GUEST EDITORIAL

The Changing Landscape for the Elimination of Racial/Ethnic Health Status Disparities

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Abstract: The elimination of racial/ethnic health status disparities is a compelling national health objective. It was etched in sharp relief by the 1985 report of the U.S. Department of Health and Human Services Secretary's Task Force on Black and Minority Health and considerable attention has been devoted to the problem since that report. But the problem persists, disparities are not fully explained and effective policies to reduce them have been elusive, a situation presenting both opportunities and challenges. Important advances towards reducing racial/ethnic health disparities may be made by better understanding the complex bidirectional relationship between and among the multiple factors, biological and non-biological, influencing morbidity and mortality. The landscape in which these influences are felt is anything but static. In this paper selected components of the landscape that are critical to the elimination of racial/ethnic health status disparities are reviewed. These factors underscore the importance of adopting and maintaining a perspective on health disparities that encompasses a broad array of health determinants.

Key words: Disparities, racial groups, ethnic groups, minority groups, environment, globalization, socioeconomic status, health literacy, health status.

The American debate over the health status of racial/ethnic minorities heated up intensely in 1985 with the release of the Heckler report (named for Margaret Heckler, then Secretary of Health and Human Services), the official title being the *Report of the U.S. Department of Health and Human Services (HHS) Secretary's Task Force on Black and Minority Health.*[1] Of course, before the report, there were periodic discussions and papers on the health of African Americans and related societal facts such as the disproportionate number of African Americans living in poverty. The Heckler report, however, was a landmark document in the history of minority health. It examined four major racial/ethnic minority groups in the United States (African Americans, Asian/Pacific Islanders, Hispanics, and Native Americans) and compared to them with the white population, a perspective congruent with the increasing

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ethnic diversity of the United States. It was prepared under the aegis of the National Institutes of Health, the body in the U.S. responsible for the health research agenda.

In 1990, *Healthy People 2000*, the nation's statement of policy on health promotion and disease prevention, called attention to the need to focus prevention efforts more sharply on racial/ ethnic minorities and other special populations, with the objective of reducing health status disparities between these groups and the majority. Eight years later, in 1998, President Clinton in a radio address committed the nation to an ambitious goal: by the year 2010 eliminate the disparities experienced by racial and ethnic minority populations; these disparities included infant mortality; cancer screening and management; cardiovascular disease; HIV infection; and child and adult immunization.[2] Since then much federal, state and local effort has been devoted to achieving this objective. Numerous organizations and agencies are exploring the most appropriate programs and services to ensure meaningful progress in eliminating health disparities disfavoring racial and ethnic minorities. Attempts are also underway to repair related policy misunderstandings.

Despite the tremendous promise for health sciences and biomedical research, however, and general improvements in the health status of the U.S. population, it is now clear that health status disparities between racial/ethnic minorities and the majority have not been fully explained and that policies to eliminate them remain elusive. Our journey of understanding is far from complete. Some disparities in health status have widened in the last three decades. Perhaps most tellingly, children younger than one year and born to black mothers have markedly higher mortality rates (14 per 1,000 live births plus late fetal deaths) than infants born to white mothers (5.7 per 1,000 live births plus late fetal deaths; data are for 2001).[3] If these trends continue, it is unlikely the U.S. will achieve the *Healthy People 2010* objectives, which are even more ambitious than those set in *Healthy People 2000*. The health status disparities discourse has too often been dominated by health insurance issues, access to medical care, and more and better data collection and coding. This is said without rancor, as the emphasis is understandable, but we believe other factors should be emphasized now.

To adopt a usefully wide perspective on health status disparities, one that is based on an array of determinants of morbidity and mortality, it is important to consider non-biological, socially-driven, health-related phenomena to guide and regulate future decisions and efforts to reduce racial/ethnic disparities in morbidity and mortality. Such a re-orientation is the objective of this paper.

There is no doubt that attention to the health-related considerations in this paper will be of increasing importance because effective approaches to eliminating health disparities are more likely to evolve among, not within, traditional disciplines as we learn more about the convergence of any number of factors that can create conditions in which health status disparities emerge and become rooted in society. Moreover, as Wade Hampton Frost (who in an earlier period made epidemiology the center of public health) with his colleagues made clear,[4] the prevention of disease requires something more than knowledge of specific organisms of disease. It equally requires knowledge of the community in the broadest sense of the term. The historical public health record provides ample evidence of the importance of a focus on community

in all of its social, economic, political, and ethical dimensions. The list of potential determinants of health operating at or having influence on the community level is long. At the same time, communities today are undergoing profound transformations. Their contours can be only dimly perceived and their driving forces barely understood; the momentous consequences of these changes can hardly be imagined, although they all may affect human health and well-being deeply.

In this context, it is clear that the landscape for eliminating health status disparities is changing as well. Moreover, the task of translating a wide array of theoretical constructs, social and economic data, principles, and concepts into policy decisions is often perplexing, mainly because of the difficulties posed by how to connect pieces or to express them in health risk terms, which is important for providing clues to risk management strategies. Even the evidence for evidence-based decisions in health may not be helpful if it is not put forth in a form in which decision makers can use it. One relevant troubling trend is the decline in racial and ethnic minority participation in clinical trials and in other evidence-gathering approaches, a trend that raises questions about the application of the evidence from such studies to policies for the elimination of health disparities. For instance, the cohorts were almost exclusively white in a recent study of cardiovascular risk that found that parental cardiovascular disease predicted future offspring events in middle-aged adults, which limits the generalizability of the evidence to other racial/ethnic groups.[5]

Different well-informed and well-meaning observers may disagree on the relevance of the landscape sketched here for current and future approaches to eliminating racial/ethnic health status disparities. However, even those who disagree must recognize that any approach that blurs the differences among the numerous direct and indirect determinants of racial disparities in health status, or that fails to recognize some at all, could do more harm than good.

Kickbusch and Buse,[6] astutely surveying public health issues of the twenty-first century, identify three types of long-term transitions shaping people's well being: demographic transitions, economic transitions and governance transitions. Each of these types covers a wide spectrum of subtypes, specific examples of which are examined in the following pages.

Demographics

Population data are integral to understanding the burden of morbidity and mortality and current demographic shifts are impossible to ignore, especially in the developing world as it becomes more urban and industrialized.[7] Almost daily, health and social service systems at home and abroad, as well as the systems for economic transactions, are being altered by population dynamics. The mass relocation of rural populations was a defining demographic trend of the latter half of the twentieth century. The world's cities are currently growing at four times the rate of their rural counterparts, and at least 40% of their expansion is the result of migration rather than natural increase.[8] Rural-to-urban migration in cities without adequate infrastructure (including effective municipal services (e.g., waste collection and disposal); affordable, high-quality housing; good public transportation; and well designed and maintained school buildings) has serious health consequences, not the least of

which is the spread of infectious diseases.[9] In the United States, the Hispanic and Asian populations each are growing faster than other population groups, according to the most recent Census Bureau analysis.[10] The number of Hispanics in the country has increased 13% and the number of Asians has increased 12.5% since the 2000 census. (The total population growth rate in that period was 3.3%.) As of July 1, 2003, there were 39.9 million Hispanics in the United States, up from 35.6 in April 2000, making Hispanics the largest minority population in the country. (Blacks were second with 38.7 million.) While the Hispanic population increased 13% during the 39-month period examined, the number of blacks rose 4.4%. The swift growth of the Asian population, many of whose number are working-age adults (18 to 64 years old) is less widely recognized. The number of Americans of Asian descent totaled 13.5 million as of mid-2003, up from 12 million in April 2000. According to the Census Bureau, about 4.3 million people listed themselves as being of more than one race, up 10.5% from 2000. People who identified themselves only as white remained the single largest group, at 197 million, up just 1% from 2000 to 2003.[11]

Another dimension of demographic transition is aging. By 2020, continuing the present birth and death rates, the elderly will constitute 17% of the country's population, a trend seen globally as well as declining fertility becomes widespread. Aging increases susceptibility to infection in the absence other underlying conditions. The efficacy of immunization also decreases with advancing age. Some elderly are more vulnerable to infectious diseases because of a breakdown in host defenses due to chronic disease, use of medication and malnutrition. In economic terms population aging depresses the growth of government revenue for such services as population-focused prevention programs. Estimates are that by 2050 pensions and health care cost will consume one-quarter of public funding in most industrialized countries.[12,13]

Moreover, because of differential birth rates in the U.S., an increasingly disproportionate fraction of the country's children, adolescents and young adults be nonwhite. There are broad social and economic implications of an aged population that is disproportionately white and a youth population that is disproportionately minority.[11,14] One demographic trend in particular has excited the attention of the health services community. Hispanics in the United States present an "epidemiological paradox." They have less health insurance, and often receive poorer health care, but by many indicators have better health than other U.S groups. Another indicator: pregnant Latinas have less education, lower income, and less health care during their first trimester than mothers from other groups, yet they have fewer low birth-weight babies than other groups and experience lower infant mortality than African American mothers.[15] The phenomenon is a good example of what may be profitably explored under the broad umbrella of multiple sources of health disparities.

Health policymakers and economic development practitioners should pay particular attention to demographic data in addressing health disparities issues because they often capture many features of social and economic well-being. At the same time, Teitlbaum and Winters remind us that, compared with political,

economic, and technological change, demographic growth or decline is usually slow and gradual,[16] often impossible to perceive in the short term, proceeding so slowly, in fact, that societies have time both to adjust to increasing or declining numbers and to modify their fertility behavior should they choose to do so.

Health/Science Literacy

Another segment of the landscape relevant to health status disparities is health/science literacy. The commonly used operational definition of health literacy was developed by the National Library of Medicine and used in *Healthy People 2010*: it refers to the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions,[17] encompassing both an appreciation of health/scientific information and application of knowledge to personal and societal problems. It is also expected that people with health/science literacy will to some degree recognize the economic, political, and legal implications of scientific progress. Health literacy should concern everyone working to reduce health status disparities, including those involved in health promotion and protection; disease prevention; early screening; ongoing health care and ongoing health maintenance; and policymaking.

Findings of the Institute of Medicine's Committee on Health Literacy underscore the importance of the subject in the twenty-first century. The Committee points to the need for health literacy skills for reading health information; interpreting charts; making decisions about participating in research studies; using medical tools, such as peak flow meters or thermometers, for personal or familial health care; calculating timing or dosage of medicine; and even voting on environmental health issues.[18] The world supply of information increases daily and nowhere is the flood greater than the sciences. Because of this avalanche of new information, science literacy among most members of the public lags far behind the technological trends and innovations of most interest to scientists. The surge in health and medical websites should especially be noted in this connection. While such websites offer much more information than was readily available in earlier times, effectively getting it involves more than clicking the mouse; often what is called for is sustained intellectual effort on the part of the information consumer to develop valuable critical thinking skills and to evaluate the quality of information.

Moreover, the public is often confused about conflicting scientific information in the popular media. The effects of sodium on hypertension, a condition affecting 50 million individuals, provide one good example. In February 2004 an Institute of Medicine (IOM) panel lowered the "daily sufficient amount" of sodium to 1.5 g/d (3.8g/d of salt) for the health of 19-to 50-year-olds with normal blood pressure.[19] Canadian researchers, however, came to different conclusions. A week prior to the IOM report, a Canadian research group suggested lifestyle modifications such as exercise and weight reduction to counter hypertension but did not recommend a reduction in sodium intake for Canadians with normal blood pressure.[20]

Another example emerges from in the field of environmental toxicology. Hormesis, which refers to the paradoxical effects of low-level environmental toxicants, a concept once discredited, has come back into environmental health

discussions.[21] The argument, drawing on a number of new findings and reanalysis of older data, is that low doses of toxins (cadmium, pesticides, and dioxins) benefit organisms in some ways. At the same time, published reports indicate that some chemicals that mimic hormones (so-called endocrine disruptors) may be more harmful at low doses than they are at higher doses.[22] What is unclear is the mechanism of low-dose effects. This lack of clarity further exacerbates public confusion about the environmental health risk of exposure to environmental toxicants. Another example: It is also unclear, and there is little consensus on, whether slightly elevated levels of mercury due to fish consumption constitute a danger to most adults, despite warnings of such dangers by regulatory authorities.[23] Still another example from environmental medicine concerns biomonitoring in which environmental chemicals in the body are detected by sampling human tissue such as blood. Advances in science have provided the tools for detecting ever-smaller concentrations of chemicals in a single blood sample.[24] Unfortunately, it is increasingly difficult for clinicians or public health officials to meet the public's expectation for clear explanations of whether the toxins detected by this type of biomonitoring are likely to make people ill. In other words, for now, biomonitoring provides lots of data but little certainty about their potential significance for morbidity or mortality.

There is another relevant important question: To what extent do awareness and knowledge influence attitudes toward the application of advances in technology to health promotion and disease prevention? Peters' group[25] studied this question and demonstrated a significant difference in awareness and attitudes about predictive testing between African Americans and Caucasians. African Americans were less likely to be aware of genetic testing and were less likely than Caucasians to endorse its potential benefits. This difference may result in future disparities in uptake of predictive genetic testing, which has the potential to improve patient care and contribute to decreases in morbidity. Why do these differences exist? The authors reported that African Americans expressed more concern than Caucasians about the potential for genetic testing to be used in the service of racial discrimination. The advent of genetic testing has occurred within a historical context of abuse of African Americans, Latinos, and American Indians in scientific research, most famously in the infamous Tuskegee Syphilis Study.[26] But few would disagree that markedly reducing illness, suffering and death must centrally involve information and communication. As the health care system struggles to address problems of chronic diseases, the participation and engagement of the patient is essential. Evidence abounds that patient participation can affect health outcomes and that its frequent absence in some communities may worsen health status disparities.

Economics

Racial/ethnic health status disparities intersect with the economy in numerous places including the distribution of income and other resources. The relationship between disease, specifically infectious disease, and economic development has been of increasing interest to scholars and practitioners in a number of fields. Studies in social epidemiology and medical anthropology have illustrated the relationship

between large-scale social patterns, such as poverty, and clinical epidemiology (and even biology).[27] Public health economists have also identified correlations between health status and the distribution of economic resources. The arrow points in both directions: not only do diseases have significant and far-reaching economic implications, but poverty and social inequality in and of themselves are major factors in morbidity and mortality trends, and also have a bearing on the new recognition of disease.

House and Williams have examined the relationships between and among socioeconomic status, racial/ethnic status and health. They conclude that what makes socioeconomic position such a powerful determinant of health is that it shapes people's experience of, and exposure to, virtually all psychological and environmental risk factors for health, past, present, and future, and that these in turn operate through a very broad range of physiological mechanisms to influence the incidence and course of virtually all major trends in disease and health.[28]

Moreover, socioeconomic status is often implicated in public health trends that might appear at first glance to be unrelated. For example, chronic infectious hepatitis B virus has been associated with low educational attainment, lower social stratum, and crowded urban residence. Meanwhile, hepatitis B virus has been implicated as a major etiological agent of liver cancer, suggesting that even the latter condition may have an economic determinant.[29] Thus, in the end, socioeconomic position itself is a fundamental cause of varied levels of individual and population health and a fundamental lever for improving health status. Addressing essentially the same issue, Davey Smith and colleagues conclude that socioeconomic position is the major contributor to differences in death rates between black and white men.[30] A better understanding of the pathways and mechanisms linking socioeconomic and racial/ethnic status to health is crucial to reducing socioeconomic and racial/ethnic health disparities.

To include this as part of the changing landscape being sketched, we discuss recent socioeconomic trends, as reported by the Bureau of the Census.[31,32] The proportion of households with close to median income ($43,318 as of 2003) has been on the decline for three decades. In 1967, nearly a quarter of households made between $35,000 and $49,999 (in inflation-adjusted terms) but that share was down to 15% by 2003. At the same time, the percentage of households earning $75,000 and up surged from 8.2% to 26.1% as more women entered the workforce and the pay of those with advanced degrees skyrocketed. Nearly half of the nation's income is now earned by the top fifth of households. The middle's share, meanwhile is flirting with its lowest level in decades. Further, while those in the middle have been earning more in absolute terms, their incomes have fallen far behind those at the top. Incomes for those in the lower middle and the upper middle have also been drifting apart.

Another aspect of this shifting landscape is the transformation of the workforce, a shift no longer just involving factory workers, whose ranks have declined by 5 million in the past 25 years. All types of jobs that pay in the middle range are disappearing, including positions such as produce manager, call center operator and office clerk. The jobs have one thing in common: for people with a high school

certificate and some college training, they can be a ticket to a modest home, health insurance and a decent retirement, among other things. Machines, workers overseas, or temporary employees at home who lack benefits now often replace people in these jobs. And when they are replaced, many do not know what course of action to pursue.

Writing about this phenomenon, Witte concludes that the growing income gap corresponds to a long-term restructuring of the workforce that has carved out jobs from the center.[33] In 1969, two categories of jobs, blue collar and administrative support, together accounted for 56% of all U.S. workers, but this had declined to 39% in 1999. Jobs at the low and high ends have replaced those in the middle; the problem is that while the ranks of janitors and fast food workers have expanded, such jobs at the low end do not support a so-called middle class life-style. At the high end, most jobs require special skills and advanced degrees, putting them completely out of reach of the average displaced worker. Some of the consequences of these changes are becoming clear. The ranks of the uninsured, the bankrupt, and the long-term unemployed have all crept up the income scale, indicating that these problems are not limited to the poor but increasingly affect the historical middle class.[34]

Another portion of the economic landscape is reflected in a June 2004 newspaper headline: *Suits Contend that Hospitals Bilked the Poor*.[35] The report details a lawsuit filed against more than a dozen hospitals across the country contending that the hospitals violated their obligation as charities by overcharging people without health insurance and then hounding them for the money. The same report notes that hospital and medical bills are now the second leading cause of personal bankruptcy after unemployment. One in seven American families has problems paying medical bills, forcing them to make a trade-off between health care and other basic needs such as housing and food. In addition to imposing major financial burdens, large medical bills affect patient and family health-related behavior. In 2003, about a quarter of families with big medical bills did not seek needed care and approximately a third shunned prescription medications.[36]

Around the time that the story about "hospital bilking" broke, an article appeared reporting that hospitals wanted to go on a spending spree, building surgery centers, renovating operating rooms, buying the latest medical equipment and installing new computers,[37] leaving unaddressed the obvious question of where hospitals will get the money to do everything they propose. In some highly dense urban areas, hospitals are rapidly losing money and many have undergone several rounds of consolidations, closings and service reductions. Many hospitals have been buffeted by steep rises in the uninsured population and new disaster-readiness expenses, among other factors. At the same time, consumers are typically more willing to pay for diagnostic and curative services than for prevention and health promotion, resulting in an inefficient use of the health care system.[38] Notably, demand for health care usually increases with income (see, e.g., Caughey *et al.*[39]). This creates a bias in health markets and public spending toward urban curative care. A strong demand for curative services, fueled by information failures regarding prevention, has led to a disproportionate emphasis on medical care facilities.[40] In the District of

Columbia, for example, public health policy over the past decade has been dominated by an emphasis on financing hospitals and clinics. This focus has been so intense that such basic health services such as ensuring a safe water supply were rarely discussed as a basic public health service until the recent widely-publicized problem of high levels of lead, a neurotoxin, in the drinking water supply.[41] In summary, a historically disproportionate emphasis on curative services has resulted in underfinancing of important preventive services.

Having said that, we cannot leave this brief view of the economic landscape without paying attention to the cost of therapeutic drugs, which can have a significant influence on racial/ethnic health disparities. The March 19, 2004 edition of *Science* includes a series of authoritative papers on this topic; the facts referred to in this paragraph are discussed at much greater length in those papers.[42] Much attention has been focused on the high price of drugs, as drug costs to insurers rose nearly 15% in 2000. At the same time, new technologies have sent drug company research and development (R&D) costs soaring, without any corresponding rise in the number of new medications. Since 1996, the number of new drugs approved by the U.S Food and Drug Administration has dropped. In fact productivity (number of new drugs per unit of R&D spending) is apparently getting worse. Many factors are at play here, including increasing complexity of chronic disease research and disruption caused by a steady string of mergers within the pharmaceutical industry.

Of particular relevance to this review is the lack of progress in pharmacogenetics, tailoring drugs more precisely to the genetic profile of patient being treated. Promoted energetically for years, such tailoring has been slow to get out of the laboratory, admittedly in part because the science is so complex. Perhaps more importantly, business managers have been skeptical of an approach that limits the market to a subset of patients. Ironically, managers may eventually be driven toward pharmacogenetics for one of the benefits it offers: a means of economizing on increasingly costly clinical trials.

The economic terrain traversed in this section plainly connects economics and health disparities in ways that should centrally affect public policy.

Globalization

Perhaps one of the most prominent features of the health disparities terrain is globalization, a multi-tiered, multinational phenomenon, which can be characterized as interdependency stretched worldwide. The impact of globalization extends from growth and development to sovereignty and inequality. All of these factors are interrelated with health and health service systems. As Nye points out, globalization is not just an economic issue: as markets have spread, they have tied people together; since markets have unequal effects, the inequality they produce can have powerful political and health consequences.[43] As globalization has matured over the last two centuries, technology and travel have made exchanges of goods, services and ideas increasingly easy.

On the negative side, even the most isolated areas today are affected by diseases such as HIV/AIDS and by environmental stressors such as climate change, industrial pollution, and environmental degradation. Furthermore, the entire global

community can be affected by public health emergencies that arise in one country from complex political crises such as war or civil strife and population displacement. The current well-publicized crisis in the Sudan is just one example. The problems of malnourishment and starvation today are not due to a lack of supply; there is plenty of food on hand to meet global demands. Instead, inadequate infrastructures, mismanagement by some governments, and rural poverty prevent the chronically hungry from reaching the available food supply. After declines for decades, the number of undernourished in the developing world increased by 18 million between 1997 and 2000 to 789 million.[44] These health risks have the potential to destabilize entire societies in our connected world.

Further, borders are becoming increasingly meaningless for people, goods and services, an increased porosity that facilitates disease transmission. These transnational forces can alter populations' susceptibility to disease, dysfunction and premature death. It is worth noting that in the developing world responses to the leading chronic diseases (cardiovascular disease, cancer, chronic respiratory disease, and diabetes) remain inadequate. The reason is that up-to-date evidence related to the nature of chronic disease burden is not in the hands of decision makers in those countries, which are also plagued by the persistent belief that chronic diseases afflict only the affluent and the elderly and that they arise solely from freely acquired risks. In these countries, the belief that the control of chronic disease is too expensive and should wait until infectious diseases are addressed affects policy in fundamental ways. Not to be ignored is the fact that some countries have been slow to recognize the scope of infectious disease epidemics, including AIDS. Thus, today, global AIDS programs are falling short, either in getting funding or in reaching treatment targets or in both.[45,46]

Globalization may well be inevitable and irreversible and so it must be carefully considered as a factor in public health. A strong argument can be made that the forces behind globalization favor corporations and ignore popular concerns such as health conditions. Such a position is consistent with the view that globalization impedes social justice, that it is unable to provide for human needs and that it pits person against person, business against business, in a perpetual quest for higher profits without regard for any higher public good.[47] This introductory discussion of globalization points to a number of intermingled and thorny issues, the disentanglement of which may well have broad implications for the reduction of racial/ethnic health status disparities and for related initiatives to improve the health and welfare of populations.

Environment

Environmental health and environmental quality are recognized as part of a broader social-economic-community development-public health perspective. In fact, the environmental health agenda itself is becoming broader. There are many important and continuously changing stresses on ecosystems and hence on humans, including chemicals manufacturing, mining, urban development, transportation, construction, farming and, perhaps even more serious, living conditions, levels of education, health care and lifestyle choices. At the same time, it is practically a natural

law that people desire to improve their standard of living, a desire resulting inevitably in greater consumption. (While increased consumption brings along problems of its own, one positive result is that, arguably, the higher the living standard, the greater the resources that can be and generally are devoted to health promotion and disease prevention services.) Thus, there is a fundamental conflict between the desire of a diverse and growing population for more goods and services and the desire for an environment with low health risk.[48]

It is obvious that physical environmental factors (excesses or deficiencies) play a fundamental role in human health and disease. From polluted air and water to toxic substances in soil and food, environmental pollutants can pose both direct and indirect risks to human health. Their role in health and health status disparities is often complex and may be influenced by a variety of factors, including exposure patterns, genetic make-up, nutritional habits and psychosocial well-being. Correlations between an environmental hazard and an adverse health effect may not, standing alone, establish that the hazard is a cause of the health problem; indeed, the relative importance of environmental exposure as a cause of disease and death remains controversial. In the United States, however, we have witnessed remarkable change in policy and perspective about the environment in the last three decades to the point where it is now widely understood that environmental health problems can be local, regional or global in scale and that many environmental effects are both long-term and life-threatening.

American efforts to reduce environmental exposures have been productive and the large number of laws and regulations continues to grow. In addition to a variety of state laws and local ordinances, federal statutes regulate such matters as air and water quality. As this paper was being written, the U.S. Environmental Protection Agency (EPA) announced plans to develop clean-air standards that could require 233 counties with 85 million people to reduce emissions of soot and other small particle pollution which are risk factors for cardiovascular and respiratory disease and premature death.[49]

Most observers believe that, in general, the quality of the environment in the United States has improved over the last three decades. Examples of these improvements are detailed in *Environment 2003*,[50] a peer-reviewed EPA technical document, the first comprehensive state-of-the-environment analysis produced by any level of government in the United States. One of us (BW), along with a number of other non-governmental scientists, participated in an intensive pre-publication assessment of the report's indicators of environmental quality and of other supporting data. Despite the data's limitations, the collection yielded important evidence about the quality of the environment. For example, ambient lead concentrations decreased by 94% from 1982 to 2001. The improvements recorded pertain primarily to public health though progress has also been registered in such far-reaching domains as aesthetics and urban planning.

Despite considerable progress, environmental health problems persist. Moreover, the remaining problems are highly complex. For example, there is no doubt that mercury is dangerous. It can clearly damage the brain and fetuses are particularly vulnerable. But it has been difficult to establish with any precision what biological

benefits would result from a particular cut in mercury emissions from power plants that burn coal and fossil fuels.[23] In a climate of emphasis on risk and cost benefit analysis, quantifying health benefits is an important challenge. While the decline in exposure to some of the older hazardous chemicals is noteworthy, environmental regulators continue to voice concerns regarding the introduction of new synthetic chemicals.

The omnipresence of electronics, while desirable, may have some undesirable health risks for workers as well as the larger community. For workers, there are increasing concerns about exposure to chemical and certain materials such as cadmium and chromium used in the manufacture of electronics. For the community, discarded electronic equipment and plant emissions may pose pollution problems. The global air pollution problem is a mixed bag. While toxic lead has disappeared from most of the world's gasoline, a new issue concerns the amount of sulfur to allow in fuels (since sulfur forms noxious gases such as sulfur oxides). (See the Environmental Protection Agency's 1999 Regulatory Announcement for one answer to this question.[51]) Sulfur-laden fuels, especially from the Mideast and Russia, contribute to the growing pollution-induced respiratory disease problem.

Understanding the risk posed by exposure to multiple pollution sources, including both cumulative and synergistic effects, is critical in quantifying the disproportionate burden of environmental hazard to the health and well being of racial minorities and low-income communities. There is a need for more information on environmental interferences with organ system development. Moreover, more work must be done to establish specific environmental influences on specific diseases in order to enhance the development of preventive and disease-modifying interventions. Finally, the questions discussed earlier about what constitutes the acceptable level of environmental risk and how to balance health- and technology-based environmental standards bear directly on the crafting of policies to reduce environmental threats to health in underserved communities.

Another aspect of the environment is not usually covered in environmental health courses in academic institutions or covered in patient counseling: we must begin to formally assess the environmental factors that are driving the obesity epidemic, which shows no signs of slowing. Hill and colleagues, while not discounting the role of biology in differences in weight, assert that the rapid weight gain that has occurred over the past three decades is the result of the changing environment.[52] Their analyses indicate that the current environment in the United States encourages consumption of energy and discourages expenditure of energy. Possible factors in the environment that promote overconsumption of energy include the easy availability of a variety of good-tasting, inexpensive, energy-dense foods and the serving of these foods in large portions. Other environmental factors tend to reduce total energy expenditure by reducing physical activity. These include reduction in jobs requiring physical labor, reduction in energy expenditures at school and in daily living, and an increase in time spent on sedentary activities such as watching television, surfing the web, and playing video games. There is still much to learn about the relative contribution of factors influencing food intake and physical activity. But the fact that environmental factors influence health means that environmental policies must be examined for their effects on health status and, in particular, the health status of specific racial, ethnic and socioeconomic groups.

Comments

This review has merely touched on the broad array of factors that contribute directly and indirectly to health status disparities. No attempt has been made to predict the benefits to health disparities elimination of adapting policies to the constantly changing landscape, nor do we recommend quick solutions to the health disparities problem. Addressing health status disparities presents the opportunity to employ many strategies, including surveillance, prevention, detection, diagnosis and treatment, broadly defined. Simultaneously, the project is challenged to do something beyond tinkering at the margin and faces uncertainty about what that something should be if it is to affect health outcomes significantly.

However, the convergence of demographic changes, economic globalization, poverty and social inequality, war, changing ecosystems (broadly defined) and the breakdown or absence of public health measures may augur an ominous future of continuing (or even worsening) racial/ethnic health status disparities. We need not accept this vision of the future, but to avoid it we must understand how these and other important factors interact as we create policies, programs and services to create a more promising reality. Although ensuring access to high quality medical care for all Americans must remain an important public health objective, it is only one factor in the total equation for addressing racial/ethnic health status disparities. Evidence continues to grow of the limited impact of medical care in explaining socioeconomic and racial/ethnic disparities. Estimates are that medical care accounts for only about 10 to 15% of the nation's premature deaths. As Issacs and Schroeder, in a recent essay, noted: "Thus, ensuring adequate medical care for all will have only a limited effect on the nation's health."[53]

The landscape described here includes much more than health care access and individual-level behaviors. The terrain covers, for example, social and economic policies that are not designed primarily to advance health but that nevertheless have significant effects on health. We have in mind such varied policies as minimum wage laws, zoning regulations, economic reconstruction (including improvements in a community's physical infrastructure), and a rebalancing of the global economy. Other examples include governmental and private sector programs designed to ensure that all groups have Internet access and the relevant training to use it; these things, too, can affect health status. All of the above are areas that require sustained investigation to assess more critically their health consequences.

In summary, multifaceted challenges posed by efforts to eliminate racial/ethnic disparities in health status require a multifaceted response by scholars and policymakers in health, environment, social services and economics. Facing these challenges requires political will not only in the government (at all levels) but also in business and industry, academia and those most affluent sectors of society where much public policy is shaped. Scholars and policymakers in health, environment, social services and economics would greatly benefit from continuous, serious, and realistic joint discussion of the broader determinants of health status. Such discussions would illuminate the farther reaches of the landscape traversed here by lending urgency to efforts to eliminate racial/ethnic health status disparities and identifying the work that must be done to make those efforts successful.

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