Translating Research Evidence Into Practice to Reduce Health Disparities: A Social Determinants Approach

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Translating research evidence to reduce health disparities has emerged as a global priority. The 2008 World Health Organization Commission on Social Determinants of Health recently urged that gaps in health attributable to political, social, and economic factors should be closed in a generation. Achieving this goal requires a social determinants approach to create public health systems that translate efficacy documented by research into effectiveness in the community. We review the scope, definitions, and framing of health disparities and explore local, national, and global programs that address specific health disparities. Such efforts translate research evidence into real-world settings and harness collaborative social action for broad-scale, sustainable change. (*Am J Public Health.* 2010;100:S72–S80. doi:10.2105/AJPH.2009.167353)

Ideally, all individuals should have an equal opportunity to reach their full potential for health, but reality falls far short of this goal. Because so many individuals lack opportunities for physical and mental well-being, the elimination of health disparities has emerged as a major worldwide public health objective. A 2008 publication of the World Health Organization (WHO) Commission on Social Determinants of Health (CSDH) identifies persistent and widening health inequities as avoidable and calls for closing the health gap in a generation.[1] Several of the 8 United Nations Millennium Development Goals either directly or indirectly address the elimination of health disparities via eradicating extreme poverty and hunger, achieving universal primary education, promoting gender equality, and empowering women.[2] Similarly, in the United States, 2 overarching goals from *Healthy People 2010* are to maximize quantity and quality of life and eliminate health disparities.[3]

To improve health and prevent disease, the global scientific community has conducted considerable research, generated relevant evidence, and translated research findings into evidence-based guides. In the United States, these include *The Guide to Community Preventive Services*,[4] the *Guide to Clinical Preventive Services*,[5] and the Institute of Medicine's *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*.[6] Global examples include the International Agency for Research on Cancer's *World Cancer Report*[7] and the WHO's *Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases*.[8] However, the extensive evidence amassed and the many recommendations for disease prevention and treatment have been largely concentrated in public health and academic medicine and could be more strongly linked to other critically related disciplines as well as to practice and advocacy settings. Without such linkage, the compelling evidence and recommendations will fail to stimulate change and the stark health inequalities throughout the United States and the world will continue or grow worse.

Eliminating health disparities will require heightened emphasis on translating and disseminating proven interventions in ways that will reach all people, irrespective of social class or racial and ethnic background. It will also require transcending the confines of academia to reach and influence broader real-world settings. Here we review the scope of health disparities, including their current definitions and framing, and explore strategies for eliminating them through an intersectoral, social determinants approach. We highlight several recent US and global initiatives that translated research evidence into real-world settings through collaborative social action, aiming to initiate broad-scale, sustainable elimination of health disparities.

THE SCOPE OF HEALTH DISPARITIES

Of all members of society, those who are poor and have a low socioeconomic position (SEP) suffer disproportionately from poor health outcomes. Evidence for this is found in myriad international and domestic studies.[1,9,10] For example, Mackenbach et al. recently found a near-universal link in 22 European countries between lower SEP and higher mortality.[11] These results mirror those from studies in Sweden,[12] England and Wales,[13] Japan,[14] and the United States.[15]

Profound health disparities are common in the United States. The recent "Eight Americas" report highlights large social and geographic disparities in life expectancy across the country that cannot be explained by "race, income, or basic health-care access utilization alone."[16(p1513)] The complicated roots of such health disparities include many social factors (e.g., living environment, education, employment, and communication opportunities) that disproportionately affect the health of poor and minority populations.[17–21] The Agency for Health Care Research and Quality's 2008 *National Healthcare Disparities Report* concluded that between 2000 to 2001 and 2004 to 2005, overall disparities in health care quality and access remained unchanged or worsened for poor and racial/ethnic minority populations.[9] The report cited continued or widening gaps for specific health outcomes such as immunization rates, AIDS diagnoses, and access to prenatal care. The report cited lack of health insurance as a persistent major barrier to eliminating health disparities.

BEYOND BIOLOGY

Eliminating health disparities will require an understanding of health. The field of medicine has traditionally been grounded in the individual approach to health, in which diagnosis and treatment focus on an individual's biology of disease. This approach, although critically important, represents only part of a needed and broader population approach. An integrated, multilevel, social determinants approach also focuses on social and economic factors, social support networks, physical and social environment, access to health services, and social and health policies.[22–25] As Rose notes, influences on health outcomes may occur both on a societal level, or upstream (e.g., policies), and on the individual level, or downstream (e.g., behaviors).[26]

Reducing health disparities involves a whole-stream strategy that addresses upstream and downstream factors. For example, global HIV prevention efforts have frequently adopted strategies focused both on upstream factors (e.g., gender equity, access to antiretroviral medicines, and targeted media campaigns)[27–30] and downstream factors (e.g., counseling and testing outreach, safer sex, and risk reduction counseling).[28,31–33] Addressing all of these influences over the lifespan maximizes a person's chances of reaching his or her highest attainable standard of health.

A growing literature is exploring the social determinants of health in a public health framework. Ansari et al.'s model, for example, proposes an integrated framework with 4 major components at multiple levels: (1) social determinants (socioeconomic factors, psychosocial risk factors, and community and societal characteristics), (2) disease-inducing behaviors, (3) health outcomes, and (4) health care system attributes.[34] The CSDH used a public health framework explicating the social determinants of health to generate their recommendations for improving conditions of daily life, rectifying inequitable resource distribution, measuring and understanding problems, and assessing the effects of action.[1]

An integrated social determinants approach provides varied and complementary lenses through which to view and address health disparities. In addition to examining types of diseases, this approach considers population domains (e.g., SEP or gender), risk factors (e.g., tobacco use or obesity), and geography (e.g., rural versus urban or developed versus developing countries). Figure 1 illustrates the potential factors within each of these 4 lenses and the extent to which all of these perspectives overlap and interact under real-world conditions.

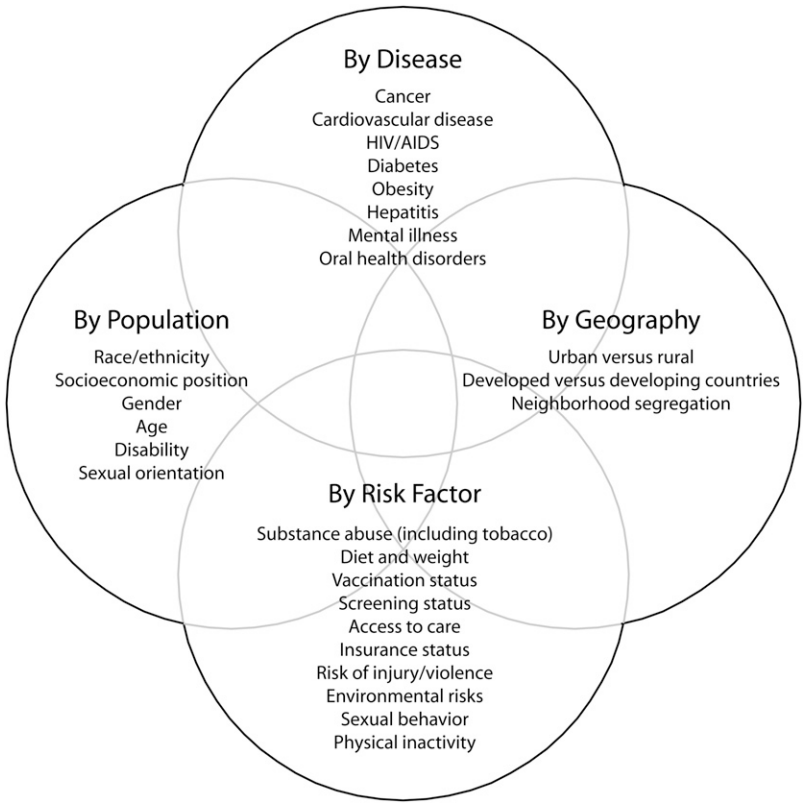

FIGURE 1—Multiple and overlapping lenses for viewing health disparities.

Moving toward practice then requires the interaction of these various lenses with targeted actions designed to address the needs of socially disadvantaged groups. The Affordability Ladder Program proposed by Dahlgren and Whitehead provides a method to analyze options in health services from a public, demand-side perspective.[35] Dahlgren and Whitehead advocate a step-by-step framework that begins with an identified health care need and progresses toward a variety of treatment paths (no care, informal care, access to professional care, quality of professional care) while simultaneously considering the health and social consequences, burden of payment, and policy environment that correspond to each step. This approach, which allows study of health systems through an equity lens, offers opportunities to measure and evaluate how various populations experience myriad aspects of health care.

The social determinants approach also involves defining health disparities in a way that engages people to become advocates for change. Thus far, the public health community has used multiple definitions, underscoring the term's complexity.[36,37] As the first group to offer a quasi-official definition for this term, the National Institutes of Health specified that "health disparities are differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States."[37(p7)] Another frequently used definition explains a health disparity as "the quantity that separates a group from a specified reference point on a particular measure of health."[38(p2)] Though accurate, these definitions employ dispassionate and technical language.

TABLE 1—The RE-AIM Model for Translating Research Efficacy Into Community Effectiveness to Reduce Health Disparities

RE-AIM	Efficacy (Limited Research Settings)	Effectiveness (Broad Community Settings)	Implications for Health Disparities Reduction When Guided by Effectiveness
Reach: participation rate and representativeness of participants	Homogenous sample	Heterogeneous sample	Includes individuals representing the study community with special attention to hard-to-reach groups
Efficacy/effectiveness: effect of an intervention on specified outcomes	Intense, specialized intervention	Brief, feasible intervention	Easily incorporated, culturally competent interventions; outcomes resonate with community interests and goals
Adoption: number and representativeness of settings and interventionists	1 setting	Multiple settings	Efforts are complementary to and in collaboration with existing community services, structures, and policies; participants receive intervention in a familiar setting
Implementation: quality and consistency with which intervention is delivered	By research staff	By variety of people	Participants educated by trusted community peers about implementation; consistent with how services may be provided in real-world, resource-limited settings
Maintenance: how long intervention holds up at both the individual (behavior change) and organizational (institutional shift) level	Few or no issues	Major issues	Sustainability efforts consider competing interests and challenges

Note. RE-AIM = reach, effectiveness, adoption, implementation, and maintenance.
Source. Data from Glasgow et al.[42] and Jilcott et al.[45]

The terms *inequality* and the even more illustrative *inequity* better convey the normative concept that differences in health are unjust, unnecessary, and unacceptable.[25,39]

Braveman and Gruskin proposed a definition of health equity that compares health and its social determinants between more and less advantaged social groups by specific criteria.[40] Such a reframing can help mobilize social and public health actors to address unjust conditions, generate public commitment for change, and ensure accountability. As an example, the CSDH's 2008 report refers to inequities rather than inequalities.[1] Such framing efforts may better mobilize those involved in research, practice, and policy to join the public and the media in bridging the critical disconnect between development and delivery noted by Freeman.[41]

TRANSLATING RESEARCH EVIDENCE INTO PRACTICE

Translating the evidence of health inequities into practice requires research that bridges the gap between discovery and delivery. In the past, it was usually assumed that research results would somehow trickle down (in a process known as passive diffusion) without much attention given to the exact mechanisms or the intended target audience. In studying this conundrum, Glasgow et al. concluded that public health studies have focused largely on efficacy research, that is, trials conducted in limited settings with strictly defined, homogeneous samples and resource-intense, specialized intervention protocols, often with limited real-world application.[42–44] They recommended instead more commitment to effectiveness research, in which interventions are tested in real-world settings with a broader audience. The disconnect between efficacy and effectiveness research needs special attention because challenges to adoption, implementation, and sustainability of interventions on a population level, particularly in resource-limited settings, raises issues about real-world limitations that can drive health inequities.[42] When interventions are scaled up, benefits may accrue unequally across different SEP groups, thus exacerbating disparities.

Moving from efficacy to effectiveness can build sustainability at the community level. To this end, Glasgow et al. have recommended regular employment of the RE-AIM (reach, effectiveness, adoption, implementation, and maintenance) model, illustrated in Table 1, to focus and evaluate public health research efforts.[42,45] Effectiveness comes through brief, carefully constructed, and feasible interventions that public health workers can implement in multiple real-world settings. These efforts refocus on "research that is contextual, practical, and robust" and move public health toward sustained intervention effects at both the individual and community levels.[44(p24)]

Translating results to influence public health practice and policy requires explicit attention to the real-world challenges of implementation and scaling up. Kim and Gilks, for example, emphasized scaling up as a key element to countering the AIDS epidemic worldwide (particularly within resource-poor settings), calling on researchers, practitioners, and policymakers to move beyond pilot projects, establish specific and time-limited targets, and accelerate momentum for expanding treatment access and adherence support.[46] The practice of implementation can, in turn, generate new research questions relevant to the real-world problems of health disparities.

Novel methods and approaches must drive innovative research design and dissemination to benefit communities. Community-based participatory research (CBPR), which brings together academicians and community members as equal partners in the research process, deserves further attention.[47,48] CBPR invests in human capacity and builds competencies among community-based organizations (CBOs) to effectively engage in research dissemination. Whereas models of research translation have traditionally asked how research institutions may unilaterally translate evidence for the benefit of

practice (push factors), CBPR generates a 2-way dialogue between researchers and the community. This reciprocal model focuses on research interests initiated by the practice community (pull factors) as well as on push factors initiated by researchers.[20] The community and researchers can thus jointly identify where research gaps exist.

Public health leaders and researchers practicing CBPR and other innovative models of research design must engage diverse sectors—including CBOs, government agencies and policymakers, and target populations—to develop research aims, interventions, conclusions, and dissemination efforts that fit the interests of all participants. Traditionally, society has focused on improving population health primarily through health care delivery systems (e.g., hospitals, clinics, and patient settings). However, events such as the September 11 and anthrax attacks of 2001 and the devastating hurricanes of 2005 have all underscored the need for broad partnerships involving all societal sectors (such as homeland security and public safety, as well as the business community, the media, and government officials). These vital partnerships could build sustainable and effective public health systems that both alleviate health inequities and save lives.

EVIDENCE FOR THE SOCIAL DETERMINANTS APPROACH

Global momentum is moving toward broad-scale, social-determinants approaches to reducing disparities. International and national commissions have been convened, reports have been drafted, and intersectoral systems and opportunities for collaboration are being created. The CSDH boldly and bluntly concluded in its 2008 report that "social injustice is killing people on a grand scale" and calls on all governments to achieve health equity and close the health gap in a generation.[1(p26)] The CSDH also advocated complementing the efforts of the health sector with involvement by other diverse and critical sectors of society—government, local communities, civil society, the private sector, and research institutions—to influence the social determinants of health. Marmot and Bell emphasized that translating the CSDH recommendations effectively into national policies and practice arenas will require top government leadership, action across diverse policy areas, community participation, and integration of local, national, and global efforts.[49] Like them, Wilensky and Satcher highlighted the opportunities presented by the global financial crisis and the change in US administration to enact the CSDH's recommendations and employ new energies for eliminating health disparities.[49,50]

The WHO and the Public Health Agency of Canada collaborated on the 2008 report *Health Equity Through Intersectoral Action*, which summarized ongoing interdisciplinary work.[51] An analysis of 18 case studies from high-, middle-, and low-income countries (e.g., England, Ecuador, and Uganda, respectively), the report shows how governments and communities are trying to use intersectoral action and a social-determinants approach to reduce inequities.

England's national commitment to reducing disparities is evident in its *Independent Inquiry Into Inequalities in Health*[52] and subsequent development of a comprehensive program for action in 2003.[53] This initiative, which calls for action at both national and local levels, has spurred 18 government units to undertake collaborative and comprehensive strategies to increase health equity in numerous target areas, including smoking, housing quality, nutrition, injuries, infant mortality, and poverty reduction. A final report issued in 2008 showed that nearly all policy commitments made in this initiative had been achieved since 2003.[54] In addition, mortality rates for cardiovascular disease and cancer for persons younger than 75 years in the identified target group (persons in the 20% of locations with the country's worst health and deprivation indicators) fell faster between 1995 and 1997 and between 2004 and 2006 than in the country as a whole, and life expectancy for both men and women in this target group increased in the same periods.[51,54]

Clear national targets derived from specific evidence-based actions, use of local evidence and actions, and engagement of both national leaders and neighborhood and community groups are credited as some of the factors responsible for successes to date.[54] Although disparities in infant mortality, overall life expectancy, and other target areas persist or are behind target levels,[54] England commissioned a strategic review of these health inequalities to more carefully explore the progress and challenges in meeting program targets.[55]

Other countries cited in the WHO report, including Uganda and Ecuador, have also demonstrated progress in planning.[51] Uganda employed a new framework to move decision making to the local level to better assist those in need.[56] Ecuador implemented an intersectoral health council to improve health systems and policies in the municipality of Cotacachi by mobilizing collaboration between local health professionals and colleagues in other fields, such as education, labor, and environment.[57] In both countries, the approach emphasized the importance of integrating diverse stakeholders, especially local leaders and policymakers, to ensure effective and sustainable strategies for social change. In Uganda, the new intersectoral framework has supported the extension of social services in new settlements, enhanced the monitoring of intervention efforts to protect and support internally displaced persons, and reduced cases of childhood acute malnutrition and stunting in the Kitgum District of northern Uganda over a 1-year period from 2005 to 2006.[51,56] In Ecuador, the efforts of the health council have enhanced health and social programs and led to such positive outcomes as the elimination of maternal and child deaths in Cotacachi for 3 consecutive years (2004–2006) and improvements in literacy among area residents between 2004 and 2006.[57]

In the United States, the Institute of Medicine's *Crossing the Quality Chasm* cited equity among its 6 specific aims for improving health care quality.[58] Because the stated purpose of the health system is "to continually reduce the burden of illness, injury, and disability, and to improve the health and functioning of the people of the United States,"[58(p53)] the report concluded that health care should be safe, effective, patient centered, timely, efficient, and equitable. A quality health system ultimately requires equity both on a population level (by ensuring universal care) and on an individual level (by ensuring that health care delivery is not influenced by personal characteristics such as gender, race, income, education, and location). The Institute of Medicine formed a Roundtable on Racial and Ethnic Health Disparities, which has sponsored several national conferences and reviewed the critical "Eight Americas" report.[16] This group has also called for new efforts in

leadership and multidisciplinary collaboration to create policies and programs that reduce health disparities not just by addressing issues of health care access, quality, and use, but also by attacking their fundamental socioeconomic roots.

INTERSECTORAL, SOCIAL DETERMINANTS INTERVENTIONS

Several resources have recently addressed health inequities through public health practice. *Tackling Health Inequities Through Public Health Practice*, a handbook published by the National Association of County and City Health Officials, provides concrete, practical information on how local health departments can build programs for social justice and health equity.[59]

A new resource from the Centers for Disease Control and Prevention, *Promoting Health Equity*, features 9 case examples, with both small- and large-scale projects, to illustrate program and policy initiatives undertaken by communities to address health inequities. These examples underscore the importance of innovative and multidisciplinary partnerships for community action that use a social-determinants approach.[60] Building and Revitalizing an Anti-Violence Environment (Project BRAVE), for example, an intervention in schools in New Orleans, Louisiana, is the product of a partnership between a school-based organization, CBOs, and local public health researchers to reduce the social determinants of violence.[60] Classes encourage students to analyze their experiences of violence through writing, theater, and other types of storytelling to raise awareness and help them become agents of community change. Short-term assessment suggests that school attendance has increased among program participants; subsequent evaluation efforts will focus on longer-term outcomes such as crime rates, educational attainment, and social support.

Healthy Eating and Exercising to Reduce Diabetes is a program developed by the East Side Village Health Workers Partnership, aimed at women residents of the East Side of Detroit, Michigan.[60] Rooted in a CBPR approach, the program aims to increase knowledge, resources, and opportunities for physical activity and nutrition. Thus far, the partnership has conducted outcome and process evaluations of the program, tracked sales of and demand for fresh produce in area markets, and advocated for policy changes to increase community access to healthy foods.

From Neurons to King County Neighborhoods, a policy intervention developed by Public Health–Seattle and King County along with state and local government agencies, CBOs, community residents, and other stakeholders in Washington State, aims to strengthen early childhood environments that will support children's healthy development, school readiness, and school success.[60] To date, the program has conducted stakeholder interviews to gauge knowledge of policy efforts and identify community needs, facilitated several population-level assessments of kindergarten school readiness, and used these data to mobilize community action in specific neighborhoods.

Evidence that intersectoral interventions can effectively address upstream factors such as housing, neighborhood conditions, and improvement of SEP is increasing. Williams cited the Moving to Opportunity housing mobility policy interventions[61] as particularly effective in improving mental health in the United States.[17] This randomized controlled study moved families from higher- to lower-poverty neighborhoods in 5 US cities. Three years after the move, parents in the intervention groups reported significantly fewer distress and depressive symptoms than did parents in the control groups, and boys in the intervention groups reported significantly fewer anxiety, depression, and dependency problems than did boys in the control group.

A 10-year follow-up study from Norway noted significant mental health improvements among residents a decade after their previously poorly functioning neighborhood was refurbished with new schools, recreation facilities, and transportation lines.[17,62] Herd et al. recently found strong preliminary evidence linking a 4.6% reduction in disability (as indicated by self-reported mobility limitations in 1990 and 2000 census data) to every $100 increase in Supplemental Security Income benefits, suggesting a need for further research into the effects of income support policies on health status.[63]

Other broad public health efforts, discussed by Marmot and Bell[49] and Wilensky and Satcher,[50] also illustrate the enormous potential of intersectoral interventions that take a social determinants approach.

Comprehensive Health Care Reform

The historic Massachusetts Health Care Reform Law, a bipartisan effort signed into law in April 2006, mandated shared responsibility among individuals, employers, and government in implementing near-universal health care coverage. To date, this unique effort has enrolled more than 428 000 newly insured persons, and Massachusetts is now recognized as the state with the lowest rate of uninsured residents (2.6%).[64,65] This achievement has received tremendous national attention; less well known are the innovative programs and mechanisms the law provides for reducing health disparities.[66] Chapter 58 of the law includes explicit provisions for increasing health insurance coverage that may not only reduce disparities in the rates of uninsurance among racial/ethnic groups but also improve prevention and treatment services for underserved populations, require explicit data collection on disparities as part of adjusting provider payments (particularly through pay for performance), and increase policy attention to these issues through changes in government infrastructure.

Some activities stemming from the law's focus on disparities deserve particular attention.[67] For example, community health workers enroll individuals in underserved communities in health insurance plans, which appears to have contributed to declining rolls of the uninsured. The legislation also established a Health Disparities Council, which provides annual recommendations to the state regarding improving data on disparities in health access, health outcomes, and the health care workforce; designing, implementing, and improving programs; and improving diversity and cultural competency in the health care workforce.[68] Provisions in the law make Massachusetts the first state to make Medicaid hospital rate increases contingent on quality indicators, including measures of disparities reduction through the pay-for-performance guidelines.[69]

San Francisco created another notable example of a government program aimed at reducing disparities by making health care services accessible and affordable for uninsured residents. Although it does not provide

health insurance, the Healthy San Francisco initiative offers universal access to primary and preventive care to uninsured residents through a clinic network with a sliding-fee scale.[70]

Tobacco Dependence

With 5 million preventable deaths worldwide attributed to tobacco use each year, tobacco control deserves our highest commitment. The tobacco industry has profited over many decades from its comprehensive marketing efforts targeting youths, lower-SEP populations, minorities, and developing countries, thereby creating broad societal and global inequities.[71]

The burden of tobacco addiction and tobacco-related deaths falls heavily on developing nations especially. Worldwide, 1 billion men smoke; 50% of men living in developing countries compared with 35% of men living in developed countries are among them.[68,69] China, where nearly 70% of men smoke, consumes more than 30% of the world's cigarettes.[72,73]

To counter this global public health challenge, the WHO launched the Framework Convention on Tobacco Control, the first and only international public health treaty. To date, 166 countries have both signed and ratified this treaty, committing their governments to adopting a comprehensive range of measures to combat the health and economic effects of tobacco.[74] The United States, along with only 25 other countries, has not signed and ratified the treaty.[74] If implemented aggressively, the treaty articles should address worldwide tobacco disparities. As the first effort of its kind, however, the treaty faces challenges in implementation in the diverse political climates throughout the world, with their competing economic incentives and priorities and their resource scarcities. It is imperative that those involved in implementation of this historic international agreement take the issue of disparities into explicit consideration.

Previous analyses of data from the Global Youth Tobacco Survey (of children aged 13–15 years in developing countries) showed that more than 75% of youths support smoke-free policies despite reports from the majority that they are exposed to smoke in public places.[75] Further attention to reducing global disparities in tobacco use and its consequences should focus on establishing smoke-free policies in public places to protect children and to establish smoke-free norms for the next generation.

In the United States, effective statewide prevention and cessation programs, starting with those created in California and Massachusetts, have used a comprehensive social determinants approach that integrates media campaigns, policies, price increases, and other tactics to aid communities, schools, families, and individuals.[76,77] Targeting both upstream factors (e.g., through counteradvertising campaigns, smoke-free policies, and tobacco taxes) and downstream factors (e.g., through individual and group counseling and nicotine replacement therapy) has stripped some of the glamour and normality from the tobacco industry's image.[76–80] Despite the effectiveness of comprehensive tobacco control programs in reducing per capita smoking consumption,[77] inequities remain. For example, smoking rates of Hispanic and Asian women, women older than 65 years, and college-educated individuals are now below *Healthy People 2010* goals,[3] but populations with lower income or lower education, along with certain other groups, continue to smoke in higher numbers than the national average.[81]

Many states have increased provision of free and low-cost cessation medications for populations in need and have instituted other efforts to address health disparities. In a 2005 needs assessment conducted by the Tobacco Prevention and Control Project of the National Association of County and City Health Officials, 83% of local health department respondents indicated that they addressed health disparities through their tobacco control programs.[82] Moreover, the 2005 National Profile of Local Health Departments showed significant associations between tobacco control programming and efforts to address inequities.[82] Nonetheless, no overarching national approach exists, and coverage of services differs by location and insurance plan. A 2006 survey reported that 39 state Medicaid programs covered at least 1 type of tobacco dependence treatment and that 4 states covered cessation treatment exclusively for pregnant women.[83] The results of a 2009 survey reported by the American Lung Association found that only 6 states offered comprehensive cessation benefits to Medicaid recipients.[84]

Cancer

Of the many pressing global public health concerns, cancer was recently projected by the WHO to become the world's top killer by 2010.[7,85] Cancer disparities have become a major worldwide public health priority.[86]

In the United States, the National Cancer Institute has committed to developing community–academic networks to address cancer disparity issues, connecting resource-rich institutions with community resources.[87] The institute first created the Special Populations Network (2000–2005), which evolved into the Community Networks Program (2005–2010). Although most of the efforts of both these programs focused on specific minority populations (e.g., African Americans or Asian Americans), the MassCONECT (Massachusetts Community Networks to Eliminate Cancer Disparities Through Education, Research, and Training) initiative has instead focused on low-SEP communities, which include many racial/ethnic minority groups. MassCONECT has employed a social determinants approach to link relevant stakeholders—academicians, policymakers, community leaders, and other representatives from community-based coalitions, media, and local and state government—to reduce and eliminate cancer inequities. The program built on the foundation of 4 community-based coalitions to engage community leaders and policymakers in Boston, Worcester, and Lawrence, 3 cities with low-SEP populations.

MassCONECT has emphasized several specific approaches to making its disparities reduction efforts sustainable. Making data usable at the community level through public health geocoding and mapping[88] and broadening outreach to local media regarding widespread health inequities[20] are high priorities. MassCONECT also disseminates efficacious interventions by providing mammography services to underserved populations, increasing access to tobacco cessation services through the statewide Quitline, supporting coalition efforts to swell the ranks of the newly insured through state health care reform, and training CBOs in media advocacy to frame health issues of importance to them and address local health inequities. MassCONECT is also moving toward

sustainability through a series of leveraged CBPR grants focusing on such issues as increasing cancer-screening rates in community health centers, disseminating efficacious interventions in low-SEP communities through the online cancer control planning tool (Cancer CONTROL PLANET; available at http://cancercontrolplanet.cancer.gov), and decreasing children's exposure to secondhand smoke in the home.

CONCLUSION

Health disparities are prevalent within and across nations and urgently require a comprehensive approach. We examined the challenges in translating research evidence into public health policy and practice. Such translation included framing the issues as inequities; undertaking intersectoral, social determinants approaches; and sharing lessons from interventions that have made a difference. Despite recent momentum in bridging the gap between research evidence and practice, capacity building within communities to take advantage of developments in the biomedical sciences, a stronger public policy agenda, and public support for eliminating health inequities are still urgently needed.

In 1948, the WHO defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[89(p100)] More than 60 years later, we more fully understand that the social determinants approach is vital to achieving broad-scale improvements in health. In addition to science and research, education, media, policy, advocacy, community engagement, and social strategy must serve as drivers to addressing and resolving inequities. In the midst of our diversity, such approaches can heighten commitment to what unifies us. As President John F. Kennedy once told a college commencement audience,

> [I]f we cannot end now our differences, at least we can help make the world safe for diversity, for in the final analysis our most basic link is that we all inhabit this small planet, we all breathe the same air, we all cherish our children's future, and we are all mortal.[90] ■

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Human Participant Protection

No protocol approval was needed for this study because no human participants were involved.

References

1. Commission on Social Determinants of Health. *Closing the Gap in a Generation.* Geneva, Switzerland: World Health Organization; 2008.
2. *The Millennium Development Goals Report 2008.* New York, NY: United Nations; 2008.
3. *Healthy People 2010: Understanding and Improving Health.* 2nd ed. Washington, DC: US Dept of Health and Human Services; 2000.
4. Task Force on Community Preventive Services. *The Guide to Community Preventive Services: What Works to Promote Health?* Zaza S, Briss P, Harris K, eds. New York, NY: Oxford University Press; 2005.
5. *Guide to Clinical Preventive Services: Report of the U.S. Preventive Services Task Force. 2nd.* 3rd ed. Alexandria, VA: International Medical Pub; 2002.
6. Institute of Medicine. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care.* Smedley BD, Stith AY, Nelson AR, eds. Washington, D.C.: National Academies Press; 2003.
7. International Agency for Research on Cancer. *World Cancer Report 2008.* Lyon, France: World Health Organization; 2008.
8. *2008–2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases.* Geneva, Switzerland: World Health Organization; 2008.
9. Agency for Healthcare Research and Quality. *National Healthcare Disparities Report, 2007.* Rockville, MD: US Dept of Health and Human Services; 2008.
10. Day P, Pearce J, Dorling D. Twelve worlds: a geodemographic comparison of global inequalities in mortality. *J Epidemiol Community Health.* 2008;62(11):1002–1010.
11. Mackenbach JP, Stirbu I, Roskam AJ, et al. Socioeconomic inequalities in health in 22 European countries. *N Engl J Med.* 2008;358(23):2468–2481.
12. Erikson R, Torssander J. Social class and cause of death. *Eur J Public Health.* 2008;18(5):473–478.
13. White C, Edgar G, Siegler V. Social inequalities in male mortality for selected causes of death by the National Statistics Socio-economic Classification, England and Wales, 2001–2003. *Health Stat Q.* 2008;38(Summer):19–30.
14. Fukuda Y, Nakamura K, Takano T. Municipal socioeconomic status and mortality in Japan: sex and age differences, and trends in 1973–1998. *Soc Sci Med.* 2004;59(12):2435–2445.
15. Rehkopf DH, Berkman LF, Coull B, Krieger N. The non-linear risk of mortality by income level in a healthy population: US National Health and Nutrition Examination Survey mortality follow-up cohort, 1988–2001. *BMC Public Health.* 2008;8(November 10):383.
16. Murray CJ, Kulkarni SC, Michaud C, et al. Eight Americas: investigating mortality disparities across races, counties, and race-counties in the United States. *PLoS Med.* 2006;3(9):e260.
17. Williams DR, Costa MV, Odunlami AO, Mohammed SA. Moving upstream: how interventions that address the social determinants of health can improve health and reduce disparities. *J Public Health Manag Pract.* 2008;14(Suppl):S8–S17.
18. Adler NE, Rehkopf DHUS. U.S. disparities in health: descriptions, causes, and mechanisms. *Annu Rev Public Health.* 2008;29:235–252.
19. Link BG, Phelan J. Social conditions as fundamental causes of disease. *J Health Soc Behav.* 1995;Spec No:80–94.
20. Viswanath K. Public communications and its role in reducing and eliminating health disparities. In: Thomson GE, Mitchell F, Williams MB, eds. *Examining the Health Disparities Research Plan of the National Institutes of Health: Unfinished Business.* Washington, DC: Institute of Medicine; 2006:215–253.
21. Adler NE, Newman K. Socioeconomic disparities in health: pathways and policies. *Health Aff (Millwood).* 2002;21(2):60–76.
22. Institute of Medicine. *Improving Health in the Community: A Role for Performance Monitoring.* Durch J, Bailey L, Stoto M, eds. Washington, DC: National Academies Press; 1997.
23. Berkman L, Kawachi I. *Social Epidemiology.* New York, NY: Oxford University Press; 2000.
24. Krieger N. Theories for social epidemiology in the 21st century: an ecosocial perspective. *Int J Epidemiol.* 2001;30(4):668–677.
25. Krieger N. A glossary for social epidemiology. *J Epidemiol Community Health.* 2001;55(10):693–700.
26. Rose G. *The Strategy of Preventive Medicine.* Oxford, England: Oxford University Press; 1992.
27. Szekeres G. The next 5 years of global HIV/AIDS policy: critical gaps and strategies for effective responses. *AIDS.* 2008;22(Suppl 2):S9–S17.

28. HIV/AIDS Department. *Priority Interventions: HIV/AIDS Prevention, Treatment and Care in the Health Sector*. Geneva, Switzerland: World Health Organization; 2009.

29. Van Rossem R, Meekers D. The reach and impact of social marketing and reproductive health communication campaigns in Zambia. *BMC Public Health*. 2007; 7(December 18):352.

30. Olshefsky AM, Zive MM, Scolari R, Zuniga M. Promoting HIV risk awareness and testing in Latinos living on the U.S.–Mexico border: the Tu No Me Conoces social marketing campaign. *AIDS Educ Prev*. 2007; 19(5):422–435.

31. Centers for Disease Control and Prevention. Rapid HIV testing in outreach and other community settings—United States, 2004–2006. *MMWR Morb Mortal Wkly Rep*. 2007;56(47):1233–1237.

32. Metzger DS, Navaline H. HIV prevention among injection drug users: the need for integrated models. *J Urban Health*. 2003;80(4 Suppl. 3):iii59–iii66.

33. Coates TJ, Richter L, Caceres C. Behavioural strategies to reduce HIV transmission: how to make them work better. *Lancet*. 2008;372(9639):669–684.

34. Ansari Z, Carson NJ, Ackland MJ, Vaughan L, Serraglio A. A public health model of the social determinants of health. *Soz Praventivmed*. 2003;48(4): 242–251.

35. Dahlgren G, Whitehead M. A framework for assessing health systems from the public's perspective: the ALPS approach. *Int J Health Serv*. 2007;37(2):363–378.

36. Institute of Medicine. *Examining the Health Disparities Research Plan of the National Institutes of Health: Unfinished Business*. Thomson GE, Mitchell F, Williams M, eds. Washington, DC: National Academies Press; 2006.

37. National Institute of Health. What are health disparities? Available at: http://healthdisparities.nih.gov/whatare.html. Accessed January 5, 2004. Quoted in: Krieger N. Defining and investigating social disparities in cancer: critical issues. *Cancer Causes Control*. 2005;16(1):5–14.

38. Keppel K, Pamuk E, Lynch J, et al. Methodological issues in measuring health disparities. National Center for Health Statistics. *Vital Health Stat*. 2005;2(141):1–16.

39. Carter-Pokras O, Baquet C. What is a "health disparity"? *Public Health Rep*. 2002;117(5):426–434.

40. Braveman P, Gruskin S. Defining equity in health. *J Epidemiol Community Health*. 2003;57:254–258.

41. Freeman HP. Poverty, culture, and social injustice: determinants of cancer disparities. *CA Cancer J Clin*. 2004;54(2):72–77.

42. Glasgow RE, Lichtenstein E, Marcus AC. Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition. *Am J Public Health*. 2003; 93(8):1261–1267.

43. Glasgow RE, Emmons KM. How can we increase translation of research into practice? Types of evidence needed. *Annu Rev Public Health*. 2007;28: 413–433.

44. Glasgow RE. What types of evidence are most needed to advance behavioral medicine? *Ann Behav Med*. 2008;35(1):19–25.

45. Jilcott S, Ammerman A, Sommers J, Glasgow RE. Applying the RE-AIM framework to assess the public health impact of policy change. *Ann Behav Med*. 2007;34(2):105–114.

46. Kim JY, Gilks C. Scaling up treatment—why we can't wait. *N Engl J Med*. 2005;353(22):2392–2394.

47. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health*. 1998;19:173–202.

48. Viswanathan M, Ammerman A, Eng E, et al. *Community-Based Participatory Research: Assessing the Evidence*. Rockville, MD: Agency for Healthcare Research and Quality; 2004. Evidence report/technology assessment 99.

49. Marmot MG, Bell R. Action on health disparities in the United States: commission on social determinants of health. *JAMA*. 2009;301(11):1169–1171.

50. Wilensky GR, Satcher D. Don't forget about the social determinants of health. *Health Aff (Millwood)*. 2009;28(2):w194–w198.

51. Public Health Agency of Canada. *Health Equity Through Intersectoral Action: An Analysis of 18 Country Case Studies*. Geneva, Switzerland: World Health Organization; 2008.

52. Acheson D. *Independent Inquiry Into Inequalities in Health*. London, England: Stationery Office; 1998.

53. *Tackling Health Inequalities: A Programme for Action*. London, England: Department of Health; 2003.

54. *Health Inequalities: Progress and Next Steps*. London, England: Department of Health; 2008.

55. *Health Inequalities: Third Report of Session 2008–09*. Vol 1. London, England: House of Commons Health Committee; 2009.

56. Mutambi R, Hasunira R, Oringa V. *Intersectoral Action on Health in a Conflict Situation: A Case Study of Kitgum District, Northern Uganda*. Geneva, Switzerland: World Health Organization; 2007. Available at: http://www.who.int/social_determinants/resources/isa_conflict_uga.pdf. Accessed March 31, 2009.

57. Vega LM. *Innovative Intersector Practices for Health and Equity: The Case of Cotacachi Ecuador*. Geneva, Switzerland: World Health Organization; 2007. Available at: http://www.who.int/social_determinants/resources/isa_cotacachi_ecu.pdf. Accessed August 12, 2009.

58. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press; 2001.

59. Hofrichter R, ed. *Tackling Health Inequities Through Public Health Practice: A Handbook for Action*. Washington, DC: National Association for City and County Health Officials; 2006.

60. Brennan Ramirez L, Baker E, Metzler M. *Promoting Health Equity: A Resource to Help Communities Address Social Determinants of Health*. Atlanta, GA: Centers for Disease Control and Prevention; 2008.

61. Leventhal T, Brooks-Gunn J. Moving to opportunity: an experimental study of neighborhood effects on mental health. *Am J Public Health*. 2003;93(9):1576–1582.

62. Dalgard OS, Tambs K. Urban environment and mental health: a longitudinal study. *Br J Psychiatry*. 1997;171:530–536.

63. Herd P, Schoeni RF, House JS. Upstream solutions: does the supplemental security income program reduce disability in the elderly? *Milbank Q*. 2008;86(1): 5–45.

64. *Health Care in Massachusetts: Key Indicators*. Boston, MA: Massachusetts Division of Health Care Finance and Policy; May 2009.

65. *State of the States*. Washington, DC: AcademyHealth; 2009.

66. Chapter 58 of the Acts of 2006; An Act Providing Access to Affordable, Quality, Accountable Health Care. 2006 Mass. Legis. Serv. 65-124 (West).

67. Long SK, Cook A, Stockley K. *Health Insurance Coverage in Massachusetts: Estimates From the 2008 Massachusetts Health Insurance Survey*. Boston, MA: Massachusetts Division of Health Care Finance and Policy; 2008.

68. Commonwealth of Massachusetts. 2007. Chapter 6A: Section 16O. Health disparities council; duties; composition; annual reports. Text of section as amended by 2007, 205, Sec. 2 effective November 29, 2007.

69. Massachusetts Medicaid Disparities Policy Roundtable. *Pay-for-Performance Incentives to Reduce Racial and Ethnic Disparities in Health Care in the Massachusetts Medicaid Program*. Boston, MA: Massachusetts Medicaid Policy Institute; 2007.

70. San Francisco Department of Public Health. Healthy San Francisco: our health access program. Available at: http://www.healthysanfrancisco.org. Accessed March 30, 2009.

71. Koh HK, Massin-Short S, Elqura L. Disparities in tobacco use and lung cancer. In: Koh HK, ed. *Toward the Elimination of Cancer Disparities*. New York, NY: Springer; 2009:109–135.

72. Mackay J, Eriksen M, Shafey O. *The Tobacco Atlas*. 2nd ed. Atlanta, GA: American Cancer Society; 2006.

73. Koh HK, Massin-Short S, Elqura LJ, Judge CM. Poverty, socioeconomic position, and cancer disparities: global challenges and opportunities. *Georget J Poverty Law Policy*. 2008;15(3):663–689.

74. Framework Convention Alliance for Tobacco Control. Framework Convention on Tobacco Control. Available at: http://www.fctc.org. Accessed August 11, 2009.

75. GTSS Collaborative Group. A cross country comparison of exposure to secondhand smoke among youth. *Tob Control*. 2006;15(suppl 2):ii4–ii19.

76. Office on Smoking and Health. *Best Practices for Comprehensive Tobacco Control Programs–2007*. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion; October 2007.

77. Koh HK, Judge CM, Robbins H, Celebucki CC, Walker DK, Connolly GN. The first decade of the Massachusetts Tobacco Control Program. *Public Health Rep*. 2005;120(5):482–495.

78. Institute of Medicine. *Ending the Tobacco Problem: A blueprint for the Nation*. Bonnie R, Stratton K, Wallace R, eds. Washington, DC: National Academies Press; 2007.

79. Fiore MC, Croyle RT, Curry SJ, et al. Preventing 3 million premature deaths and helping 5 million smokers quit: a national action plan for tobacco cessation. *Am J Public Health*. 2004;94(2):205–210.

80. National Cancer Institute. *The Role of the Media in Promoting and Reducing Tobacco Use*. Bethesda, MD: National Institutes of Health; 2008. Tobacco

Control Monograph No. 19. NIH Publication 07-6242.

81. Centers for Disease Control and Prevention. Cigarette smoking among adults—United States, 2006. *MMWR Morb Mortal Wkly Rep.* 2007;56(44):1157–1161.

82. *Issue Brief: Incorporating Principles of Social Justice to Tobacco Control.* Washington DC: National Association of City and County Health Officials; 2007.

83. Centers for Disease Control and Prevention. State Medicaid coverage for tobacco-dependence treatments—United States, 2006. *MMWR Morb Mortal Wkly Rep.* 2008;57(5):117–122.

84. American Lung Association. Helping smokers quit: state cessation coverage. 2009. Available at: http://www.lungusa.org/assets/documents/publications/other-reports/smoking-cessation-report-2009.pdf. Accessed January 5, 2009.

85. Stephenson J. Cancer no. 1 killer by 2010. *JAMA.* 2009;301(3):263.

86. Koh HK, ed. *Toward the Elimination of Cancer Disparities.* New York, NY: Springer; 2009.

87. Kerner J, Rimer B, Emmons KM. Dissemination research and research dissemination: how can we close the gap? *Health Psychol.* 2005;24(5):443–446.

88. Krieger N, Chen JT, Waterman PD, Rehkopf DH, Subramanian SV. Painting a truer picture of US socioeconomic and racial/ethnic health inequalities: the Public Health Disparities Geocoding Project. *Am J Public Health.* 2005;95(2):312–323.

89. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19–22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948. Geneva, Switzerland: World Health Organization; 1948.

90. Kennedy JF. American University commencement address: delivered 10 June 1963. Available at: http://www.americanrhetoric.com/speeches/PDFFiles/John%20F.%20Kennedy%20-%20American%20University%20Commencement.pdf. Accessed March 30, 2009.