

**Boston Medical Center &
Boston University School of Medicine**

**Report from the Committee to Reduce Implicit and
Explicit Bias in Research**

Fall 2020

Committee Membership

1. Megan H Bair-Merritt, MD, MSCE (Chair)
2. Karen Antman, MD
3. David Center, MD
4. Ravin Davidoff, MD
5. John Ennever, MD, PhD, CIP
6. Robert Graham
7. Greg Grillone, MD
8. Angelique Harris, PhD
9. David Henderson, MD
10. Thea James, MD
11. Aviva Lee-Parritz, MD
12. Tuhina Neogi, MD, PhD
13. Maria Ober
14. Lisa Tenerowicz, JD

Introduction

Boston Medical Center (BMC) and Boston University School of Medicine (BUSM) are committed to equity, diversity and inclusion across our tripartite mission of patient care, research and education. With regards to research, embedding principles of equity, vitality and inclusion from study inception through publication leads to more innovative, creative science that improves health across diverse communities. Therefore, the goal of the Committee to Reduce Implicit and Explicit Bias in Research was to recommend systems-level changes to identify and minimize racism, sexism and other forms of bias in research design and reporting.

Historically, medical research has been plagued by racism and sexism, fueling health inequities and negatively impacting the health of women and people of color, in particular Blacks and indigenous people.^{1,2,3} For example, some scientists used research to support fictitious racist and sexist beliefs of differences in intelligence between races and sexes.⁴ From bench (i.e. animal models) to bedside (i.e., human subjects studies), many studies in medical science considered male physiology the norm and women's physiology to be aberrant, leading to lack of understanding about how diseases manifest in women, and how drugs affect women.^{1,2,3} Biases in research also can be more subtle. Too often both gendered and racialized language are incorporated into peer-reviewed manuscripts and are not recognized, flagged or revised by reviewers or editors, who often harbor the same biases and assumptions.⁵

Changing the culture and practice of medical research is complex and will require widespread systems-level change, with continuous improvements over time, to address some of the underlying reasons that research with these biases persists. Specifically, systems changes will need to address the following:

- too few “checks” exist to question potentially biased methodology and scientific writing;
- scientific teams, journal editorial boards and reviewers often lack diversity;
- culture and climate of medical institutions often tolerate explicit and implicit biases; and
- there is inadequate education in this area for many current and future scientists.

The Committee to Reduce Implicit and Explicit Bias in Research met regularly during Fall 2020 to recommend systems changes to identify and minimize bias, considering the following questions:

1. What key systems can we adopt to recognize and minimize racism, sexism and other forms of bias in research design and reporting? How do we operationalize these systems in a way that is feasible and timely? What should be done with studies that do not require-IRB review (Non-Human Subjects Research)?
2. How do we accomplish the following:
 - change the culture and climate of research to raise awareness of sexism, racism and other common biases in research questions and presentations.
 - promote scientific freedom *and* ensure that research emerging from our Institution is high quality and free of bias.

- promote the creation of study teams that are diverse across many different identities.
- teach the next generation of researchers these concepts.
- define professionalism in an inclusive way that respects the diversity of our faculty, staff and trainees.
- incorporate or consider the power of social media and other emerging communication vehicles into research considerations.

This report documents the Committee’s recommendations including potential strategies and initiatives to support the primary goal of reducing implicit and explicit bias in research from our Institutions. Core values related to these recommendations that were elevated by the Committee include the following: (1) moving towards the shared goal of minimizing bias in research requires collective responsibility; (2) broad-based training is critical; (3) efforts should focus on support and education as opposed to punitive action; and (4) given the complexity of this issue, and the role of our Institution in forging this path across the country, implementing these recommendations will need to be done within the frame of continuous improvement. Of note, the design and implementation of equitable research also requires building meaningful community partnerships and including diverse participants in research studies. This approach to research was not within the scope of the Committee, but is noted to be a valuable “piece of the larger puzzle.”

Committee Recommendations

1. **Create and implement a system to minimize racism, sexism and other forms of bias in research design and reporting** by first recognizing research studies that may be impacted by bias, and second providing supportive resources when needed. The goals of this process are both to provide support to studies that may be sensitive, and also to raise awareness among investigators about the potential for implicit and explicit biases. Specifically, the Committee recommends the following steps:

- a) Within the BUMC/BMC IRB system, every application will be routed to the PI to answer a series of questions followed by PI sign off. This information will be sent to the Chairs for review. Chairs must then (a) sign off on the IRB and (b) check a box to confirm that they have evaluated the potential for the study to have implicit and explicit biases.

For all studies that do *not* require an IRB review, investigators will be required to answer the same questions at the start of the study and send the responses to their Chair for review.

The questions are as follows:

- Study Title
 - Names, titles and Departments of members of the study team
 - Abstract including intro/background and methods
 - If the study is led by a student, resident or fellow, name of the trainee's mentor and how frequently are the mentor and trainee meeting?
 - Does your team have the expertise to implement the study as designed, such as experience with the design (surveys, cohort studies), or with the analyses that you are proposing? If yes, describe briefly the expertise of each member of the team and their experience with the proposed methods? If no, what skills are you missing?
 - Could the study question, methods or interpretation of results potentially harm a community that historically has been marginalized?
 - What processes do you have in place to ensure that decision-making is as free from implicit and explicit biases as possible when the study is implemented? How will you build into your study team meetings times to pause and ask questions about the degree to which there is actual or perceived implicit and explicit bias in your approach?
 - How will you measure and analyze demographic variables such as sex, gender, race/ethnicity and other forms of identity in your study?
 - Timeline (including planned abstract and paper submission)
- b) A small group of researchers with expertise in research methods, biostatistics, and explicit and implicit biases will serve as a consultative service. If Chairs have concerns, or if investigators desire support, researchers will be put in contact with members of

this consultative service with the appropriate related expertise (i.e., appropriate use of race in regression modeling).

- c) *Note:* The Committee recognizes that this recommendation does not address the many current, ongoing studies. As such, the Committee recommends that each Chair/Chief temporarily consider options for reviewing potentially concerning manuscripts prior to submission.

2. Continue and expand education of medical students and doctoral students, residents, fellows, faculty and leadership about the history of racism and sexism in medical research as well as ways in which to combat these biases. This education must be ubiquitous across career levels (from students to senior faculty) and must include continuous learning over time.

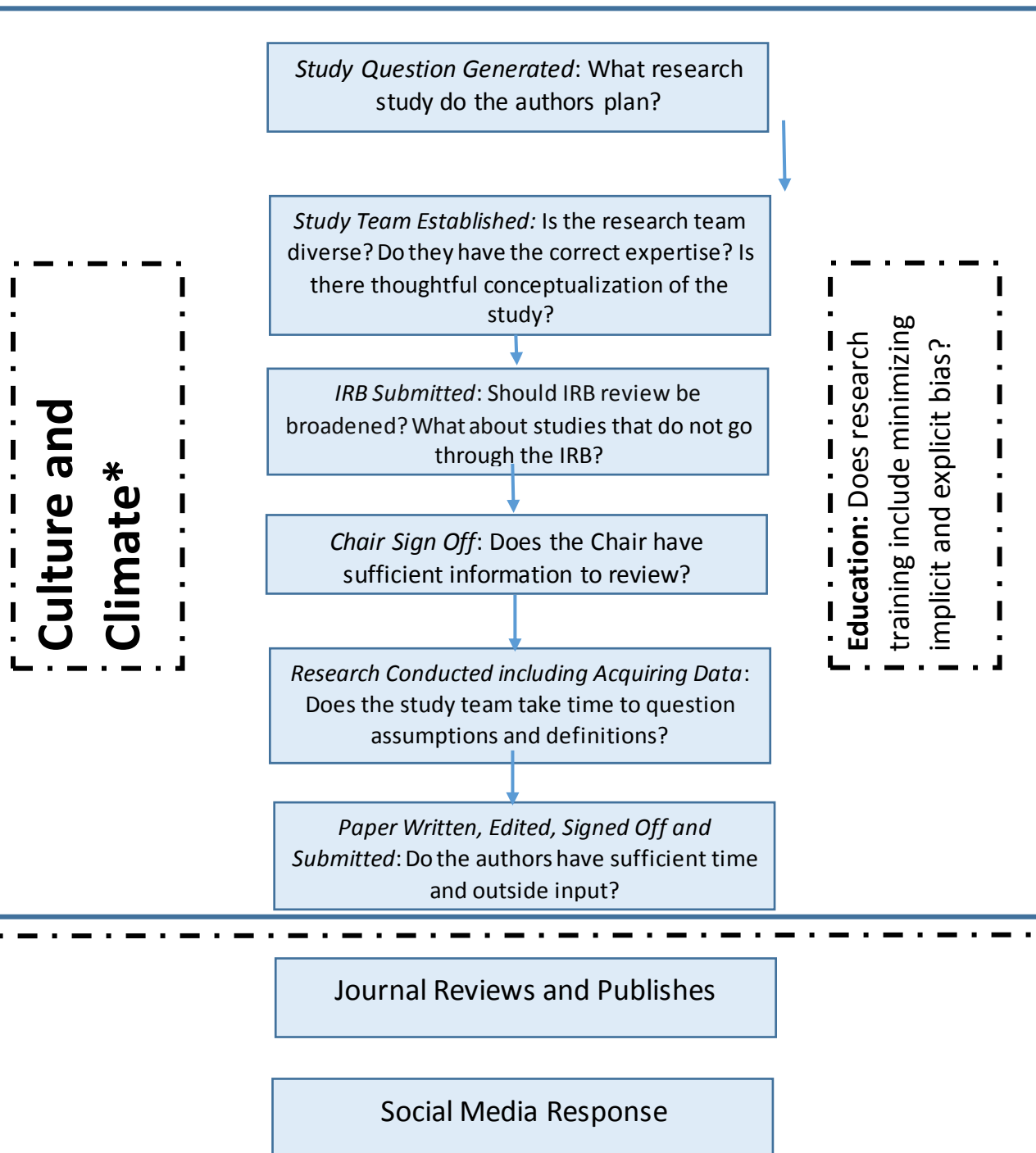
- a. Create a series of “journal clubs” in which participants read articles that have issues with implicit or explicit bias, with facilitated discussions about these articles’ potential impact and alternative approaches
- b. Create and widely disseminate a brief list of “stop points” when researchers and research teams should pause and consider the approach to the science including:
 - i. **Creation of the study team:** Does your team include diverse members?
 - ii. **Establishing the study question and methodology:** Do you need input from others with different expertise? Who is your study population? Are you as inclusive as possible? If you are excluding particular groups, why?
 - iii. **Analysis of results:** How are you thinking about analyzing race, ethnicity and sex? Would your study benefit from the input of an analyst, biostatistician or epidemiologist with expertise in this area?
 - iv. **Writing/reviewing the manuscript:** Have you considered your language carefully to avoid racialized or gendered language? Have several colleagues outside of your research group read drafts with this in mind?
- c. Use existing structures to incorporate information and teaching about racism and sexism in research as well as solutions (e.g., creation of diverse research teams) including faculty and staff orientation; the required Responsible Conduct of Research training that is required for all investigators; faculty meetings; faculty development programs; the medical school curriculum.
- d. Teach Chairs key information about implicit and explicit biases in research to support their participation in the overarching system described above. The Committee noted that education for the Chairs was a top priority, given their key role in implementing other recommendations.
- e. Support broader training of our community on implicit bias, such as through the Bias Reduction In Medicine (BRIM) program

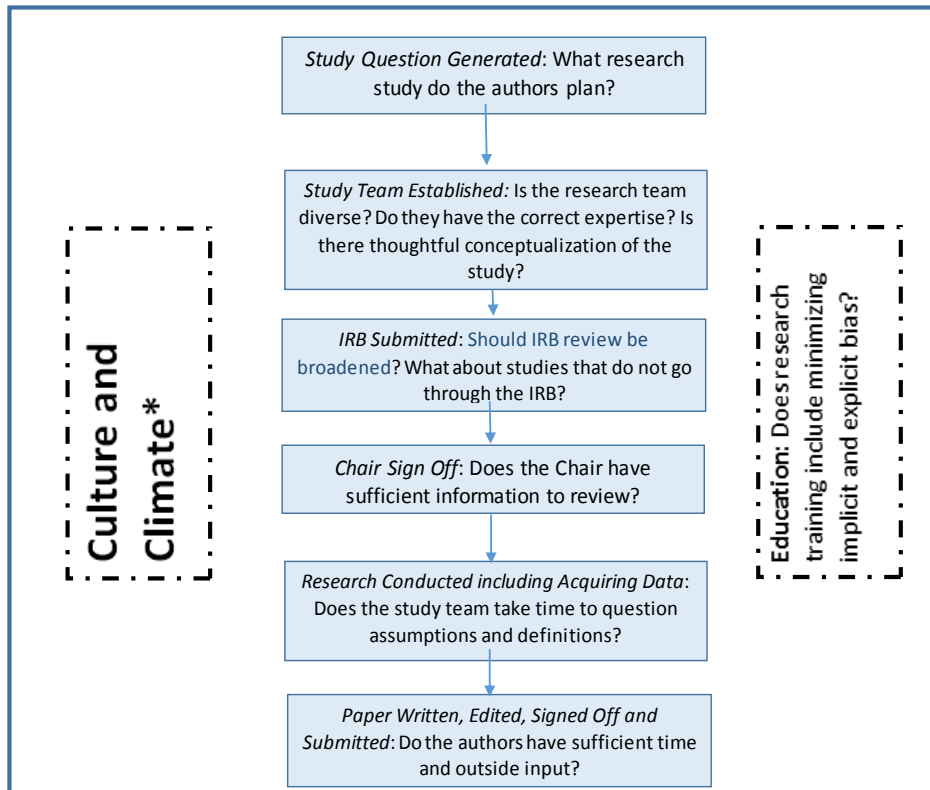
3. **Leverage and customize technology platforms to identify biased language in publications.**
The Committee recommends partnering with BU colleagues to customize a technology platform that uses machine learning or other algorithms to identify gendered and racialized language. Notably, Drs. Saligrama and Bolukbasi at the BU School of Engineering have developed similar technology (<https://www.bu.edu/articles/2016/sexist-computer>) and could be a starting place to develop this type of platform. Once validated, investigators will be asked to input their abstracts and manuscripts into this platform prior to submission, and to consult with their Departmental leadership for assistance if there are concerns. The group of researchers with expertise in research methods, biostatistics, and explicit and implicit biases will be available to read manuscripts and provide recommended revisions (both before and after this technology platform has been built); the BU Professionalism Committee, led by Drs. John Polk and Kenneth Grundfast, along with several other diverse faculty members, staff and students also could serve as a “review” committee to provide specific feedback on manuscripts about potential biases.
4. **Create an online platform for anonymous reporting of concerns related to explicit and implicit bias in research.** Much like reporting of medical errors, this platform could serve several functions. First, this platform would allow BMC/BUSM to identify common concerns across the Institution, and deploy resources and support accordingly. Second, it would enhance awareness of the potential impact of explicit and implicit bias in research, and the need to create and align systems that minimize this bias. Finally, it could serve as a metric by which to track progress of the Committee’s recommendations.
5. **Design an evaluation that allows BMC/BUSM to track process and outcome metrics.** Rigorous collection of process and outcome metrics will allow us to understand the degree to which we are making progress as well as areas in which we need to make improvements.
6. **Professionalism at BMC/BUSM.** The Committee recognizes an inclusive definition of professionalism that prioritizes and celebrates diversity, and recognizes that professionalism standards vary based on specialty and community.

References

1. Oh SS, Galanter, Thakur N, Pino-Yanes , Barcelo NE, White MJ, et al. Diversity in Clinical and Biomedical Research: A Promise Yet to Be Fulfilled. 2015; *PLoS Med*: 12: 31001918.
2. Holdcroft A. Gender Bias in Research: How Does it Affect Evidence Based Medicine? *Journal of the Royal Society of Medicine*. 2017; 100: 1-2.
3. Jackson G. The Female Problem: How Male Bias in Medical Trials Ruined Women’s Health. *The Guardian*. 2019; accessed 10/27/20.
<https://www.theguardian.com/lifeandstyle/2019/nov/13/the-female-problem-male-bias-in-medical-trials>
4. Skibba R. The Disturbing Resilience of Scientific Racism. *Smithsonian Magazine*. 2019; accessed 10/27/20. <https://www.smithsonianmag.com/science-nature/disturbing-resilience-scientific-racism-180972243/>
5. Hodin RA, Pawlik TM. Journal of Gastrointestinal Surgery: Commitment to Diversity and Inclusion in the Editorial Process. *Journal of Gastrointestinal Surgery*. 2020; <https://doi.org/10.1007/s11605-020-04801-5>.

Appendix 1: The “Life Course” of a Research Study





Proposed Systems Intervention

BUMC/BMC IRB and Chairs for non-IRB studies direct all investigators to answer key questions.

Responses sent to Chair to review and Chair must sign off that they have considered the possibility of bias

Investigators needing help referred to consultative service with expertise in the conduct of equitable research

Technology platform using machine learning or other algorithms identifies gendered or racialized language