract and was mentioned in at least three locations throughout the abstract - the title, under the title and in the abstract itself. To avoid a possible order effect, the order in which the abstracts were presented in the survey was randomized for each participant. Neither the original nor fictionalized journals were included in the source in order to avoid respondents reacting to the reputation of the publication type. Furthermore, in order to not influence the responses, the survey was described as a Speed Reading survey, designed to examine whether the time taken to read an abstract influences the interpretation of the information within it. The survey platform enabled us to measure the time taken to respond to the entire survey, and each abstract, and this information was provided to the respondent at the end of the survey to heighten the 'psychological realism' of the survey. The survey was pilot-tested with Masters in Public Health students at Imperial College London and some faculty members at New York University to ensure face validity of the questions and that the design and flow of the survey was straightforward.

Participants and survey management

We included all core faculty members of Schools and Programs of Public Health located in a US State that had publically available contact information and that were

Council on the Education of Public Health http://ceph.org/accredited) (159 institutions) (see Appendix 1 for full listing). We excluded administrators, managers, adjunct faculty members and visiting faculty members, and faculty members from our own institution. From this universe of potential respondents (n=9421 once duplicates were removed), we randomized them to receive either Survey A or Survey B and sent them an invite to take the survey. Block randomization within respective institutions was used, with 4, 6 and 8 sequences, from a web-based randomization service (www.sealedenvelope.com, seed 137526655595533).

The survey was designed so that only the email recipient could open the link to the survey and that it could be taken only one time. The survey could not be sent anonymously, and was inaccessible to search engines. The survey was active only within the specified time frame (20th January to 4th February 2015, chosen so that faculty members were highly likely to be present at their institution) and two email reminders were sent on day 7 and day 14 following the first email invite (20th January 2015). Panel members did not receive prior invitation to participate in the survey however our email invite indicated clearly that all responses were to be deidentified, and analyzed in aggregate form only and only for the purposes of this research. It also indicated that there was no obligation to participate but by choosing to participate consent to use the response for research is implied. We offered participants entry into a lottery draw for a \$500 Amazon voucher as an incentive to complete the survey. The study protocol, including the non-harmful

deception around the ulterior motive of the study, was reviewed by the New York University Committee on Activities Involving Human Subjects and deemed exempt from full ethical review (#14-10332).

Statistical analysis and power calculation

Data was retrieved via Qualtrics in CSV format and analyzed using Stata/SE 13 (Statacorp, College Station, Texas). We used demographic covariates (age, sex), professional experience covariates (research exposure, peer review experience, educational attainment) and institutional covariates (region, CEPH accreditation type, and Ivy league status) to explain variation in the outcomes of interest. We grouped respondent age into categories based on a presumed mid-year birth and survey completion date of 31st January 2015. Educational attainment was categorized into two groups Academic and Clinical Academic based on the completed qualifications provided in the survey responses. We used a generalized ordered logit model for the multivariable analysis and two-tailed t-tests to compare the differences in mean responses as well as for the descriptive characteristics of the survey samples. We also explored high and low cut points for the outcome variables in bivariate analysis and illustrate the distribution of scores as proportions of respondents at the high ( $\geq 8$ ) and low ( $\leq 3$ ) ends of the distribution, using a univariate logistic regression model containing the binary outcome (i.e. above/below a certain threshold) and a binary indicator of the abstract's country of

origin. The corresponding test is a Wald test of the beta coefficient for the abstract country of origin.

We calculated that sample sizes of 400 respondents for each survey would provide enough power (80%) to detect a statistically significant (95% confidence level) difference of 0.35 in mean scores between the two groups<sup>28</sup>.

### Results

After randomization, 4711 potential respondents received email-invites for Survey A, and 4710 received email-invites for Survey B. 51 and 61 invitations bounced respectively. 567 started Survey A and 594 started Survey B. Of these, 433 completed Survey A and 466 completed Survey B. This corresponds to a response rate of 9.2% for Survey A and 9.9% for Survey B. Institutional characteristics (region and Ivy league representation) of responders and invitees were not significantly different, although there was a small over-representation of responders from CEPH accredited Programs in Public Health. The demographic characteristics of the respondents of both surveys were equal suggesting that randomization performed as was expected (Table 1). 90% of respondents of both survey types serve as peer reviewers for academic journals.

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cversus non-US born

dversus reads research less than daily

eversus CEPH School of Public Health

fversus non-Ivy league institution

On average, respondents spent between 72.5-109.9 seconds on each abstract with no significant differences between the groups. Table 2 shows the mean (SD) ratings for strength and referral for the four abstracts by the type of source. Referral to a peer for Abstract 3 (Randomized controlled trial of a pharmaceutical intervention) was significantly more likely if the source was from a high-income country. There were no other significant differences between the abstracts based on the source. The findings were unchanged when using the proportion rating higher than 8 or lower than 3. As might be expected, strength rating for abstracts that described a more robust research design, specifically Randomized Controlled Trials (Abstract 1 and 3) scored higher for strength than Abstracts 2 and 4 that were of a crosssectional design. Also, as might be expected, the disposal of these abstracts also correlated well with respondents' view of the strength of the evidence contained within them. Correlation between the scores given for strength of evidence and subsequent referral was high (Spearman correlation coefficients varied between 0.71 - 0.85).

Table 2: Abstract rating for strength and referral

			Abstract 1			Abstract 2			Abstract 3			Abstract 4	
	Source	High Income	Low Income	All	High Income	Low Income	All	High Income	Low Income	All	High Income	Low Income	All
	Mean	5.77	5.78	5.77	4.92	4.90	4.91	6.92	6.76	6.84	3.95	4.05	4.00
ţţ,	(SD)	(2.30)	(2.11)	(2.20)	(1.95)	(2.04)	(1.99)	(2.02)	(2.03)	(2.02)	(2.14)	(2.06)	(2.10)
Strength	≥8 (%)	27.61	24.78	26.15	10.13	12.06	11.06	47.63	43.16	45.47	6.96	4.74	5.81
• •	≤3 (%)	22.04	18.10	20.00	27.59	30.63	29.05	8.19	9.05	8.60	48.49	45.91	47.15
	Mean	5.14	5.38	5.27	4.50	4.56	4.53	6.05*	5.68	5.87	3.79	3.96	3.88
عا	(SD)	(2.54)	(2.36)	(2.45)	(2.21)	(2.26)	(2.23)	(2.40)	(2.45)	(2.43)	(2.23)	(2.21)	(2.22)
Referral	≥8 (%)	21.58	23.71	22.68	10.34	11.60	10.95	32.97	27.61	30.39	7.66	7.33	7.49
_	≤3 (%)	30.63	24.78	27.60	36.64	37.35	36.98	17.46	21.81	19.55	51.74	46.77	49.16
	Mean time(s)	87.4	87.4	87.4	109.9	103.0	106.2	109.8	97.3	103.8	72.5	79.4	76.0
	(SD)	(68.4)	(118)	(97.3)	(169)	(200)	(186)	(131)	(304)	(237)	(56.4)	(146)	(112)
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<sup>\*</sup>p<0.05

Tables 3 and 4 show the results of the multivariable analysis. Controlling for individual and institutional covariates, high-income source was a significant predictor of referral for Abstract 3 only (OR 1.28, 1.02-1.62). For some abstracts, the time spent reviewing the abstract was negatively associated with the rating given to it for strength of evidence (Abstract 1 OR 0.49, 0.34-0.71; Abstract 3 OR 0.65, 0.46-0.92) or referral to a peer (Abstract 1 OR 0.50, 0.35-0.72; Abstract 2 OR 0.61, 0.44-0.84; Abstract 3 OR 0.66, 0.44-0.84). However, rating for Abstract 4 (both strength of evidence (OR 1.63, 1.06-2.51) and referral to a peer (OR 1.55, 1.01-2.38) improved when more time was spent on it. Individuals affiliated to CEPH Programs of Public Health were significantly more likely to rate the strength of the evidence for this abstract higher (OR 1.38, 1.07-1.78) and to refer it to colleagues (OR 1.67, 1.30-2.15) than individuals affiliated to Schools of Public Health.

Table 3: Predictors of abstract strength ratings <sup>a</sup>

	Abstract 1	Abstract 2	Abstract 3	Abstract 4
	OR	OR	OR	OR
	95% CI	95% CI	95% CI	95% CI
High v low country origin	1.03	1	1.16	0.94
<u> </u>	0.82,1.30	0.80,1.26	0.92,1.46	0.74,1.18
Male (v female)	0.93	0.87	0.97	0.87
	0.73,1.18	0.68,1.10	0.76,1.23	0.68,1.10
41-50 years (vs 21-40)	0.81	0.71*	1.01	0.87
	0.59,1.12	0.52,0.97	0.73,1.39	0.64,1.20
51-60 years (vs 21-40)	0.79	0.74	1.14	0.77
	0.57,1.09	0.54,1.03	0.82,1.58	0.56,1.06
61+ years (vs 21-40)	0.76	0.85	1.12	0.82
	0.54,1.06	0.60,1.19	0.80,1.57	0.58,1.15
Clinical academic credentials (vs academic only)	0.83	0.65**	0.95	0.78
	0.60,1.14	0.47,0.89	0.68,1.32	0.57,1.08
US born (vs not)	1.06	0.83	0.94	0.89
	0.78,1.44	0.62,1.13	0.69,1.28	0.66,1.21
Reads research daily (vs < daily)	1.03	0.94	0.85	1.14
	0.81,1.31	0.74,1.20	0.67,1.08	0.89,1.45
CEPH program (vs school)	1.12	1.06	1.03	1.38*
	0.87,1.45	0.82,1.36	0.80,1.32	1.07,1.78
Ivy league institution (vs others)	0.78	0.67	1.14	1.08
	0.50,1.21	0.43,1.06	0.73,1.78	0.69,1.68
South region (vs Northeast)	0.71	1.08	0.84	1.05
	0.50,1.00	0.77,1.52	0.59,1.18	0.74,1.47
Midwest region (vs Northeast)	0.82	1.17	1.14	1.07
	0.55,1.23	0.78,1.74	0.76,1.71	0.72,1.59
West region (vs Northeast)	0.93	1.11	1.05	0.89
	0.59,1.46	0.72,1.74	0.66,1.67	0.56,1.40
60-<120 seconds spent reading (vs <60s)	0.67**	0.87	0.98	1.33*
	0.51,0.87	0.66,1.15	0.74,1.28	1.04,1.70
120+ seconds spent reading (vs <60s)	0.49***	0.77	0.65*	1.63*
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120 · 00001100 open reading (10 · 0000)	0.34,0.71	0.56,1.07	0.46,0.92	1.06,2.51

<sup>&</sup>lt;sup>a</sup> Generalised ordered logit model controlling for all variables in each column.

Abstract 1=RCT/Service; Abstract 2=Cross-sectional/Service; Abstract 3=RCT/Pharmaceutical; Abstract 4=Cross-sectional/Pharmaceutical

<sup>&</sup>lt;sup>b</sup> Only survey responses with no missing data included in the multivariate analysis

<sup>\*</sup>p<0.05

Table 4: Predictors of abstract referral ratings <sup>a</sup>

	Abstract 1	Abstract 1	Abstract 3	Abstract 4
	OR	OR	OR	OR
	95% CI	95% CI	95% CI	95% CI
High v low country origin	0.85	0.94	1.28*	0.9
	0.67,1.07	0.75,1.19	1.02,1.62	0.71,1.13
Male (v female)	0.95	0.78*	0.98	0.84
	0.75,1.20	0.61,0.99	0.78,1.25	0.66,1.06
41-50 years (vs 21-40)	0.98	0.85	1.06	0.83
	0.72,1.34	0.62,1.16	0.77,1.46	0.61,1.15
51-60 years (vs 21-40)	0.92	0.83	1.15	0.8
	0.67,1.28	0.60,1.15	0.83,1.60	0.58,1.11
61+ years (vs 21-40)	1.07	1.09	1.16	0.84
	0.77,1.50	0.77,1.54	0.83,1.63	0.60,1.18
Clinical academic credentials (vs academic only)	0.92	0.75	0.92	0.79
	0.67,1.26	0.54,1.04	0.66,1.28	0.57,1.08
US born (vs not)	0.91	0.8	0.84	1.01
•	0.67,1.23	0.59,1.09	0.61,1.14	0.74,1.38
Reads research daily (vs < daily)	0.95	0.97	0.93	1.1
	0.75,1.21	0.76,1.23	0.74,1.19	0.86,1.39
CEPH program (vs school)	1.26	1.12	1.11	1.67***
	0.98,1.62	0.87,1.43	0.86,1.43	1.30,2.15
Ivy league institution (vs others)	0.8	0.71	0.92	0.96
	0.52,1.24	0.46,1.11	0.59,1.43	0.62,1.49
South region (vs Northeast)	0.91	1.14	0.93	1.01
	0.65,1.29	0.80,1.61	0.66,1.30	0.72,1.43
Midwest region (vs Northeast)	1.09	1.39	1.04	1.23
	0.73,1.63	0.93,2.07	0.70,1.55	0.83,1.84
West region (vs Northeast)	1.16	1.2	0.88	0.97
	0.74,1.82	0.77,1.89	0.56,1.39	0.62,1.52
60-<120 seconds spent reading (vs <60s)	0.65**	0.73*	0.97	1.31*
	0.50,0.84	0.55,0.96	0.74,1.28	1.02,1.67
120+ seconds spent reading (vs <60s)	0.5***	0.61**	0.66*	1.55*
	0.35,0.72	0.44,0.84	0.47,0.93	1.01,2.38
Nb	895	895	895	895

<sup>&</sup>lt;sup>a</sup> Generalised ordered logit models controlling for all variables in each column.

Abstract 1=RCT/Service; Abstract 2=Cross-sectional/Service; Abstract 3=RCT/Pharmaceutical; Abstract 4=Cross-sectional/Service; Abstract 4=Cross-sec sectional/Pharmaceutical

 $<sup>^{\</sup>mathrm{b}}$  Only survey responses with no missing data included in the multivariate analysis

<sup>\*</sup>p<0.05

#### **Discussion**

Two sinister issues may be occurring if the source of the research affects one's judgement of it. First, poor research may be given undue significance in part because of the perceived legitimacy of its source. The MMR scandal in the UK may have been a painful example of this. In this case, vaccination rates for the MMR immunisation plummeted when a study published by a high profile research group in a prestigious journal claimed a tenuous (and later discredited) connection between the immunisation and rates of autism.<sup>29</sup>

 Secondly, good research from an unexpected source may be discounted early on, resulting in missed opportunities to learn from important innovations. Low-Income Countries (LICs) have developed novel innovations and there are multiple opportunities to learn from LICs, for example around improved surgical procedures,<sup>30</sup> improved long-term outcomes in mental illness<sup>31-35</sup> improved skill mix with scaled use of community health workers.<sup>36-38</sup> However, there are strikingly few examples where these innovations have been adopted in High Income Countries (HICs).<sup>39</sup> Even in Health Links, where HICs and LICs collaborate explicitly and reciprocally, there are surprisingly few examples of attempts to adopt LIC innovations in high-income settings – HIC volunteers learn a lot personally and professionally however this does not translate into changes in their own health care systems and the learning and exchange of expertise is predominantly directed from the HICs towards the LICs.<sup>40-43</sup> The Reverse Innovation 'movement' sets out to

unpack the barriers to adopting LIC innovations in HIC contexts. It is motivated in

part by the rapidly changing global health landscape and has gained interest in the

US and UK because the unsustainable growth in healthcare expenditure means that

there is likely to be a genuine need to learn from LICs.44

We know already from the Diffusion of Innovation literature that healthcare professionals perform poorly when it comes to adopting innovations or evidence

from 'elsewhere.'<sup>2,45</sup> The not-invented-here culture prevails. However we also know 

that innovations are more likely to diffuse if actors perceive the source to be similar

to their own. Health professionals are homophilus.4 We might ask therefore 

whether health professionals are even more discriminating when presented with

research from very 'unlikely' sources? Do they discriminate against sources that

they might perceive to be so different from their own, or perceive to be so unlikely

to produce good research, that the evidence is discounted early on?

We were motivated to conduct this study due to a strong expectation that there would be a bias against low-income country abstracts, or at least that source would make a difference to how the respondents viewed the strength of evidence in the abstract and whether they would chose to refer the abstract to a peer. Although we found no difference in three of the four abstracts, a high-income source did make a difference to participants' view of the relevance of one of the abstracts. All things

being equal our sample population considered the Randomised Controlled Trial of

We did take several steps to ensure that if explicit biases existed then we would

For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

the pharmaceutical intervention to be significantly more relevant to their peer group if its source was from the UK rather than from Malawi.

capture them. We randomised the survey abstracts to control for known and unknown confounders and this was performed well as evidenced by the balanced characteristics of the two survey groups. We framed the research as a Speed Reading survey to encourage respondents to spend the minimum time assessing the abstract and allow anchoring to specific pieces of information in the abstract to occur and we made no reference to the hypothesis that we were testing to not influence the responses. We achieved a large sample size to be able to detect small, but meaningful differences in the distribution of the responses - the completedsurvey response rate of nearly 10% is within the range expected for a timeconsuming, internet-based survey with no pre-invitation recruitment.<sup>46</sup> The fact that the survey was presented as a Speed Reading test may also have reduced selection bias, in that its stated purpose would not necessarily appeal to one type of researcher, such as those with more global health experience.

However, the result was less dramatic than we expected, occurring in only one of the four abstracts, and it suggests that explicit biases are small and difficult to detect across a relatively small group of abstracts. The study provides an empirical

baseline against which to compare future research into the effect of source on

abstract evaluation. Indeed, it could be argued that the implications of this study

are encouraging for the population that participated because the two groups of survey respondents treated three of the four abstracts almost identically irrespective of the source. Public health faculty in the US seem to be doing what is expected of them. Research is being assessed, by and large, according to its content rather than its origin. For those interested in exploring the barriers to Reverse Innovation, or types of publication bias, this finding may be encouraging.

In our study, we also found that respondents spent on average between 70-100 seconds per abstract. Rapid responders tended to rate abstracts higher, so it is possible that if less time is spent on the abstracts then anchoring to particular triggers might be having a greater effect. We did find that in Abstract 4, if more time is taken to respond to the abstract then opinion of it improves (for both strength of evidence and referral), however this is equal between both high and low income sources. We also found, as would be expected, that respondents tended to rate the randomised controlled trial abstracts higher for strength of evidence compared to the abstracts that were of a cross-sectional design. As the study was framed as a Speed Reading survey participants might have felt the need to speed-read the abstracts and which may not mirror normal practice.

We also note that the wide standard deviations in the outcomes indicate that, despite the large sample size, there is considerable variation in how readers view and consume research. The wide standard deviations might have reduced our ability to detect differences and further work should be conducted to validate

measurement constructs in this context. GRADE<sup>47</sup> and Jadad<sup>48</sup> scores are widely used but usually to assess entire research articles against judgement of research quality, risk of bias, inconsistency, indirectness, imprecision and publication bias.<sup>49-55</sup> Our study, designed purposefully to be a rapid appraisal only of the research abstract, demonstrated extremely wide variation in the assessment of the limited information provided in the abstracts. This finding may have implications for systematic reviews, meta-analyses and for reviewers of abstracts submitted for conferences.

Considering the volume of abstracts read and consumed on a daily basis from all parts of the globe, if source impacts on one's perception, even though by a tiny margin, this might at scale be an observable phenomenon. We cannot speculate as to the triggers individuals identify with when reading each individual abstract under relatively rapid, timed conditions but it is encouraging that overall there were few differences between the two survey groups. As highly trained researchers in public health we could expect an explicit bias to be extremely small if present at all. It is possible that in other population groups this survey would present different findings. Policy-makers, clinicians, journalists, health service managers are all important actors in innovation diffusion processes, and may also be involved in peer-review processes for academic publication. Our strategy to include academic public health professionals in this survey is based on a best-case assessment of likely bias. Future research ought to modify the approach we have chosen in accordance with the target population, using other abstracts or developing a

research design that allows respondents to serve as their own controls. Although we found only one of the four abstracts to elicit a small (yet statistically significant) difference in rating, it is unclear whether this proportion would hold across the population level in practice. It certainly raises the question of whether abstracts and articles submitted for peer-review should be masked to country-of-origin.<sup>56</sup> The 8th International conference on peer review in biomedical research sets the stage for a more detailed examination of cognitive biases in healthcare evidence interpretation.<sup>57,</sup>

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#### **Author Contributions**

MH conceived and designed the research, collected and cleaned the data, helped to analyze the data, wrote the first draft and revised subsequent drafts for important intellectual content. JM analyzed the data and helped to design the research, and revised the drafts for important intellectual content. MM conducted an initial pilot of the survey, helped to collect data, contributed to the first draft and revised

1	subsequent drafts for important intellectual content. GJ helped to collect data,
2	design the research and revised subsequent drafts for important intellectual
3	content. CA helped to clean the data and analyze it, and revised subsequent drafts
4	for important intellectual content.
5	
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7	
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11	Commonwealth Fund.
12	
13	Conflict of Interests
14	
15	None declared. All authors have completed the Unified Competing Interest form at
16	www.icmje.org/coi disclosure.pdf (available on request from the corresponding
17	author)
18	
19	Data sharing:
20	No additional data available.
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6	Refer	rences
7	1.	Kaptchuk, T. Effect of interpretive bias on research evidence. BMJ, 326, 1453-
8		5.
9	2.	Ferlie, E. Fitzgerald L, Wood M and Hawkins C. The nonspread of
10		innovations: the mediating role of professionals. Academy of Management
11		Journal, 2005 48, 117-134
12	3.	Dearing J, Meyer G and Kazmierczak J. Portraying the New: communication
13		between university innovators and potential users. Science Communication
14		1994:16(1) 11-42
15	4.	Fitzgerald, L., E. Ferlie, M.Wood, and C. Hawkins. 2002. Interlocking
16		Interactions, the Diffusion of Innovations in Health Care. Human Relations
17		55(12):1429-49.
18	5.	Bilkey, W. and Nes, E. Country-of-Origin Effects on Product Evaluations.
19		Journal of International Business Studies. 1982; Vol. 13, Issue 1, pp. 89-100, 1982
20	6.	Peterson, Robert A. and Jolibert A. A Meta-Analysis of Country-of-Origin
21		Effects. Journal of International Business Studies. 1995; 26 (4), 883-900

- 1 7. Greenhalgh T, Robert G, Macfarlane F, Bate P and Kyriakidou O. Diffusion of
- 2 Innovations in Service Organizations: Systematic Review and
- 3 recommendations. *Milbank Quarterly* vol. 82, No. 4, 2004 (pp. 581–629)
- 4 8. Damschroder L, Aron D, Keith R, Kirsch S, Alexander J and Lowery. Fostering
- 5 implementation of health services research findings into practice: a
- 6 consolidated framework for advancing implementation science.
- *Implementation Science* 2009, 4:50
- 8 9. Tversky A and Kahneman D. The Framing of Decisions and the Psychology of
- 9 Choice. *Science* 1981 211:453-58
- 10 10. Bargh J, Chen M and Burrows L. Automaticity of Social Behaviour: Direct
- effects of Trait Construct and Stereotype Activation on Action. *Journal of*
- 12 Personality and Social Psychology 1996 vol 71:2 230-44
- 13 11. Lord C and Lepper M. Biased Assimilation and Attitude Polarization: The Effects
- of Prior Theories on Subsequently Considered Evidence. *Journal of Personality*
- *and Social Psychology*, 37, 2098-2109
- 16 12. Maccoun RJ. Biases in the interpretation and use of research results. Annual
- *Reviews Psychol,* 1998 49, 259--87.
- 18 13. Tversky, A and Kahneman, D. Judgment under uncertainty: Heuristics and biases.
- 19 Science, 185 (1974), 1124-1131.
- 20 14. Harris M. Research papers should omit their authors' affiliations. *British Medical*
- *Journal*. Personal View. 2014;349:g6439

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- 2 manuscript selection bias: a review of published studies. BMC Med Res Methodol,
- 3 2006: 6, 37.
- 4 16. Horton, R. 2000. North and South: bridging the information gap. *Lancet*, 355,
- 5 2231-6
- 6 17. Patel V and Sumathipala A. PATEL, V. International representation in psychiatric
- 7 literature: survey of six leading journals. *Br J Psychiatry*, 2001:178, 406-9.
- 8 18. Mendis S, Yach D, Bengoa R, Narvaez D and Zhang X. Research gap in
- 9 cardiovascular disease in developing countries. *Lancet* 2003:361, 2246-7
- 10 19. Yach D and Kenya P. Assessment of epidemiological and HIV/AIDS publications in
- 11 Africa. *Int J Epidemiol*, 1992:21, 557-60
- 12 20. Singh D. Publication bias- a reason for the decreased research output in
- developing countries *S Afr Psychiatry Rev*, 2006:153-155
- 14 21. Keiser J, Utzinger J, Tanner M and Singer B. Representation of authors and editors
- from countries with different human development indexes in the leading
- literature on tropical medicine: survey of current evidence. *BMJ*, 2004:328, 1229-
- 17 32
- 18 22. Opthofa T, Coronel R and Jansed M. The significance of the peer review process
- against the background of bias: priority ratings of reviewers and editors and the
- prediction of citation, the role of geographical bias. *Cardiovascular Research*,
- 21 2002:339-346.
- 22 23. Link AM. US and non-US submissions. An analysis of reviewer bias. *JAMA* 1998;
- 23 280: 246-7

- 1 24. Tutarel O. Composition of the editorial boards of leading medical education
- journals. BMC Med Res Methodol, 2004:4, 3
- 3 25. Winnick S, SPeer T, Raptis D, Walker J, Hasun M, Clavien P-A et a. The wealth of
- 4 nations and the dissemination of cardiovascular research. *Int J Cardiology* 169:3;
- 5 190-195
- 6 26. Peters DP and Ceci SJ. Peer-review practices of psychological journals: the fate of
- 7 published articles, submitted again. *The Behavioural and Brain Sciences* 1982;
- 8 5:187-255
- 9 27. Kliewer M, DeLong D, Freed K, Jenkins C, Paulson E and Provenzale J. Peer
- Review at the American Journal of Roentgenology: How Reviewer and Manuscript
- 11 Characteristics Affected Editorial Decisions on 196 Major Papers. *American*
- *Journal of Roentgenology* 2004:183:6, 1545-1550
- 13 28. Kirkwood B and Sterne J. Essentials of Medical Statistics. Blackwell Science,
- 14 Oxford. 2003
- 15 29. Wakefield A, Murch S, Anthony A, Linnell J, Casson D et al. RETRACTED: Ileal-
- lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental
- disorder in children. *Lancet* 1998: 351(9103) p637–641
- 18 30. Abeygunasekera A. Effective surgery can be cheap and innovative. BMJ 2004;
- 19 329:1185
- 20 31. Dogra N and Omigbodun O. Partnerships in mental heatlh are possible without
- 21 multidisciplinary teams. *BMJ* 2004; 329: 1184
- 22 32. McKenzie K, Patel V and Araya R. Learning from low income countries: mental
- 23 health. BMJ 2004; 329:1138

- 33. Swartz HA and Rollman BL. Managing the global burden of depression: lessons
- from the developing world. World Psychiatry 2003; 2:3
- 34. Susser E, Collins P, Schanzer B, Varma V and Gittelman M. Topics for our times:
- can we learn from the care of persons with mental illness in developing
- countries? American Journal of Public Health 1996; 86:7
- 35. Rosen A. Destigmatizing day-to-day practices: what developed countries can
- learn from developing countries. World Psychiatry 2006; 5:1
- 36. Haines A, Sanders D, Lehmann U, Rowe A, Lawn J, Jan S, Walker D and Bhutta Z.
- Achieving child survival goals: potential contribution of community health
- workers. Lancet 2007; 369: 2121-31
- 37. Haider R, Ashworth A, Kabir I, Huttly SR. Effect of community based peer
- counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a
- randomised controlled trial. *Lancet* 2000;356(9242):1643-7.
- 38. Kumar V, Mohanty S, Kumar A, Misra RP, Santosham M, Awasthi S, et al. Effect of
- community-based behaviour change management on neonatal mortality in
- Shivgarh, Uttar Pradesh, India: a cluster randomised controlled trial. Lancet
- 2008:372(9644):1151-62
- 39. Syed S, Dadwal V and Martin G. Reverse innovation in global health systems:
- towards global innovation flow. Globalization and Health 2013, 9:36 (30 August
- 2013)
- 40. Wright J, Walley J, Philip A, Petros H and Ford H. Research into practice: 10 years
- of international public health partnership between the UK and Swaziland. Journal
- of Public Health 2010;32(2):277-282

- 1 41. Baguley D, Killeen T and Wright J. International health links: an evaluation of
- 2 partnerships between healthcare organizations and developing countries.
- *Tropical Doctor* 2006; 36:149
- 4 42. Lam CLK. Knowledge can flow from developing to developed countries. *BMJ* 2000;
- 5 321:830
- 6 43. Berwick D Lessons from developing countries on improving health care *BMJ*
- 7 2004;328:1124-9
- 8 44. Crisp N. Turning the World Upside Down. RSM books. Jan 2010
- 9 45. Greenhalgh T, Robert G, Macfarlane F, Bate P and Kyriakidou O. Diffusion of
- 10 Innovations in Service Organizations: systematic review and recommendations.
- 11 The Milbank Quarterly. 2004;82(4):581-629
- 12 46. Cook C, Heath F and Thompson R. A meta-analysis of response rates in web- or
- internet-based surveys. *Educational and Psychological Measurement*, Vol. 60 No.
- 14 6, December 2000 821-836
- 47. Malmivaara A. Methodological considerations of the GRADE method. *Annals of*
- *Medicine.* 2015; 47:1-5
- 48. Jadad AR, Moore RA, Carroll D, et al. Assessing the quality of reports of
- randomized clinical trials: is blinding necessary? *Control Clin Trials* 1996;**17**:1–
- 19 12.
- 20 49. Balshem H, Helfand M, Schunemann HJ, Oxman AD, Kunz R, Brozek J, et al.
- GRADE guidelines: 3. Rating the quality of evidence. *J Clin Epidemiol*. 2011; 644:
- 22 401–6.

Page 34 of 47

- 1 50. Guyatt GH, Oxman AD, Vist G, Kunz R, Brozek J, Alonso-Coello P, et al. GRADE
- 2 guidelines: 4. Rating the quality of evidence—study limitations (risk of bias). *J*
- *Clin Epidemiol*. 2011; 644: 407–15.
- 4 51. Guyatt GH, Oxman AD, Kunz R, Woodcock J, Brozek J, Helfand M, et al. GRADE
- 5 guidelines: 7. Rating the quality of evidence—inconsistency. *J Clin Epidemiol*.
- 6 2011; 6412: 1294– 302.
- 7 52. Guyatt GH, Oxman AD, Kunz R, Woodcock J, Brozek J, Helfand M, et al. GRADE
- 8 guidelines: 8. Rating the quality of evidence—indirectness. *J Clin Epidemiol*. 2011;
- 9 6412: 1303– 10.
- 10 53. Guyatt GH, Oxman AD, Kunz R, Brozek J, Alonso-Coello P, Rind D, et al . GRADE
- guidelines 6. Rating the quality of evidence—imprecision. *J Clin Epidemiol*. 2011;
- 12 6412: 1283 93.
- 13 54. Guyatt GH, Oxman AD, Montori V, Vist G, Kunz R, Brozek J, et al. GRADE
- guidelines: 5 . Rating the quality of evidence—publication bias. *J Clin Epidemiol.*
- 15 2011; 6412: 1277–82.
- 16 55. Guyatt GH, Oxman AD, Sultan S, Glasziou P, Akl EA, Alonso-Coello P, et al . GRADE
- guidelines: 9. Rating up the quality of evidence. *J Clin Epidemiol*. 2011; 6412:
- 18 1311–16.
- 19 56. Harris M, Weisberger E, Silver D and Macinko J. 'They hear "Africa" and they think that there can't
- be any good services' perceived context in cross-national learning: a qualitative study of the barriers
- to Reverse Innovation. Globalization and Health 2015 (in press)
- 22 57. Rennie D, Flanagin A, Godlee F and Bloom T. Eight international congress on peer
- 23 review in biomedical publication. BMJ 2015;350:h2411 doi: 10.1136/bmj.h2411
- 24 (Published 26 May 2015)

Figure 1: List of abstracts used in the survey and the fictionalized sources and institutions

	Abstract 1	Abstract 2	Abstract 3	Abstract 4
Original article title	Lay health worker intervention with choice of DOT superior to standard TB care for farm dwellers in South Africa: a cluster randomized control trial.	The use of routine monitoring and evaluation systems to assess a referral model of family planning and HIV service integration in Nigeria.	C-reactive protein lowering with rosuvastatin in the METEOR study.	Profiles of self-reported HIV-risk behaviors among injection drug users in methadone maintenance treatment, detoxification, and needle exchange programs.
Original first author	Clarke M	Chabikuli NO	Peters SA	Mark HD
Original journal	International Journal of Tuberculosis and Lung Disease	AIDS	Journal of Internal Medicine	Public Health Nursing
Original source	Sweden	Nigeria	The Netherlands	USA
Source Cochrane Review	Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases	Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services	Statins for the primary prevention of cardiovascular disease	Oral substitution treatment of injecting opioid users for prevention of HIV infection
Year	2005	2009	2010	2006
Degree of internal validity from Cochrane Review	****	****	****	****
Fictional Source Survey A	Faculty of Medicine, University of Freiburg, Freiburg, Germany	College of Health Sciences, Addis Ababa University, Addis Ababa, Ethiopia	Faculty of Health Sciences, Mzuzu University, Mzuzu, Malawi	Department of Public Health and Primary Care, Oxford University, Oxford, United Kingdom
	RSH	XSL	RPL	XPH
Fictional Source Survey B	College of Health Sciences, Addis Ababa University, Addis Ababa, Ethiopia	Faculty of Medicine, University of Freiburg, Freiburg, Germany	Department of Public Health and Primary Care, Oxford University, Oxford, United Kingdom	Faculty of Health Sciences, Mzuzu University, Mzuzu, Malawi
	RSL	XSH	RPH	XPL

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## Appendix 1: CEPH accredited Institutions

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	Environmental Health	School
	Health sciences	School
	Health Services Management and Policy	School
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	Dietetics and nutrition	School
	Environmental and occupational health	School
	Epidemiology	School
	Health policy and management	School
	Health promotion and disease prevention	School
	Social work	School
George Washington university Milken Institute School of Public Health	Environmental and occupational health	School
	Epidemiology and Biostatistics	School
	Global Health	School
	Exercise and nutrition sciences	School
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Oregon State University College of Public Health and Human Sciences*		School
Pennsylvania State University MPH Program	Biostatistics and bioinformatics	Program
	Epidemiology	Program
	Health services and behavioural research	Program
Rutgers School of Public Health		School
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	Health services and policy analysis	School
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	Maternal and Child Health	School
	Public Health nutrition	School
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	Physical therapy	School
	Rehabilitation science	School

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	Epidemiology and population health	School
	Health management and systems science	School
	Health promotion and behavioural science	School
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University of New England Graduate Programs in Public Health		Program
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University of North Carolina Gillings School of Global Public Health	Biostatistics	School
omversity of North Euroma Chinings School of Global Fublic Ficulti	Environmental sciences and engineering	School
	Epidemiology	School
	Health behaviour	School
	Health policy and management	School <b>g</b>
	Maternal and child health	School School
	Nutrition	School
	Public health leadership	School =
University of North Texas Health Science Centre School of Public Health		School
University of Oklahoma Health Sciences Centre College of Public Health	Biostatistics and epidemiology	School
	Health administration and policy	School
	Health promotion sciences	School
	Occupational and environmental health	School
University of Pennsylvania Master of Public Health Program		Program 4
University of Pennsylvania Master of Public Health Program - Centre for		Program
University of Pittsburgh Graduate School of Public Health	Behavioural and community health sciences	School
	Biostatistics	School
	Environmental and occupational health	School
	Epidemiology	School
	Health policy and management	School
	Human genetics	School

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		School School School
	Infectious diseases and microbiology	School
niversity of South Carolina Arnold School of Public Health	Communication sciences	School
	Environmental health sciences	
	Epidemiology and biostatistics	School
	Exercise science	School
	Health policy and management	School
	Health promotion, education and behaviour	School
niversity of South Florida College of Public Health	Community and family health	School
	Environmental and occupational health	School
	Epidemiology and biostatistics	School
	Global health	School
	Health policy and management	School
Iniversity of Southern California MPH Program	Health education and promotion	Program
	Biostatistics and epidemiology	Program
	Health communication	Program
	Child and family health	Program
	Global health leadership	Program
	Public health policy	Program
	Environmental health	Program 9
niversity of Tennessee Department of Public Health		Program
niversity of Texas Medical Branch at Galveston Graduate Program in Public		Program School School
niversity of Texas School of Public Health	Management policy and community health	School
	Health promotion and behavioural sciences	School
	Biostatistics	
	Epidemiology, human genetics and environmental	School
Iniversity of Virginia MPH Program	Biostatistics	Program
	Health policy, management and regulation	Program
	Comparative effectiveness, quality and outcomes	Program
	Data sciences	Program
	Bioethics	Program Program School School
Iniversity of Washington School of Public Health	Biostatistics	School
	Environmental health and occupational sciences	School
	Epidemiology	School
	Global health	School
	Health services	School
anderbilt University Institute for Medicine and Public Health	Biomedical informatics	Program
	Biostatistics	Program
	Epidemiology	Program
	Public health	Program

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Washington University in St. Louis Brown School Public Health Programs	
West Virginia University School of Public Health	Biostatistics
	Epidemiology
	Health policy management and leadership
	Occupational, environmental health sciences
	Social and behavioural sciences
Yale School of Public Health	Biostatistics
	Chronic disease epidemiology
	Environmental health sciences
	Epidemiology of microbial diseases
	Global health
	Health policy and management
	Social and behavioural sciences
Arcadia University MPH program	
Armstrong State University MPH program in Community Health Education	
Baylor University MPH program	
Benedictine University MPH program*	
Brigham Young University MPH program in Health Promotion	
Brown University MPH program	
California State University Fresno	
California State University Fullerton	
California State University Long Beach	
California State University Northridge	
Case Western Reserve University MPH Program*	
Central New York MPH Program*	
Charles Drew University of Medicine and Science MPH program in Urban	
Claremont Graduate University MPH program	
Consortium of Eastern Ohio MPH Program	
DePaul University MPH program	
Des Moines University MPH program East Carolina University	
East Stroudsburg University MPH program in Community Health Education	
Eastern Kentucky University Public Health Program	
Eastern Virginia Medical School MPH program	
Florida State University MPH program	
George Mason University MPH program	
Idaho State University MPH program	
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Purdue University Indianapolis Public Health Program^

Virginia Commonwealth University MPH Program

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ew Mexico State University MPH program in Community Health Education		Program <b>5</b>
orthern Illinois University MPH program orthwest Ohio Consortium for Public Health		Program Program
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an Francisco State University MPH program in Community Health Education		Program 2
an Jose State University MPH Program in Community Health Education		Program 2
mon Fraser University Public Health Program		Program 5
outhern Connecticut State University Public Health Program		Program <b>3</b> .
outhern Illinois University Carbondale MPH program*		Program
niversity of Alaska, Anchorage MPH program		Program .
Iniversity of Connecticut Graduate Program in Public Health		Program <b>≥</b>
Iniversity of Illinois at Urbana-Champaign MPH program		Program 5
niversity of Maryland at Baltimore, MPH Program		Program =
niversity of Missouri, Columbia MPH program		Program in
niversity of Montana MPH program		Program
niversity of Nevada Las Vega MPH program	Environmental and Occupational health	Program <b>a</b>
	Epidemiology and Biostatistics	Program 🙍
	Healthcare administration and policy	Program <b>3</b> .
	Social and behavioural health	Program 💆
niversity of Nevada, Reno		Program 👼
niversity of New Hampshire MPH program		Program 🔓
niversity of North Carolina, Greensboro MPH program in Community		Program <b>h</b>
niversity of North Carolina at Charlotte Public Health Programs		Program <b>O</b>
niversity of North Florida MPH program		Program 7.
niversity of Rochester MPH program	Epidemiology	Program 🧖
	Health policy and outcomes research	Program
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niversity of San Francisco MPH program		Program
Iniversity of Southern Mississippi MPH program		Program
niversity of Texas at El Paso MPH program		Program

University of Utah Public Health program*
University of West Florida MPH Program
University of Wisconsin La Crosse MPH program in Community Health
University of Wisconsin Madison MPH program
Virginia Tech Public Health Program
Wayne State University MPH program
West Chester University MPH program
Western Kentucky University Public Health Programs
Westminster College Public Health Program*
Wright State University MPH program

<sup>\*</sup>No directory available or accessible

<sup>^</sup>CEPH listing duplicated with Indiana Fairbanks School of Public Health

Open Access Miscellaneous

# Correction

Harris M, Macinko J, Jimenez G, et al. Does a research article's country of origin affect perception of its quality and relevance? A national trial of US public health researchers. BMJ Open 2015;5:e008993. The institutional affiliation of the last author of this paper is incorrect. Chloe Anderson's correct affiliation is: MDRC, New York, NY, USA; work supported and completed while at The Commonwealth Fund, New York, NY, USA.

BMJ Open 2016;6:e008993corr1. doi:10.1136/bmjopen-2015-008993corr1

