FAIR to the community

Largely owing to inequitable distribution of resources, the United States is failing its population in healthcare, for which it vastly overspends relative to other wealthy countries. We advocate extending research in genetic epidemiology to oversample poor people, underserved ancestry groups and ethnic minorities, as well as to use genetic predisposition as a baseline from which to examine environmental influences on the costly comorbidities of common diseases.

In a recent review, Irene Papanicolas and co-authors (*J. Am. Med. Assoc.* **319**, 1024–1039, 2018) found that the United States spent far more per capita on healthcare than any other of the ten countries with the highest gross domestic product, but had the lowest life expectancy, highest infant mortality and highest maternal mortality, the largest proportion of adults overweight or obese, and high hospitalization rates for asthma and diabetes. The US was otherwise remarkably similar to other wealthy countries, apart from having the lowest proportion of its population covered by health insurance. Where it differed is that it was by far the most populous and diverse nation studied, with the greatest discrepancy in access to doctors based upon income (measured by horizontal inequity index). The authors thought that out-of-pocket spending may be disproportionally by the poor and that many may not make use of healthcare providers because of cost.

The National Academies' 2017 report *Communities in Action: Pathways to Health Equity* (https://doi.org/10.17226/24624) identifies the United States' malady as disparities in the health of communities and groups occupying unequal positions in society and the determinants of health being the different social, economic and environmental conditions in which people live. Although these may be highly correlated with individual behavior and biology and influenced by genetics, the Academies say that inequalities of the environment are by far the greatest influence. In consequence, to fix these serious flaws, the report rightly focuses on investigating the efficacy of community-based structural solutions, anchored on community service sites such as universities and hospitals.

Because these institutions are where the genetic epidemiology research we publish takes place, we endorse efforts to oversample underserved ancestry groups and ethnic minorities and economically under-resourced populations and to recruit them as research participants. This diversified health outreach effort should also extend to diverse sexual orientations and gender identities and should represent veterans and individuals with disabilities. To encourage participation, it is important that there be interventional studies addressing locally defined priority health needs identified as desirable by the participants themselves. To encourage participation and harmonization of terminology among such studies, self-reporting tools such as common vocabularies have an important role to play. In this issue, Melissa Haendel and colleagues (http://dx.doi.org/10.1038/s41588-018-0096-x) have developed plain language for mapping self-reported symptoms and experiences onto the terms of the Human Phenotype Ontology. They emphasize that this ontology is suitable for secure data sharing among projects via the Findable, Accessible, Interoperable and Reusable (FAIR) framework. Although this project is aimed at maximizing information for single-gene heritable conditions and other rare diseases, the approach can be readily scaled to tackle other problems in healthcare and to enable the systematic collection of epidemiological and dynamic gene–environment data at national and international scales far beyond those of the largest projects in genetic epidemiology.

Good population health science requires that we tackle the largest ubiquitous influence on public health first: the inequity that is imposed by poverty, structural racism and discrimination. There is a temptation not to call our differences genetic or biological because reification of human diversity as 'race' historically compounded the environmental effects of racism. Nevertheless, shared and individual genetic differences are real and present, and we need to understand how they exert their effects both in the crisis and in its remediation. ❐

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