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LETTERS

Edited by **Jennifer Sills**

NIH must confront the use of race in science

Recent protests across the United States and the world have called attention to anti-Black racism in policing, employment, housing, and education. Science and medicine also have long histories of racism (*1*, *2*). This unfortunate yet persistent aspect of science and medicine includes the use of obsolete concepts of race to measure human biological difference and the false belief, by some, that differences in disease outcomes stem primarily from pathophysiological differences between racial groups (*3*, *4*).

We are particularly concerned that explanations for the disproportionate rates of coronavirus disease 2019 (COVID-19) in Black, Latino, Indigenous, and other communities of color will mistakenly point to innate racial differences instead of long-standing institutionalized racism and other underlying social, structural, and environmental determinants. Although genetic risk factors may contribute to severity of COVID-19 (*5*, *6*), race is a poor proxy to understand the population distribution of such risk factors (*7*). Compelling evidence shows that racism, not race, is the most relevant risk factor (*8*, *9*). We are hopeful that scientists will not turn to racial science—a reflection of long-standing beliefs about superiority and inferiority that have no place in scientific and clinical practice (*1*, *10*)—to explain COVID-19 disparities and justify policy responses to it. However, racial categories have been misused in the past.

In 2016, we called for the elimination of the use of race as a means to classify biological diversity in both laboratory and clinical research. Since that time, little has changed (*11*). The National Institutes of Health (NIH) made progress by releasing a request for applications in support of research leading to the creation of best practices for the study of race and other population identifiers (*12*). However, R01 awards could take years to address these issues, and NIH still offers no guidance about the use of racial and ethnic identifiers in research beyond recruitment. There is an urgent need for NIH to provide scientists with information about what utility racial data have beyond fostering diversity in research, how such information should or should not be used in data analysis, and what identifiers of human populations might be better suited for use in biomedical research.

To begin to address the misuse of racial measures in scientific and clinical practice, we urge the director of NIH to lead education efforts directed at both scientists and the public about the nature of human genetic diversity and the ongoing need and obligation to confront racism in science. In these troubled times, a clear statement regarding use and misuse of population identifiers in the pursuit of characterizing human difference could help alleviate ongoing and widespread confusion on such matters.

A member of the Black Doctors COVID-19 Consortium, formed to help address health disparities in the African American community, tests a patient. Racial disparities in COVID-19 cases are better explained by structural racism than by genetic differences.

NIH should then support the National Academy of Sciences to bring together a diverse group of scientists and scholars to develop a consensus statement on best practices in genetic, clinical, and social scientific studies for characterizing human genetic diversity, including guidance for using racial categories to study racism's impact on human health. Guidelines for federally funded science should also include best practices for the integration of biological, social, structural, and environmental health determinants into the study of human health and disease.

NIH should continue and expand its work to hire more career scientists and clinicians from underrepresented minority groups. It should also substantially increase the extramural funding that supports scientists from underrepresented groups at every level of training and throughout career development. We have the tools to remedy this challenge. The time to act is now.

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SUPPLEMENTARY MATERIALS

List of signatories
www.sciencemag.org/content/369/6509/1313/suppl/DC1

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Accumulation of plastic waste during COVID-19

Medical waste generated by COVID-19 protocols has overwhelmed waste treatment facilities in Wuhan, China.

As lockdowns took effect to slow the spread of coronavirus disease 2019 (COVID-19), the global demand for petroleum collapsed. As a result, oil prices plummeted, making the manufacture of virgin plastics from fossil fuels less expensive than recycling (*1*). This cost incentive, along with lifestyle changes that increase plastic use, has complicated the challenge of overcoming plastic pollution.

During the pandemic, personal protective equipment (PPE) has driven increased plastic pollution. In response to high PPE demand among the general public, health care workers, and service workers, single-use face mask production in China soared to 116 million per day in February, about 12 times the usual quantity (*2*). The World Health Organization has requested a 40% escalation of disposable PPE production (*3*). If the global population adheres to a standard of one disposable face mask per day after lockdowns end, the pandemic could result in a monthly global consumption and waste of 129 billion face masks and 65 billion gloves (*4*). Hospitals in Wuhan, the center of the COVID-19 outbreak, produced more than 240 tons of single-use plastic-based medical waste (such as disposable face masks, gloves, and gowns) per day at the peak of the pandemic, 6 times more than the daily average before the pandemic occurred (*5*). If the increases observed in Wuhan hold true elsewhere, the United States could generate an entire year's worth of medical waste in 2 months (*6*).

Individual choices during lockdowns are also increasing plastic demand. Packaged take-out meals and home-delivered groceries contributed an additional 1400 tons of plastic waste during Singapore's 8-week lockdown (*7*). The global plastic packaging market size is projected to grow from USD 909.2 billion in 2019 to 1012.6 billion by 2021, at a compound annual growth rate of 5.5%, mainly due to pandemic response (*8*).

This global health crisis puts extra pressure on regular waste management practices, leading to inappropriate management strategies, including mobile incineration, direct landfills, and local burnings (*9*). Improper disposal of just 1% of face masks translates to more than 10 million items, weighing 30,000 to 40,000 kg (*10*). Waterlogged COVID-19–related plastic has been observed on beaches and in water (*11*), potentially aggravating the challenge of curtailing microplastics.

At the regional and national levels, prioritization of human health over environmental health has led to the delay or reversal of policies aiming to reduce single-use plastic (*9*). As a result, demand for recycled plastic material has dropped, the profit margins of recycling have decreased, and the environmental footprint of plastics has increased (*9*). We need urgent and coordinated commitment to circular economy approaches, including recycling practices and strict policies against plastic pollution. Companies should continue efforts to curtail virgin plastic use and increase plastic recycling to live up to their corporate social and environmental responsibilities. Without a concerted effort to protect the environment during and after the pandemic, we are unlikely to meet the United Nations' Sustainable Development Goals (*12*).

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