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# Diversity, Equity, and Inclusion in the Environmental Health Workforce: Mapping the Literature and Moving Toward Liberation

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## ABSTRACT

**INTRODUCTION:** Diversity, equity, and inclusion, also known as DEI, is an essential topic being discussed across society. The field of environmental health (EH) should certainly not be excluded from the conversation.

**OBJECTIVE:** The purpose of this mini-review was to map the literature and identify gaps on the topic of DEI in the EH workforce.

**METHODS:** A rapid scoping review was conducted using standard synthesis science methods to search and map the published literature. All study titles, abstracts, and full texts were screened by 2 independent reviewers among the authorship team.

**RESULTS:** The search strategy yielded 179 English language papers. Of those, 37 met all inclusion criteria after full text screening. Overall, the majority of the articles had weak or moderate DEI engagement and only 3 articles had strong DEI engagement.

**DISCUSSION:** There is a significant need for additional research in this realm. Future studies should explicitly focus on workforce issues, and attempt to achieve the highest level of the evidence possible for this field.

**CONCLUSION:** Although DEI initiatives are a step in the right direction, the current evidence suggests that inclusivity and liberation may prove to be more impactful and meaningful constructs to fully advance equity in the EH workforce.

**KEYWORDS:** Environmental health, diversity, equity, inclusion, equality, liberation, workforce

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## Introduction

Society continues to confront issues of diversity (ie, the state of being different; variety), equity (ie, the quality of being fair and impartial), and inclusion (ie, the action or state of including or of being part of a group or structure), or DEI.<sup>1</sup> For example, the voices of certain social groups remain absent from the decision-making table due to racism, sexism, ableism, heterosexism, cis-normativity, classism, and other systems of oppression.<sup>2</sup> The scarcity of research funding, the dearth of scholarly literature, and the absence of community voices on important DEI issues are additional examples.<sup>2</sup> The ongoing lack of diversity in the health workforce may be both a contributing factor and a consequence of a lack of attention to recruitment, retention, and training of a diverse workforce. The environmental health (EH) field is certainly not exempt from these enduring DEI problems.<sup>3</sup> It is widely recognized that DEI initiatives are important in the workplace because it is value-added to have a workforce that is diverse, equitable,

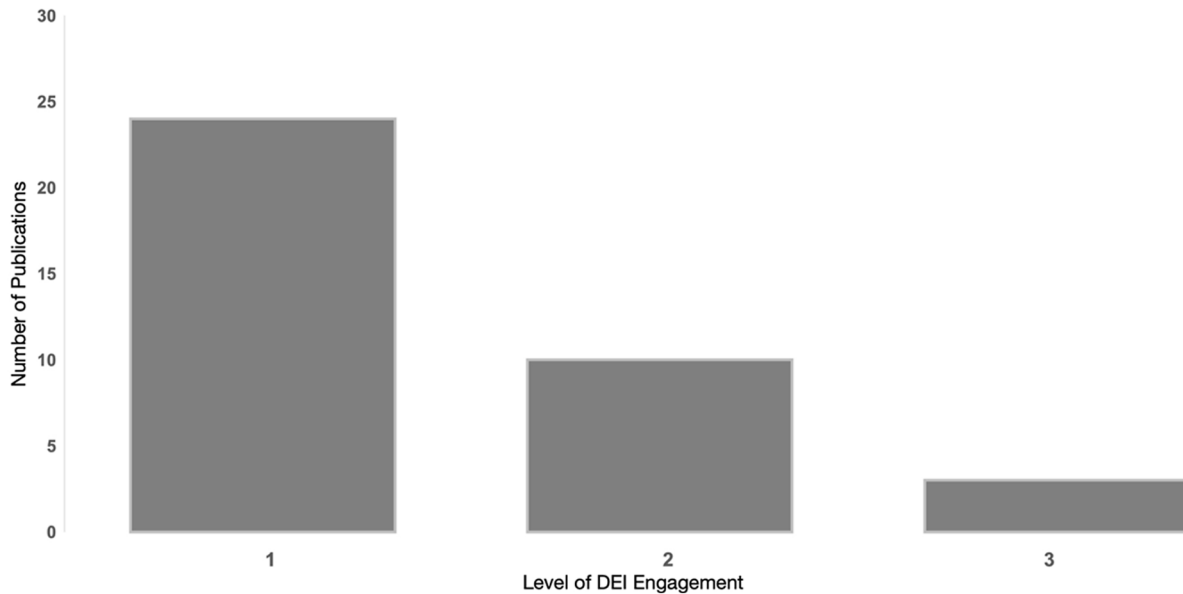
and inclusive across multiple dimensions (eg, race, ethnicity, gender) when providing services to the community.<sup>4</sup> Similarly, higher levels of community engagement and participating in citizen science can advance environmental justice through increased surveillance of and attention to various environmental issues and better policies and practices that improve environmental health conditions.<sup>3</sup> Nonetheless, there remains a lack of clarity in several areas within the EH literature, including: education and workforce development; methods and tools for research and their application in practice; and proposed solutions for environmental health issues. The purpose of this article is to review the literature, map current practice, and identify gaps on the topic of DEI in the EH workforce.

## Methods

A rapid scoping review<sup>5,6</sup> was conducted, with a search performed in July 2022, to map the published literature from Medline, the largest health-related database for research and



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**Figure 1.** Number of publications by level of DEI engagement.\*  
\*Levels of DEI engagement: 1=weak, 2=moderate, 3=strong.

scholarly evidence. The review followed PRISMA-ScR methodological guidelines,<sup>7</sup> and searched for and included articles in any language that covered all of the following concepts and related terms: (1) diversity, equity, inclusion, and inclusivity; (2) environmental health, and (3) environmental health workforce. In this review, we adopted the following definition of the environmental workforce: “professionals who are concerned with environmental health effects research, with environmental health effects technology, with environmental health policy, and with applied environmental health.”<sup>8</sup> In addition to research studies, we included other scholarly articles such as editorials and other published opinion pieces; quality improvement, program evaluation, or policy analysis articles; and published conference reports or other forms of scholarly discourse that dealt with DEI issues.

All study titles, abstracts, and full texts were screened by 2 independent reviewers among the authorship team which consists of environmental health experts from the professions of medicine, nursing, and public health. An a priori concept map developed by the authors was later modified to better inform the synthesis of the articles into a gap map,<sup>9</sup> which then guided the scoping review recommendations. The articles were then classified according to a defined level of DEI engagement. Ranging from weak to moderate to strong, the level of DEI engagement was defined in the evidence gap map as: (1) weak if the article only targeted disadvantaged/vulnerable populations but did not call for any interventions or approaches that would advance DEI either in the workforce or in general; (2) moderate if the article explicitly acknowledged and called for mitigation of DEI needs (eg, training, competency development, implementation, and evaluation, interventions for vulnerable populations, greater community engagement in seeking solutions,

etc.) but stopped short of calling for interventions to mitigate DEI in the workforce; and (3) strong if the article called for interventions to mitigate DEI in the workforce (eg, recruitment of diverse faculty and students, vulnerable community members as research and policy partners with the intent of community capacity building, etc.).<sup>10,11</sup>

## Results

Supplemental Appendix Table 1 illustrates the search strategy which yielded 179 English language papers, and Supplemental Appendix Figure 1 shows the article selection process. Thirty-seven articles met all inclusion criteria after full text screening. In addition to the levels of DEI engagement of the article with regards to the EH workforce, the evidence gap map analysis yielded the following relevant areas that helped to further classify articles: the health profession (eg, nursing, medicine, etc.) or the public health knowledge or practice area of emphasis (eg, environmental justice, occupational health, etc.). Supplemental Appendix Table 2 illustrates the results of this gap map analysis. Supplemental Appendix Table 3 reports the characteristics of the included studies.

The review found an inverse correlation between the number of articles and the level of DEI engagement: 24 articles have weak DEI engagement, 10 articles have moderate DEI engagement, and only 3 articles have strong DEI engagement. No definitive patterns emerged between the type of health profession or the public health knowledge or practice area and the level of DEI engagement. However, some EH professions appear to be more engaged in DEI efforts than others. In particular, public health nursing is the most well represented profession, while microbiology called for the strongest level of DEI engagement. The published DEI literature in the EH field, dating back to 1965, appears to have grown in volume but



**Figure 2.** Level of DEI engagement by year of publication.\*

\*The size of the circles indicates the number of articles, and the shaded areas around the circles indicates greater clustering of the articles across consecutive years at a given level of DEI engagement; Levels of DEI engagement: 1=weak, 2=moderate, 3=strong.

not in its level of DEI engagement over time. Figures 1 and 2 illustrate these results.

## Discussion

Due to a dearth of research evidence, we chose to include all published scholarly works such as editorials, opinion papers, white papers, quality improvement manuscripts, and others in this analysis. Additional research is needed in this realm with explicit focus on workforce issues and high-level evidence (ie, generalizable large cohort studies with subsequent follow-up of DEI relevant outcomes). The development of a psychometrically valid scale that measures the institutional level of DEI engagement in a given place and time would provide data to effectively undertake DEI engagement improvement initiatives.

Furthermore, though there are rare exceptions,<sup>12</sup> most DEI initiatives tend to omit the more progressive principles of inclusivity and liberation in their formulation. Inclusivity is defined as “the fact or quality of being inclusive, especially the practice or policy of not excluding any person on the grounds of race, gender, religion, age, disability, etc.”<sup>13</sup> Liberation is defined as “the action of freeing a region or its people from an oppressor or enemy force; freedom from restrictive or discriminatory social conventions and attitudes.”<sup>14</sup> These principles indicate that DEI must be a systematic practice or policy and sustained until the affected peoples served by EH professionals are no longer oppressed, respectively, thus setting a higher bar for the EH field that better aligns with the public health profession’s centering on health equity and renewed mission to “protect and promote the health of all people in all communities.”<sup>15</sup>

One limitation of this research is the inclusion of commentaries, editorials, and other publication types that could incorporate a wide range of approaches to peer review, depending on the journal. However, this scoping review did not aim to synthesize evidence to be used for clinical or policy decision-making, and instead aimed to provide a preliminary map of DEI

engagement in the EH literature. As such, the inclusion of only peer reviewed research articles would have counterproductively limited the scope of the literature included. Lastly, the nature of this study design, which involved the rapid query of a single database, could have led to the exclusion of relevant articles that were not indexed by Medline. Additionally, the use of Medline and not a social science index, could lead to exclusion of articles with a high level of DEI engagement. This choice was made by the authors to be responsive to the urgency of providing rapidly synthesized evidence and the call for mini-reviews on this topic. To investigate the inclusion of a social science index and its impact on the search, we did conduct a sensitivity analysis by applying our search strategy in the Social Sciences Full Text database via the EBSCO platform in April of 2023. The search yielded 32 citations, of which 14 additional articles could be included after screening title and abstract, and it is likely fewer would be included after a full text review and even fewer would meet a high level of DEI engagement. Future work should include comprehensive scoping reviews of this topic.

## Conclusion

DEI initiatives hold the potential to move the EH profession and society as a whole in a more positive direction. We suggest, however, that inclusivity and liberation may prove to be more impactful and meaningful constructs to fully advance equity in the EH workforce. They are more likely to persist well after DEI efforts subside, principally because those previously excluded will be empowered and present at the decision-making table.


## Author Contributions

All authors contributed to the concept and design of the project and reviewed abstracts and articles. YJ conducted the search and was the primary author of the manuscript with input and review from all authors. LAT was responsible for submission and coordinating revisions of the article. All authors

approve of the content of the manuscript and agree to be held accountable for the work.

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### Supplemental Material

Supplemental material for this article is available online.

### REFERENCES

1. Grubbs V. Diversity, equity, and inclusion that matter. *N Engl J Med.* 2020; 383:e25.
2. Jadotte YT. AJPM focus: a guide and road map on inclusivity in people, methods, and outcomes. *AJPM Focus.* 2022;1:100001.
3. Balanay JAG, Richards SL. Insights into diversity in the Environmental Health Science Workforce. *Environ Health Insights.* 2022;16:11786302221077513.
4. Stanford FC. The importance of diversity and inclusion in the healthcare workforce. *J Natl Med Assoc.* 2020;112:247-249.
5. Haby MM, Chapman E, Clark R, Barreto J, Reveiz L, Lavis JN. What are the best methodologies for rapid reviews of the research evidence for evidence-informed decision making in health policy and practice: a rapid review. *Health Res Policy Syst.* 2016;14:83.
6. Peters MD, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. Guidance for conducting systematic scoping reviews. *Int J Evid Based Healthc.* 2015; 13:141-146.
7. Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med.* 2018;169:467-473.
8. Walker B Jr, Miles-Richardson S, Warren R. Guest commentary: the Environmental Health Workforce in the 21st Century. *J Environ Health.* 2014;77:28-31.
9. Snilstveit B, Vojtkova M, Bhavsar A, Stevenson J, Gaarder M. Evidence & gap maps: A tool for promoting evidence informed policy and strategic research agendas. *J Clin Epidemiol.* 2016;79:120-129.
10. King AC, King DK, Banchoff A, et al. Employing participatory citizen science methods to promote age-friendly environments worldwide. *Int J Environ Res Public Health.* 2020;17:1541.
11. Coun MJH, Peters P, Blomme RJ, Schaveling J. To empower or not to empower, that's the question'. Using an empowerment process approach to explain employees' workplace proactivity. *Int J Hum Resour Manage.* 2022;33:2829-2855.
12. Williams C, Birungi J, Brown M, et al. Public Health Liberation – an emerging transdiscipline to elucidate and transform the public health economy. *Adv Clin Med Res Healthc Deliv.* 2022;2:10.
13. Oxford English Dictionary. *Inclusivity*, n. Oxford University Press; 2021.
14. Oxford English Dictionary. *Liberation*, n. Oxford University Press; 2022.
15. Public Health National Center for Innovations. The 10 essential public health services. Public Health Accreditation Board. Accessed September 10, 2020. <https://phnci.org/uploads/resource-files/EPHS-English.pdf>