



Science and equality of opportunity

Marcia McNutt^{a,1}

Since I issued my statement (<http://www.nasonline.org/about-nas/leadership/president/diversity-equity-and-inclusion-statement.html>) on racial inequality as president of the National Academy of Sciences, many scientists have written asking how they can help rectify this situation. Sadly, I believe that in the past science has been, or at least was perceived to have been, part of the problem rather than part of the solution. We hope we have put behind us the sorry history of Black, Indigenous, and People of Color (BIPOCs) being unwilling or coerced participants in human trials for biomedical experiments and that we have enacted policies and procedures to prevent such unethical practices. Yet, even today, science can exacerbate the equality divide in subtle and more pervasive ways.

The coronavirus disease 2019 (COVID-19) pandemic has brought this issue into stark focus. Despite the miracles of modern medicine and improved health in general, life expectancy varies by more than 10 years between Black and White neighborhoods in Tulsa, OK, and the same can be said of other cities where the population is segregated. Similarly, the chance of surviving COVID-19 is not equally distributed. The death rate from COVID-19 for Blacks is three times that of the White population. Simply put, the public health for Whites in America is much better than that for Blacks, and neither science nor the rest of the health-care industry puts sufficient emphasis on increasing access and reducing cost.

The disparate impact is not just in health but is also seen in economic terms. COVID-19 has had an impact on working life in three ways: 1) One group of workers, mostly low wage, has become unemployed; 2) a second group of workers is deemed essential and experiences a higher health risk; and 3) a third group can work from home and is still employed and safe. Since the rise of the internet and information age, which are by-products of science and technology innovation, an increasing number of jobs are in the last category, require a college degree, and are held by Whites. BIPOCs have been disproportionately laid off or put at risk in the lower-paying service jobs during the pandemic.

This magnified impact of COVID-19 on BIPOCs is just the latest manifestation of a series of barriers, biases, and disparities that begin before birth and accumulate throughout their lives, as documented in a series of reports from the National Academies. Racism and other forms of disrespectful treatment from health-care workers can influence prenatal care, causing considerable racial and ethnic disparities in both maternal and child health. Child poverty rates are much higher for Black and Hispanic children than for non-Hispanic Whites, creating disparities in access to preschool, safe summer experiences, high-quality education, and healthy lives. High-achieving Black children are less likely to be recommended for gifted programs than White children. Educational attainment for Blacks and other minorities is limited by food and housing insecurity, exposure to violence, unsafe neighborhoods, adverse childhood experiences, and exposure to environmental toxins. This lack of education repeats the cycle of poverty for the next generation.

Racial and ethnic minorities are overrepresented at every stage of the juvenile justice system; BIPOCs are more likely to be arrested and, for certain offenses, more likely to face harsh punishment. They also remain in the system longer than White youths. Experience in the juvenile justice system is just the first step for racial and ethnic minorities in what too often becomes a cycle of admission and return to the penal system. The consequence of high incarceration rates of Black men is that nearly one-third of that population is permanently ineligible to serve in the juror pool, further exacerbating the difficulty in providing Blacks on trial with a "jury of their peers."

The poor suffer from many of these inequities, but BIPOCs carry an additional major burden: that of color. Deeply rooted racism and prejudice in this country give rise to additional barriers and stigmas that thwart advancement simply based on skin color, regardless of ability, aptitude, educational attainment, work ethic, or any other measure of future potential.

As a result of the nationwide and growing worldwide peaceful protests to end police brutality against Black people, many are also demanding an end to

^aPresident, National Academy of Sciences
Author contributions: M.M. wrote the paper.
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¹Email: naspresident@nas.edu.
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the inequality of opportunity and the tragic waste of human capital that results from systemic racism.

By first admitting that science has been part of the problem in the widening gap in equality we can start to understand what we must do to start addressing the problem. I suggest the following five-step program for the scientific community:

- 1) Build cultures of caring and equality into each research group, department, college or university, and scientific institution so that all BIPOCs are valued and heard.
- 2) Commit to initiating, expanding, and evaluating the effectiveness of programs to increase the representation of BIPOCs in science. We need their help and their leadership to fix these problems.
- 3) Commit to expanding programs to hire and retain BIPOC graduates in teaching and research so that they can be mentors to more generations

of underrepresented students who can continue to work to solve these problems of inequity in opportunity.

- 4) Create a new type of convergence of the natural and social sciences so that the impact of an initiative on people can be anticipated in advance and the project can be modified if necessary to avoid undesirable societal outcomes.
- 5) Examine science-based policy recommendations for how they could be adjusted to alleviate, rather than exacerbate, racial inequalities.

Racism, inequality, and despair arising from the absence of opportunity is devastating to those who happen to be born in the United States with black or brown skin. However, it affects all of us by robbing our nation of realizing the full potential of each human being. Please join me in committing to ensuring that science is part of the solution for everyone.