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## **“Epidemiologists Count”: The Role of Diversity and Inclusion in the Field of Epidemiology**

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Running head: Epidemiologists Count

## Abstract

We present interpretations of the idea that “epidemiologists count” in response to the current status of membership and diversity and inclusion efforts within the Society for Epidemiological Research (SER). We review *who epidemiologists count* to describe the (mis)representation of SER membership and how categorizations of people reflect social constructions of identity and biases that exist in broader society. We argue that *what epidemiologists count* – how diversity and inclusion are operationalized – has real-world implications on institutional norms and how inclusive/non-inclusive environments are. Lastly, we examine *which epidemiologists count* within the field and argue that inclusion can only be achieved when we address how resources and opportunities are distributed among epidemiologists. To improve diversity and inclusion within SER and beyond, we recommend that SER strengthen its commitment to diversity, inclusion and equity by: (1) integrating this priority on all agendas; (2) enhancing efforts to improve self-awareness among members and accountability within the organization; (3) supporting the growth of a diversifying workforce in epidemiology; and (4) increasing the visibility of health disparities research and researchers in epidemiology.

Keywords: diversity, inclusion, social epidemiology, health equity

Abbreviations: AJE, American Journal of Epidemiology; SER, Society for Epidemiological Research

If you peruse the Society of Epidemiologic Research (SER) website, you will find the *Epidemiology Counts* podcast. Upon your first read, the title seems “punny” because epidemiologists count the distribution of disease. However, a deeper interpretation is that epidemiologists count as individuals and determine who and what counts. For diversity and inclusion initiatives to succeed, we need to critically reflect on how diversity and inclusion has translated into *who, what, and which epidemiologists count*. Unsurprisingly, the discussion on diversity and inclusion in epidemiology is not new. The American Journal of Epidemiology (AJE) has published articles that have flirted with these topics, albeit implicitly. These articles emphasized the need to improve epidemiology training (1) and engagement with community members and multidisciplinary teams (2,3), concluding with recommendations for diversity and inclusion in epidemiology. We frame this interpretation of “epidemiologists count” to discuss the recent paper on SER membership (4) and its respective implications on diversity and inclusion in epidemiology.

#### KEY POINT 1: WHO EPIDEMIOLOGIST COUNT?

One of the goals of epidemiology is to make population level estimates, but how do epidemiologists “specify” populations, and how does this reflect assumptions about diversity and inclusion? These specifications reflect the underlying social constructions of identity, including conscious and subconscious biases that exist in broader society (5,6). Pre-determined social categories (e.g., race/ethnicity or gender binary) reflect who is considered important by epidemiologists. These categories often fail to capture individuals’ truly lived experiences, forcing respondents to check a box that is oversimplified and overly restrictive. The inadequacy is reflected in greater non-response and tendency towards the “other” category. Therefore, the

very nature of specifying populations by restricting responses to stringently held norms of social categorization in the SER survey could ultimately lead to perceptions of non-inclusivity among respondents.

A thorough discussion of diversity cannot be held without recognizing the role of the “-isms” in society, including racism, classism, and sexism. These “-isms” reflect the historical ways in which certain groups have been privileged and prioritized over others, which inevitably affects how we categorize people today for the sake of data analysis. Increasingly, as our society becomes more diverse and survey responses become more difficult to obtain, it will be important to consider how to capture peoples’ intersectional identities. Intersectionality is defined as “the complex, cumulative way in which the effects of multiple forms of discrimination (such as racism, sexism, and classism) combine, overlap, or intersect especially in the experiences of marginalized individuals or groups” (7). When applied to epidemiology, capturing intersectionality means moving beyond the pre-determined categories to determine how people view themselves in relation to broader society (8,9).

It may be difficult to understand how epidemiologists should measure intersectionality. The typical but theoretically vague approach is to operationalize intersectionality by examining the joint of effects of each social category on an outcome (i.e., interaction term). This approach reaches at intersecting identities but improperly distills identities as additive. The ideal approach is to allow the lived experiences of individuals who lie at intersecting and marginalized identities to be part of the research process. Take for example a study examining barriers to condom use among men who have sex with men (10). Researchers could analyze the data by individual and combinations of the social categories (e.g., Latinx men, Black men, gay men, gay Latinx men, gay Afro-Latinx men). However, while this approach may identify disparities by combinations of

race/ethnicity and sexual orientation, it may not identify the advantages and disadvantages individuals experience because of these ascribed identities. An approach that properly involves men who have these social identities in the research development process would allow researchers to create questions specifically tailored to the men's respective communities. Involving community members aides with interpreting these categories appropriately, guiding researchers to focus on communities experiencing the greatest social disadvantage.

Incorporating an intersectionality framework to epidemiology provides new opportunities and challenges for population research (11,12). Qualitative data and open-ended questions can illuminate diverse identities that become hidden when forced into limited categorical responses. SER members could be asked to share their experiences with the -isms within SER, or to rank their perceived social standing within the organization. We recognize that examining dimensions of intersectionality and the -isms will force many in epidemiology to ask difficult questions of ourselves and others, pushing us out of our comfort zones. Genuine efforts to address issues of diversity and inclusion may go against the very nature of epidemiological analyses, which tend to overgeneralize towards the average. When examining issues of diversity, it is not the majority or the average we are most concerned with. Often, it is the outlier, the minority, and the missing we are *most* interested in. Instead of aggregating towards the majority, we should recognize and affirm the marginalized experiences.

Lastly, we should question the assumptions and use of methods such as imputation and weighting. Imputation seeks to account for missing in data, but studies have shown imputation may reflect inaccurate underlying assumptions and bias results (13). More importantly, imputation does not answer the larger question of *why* people are missing in the SER survey. Furthermore, weighting of data by factors like race/ethnicity places the burden of

representativeness on a few. For example, if there are fewer Asian respondents than are in the SER member database, and their responses are given greater weights, this may cause overgeneralizations to be made based on the responses of a few. It is, in essence, similar to asking a few members of a racial group to explain the experiences of their entire race, when this is neither a fair nor accurate assumption.

## KEY POINT 2: WHAT EPIDEMIOLOGIST COUNT?

What epidemiologists choose to measure and how these data are presented have real-world implications on evidence-based policies and interventions. This section considers the operationalization of diversity and inclusion and argues current measures may actually impede the progress of diversity and inclusion in epidemiology.

There are top-down (i.e., institutional-level) and bottom-up (i.e., individual-level) factors that influence and perpetuate non-inclusive environments. Only counting individual-level dimensions of inclusivity can have serious implications for future diversity and inclusion initiatives because it does not address the broader system of power and privileges that SER members are embedded within. Epidemiologists should adopt a multilevel (i.e., individual-, interpersonal- and institutional-level) approach to better understand and advance institutional diversity and inclusion.

DeVilbiss and colleagues (2020) characterized individual-level dimensions of social identity to understand perceptions of inclusion and participation (4). However, operationalizing diversity at the individual-level means the onus of change falls upon on SER members and ignores the interpersonal- and institutional-level factors that impact SER inclusion. For example, the authors measured participation in society-initiated activities but failed to consider the barriers

to individual participation. Thus, a more comprehensive assessment of inclusion could involve “organizational strategies and practices that promote meaningful social and academic interactions among persons and groups who differ in their experiences, their views, and their traits” (14). For instance, diversity at the institutional-level could be measured by the makeup of SER leadership or journal editorial boards. Leadership positions are an indication of inclusion at the highest levels of epidemiological excellence (15) and represent who holds the power to make decisions on organizational priorities. Assessing these interpersonal interactions (e.g., collaborations and collegial networks) among SER members could help us identify patterns of segregation and inclusion within the organization. Ultimately, SER should build a diverse and inclusive society, rather than a diverse but segregated society.

An ideal approach would embed diversity and inclusion in all of the organization’s activities. The complete work of improving diversity and inclusion cannot be assigned to a committee or minoritized individuals (16). Allocating initiatives to a committee often means that few individuals beyond committee members are intentionally thinking about diversity and inclusion. Furthermore, minoritized individuals are often expected to represent the perspective of all minoritized groups (17). The greatest improvements in health behavior interventions often occur with multilevel approaches, when individual actions are enabled by environmental and institutional change (18,19). Similarly, the responsibility to improve diversity and inclusion should be assigned to the SER organization, which would ultimately move the needle to promote diversity and inclusion.

The SER code of conduct states “all participants in SER activities will enjoy a welcoming environment free from discrimination, harassment and retaliation” (20). However, it will take more than individual-level reporting of policy violations to ensure the “free expression and

exchange of ideas” that this code encourages (20). It will require bottom-up approaches from individuals and top-down approaches from SER leadership.

### KEY POINT 3: WHICH EPIDEMIOLOGISTS COUNT?

Understanding who and what epidemiologists count, leads us to the last point on which epidemiologists count. Here, we can change the SER institutional norms to critically consider intersectionality in epidemiological studies. We argue that we can only attain “inclusion of diverse individuals” when we achieve equity in the field of epidemiology.

What are the facilitators or barriers that advantage some and not others in the field of epidemiology? The biases that exist in the social constructions of identity are also present in determining who has the power, who opportunities are provided to, and how resources are distributed within epidemiology. The majority of SER members identified as white and female (4). Why does SER membership look this way? Who holds the leadership positions and power to make decisions on conference and journal publication acceptance? If we understand who research is conducted by, we can also understand who research is conducted for, who is benefitting from the research, and the biases that exist towards who researchers are and what epidemiological research is deemed important.

SER is a professional society where research presence and participation are often required for promotion and tenure. Therefore, individuals would participate in SER activities regardless of feeling included or welcome. Barriers prior to SER membership include unequal access to opportunities because of unconscious or conscious biases. Barriers to success in epidemiological research include gender disparities in authorship, who is cited in high-impact journals, and lack of diverse representation on editorial boards (15,21). It is incorrect to assume

diversity within epidemiology exists in a vacuum; we should challenge structures of power and privilege within the field.

## FUTURE RECOMMENDATIONS

In conclusion, we offer the following recommendations to improve diversity and inclusion within SER and beyond. First, strengthen SER's commitment to diversity, inclusion and equity by integrating this priority on all agendas. Having this commitment embedded into the SER framework and programming ensures that everyone will engage in conversations on issues of diversity and inclusion.

Second, SER should enhance efforts to improve self-awareness and hold the organization accountable to achieving diversity and inclusion. The society should regularly evaluate the progress of diversity and inclusion efforts in all activities and programming, and at multiple levels of SER, to examine whether these initiatives are truly centered around diversity and inclusion and provide equitable access to opportunities. SER should provide trainings on diversity and inclusion topics and allyship (i.e., using power and privilege to create inclusive environments) to improve engagement within the organization. Individual members should also acknowledge their own biases, recognizing where they are situated in the hierarchy of power (e.g., power dynamics), who their biases negatively or positively impact, and how these biases impact their work (22).

Third, SER should support the growth of the diversifying workforce and be intentional about who receives training opportunities, at all access points into epidemiology. The SER leadership team and AJE editorial board should strive to represent multiple dimensions of diversity, because the society cannot truly achieve equity until minoritized individuals are able to

lead in meaningful ways (i.e., ability to impact change and not be the token minoritized person whose voice is not heard).

Lastly, SER should advance scientific knowledge and innovation by increasing the visibility of health disparities research and diverse researchers. For example, SER highlighted sessions or AJE special issues could center around the work of and about minoritized individuals, to affirm that these individuals and research topics are important. Improving diversity and inclusion in SER will advance equity in research and practice, and ultimately improve discovery within epidemiology and public health.

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## References

1. D'Agostino EM, Hlaing WM, Stark JH. Teaching on the Continuum: Epidemiology Education From High School Through Graduate School. *Am J Epidemiol*. 2019 Jun 1;188(6):979–86.
2. Windle M, Lee HD, Cherng ST, Lesko CR, Hanrahan C, Jackson JW, et al. From Epidemiologic Knowledge to Improved Health: A Vision for Translational Epidemiology. *Am J Epidemiol*. 2019 Dec 31;188(12):2049–60.
3. Bensyl DM, King ME, Greiner A. Applied Epidemiology Training Needs for the Modern Epidemiologist. *Am J Epidemiol*. 2019 01;188(5):830–5.
4. DeVilbiss EA, Weuve J, Fink DS, Morris MD, Arah OA, Radoc JG, et al. Assessing Representation and Perceived Inclusion among Members in the Society for Epidemiologic Research. *Am J Epidemiol* [Internet]. [cited 2020 Mar 5]; Available from: <https://academic.oup.com/aje/advance-article/doi/10.1093/aje/kwz281/5697299>
5. Smedley A, Smedley BD. Race as biology is fiction, racism as a social problem is real: Anthropological and historical perspectives on the social construction of race. *Am Psychol*. 2005 Jan;60(1):16–26.
6. Lorber J, Moore LJ. *Gender and the Social Construction of Illness*. Lanham, MD: Rowman & Littlefield; 2002. 201 p.
7. Crenshaw K. Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. *Stanford Law Rev*. 1990 1991;43(6):1241–300.
8. Ford CL, Airhihenbuwa CO. The public health critical race methodology: Praxis for antiracism research. *Soc Sci Med*. 2010 Oct;71(8):1390–8.
9. Ford CL, Harawa NT. A new conceptualization of ethnicity for social epidemiologic and health equity research. *Soc Sci Med*. 2010 Jul 1;71(2):251–8.
10. Contributions of Qualitative Research in Informing HIV/AIDS Interventions Targeting Black MSM in the United States [Internet]. [cited 2020 Apr 13]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4740277/>
11. Bauer GR. Incorporating intersectionality theory into population health research methodology: Challenges and the potential to advance health equity. *Soc Sci Med*. 2014 Jun 1;110:10–7.
12. Bowleg L. The problem with the phrase women and minorities: intersectionality-an important theoretical framework for public health. *Am J Public Health*. 2012 Jul;102(7):1267–73.

13. Sterne JAC, White IR, Carlin JB, Spratt M, Royston P, Kenward MG, et al. Multiple imputation for missing data in epidemiological and clinical research: potential and pitfalls. *BMJ* [Internet]. 2009 Jun 29 [cited 2020 Mar 5];338. Available from: <https://www.bmj.com/content/338/bmj.b2393>
14. Tienda M. Diversity  $\neq$  Inclusion: Promoting Integration in Higher Education. *Educ Res Wash DC* 1972. 2013 Dec;42(9):467–75.
15. Qureshi R, Lê J, Li T, Ibrahim M, Dickersin K. Gender and Editorial Authorship in High-Impact Epidemiology Journals. *Am J Epidemiol*. 2019 Dec 31;188(12):2140–5.
16. Jimenez MF, Lavery TM, Bombaci SP, Wilkins K, Bennett DE, Pejchar L. Underrepresented faculty play a disproportionate role in advancing diversity and inclusion. *Nat Ecol Evol*. 2019 Jul;3(7):1030–3.
17. Swartz TH, Palermo A-GS, Masur SK, Aberg JA. The Science and Value of Diversity: Closing the Gaps in Our Understanding of Inclusion and Diversity. *J Infect Dis*. 2019 Aug 20;220(Supplement\_2):S33–41.
18. Golden SD, Earp JAL. Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions. *Health Educ Behav Off Publ Soc Public Health Educ*. 2012 Jun;39(3):364–72.
19. Sallis JF, Owen N. Ecological models of health behavior. In: *Health behavior: Theory, research, and practice*, 5th ed. San Francisco, CA, US: Jossey-Bass; 2015. p. 43–64.
20. Society for Epidemiologic Research. Code of Conduct: Society for Epidemiologic Research Meeting Conduct Policy [Internet]. [cited 2020 Mar 10]. Available from: <https://epiresearch.org/about-us/code-of-conduct/>
21. Schisterman EF, Swanson CW, Lu Y-L, Mumford SL. The Changing Face of Epidemiology: Gender Disparities in Citations? *Epidemiol Camb Mass*. 2017;28(2):159–68.
22. Blair IV, Steiner JF, Havranek EP. Unconscious (Implicit) Bias and Health Disparities: Where Do We Go from Here? *Perm J*. 2011;15(2):71–8.