TBM OXFORD

The call for science communication and public scholarship

Monica L. Wang,^{1,2,3,} Olivia J. Britton,^{2,4} Jennifer Beard,^{2,5}

¹Department of Community Health Sciences, Boston University School of Public Health, Boston, MA, USA ²Office of Narrative, Boston University Center for Antiracist Research, Boston, MA, USA ³Department of Health Policy and Management, Harvard T.H. Chan School of Public Health, Boston, MA, USA ⁴Department of Political Science, Boston University School of Graduate Arts and Sciences, Boston, MA, USA ⁵Department of Global Health, Boston University School of Public Health, Boston, MA, USA

Correspondence to: Monica L. Wang, mlwang@bu.edu

Lay summary

This commentary calls for a collective shift in the sciences and academia to prioritize and invest in communicating research in ways that are engaging, relevant, and accessible to public audiences. We provide the context and rationale for increasing and enhancing science communication, and identify barriers that prevent health researchers, educators, and practitioners from engaging with the public. Academic institutions need to develop and implement policies that encourage and support science communication and public scholarship initiatives that are sustainable and scalable.

Keywords Science communication, Public scholarship

Implications

Practice: Engaging in science communication and public scholarship is necessary to address misinformation and to maximize the impact of research findings and recommendations to promote the health of communities and the public.

Policy: Academic publishers and institutions can implement organizational policies, practices, and programming that minimize barriers and provide support for scholars to engage in science communication and to enhance the accessibility of research insights for the public.

Research: Future research should include strategies for disseminating findings and insights through formats that are accessible and engaging to the public.

Investing in science communication and public scholarship is urgently needed to combat misinformation and promote health and well-being. The COVID-19 pandemic has triggered one of the most difficult and pressing periods for science communication in recent history. Individuals with large platforms and without scientific, health, or medical expertise continue to spread health misinformation and influence civil and political discourse. The seeds of confusion are often sown at the highest levels, with former President Trump serving as one of the largest drivers of misinformation around COVID-19 [1]. The rapid and far-reaching spread of misinformation and infodemics, exacerbated by declining public trust in science and government [2], has led to preventable disease and death. The 319,000 COVID-19 deaths in the USA that occurred between January 2021 and April 2022 could have been averted if individuals had been fully vaccinated [3]. Misinformation and disinformation about COVID-19 vaccines alone cost the U.S. economy an estimated \$50-\$300 million per day [4].

The spread of health myths and misconceptions is not new [5]. Currently, we are experiencing a new age of misinfor-

mation fomented by the rise of social media, advancements in technology and communications, and declining trust in government and scientific institutions. Social media use in the USA has increased exponentially from 5% in 2005 to 72% in 2021 [6], and over 80% of Americans report receiving news from digital devices [7]. On the one hand, social media and digital technology provide ready tools that can be harnessed to disseminate evidence-based health information and promote healthy behavior change among a wider audience. Specifically, social media platforms can support public health efforts by increasing access to up-to-date health information, providing networks and opportunities for social support, enhancing audience reach, reducing cost, scheduling, and transportation barriers associated with in-person health programs, and facilitating the development and dissemination of content and messages tailored to specific groups [8, 9]. Health care, public health, and medical institutions have used social media to launch health campaigns and interventions, circulate medical education, employ disease outbreak surveillance, and promote equitable health communication [10].

[©] The Author(s) 2022. Published by Oxford University Press on behalf of the Society of Behavioral Medicine.

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial License (https://creativecommons.org/ licenses/by-nc/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

On the other hand, social media also provides tools to facilitate the creation of information silos that reinforce pre-existing beliefs and actions, and reduce "exposure to content that contradicts the views of individuals' carefully curated networks" [11]. A study examining the spread of true and false news via Twitter found that falsehoods spread "further, faster, deeper, and more broadly than the truth" across all categories of information, with falsehoods 70% more likely to be re-tweeted than the truth and true information taking about six times as long as a falsehood to reach 1.500 people [12]. Findings indicated that disparities in the rate and reach of false vs. true information spread may be partially explained by novelty: people are more inclined to share novel information, even when false. This is deeply concerning when the misinformation being shared leads to preventable illness and death.

While vaccines are currently the leading topic of health misinformation circulating on social media, misinformation on other health behaviors and diseases such as smoking or substance use, chronic diseases, eating disorders, and medical treatments are also prevalent across platforms [13]. With the ubiquity of social media and lack of regulation of health information disseminated by unreliable sources, the need for health care and the academy to efficiently and effectively communicate medical, public health, and behavioral health research to public audiences is critical.

Yet traditional promotion and tenure policies at many academic institutions create numerous barriers that prevent faculty researchers, clinicians, and educators from engaging the public. Within research universities, the current model trains and rewards productivity in traditional scholarship, such as peer-reviewed academic articles and books published by academic presses. However, the overwhelming majority of academic journal readers are other academics, with one study reporting that only 7.2% of people who read articles about clinical medicine were non-academics [14].

More public forms of science communication, such as op-eds, commentaries, radio or TV interviews, and social media engagement, are often undervalued—or not even counted at all—in the criteria for promotion [15]. Additionally, academics typically do not receive training, support, or resources to develop communication skills with the public and the media. This perpetuates a troublesome, and as we have seen during the COVID pandemic, deadly dichotomy. While the potential for academics to contribute to civil society, public health, and social justice movements is high [16], the overall reach of academic expertise and insights beyond their respective disciplines is remarkably low [17].

Cost is another a key barrier to accessing peer-reviewed articles. A growing open-access ethos has led to a number of accessible, high-quality publications, including online journals published by PLOS and BioMed Central. Nevertheless, roughly 75% of journal articles remain locked behind costly subscription firewalls [18]. Readers not affiliated with a university or other large institutional libraries can only access the latest research findings by paying approximately \$30 per article. In the case of medicine and public health, research hidden behind expensive subscription paywalls prevents groundbreaking evidence from reaching policymakers and leaders that make routine, critical decisions that influence the public's well-being [19].

The training that academics receive to write for peers in increasingly narrow areas of expertise also makes academic articles exceedingly challenging for lay audiences to understand [20]. Academic articles often use technical jargon specific to their field and assume an understanding of complex methods and concepts. Additionally, the strict format prescribed by most scientific and medical journals leaves little room for storytelling or narratives to help readers understand how and why a particular study's findings are relevant to people outside the field of study. While narratives serve as a powerful form of communication that can drive change in behavior, policy, and societal norms [21], this communication strategy is largely unaccepted in scientific writing.

The call for academics to translate and disseminate their research and expertise in ways that reach the public and policymakers is neither new nor specific to science. Ernest L. Boyer urged academic institutions in 1990 to develop "a more inclusive view of what it means to be a scholar" [22]. He mapped out four scholarship categories with equally important functions: discovery, integration, application, and teaching. Together, these four core activities become much more than the sum of each part by reclaiming public engagement as a central function of the academy [23]. More than thirty years later, academia and the sciences in particular continue to prize discovery and, to some extent, integration (in the form of translational science) over teaching, application, and engagement. In the midst of multiple global crises such as climate change, pandemics, and racial injustice, public scholarship that brings discovery and data-driven solutions to the people is urgently needed.

We recommend a collective shift in the culture of academia as well as the systems and resources put in place to support scholars and researchers across all disciplines in public engagement. To some extent, the sciences, academic medicine, and public health are lagging behind the arts and humanities. In 2008, the Imagining America Tenure Team Initiative on Public Scholarship, led by the then presidents of Syracuse University and the California Institute of the Arts, mapped a continuum of scholarship that "gives public engagement full and equal standing" [17]. The narrative medicine movement also offers a model for science and public health communication in its emphasis on storytelling as a bridge between physician and patient, science and emotion, knowledge, and action [24–26].

Public scholarship strategies include training in narrative, op-ed, and book proposal writing, podcasts, news or radio interviews, and social media engagement. In addition to increasing open-access options and providing discounted or free memberships for community organizations or members, academic journals can encourage contributions or research and practice briefs designed for wider audiences. Scholars can also collaborate with the communications office within their institutions and build relationships with local and regional journalists who report on one's field of research.

Such strategies can pave the way for scholars and researchers to be better equipped to communicate the implications of their work to a wider audience, help bridge the chasm between research and practice, and move towards transparency and open science [27]. Doing so will require a cultural shift at multiple levels, from department chairs to presidents, from peer reviewers to editors, to value, cultivate, and reward public scholarship. Without this institutional shift in priorities and corresponding support, academics will continue to carry the individual burden of public engagement and be steered towards maximizing impact factor over impact to society.

Many academic institutions and organizations are leading the way in equipping experts with the tools and support for effective science communication and public scholarship. Organizations such as the American Association for the Advancement of Sciences [28], the Alan Alda Center for Communicating Science at Stonybrook University [29], and The Op-Ed Project [30] offer dedicated programming to faculty, scientists, and researchers across the USA and globally that support public engagement and accessible scholarship. Other examples of institutional support for public scholarship include workshops, seminars, toolkits, awards, and resources offered through the Society of Behavioral Medicine [31], the Center for Community and Civic Engagement Public Scholarship Program at Carlton College [32], the Boston University Center for Antiracist Research Public Scholarship Shop [33], and the Boston University Medical Campus Narrative Writing Program [34]. Still, we have much more to learn and do. The age of misinformation requires us to change how, when, and with whom we communicate. Our very society depends on it.

Compliance with Ethical Standards

Conflicts of Interest: The authors declare that they have no conflicts of interest.

Authors' Contributions: Dr. Wang, Ms. Britton, and Dr. Beard contributed to drafting and revising this manuscript. All authors approved of the final version.

Ethical Approval: This article does not contain any studies with human participants performed by any of the authors. This article does not contain any studies with animals performed by any of the authors.

Informed Consent: This study does not involve human participants and informed consent was therefore not required.

Transparency Statements: N/A.

REFERENCES

- Evanega S, Mark L, Adams J, Smolenyak K. Coronavirus misinformation: quantifying sources and themes in the COVID-19 "infodemic" (Preprint). 2020. 10.2196/preprints.25143. Accessibility verified September 1, 2022.
- Pew Research Center. Americans' Trust in Scientists, Other Groups Declines. Published February 15, 2022. https://www.pewresearch. org/science/wp-content/uploads/sites/16/2022/02/PS_2022.02.15_ trust-declines_REPORT.pdf. Accessibility verified July 22, 2022.
- Brown University School of Public Health. Vaccine Preventable Deaths Analysis. https://globalepidemics.org/vaccinations/. Accessibility verified September 1, 2022.
- 4. Bruns R, Hosangadi D, Trotochaurd M, Kirk Sell T. COVID-19 vaccine misinformation and disinformation costs an estimated \$50 to \$300 million per day. Report Brief. Johns Hopkins Center for Health Security. October 20, 2021. https://www. centerforhealthsecurity.org/our-work/publications/covid-19-vaccine-misinformation-and-disinformation-costs-an-estimated-50-to-300-million-each-da. Accessibility verified September 1, 2022.
- Office of the Surgeon General (OSG). Confronting Health Misinformation: The U.S. Surgeon General's Advisory on Building a Healthy Information Environment [Internet]. Washington (DC): US Department of Health and Human Services; 2021. Background.
- Pew Research Center. Social Media Fact Sheet. Published April 7, 2021. https://www.pewresearch.org/internet/fact-sheet/social-media/. Accessibility verified October 25, 2022.
- Shearer E. More than eight-in-ten Americans get news from digital devices. Pew Research Center. Published January 12, 2021.

https://www.pewresearch.org/fact-tank/2021/01/12/more-thaneight-in-ten-americans-get-news-from-digital-devices/. Accessibility verified October 25, 2022.

- Moorhead S, Hazlett D, Harrison L, Carroll J, Irwin A, Hoving C. A new dimension of health care: systematic review of the uses, benefits, and limitations of social media for health communication. *J Med Internet Res.* 2013; 15(4):e85.
- Chou WY, Prestin A, Lyons C, Wen KY. Web 2.0 for health promotion: reviewing the current evidence. *Am J Public Health*. 2013; 103(1):e9–18.
- 10. Chen J, Wang Y. Social media use for health purposes: systematic review. J Med Internet Res. 2021; 23(5):e17917.
- Wang ML. Health Misinformation is Making us Sick. The Boston Globe. September 1, 2022. https://www.bostonglobe. com/2022/09/01/opinion/health-misinformation-is-making-us-sick/. Accessibility verified October 25, 2022.
- 12. Vosoughi S, Roy D, Aral S. The spread of true and false news online. *Science*. 2018; 359(6380):1146–1151.
- Suarez-Lledo V, Alvarez-Galvez J. Prevalence of health misinformation on social media: systematic review. J Med Internet Res. 2021; 23(1):e17187.
- Mohammadi E, Thelwall M, Haustein S, et. al. Who reads research articles? An altmetrics analysis of Mendeley user categories. J Assoc Inf Sci Technol. 2015; 66(9):1832–1846. doi:10.1002/asi.23286.
- Schimanski LA, Alperin Juan Pablo., Alperin JP. The evaluation of scholarship in academic promotion and tenure processes: past, present, and future. *F1000Res*. 2018;7:1605.
- 16. Ellison J, Eatman TK. Scholarship in Public: Knowledge Creation and Tenure Policy in the Engaged University A Resource on Promotion and Tenure in the Arts, Humanities, and Design. 2008. https:// imaginingamerica.org/wp-content/uploads/TTI_FINAL.pdf. Accessibility verified October 25, 2022.
- 17. Moher D, Naudet F, Cristea IA, Miedema F, et al. Assessing scientists for hiring, promotion, and tenure. *PLoS Biol.* 2018; 16(3):e2004089. doi:10.1371/journal.pbio.2004089.
- Tennant JP, Waldner F, Jacques DC, et al. The academic, economic and societal impacts of Open Access: an evidence-based review. *F1000Res.* 2016(5):632. doi:10.12688/f1000research.8460.3.
- Day S, Rennie S, Luo D, et al. Open to the public: paywalls and the public rationale for open access medical research publishing. *Res Involv Engagem.* 2020; 6(8). doi:10.1186/s40900-020-0182-y.
- 20. Limerick, P. Dancing with professors: the trouble with Academic Prose: Patricia Nelson Limerick. In: Zamel V, Spack R, eds. Negotiating Academic Literacies: Teaching and Learning Across Languages and Cultures. New York, New York; 1998:199–206.
- Goldstein C, Murray E, Schnoedes A, Beard J, Wang ML. Science communication in an age of miscommunication. *Ann Behav Med.* 2020; 54(12):985–990.
- Boyer EL. Scholarship Reconsidered: Priorities of the Professoriate. New York, NY: The Carnegie Foundation for the Advancement of Teaching; 1990.
- Boyer EL. The scholarship of engagement. J Public Serv Outreach. 1996; 1(1):11–20.
- Charon R. Narrative medicine a model for empathy, reflection, profession, and trust. J Am Med Assoc. 2001; 286(15):1897–1902.
- Charon R. What to do with stories: the sciences of narrative medicine. Can Fam Physician. 2007; 53:1265–1267.
- Remein CD, Childs E, Pasco JC, et al. Content and outcomes of narrative medicine programmes: a systematic review of the literature through 2019. *BMJ Open.* 2020; 10:e031568.
- McVay MA, Conroy DE. Transparency and openness in behavioral medicine research. *Transl Behav Med.* 2021; 11(1): 287–290. doi:10.1093/tbm/ibz154
- American Association for the Advancement of Sciences. https:// www.aaas.org. Accessibility verified October 25, 2022.
- The Alan Alda Center for Communicating Science. Stony Brook University. https://aldacenter.org. Accessibility verified October 25, 2022.
- 30. The Op Ed Project. https://www.theopedproject.org. Accessibility verified October 25, 2022.

- The Society of Behavioral Medicine. Science Communication Toolkit. https://www.sbm.org/scicomm. Accessibility verified October 25, 2022.
- 32. Center for Community and Civic Engagement, Carleton College. Public Scholarship Program. https://www.carleton.edu/ccce/faculty/engaged-research-scholarship/. Accessibility verified October 25, 2022.
- Boston University Center for Antiracist Research: Narrative Office. https://www.bu.edu/antiracism-center/narrative/. Accessibility verified October 25, 2022.
- 34. Boston University Medical Campus: Faculty Development and Diversity. Narrative Writing Program. https://www.bumc.bu.edu/ facdev-medicine/all-bumc/narrative-writing-program/. Accessibility verified October 25, 2022.