

Racial/Ethnic Discrimination and Health: Findings From Community Studies

The authors review the available empirical evidence from population-based studies of the association between perceptions of racial/ethnic discrimination and health. This research indicates that discrimination is associated with multiple indicators of poorer physical and, especially, mental health status.

However, the extant research does not adequately address whether and how exposure to discrimination leads to increased risk of disease. Gaps in the literature include limitations linked to measurement of discrimination, research designs, and inattention to the way in which the association between discrimination and health unfolds over the life course.

Research on stress points to important directions for the future assessment of discrimination and the testing of the underlying processes and mechanisms by which discrimination can lead to changes in health. (*Am J Public Health*. 2003;93:200–208)

Originally published as: David R. Williams, PhD, MPH, Harold W. Neighbors, PhD, and James S. Jackson, PhD. Racial/Ethnic Discrimination and Health: Findings From Community Studies. *Am J Public Health*. 2003; 93:200–208.

THERE IS GROWING SCIENTIFIC interest in examining the extent to which perceptions of racial/ethnic discrimination are a type of stressful life experience that can adversely affect health.^{1–5} The stress induced by personal experiences of racial bias is viewed as one mechanism by which racism in the larger society can affect health.^{6–8} Here we review the evidence for an association between discrimination and health in population-based studies. Gaps in the literature are identified, along with critical next steps for advancing research in this area.

RACIAL BIAS AND HEALTH: THE EVIDENCE

A 1999 review of the literature on discrimination and health identified 15 studies of racial/ethnic discrimination,¹ and a 2000 review of studies restricted to mental health identified 13 studies.² Our goal here is to update these earlier reviews. We used the key word *prejudice* to search the MEDLINE database from 1998 to the present and the keywords *discrimination*, *race discrimination*, *ethnic discrimination*, *social discrimination*, and *racism* to search the PSYCHINFO and SOCIOFILE databases for the same period. We limited our search to population-based empirical studies that examined the association between perceptions of racial/ethnic discrimination and a particular indicator of health. We excluded studies involving college student samples^{9–11} and studies in which the outcome measured was

an aspect of medical care^{12,13} or stress.¹⁴ We identified a total of 53 studies, 24 of them published between 2000 and the present, reflecting the increasing number of studies in this area.

Table 1 lists the included studies and characterizes the association between perceived discrimination and health status. A positive association indicates that higher levels of discrimination were associated with higher levels of illness/health risk in a multivariate model that included adjustment for demographic and socioeconomic factors (if available). A negative association indicates that higher levels of discrimination were associated with lower levels of illness/health risk. A conditional association indicates the presence of a positive association but only under certain conditions. No association indicates that discrimination was unrelated to health status. We acknowledge that, by focusing on published articles, we may overstate the strength of the evidence. Multiple articles published as part of a single study, such as the Detroit Area Study,^{15–18} the National Study of Black Americans,^{19–22} and the National Survey of Ethnic Minorities in the United Kingdom,^{23,24} sometimes focus on different outcomes but involve overlapping health status measures in certain instances.

MENTAL HEALTH

Mental health status was the most common outcome examined.

Of the 53 studies reviewed, 32 included at least one measure of mental health. Scales of nonspecific distress were the most common mental health indicators used. Of the 25 associations examined for psychological distress, 20 studies reported a positive association between discrimination and distress,^{15,18,20,21,25–39,41} 3 reported a conditional association,^{42–44} and 2 reported no association.^{19,40} Six studies examined measures of psychological well-being such as happiness and life satisfaction,^{15,18,20,35,42,45} 5 examined self-esteem,^{25,40,45–47} and 3 focused on perceptions of mastery or control.^{27,45,48} In the case of each of these mental health indicators, all but one study⁴⁵ reported a positive association with discrimination.

Four studies^{21,23,34,49} examined the relationship between perceived discrimination and a diagnosis of major depression, and 3 revealed a positive association. Other studies focusing on mental health examined generalized anxiety disorder,³⁴ early initiation of substance use,⁵⁰ psychosis,²³ and anger,⁵⁰ and all reported a positive association with discrimination. None of the mental health studies showed a negative association.

PHYSICAL HEALTH

General self-report measures were the most commonly used indicators of physical health status. Six studies^{15–17,23,24,51}

TABLE 1—Studies of Perceived Discrimination and Health

	Positive Association ^a	Negative Association ^b	Conditional Association ^c	No Association ^d	Total
Mental health studies					
Well-being	<i>15, 18, 20, 35, 42</i>			45	6
Self-esteem	<i>25, 40, 46, 47</i>			45	5
Control/mastery	<i>27, 48</i>			45	3
Psychological distress	<i>15, 18, 20, 21, 25–39, 41</i>		<i>42–44</i>	<i>19, 40</i>	25
Major depression	<i>23, 34, 49</i>			21	4
Anxiety disorder	<i>34</i>				1
Other mental disorder	<i>23, 50</i>				2
Anger	<i>50</i>				1
Total	38	0	3	6	47
Physical health studies					
Self-rated health	<i>15–17, 23, 24, 51</i>				6
Other self-report	<i>15, 16, 20, 23, 37, 51</i>		<i>19, 52</i>	<i>23, 24, 33</i>	11
Blood pressure	<i>52, 55, 56</i>		<i>23, 24, 57, 58, 59</i>	<i>55, 60, 61</i>	11
Other cardiovascular	<i>62</i>			<i>24, 61</i>	3
Mortality			22		1
Very low birthweight			63	64	2
Total	16	0	9	9	34
Health behavior studies					
Smoking	<i>26, 65, 66</i>				3
Alcohol	<i>67, 68</i>				2
Total	5	0	0	0	5
Overall total	59	0	12	15	86

Note. Italicized numbers represent the relevant article’s location in the reference list. Totals are the sums of the numbers of articles reporting various types of empirical associations between perceived discrimination and indicators of health status/health risk. Many of the articles reviewed examined multiple outcomes, so the number of associations summarized (86) exceeded the number of articles examined (53).

^aDefined as more perceived discrimination associated with higher levels of illness/health risk.

^bDefined as more perceived discrimination associated with lower levels of illness/health risk.

^cDefined as a positive association but only under some conditions.

^dDiscrimination unrelated to health status/health risk.

included a global self-rated health item as an outcome variable, and all reported that discrimination was associated with poorer health status. Eleven studies examined other self-report indicators of health status, including chronic conditions, indicators of disability, and other global ratings of health. Six of these studies revealed a positive relationship with discrimination,^{15,16,20,23,37,51} 2 reported a positive association only under some conditions,^{19,52} and 3 reported no association.^{23,24,33}

There has also been considerable interest in the relationship between perceptions of discrimination and blood pressure and in the potential for discrimination to account, at least in part, for the elevated prevalence of hypertension among African Americans.^{53,54} Eleven studies examined this association, and the findings were complex. A positive association between discrimination and blood pressure was found in 3 studies^{52,55,56}; in an additional 5 studies, the effect was dependent on coping

style,^{57,58} sex or social class,⁵⁹ or ethnicity.^{23,24} In 2 studies, reports of no previous exposure to discrimination were associated with elevated blood pressure among at least some respondents,^{58,59} and 3 studies showed that discrimination was unrelated to blood pressure or hypertension.^{55,60,61}

Some studies have also examined other cardiovascular outcomes. One study revealed a positive association between chronic everyday discrimination and the development of atherosclerotic disease (intima-media thickness)

in the carotid artery among Black women but not among White women,⁶² but in 2 studies discrimination was unrelated to self-reported heart disease.^{24,61}

A range of other outcomes have also been examined. One study reported a positive association between perceived discrimination and low birthweight only among women with high scores on other risk factors⁶³; in another study, however, these 2 variables were unrelated.⁶⁴ Results from a national sample showed that discrimination was related to elevated mortality risks over a 13-year follow-up period among African Americans who had self-blaming as opposed to external attributional orientations.²²

Recognizing that health behaviors may be the pathway through which perceptions of discrimination can affect health, several recent studies have examined cigarette smoking and alcohol use. Three studies revealed a positive association between discrimination and cigarette smoking,^{26,65,66} and 2 others reported similar associations for alcohol use.^{67,68} Two studies examined the contributions of discrimination to explaining racial disparities in health. Both showed that, after consideration of socioeconomic status, perceptions of discrimination made an incremental contribution in accounting for Black–White differences in self-reported physical health.^{15,37}

GAPS IN KNOWLEDGE

Generally, discrimination is associated with poor health status, and the association is strongest in the case of mental health. Although most studies have involved probability samples, there is considerable

variation in methodological quality, with virtually every study having at least one serious methodological limitation such as a small sample size, a limited number of statistical analyses, inadequate controls for potential confounders, inadequate assessment of discrimination or health status (or both), and reliance on cross-sectional data (only 3 of the studies included involved prospective data). Nonetheless, the consistency of the finding that discrimination is associated with higher rates of disease is quite robust. However, we do not know the extent to which exposure to perceived discrimination leads to increased risk of disease, the conditions under which this might occur, or the mechanisms and processes that might be involved.

It is also not clear whether there is a dose–response relationship between discrimination and changes in health status. As noted, some studies have revealed nonlinear patterns in the association between perceived discrimination and blood pressure.^{1,58,59,69} At present, we do not know the threshold for exposure to, appraisal of, or response to the stress of discrimination that is necessary to alter disease processes. It is also not clear whether persistent exposure to perceived discrimination accentuates the impact of exposure to the stressor or leads to patterns of habituation, such that the effect of perceived discrimination is minimized.

The coverage of population groups has also been selective. Only 6 studies have focused on children or adolescents,^{25,41,46,47,50,66} while the vast majority have focused on adults. Most have been based in the United States, but recent studies have included

immigrant groups in Canada,^{32,44} England,^{23,24} Ireland,⁴¹ the Netherlands,^{45,47} and Finland.²⁹ Most US research has focused on the experience of African Americans, but there has been increasing attention to other racial/ethnic groups. Most of the studies comparing 2 racial groups have been limited to Blacks and Whites.

A RESEARCH AGENDA

Clearly, research on discrimination and health is in its infancy. However, the available evidence suggests that perceived discrimination is an important though understudied race-related stressor that may adversely affect health. Because perceived discrimination represents a type of stressful life experience, there is much that can be learned from the larger stress literature that can inform and structure future research in this area. We consider insights related both to measurement of discrimination and to mechanisms and processes by which it can affect health.

MEASURING DISCRIMINATION

One of the critically important issues for future research is to improve the assessment of discrimination in health studies.^{1,53} There is not a consensus in the literature as to the optimal measures to capture exposure to discrimination. We found wide variability in how discrimination is assessed, with no approach clearly standing out as superior to others. The extant measures vary considerably in both their length and content. Only a few studies employed scales with multiple items, although some

included elaborate and lengthy scales. Some measures seek to capture acute experiences of discrimination, others capture only chronic experiences, some capture both, and many make no distinction between acute and chronic indicators.

In most studies, participants' exposure to discrimination is measured at one point in time. In some studies, respondents have been asked to provide a retrospective report regarding exposure to perceived discrimination over their life course, while other studies have involved a 30-day, 1-year, or 3-year time frame.

Comprehensive Coverage: Acute and Chronic Discrimination

The literature on assessment of stress offers important lessons for the study of discriminatory experiences. As is the case with other stressful experiences, discrimination is multidimensional, and its assessment should provide comprehensive coverage of all relevant domains. The most commonly assessed types of stressful experiences are life events, chronic stress, and daily hassles, and they all have their analogues among existing measures of discrimination. Life events are discrete, observable stressors. Chronic stressors are ongoing problems that are often role related. "Daily hassles" refers to chronic or episodic irritations that are minor.

Major acute experiences of racial bias are the most commonly assessed type of discriminatory experience. We found that few studies have provided psychometric data regarding the measures of discrimination used. Many of the studies involving multiple-item scales reported Cronbach α coefficients, but

only 6 attempted some type of scale validation such as test–retest convergence/stability or factor analysis.^{26,29,39,46,60,65} Many of these studies focused on the 18-item Schedule of Racist Events.²⁶ Psychometric properties have also been reported for other measures.^{70,71}

However, not all psychometric data are necessary for all measures of exposure to discrimination. While a measure of internal reliability is relevant for indices that assess chronic exposure to discrimination, it is not an appropriate statistic for a checklist of acute experiences of discrimination. As has been argued in the literature on stressful life events, the items included in inventories measuring acute stressful experiences are not intended as alternative indicators of a single underlying construct.^{72,73} Because the experience of one of these events does not necessarily increase the likelihood of another, internal reliability should not be expected for such a checklist, and evidence of high internal reliability may suggest that there are problems involving item redundancy.⁷²

The preceding also underscores the importance of comprehensive assessment of acute experiences of discrimination. Because these experiences are largely independent of each other, failure to include relevant events understates exposure to discrimination and thus understimates the association between acute discrimination and health. At the same time, test–retest reliability—not for the total checklist of acute experiences of discrimination but for the specific stressors themselves—is appropriate in the evaluation of acute measures of perceived discrimination.

In the general literature on stress, chronic stressors are

stronger predictors of onset and course of illness than are acute life events⁷⁴; they are challenging to measure, however, and few studies have comprehensively assessed them and examined their effects on health, and even fewer have focused on objective health outcomes.⁷⁵ Conceptually, persistent and repeated experiences of discrimination are especially relevant in identifying the contribution of discrimination to health conditions in which onset and progression are characterized by long periods of time. To date, assessment of chronic discrimination has focused on the domains of work and education.⁷¹ There is a need to focus beyond the interpersonal conflicts and tensions associated with these contexts and assess chronic stressors, such as persistent noise, air pollution, or crowding, that can also be consequences of institutional discrimination.⁷⁶ In addition, as is the case with the larger literature on chronic stressors, measures of chronic exposure to discrimination need to devote more attention on directly assessing duration and frequency of exposure.⁷⁵

Comprehensive Coverage: Traumas, Nonevents, and Macrostressors

Traumas, nonevents, and macrostressors are other distinctive types of stressors⁷⁷ that point to promising areas of expansion for comprehensively assessing discrimination. Traumas are acute or chronic stressors, such as sexual assault or natural disasters, that are very serious, overwhelming in impact, and usually regarded as outside of the typical range of human experience. Although some experiences of discrimination that receive

high-profile media coverage are clearly traumatic, we know little about their prevalence in the general population, and current assessment strategies do not gather the contextual information necessary to identify traumatic experiences.

Macrostressors are large-scale, systems-related stressors such as economic recessions. Highly publicized race-related traumatic events may also be macrostressors. Such experiences can lead to vicarious discrimination, and the effects of historical trauma involving an individual's racial/ethnic group may be transmitted across generations.⁷⁸ Some of the items included in the Cultural Racism and Collective Racism subscales of the Index of Race-Related Stress appear to capture macrostressors.⁷⁹

Nonevents are desired and expected experiences that fail to occur. Nonevents appear to be especially appropriate to the study of racial bias, because one key characteristic of racism is its ability to produce blocked opportunity.^{80(p99–128)} Some types of nonevents, such as being denied a promotion, are captured by existing measures of acute experiences of discrimination, but the literature has yet to characterize exposure to this stressor in a systematic way.

The stress literature indicates that the various types of stress have independent effects on health, such that an evaluation of the full impact of stress requires inclusion of all relevant classes of stressors.^{77,81} It is thus likely that, as a result of the literature's failure to consider the distinct and cumulative impact of multiple dimensions of perceived discrimination, current assessments of the strength of the association between perceived

discrimination and health represent underestimates.

Comprehensive Coverage: Content

The stress literature has indicated that it is crucial for measures of stressors to provide adequate representation of all of the stressful experiences occurring in individuals' lives.^{74,82} This issue is relevant to the measures of perceived discrimination that have been used to date, especially among population subgroups such as children, adolescents, and the elderly. One strategy that has been used to identify additional stressors is the use of follow-up probes that seek to elicit important stressors that may not have been captured by standard questions.⁷² A similar approach should be used in studies of acute and chronic measures of discrimination. The data obtained could enable us to identify the extent to which there are experiences of discrimination that are not included in our existing measures.

At the same time, the stress literature also indicates that more items do not necessarily translate into a better measure, because not all stressful experiences are equally likely to affect health. All stressors are not equivalent, with as many as half of the items on inventories of life events having little or no association with health status for most individuals.^{72,73} A judicious selection of 30 to 50 events is regarded as adequate to capture exposure to acute stressful experiences.⁷² Thus, research is needed to identify the specific indicators of discrimination that are associated with health status.

Variations in role occupancy can also affect variations in exposure to stress, especially in the

case of assessment of role-related stressors.⁷² Among the most prevalent forms of chronic role-related discrimination is discrimination at work. One measurement solution in the area of role-related workplace discrimination and other forms of role-related discrimination is to establish the number of roles occupied by an individual and adjust for role occupancy in assessing the effects of role-related stressors on health status.⁷²

Identifying Relevant Characteristics of Stressors, Appraisals, and Situations

Research reveals that the association between a stressor and health varies when specific characteristics of the stressful experience are taken into account.⁷³ Key aspects of stressful life experiences include the domain in which the event occurs, the magnitude of the event, the temporal characteristics of the event, and the nature of the relationship between the stressor in question and other race-related and non-race-related stressors.⁷⁴ Thus, more information about discrimination and its particular context is necessary for determining its impact. Some measures of discrimination attempt to assess severity by having respondents rate their experiences according to their stressfulness.^{26,35} However, this approach has been rejected in the larger stress literature because it fails to separate measures of exposure from measures of reactions to stressors.⁷³

Also, inadequate attention has been given to the temporal characteristics and course of particular stressors in general⁷⁴ and measures of discrimination in particular. Stressors can be characterized according to the

duration of exposure to the event, duration of the appraised threat or demand, and duration of behavioral, emotional, or physiological responses to the stressor.⁸³ Other temporal characteristics, such as the continuousness or repetitiveness of the stressor, may also be important.^{74,84}

Certain individual and contextual factors may increase one's vulnerability to stressful experiences by accentuating appraisal of the stress.⁷⁴ However, we do not know the characteristics of individuals or situations that modify the effects of perceived discrimination on health. Beliefs about oneself and the environment are individual factors that might affect appraisals of stress. The salience of racial consciousness and identity might function in this way for race-related stressors.^{10,11,16,24,85} Similarly, resources such as social support and feelings of control could enhance an individual's capacity to cope and respond to stressful experiences. Attention should also be given to the long-term consequences of moderating variables. For example, factors such as dispositional optimism could enhance adaptive capacities, while coping styles such as denial, repression, and neuroticism might provide short-term relief but have longer term negative effects on health.

Assessments of characteristics of discriminatory experiences should include characteristics of the perpetrator. One study of African Americans showed that experiences of discrimination were more strongly related to psychological distress when the perpetrator was also Black than when the perpetrator was White.³⁸ However, a laboratory-based study revealed

that the race of the perpetrator had little impact on participants' responses.⁸⁶

Assessing Discrimination Over the Life Course

An important challenge for future research is to capture exposure to experiences of discrimination over the life course. At present, it is not clear whether the effects of exposure to discrimination are cumulative. Existing longitudinal analyses have failed to characterize exposure to perceived discrimination throughout the follow-up period. For example, the National Study of Black Americans captured exposure to discrimination within the previous 30 days at baseline and used the same window of exposure in subsequent waves.^{19,22}

An important barrier to long-term retrospective reports of discrimination is substantial error due to forgetting. Some evidence suggests that the falloff in reporting stressors occurs at a rate of 5% per month.⁸⁷ Recent research on the structure of autobiographical memory reveals that event history calendars can facilitate reconstruction of past events more completely and accurately and lead to better quality retrospective reports than traditional questionnaires.^{88,89} These approaches should be used to capture exposure to discrimination over the life course.

Subjective Nature of Reports

Many researchers are concerned about the shared response biases that can occur when both the measure of stress and measures of health status are based on self-reports. This is especially important in mental health studies in which there is concern about confounding

between reports of discrimination and health based on selective recall as a function of current mental health status.⁷³ However, the available evidence suggests that these fears may not be warranted.⁵³ For example, a national longitudinal study of African Americans revealed no association between baseline measures of major depression or psychological distress and subsequent reports of racial discrimination.²¹

Several strategies that have been used to improve individuals' accuracy in reporting stressors should be applied to the study of discrimination as well. These strategies include using cues to memory such as visual representations and reminders of personally salient events, wording questions in ways that clearly define the domain of the experience being captured, and using a life events calendar, which helps to identify the onset and resolution of stressful experiences. These efforts have been shown to substantially increase the reliability of reports of stressful experiences.⁹⁰ Establishing the accuracy of reports of perceptions of discrimination is important in correctly estimating the association between discrimination and health outcomes.

Another strategy for addressing the potential of bias in observational studies is to include statistical adjustment for potentially confounding factors. Such adjustment strengthens the analytic design and increases the likelihood that observed associations between perceived discrimination and health outcomes might reflect a causal relationship. Most of the studies reviewed included controls for sociodemographic variables, and some controlled for other stressors; however, few

adjusted for additional psychological variables. A clear consensus has yet to emerge regarding the potential confounding variables that should be included in such studies. Personality dispositions such as neuroticism, social desirability, and negative affect are promising candidates.⁹¹

Measurement: Framing the Question

One debate that has emerged in the literature is the extent to which race should be made salient in assessments of discrimination. Williams and colleagues^{15–18,34} have adopted an approach that downplays the salience of race and frames exposure to discrimination in terms of "unfair treatment." Once a particular unfair treatment experience has been endorsed, the respondent is asked to indicate the source of this unfair treatment and is allowed to select from multiple social status categories, including race and ethnicity. It has been suggested by some that this approach may not truly capture racial discrimination,⁹² but the current evidence in support of such a view is weak.⁵³

At the same time, approaches to the assessment of discrimination that involve long lists of questions in which a respondent is repeatedly asked whether a particular event occurred "because of your race" can produce demand characteristics that lead to either overreports or underreports of exposure. One study of college students showed that the use of discrimination terminology in the wording of questions leads to higher self-reports of both racial and sex discrimination.⁹³

Complex Relationships Among Stressors

Another important issue in the literature is that of gaining an

understanding of how multiple types of discrimination relate to each other as well as to other types of stressors. Chronic stress is linked to exacerbation of the effects of acute life events, especially when the life domains affected by these events are the same as those affected by chronic stress.⁷³ Experience of a particular acute stressor may also change the meaning of other ongoing chronic stressors, generate new stressors, or exacerbate existing ongoing strains.^{72,94}

Losing one's job because of one's race (acute discrimination) can trigger a chronic stressor such as financial strain, which in turn can exacerbate marital conflict. This example illustrates that chronic or acute experiences of discrimination may magnify the impact of other non-race-related stressors. Turner and Avison⁹⁵ attempted to address this complex relationship among multiple types of stressors by obtaining detailed information about each reported event in terms of both when it began and when it ended. More generally, research on discrimination needs to consider the joint effects of acute and chronic stressors, especially within the same domain.

Studying Individual Events

Future research should focus on studying individual experiences of discrimination to provide an understanding of both the causal processes by which these stressors might affect health and the pathways through which they operate, as well as the coping challenges, resources, and vulnerabilities that can play a role in these processes.⁷³ The study of individual events might also enhance our understanding of the specific aspects of discrimination that would affect the

strength of its association with health status.

One approach to obtaining rich contextual data on discrimination is use of the Life Events and Difficulties Schedule,⁹⁶ a semistructured intensive personal interview that allows for detailed qualitative probes to identify the contextual threat of events, severity levels, and the timing of events in relationship to the onset of health problems. Some evidence suggests that such intense interviewing methods are effective in terms of dating events.⁹⁷ However, this approach is not without its problems.⁷³ It is labor intensive and requires highly trained interviewers, and, more important, the contextual rating of the stressful experience often incorporates important information about stress modifiers into the stress severity rating.

Nonetheless, this approach might yield useful foundational data for future research on discrimination. It can shed light on many of our unanswered questions, facilitating identification of traumatic experiences of discrimination, the key characteristics of perceived discrimination that are related to changes in health status, the range of coping responses to discrimination, and the complex ways in which experiences of discrimination are related to other stressors.

FROM ASSOCIATIONS TO UNDERLYING PROCESSES

A major challenge in future research is to think more carefully about the models by which perceived discrimination might adversely affect health status, including focusing more explicit attention on the plausible pathways by which these effects might occur. One of the most

critical needs is for more careful research attention to the specific mechanisms by which perceptions of discrimination might adversely affect health. The literature on stress and health indicates that stressors influence physical illness primarily through causing negative emotional states such as anxiety and depression, which in turn can have direct effects on biological processes or patterns of behavior that affect disease risk.⁷⁴

It is instructive that mental health has been the most frequently studied outcome in the research literature on discrimination and health and that, consistently, perceptions of discrimination tend to be associated with poorer mental health status. Researchers studying the association between perceptions of discrimination and health can view measures of mental health status as intermediary mechanisms by which perceptions of discrimination might ultimately affect physical disease processes.

Research needs to assess the extent to which reports of discrimination and the negative emotional states created by them might lead to health behaviors, such as impaired sleep patterns, decreased physical activity, increased substance use, and overeating, that may ultimately affect disease risk. Use of tobacco and alcohol and poor diets have been established as risk factors for multiple chronic illnesses. As noted, some studies have shown that exposure to discrimination is associated with problem drinking^{67,68} and cigarette smoking.⁶⁵ Experiences of discrimination and the negative affect created by them may also lead to lower levels of compliance with medical recommendations.⁷⁴ This latter mechanism

has not yet been explored in the literature.

In studying how individuals confront and adapt to discrimination, it is also important to focus on the potential positive, as well as negative, consequences. Some stressful life experiences can change people's perspectives in ways that can improve and enhance their coping capacity and make them better able to deal with future stressful experiences. A growing literature on trauma-related growth documents that some individuals experience positive changes in their lives as a result of adaptation to traumatic experiences.⁹⁸

At this early stage of the research, we do not understand how exposure to discrimination leads to changes in particular biological responses and health behaviors. Future research needs to identify the conditions under which particular types of exposure affect health. A broad range of health-related outcomes should be used to examine the specificity of underlying processes. Research also needs to identify the specific physiological systems (cardiovascular, neuroendocrine, immune) that are affected by discrimination.

In addition, we are largely unaware of what may be the crucial psychological or biological vulnerability factors and the extent to which the same race-related stressor can produce different responses in different individuals. We are equally unaware of the individual factors, both genetic and psychological, that result in some organ systems being especially vulnerable to the health effects of discrimination. Some evidence suggests, for example, that greater genetic vulnerability to depression is associated with an increased

impact of stressful life experiences on major depression.⁷³

The model of underlying processes should also guide selection of the measure of discrimination most appropriate for a particular study. The target population and its characteristics, as well as the research questions used, should guide the selection of the most appropriate measure of discrimination. The optimal measure of a stressor depends on understanding the disease and its course, especially the particular stage of the disease that is under investigation.⁷⁴

For example, the appropriate measure of discrimination for studying a disease, such as atherosclerosis, that develops over decades would be different from the measure used to study a new episode of major depression. The relevant measure might differ for research questions focused on understanding onset of disease and research questions seeking to capture progression or course of disease. Thus, the choice of instrument and research design should be linked to the particular research context. Depending on the question, there may be a need to capture lifetime exposures to stressful experiences as well as the timing of such exposures.

CONCLUSIONS

Race plays a significant role as a determinant of health in the United States. Racial disparities in all-cause and infant mortality are larger now than they were in 1950.⁹⁹ The persistence of racial inequalities in health must be understood in light of the persistence of racialized social structures that affect health status in multiple ways.^{8,100} The research reviewed here suggests that the subjective experience of

racial bias may be a neglected determinant of health and a contributor to racial disparities in health.

Perceptions of discrimination appear to induce physiological and psychological arousal, and, as is the case with other psychosocial stressors, systematic exposure to experiences of discrimination may have long-term consequences for health. These experiences are part of the social and psychological context in which disease risk emerges and within which effective interventions to improve health must be embedded. Although the rigorous scientific research that would allow us to evaluate causal directionality in the discrimination–health association is still in the future, the available evidence suggests that there is likely to be a high payoff in pursuing this line of research.

Despite the many inadequacies noted in assessment of discrimination and the limitations of earlier research, there is substantial consistency of results, especially among the methodologically strongest studies. Findings are consistent as well with the larger literature on stress and the mechanisms by which potential stressors can affect health. It is impressive that perceptions of discrimination tend to be associated with poorer health across a broad range of outcomes and across socially disadvantaged groups in different societies. Nonetheless, virtually all of the studies conducted in this field have involved limitations with respect to comprehensively assessing discrimination and identifying accumulation of exposures over the life course. The promise of the research findings in this area and the research directions out-

lined here suggest an urgent need to systematically assess the extent to which exposure and adaptation to racial/ethnic bias affect the health of various population groups. ■

About the Authors

The authors are with the Institute for Social Research, University of Michigan, Ann Arbor.

Requests for reprints should be sent to David R. Williams, PhD, MPH, Institute for Social Research, University of Michigan, PO Box 1248, Ann Arbor, MI 48106-1248 (e-mail: wildavid@umich.edu).

This article was accepted October 21, 2002.

Contributors

All of the authors contributed to the conceptualization of this article. D.R. Williams and H.W. Neighbors analyzed the data, and all of the authors contributed to the writing of the article.

Acknowledgments

Preparation of this commentary was supported by grant MH 59575 from the National Institute of Mental Health and by the John D. and Catherine T. MacArthur Foundation Research Network on Socioeconomic Status and Health.

We wish to thank Scott Wyatt, Carl Hill, Rashid Njai, and Car Nosel for assistance with research and manuscript preparation.

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