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Racial and ethnic disparities in access to and quality of health care

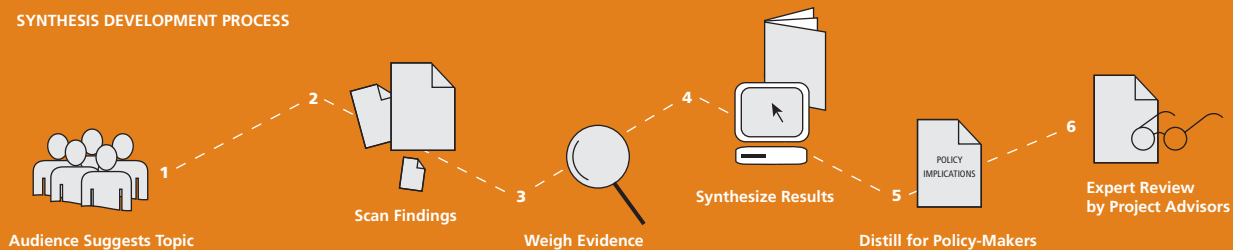
See companion Policy Brief available at www.policysynthesis.org

TABLE OF CONTENTS

1	Introduction
3	Findings
18	Implications for Policy-Makers
19	The Need for Additional Information
APPENDICES	
20	Appendix I References
23	Appendix II Methodological Discussion

THE SYNTHESIS PROJECT (Synthesis) is an initiative of the Robert Wood Johnson Foundation to produce relevant, concise, and thought-provoking briefs and reports on today's important health policy issues. By synthesizing what is known, while weighing the strength of findings and exposing gaps in knowledge, Synthesis products give decision-makers reliable information and new insights to inform complex policy decisions. For more information about the Synthesis Project, visit the Synthesis Project's Web site at www.policysynthesis.org. For additional copies of Synthesis products, please go to the Project's Web site or send an e-mail request to pubsrequest@rwjf.org.

SYNTHESIS DEVELOPMENT PROCESS



Introduction

Reducing health disparities is a major national concern, representing one of two overarching goals for *Healthy People 2010*, a set of health objectives for the nation (44). The causes of health disparities among racial and ethnic groups in the United States are multiple and complex, and serious efforts to eliminate disparities must account for differences across groups in social determinants of health that lie beyond the reach of health care. Nonetheless, health care has an essential role to play in preventing disease and mitigating its impact on life expectancy and quality of life. Therefore, serious efforts to eliminate racial and ethnic *health* disparities must incorporate strategies to reduce racial and ethnic disparities in *health care* as well. The U.S. Congress, state policy-makers and many health plans have recently begun to focus on identifying effective approaches for achieving this goal. Another important reason to explore and find solutions for health care disparities is that without doing so we will not be able to address the overall health care quality issues we as Americans face.

In a recent, much publicized report, the *Institute of Medicine (IOM)* concluded that racial and ethnic disparities in health care are consistent across a range of diseases and health care services (18). The *IOM* also concluded that racial and ethnic disparities are associated with socioeconomic differences and tend to diminish when socioeconomic factors are accounted for, but that disparities remain even after adjusting for health insurance coverage, income, education and health care system characteristics that influence access to and quality of health care. The *IOM* reached its conclusions after reviewing a large number of studies. However, many of these studies lacked methodological rigor or focused on selected populations. Further, policy-makers intent on reducing racial and ethnic disparities in health care need quantitative information on the extent to which factors other than race or ethnicity, including insurance coverage, socioeconomic status and health care system characteristics, account for observed disparities.

This Synthesis Report takes a critical look at the research evidence on racial and ethnic disparities in health care. The Synthesis assesses whether racial and ethnic disparities in access remain after adjusting for factors such as insurance and socioeconomic status and also sheds light on the contributions of these factors to the observed disparities. The Synthesis focuses on two key dimensions of health care—access and quality—and on the three racial and ethnic groups for which a body of research has accumulated—non-Hispanic whites, non-Hispanic blacks and Hispanics.¹

The Synthesis examines the evidence on the following questions:

- What is the size of racial and ethnic disparities in *access to care*, and to what extent are these disparities explained by factors other than race?
- What is the size of racial and ethnic disparities in *quality and appropriateness of health care*, and to what extent are these disparities explained by factors other than race?

¹ As used in this synthesis, the terms “white” and “black” do not include Hispanics.

Introduction

Because the literature on racial and ethnic disparities in health care is vast, this Synthesis focuses on research studies that meet three criteria. First, the research is based on data collected over the last decade (since 1996). There is evidence that the growing attention focused on disparities may have reduced them to some degree, making older studies less relevant. Second, the research is based on data that have a national scope even if they are not obtained from nationally representative probability samples. Documented geographic variations in health care delivery and in the size of disparities are likely to render most local or regional studies unrepresentative of the nation. Nonetheless, it is important to recognize that local or regional disparities are themselves of interest and could have important implications for local and state policy-makers that are ignored in the Synthesis. Third, the studies use statistical methods—specifically, multivariate regression methods—to adjust measured disparities in care for racial and ethnic differences in individual and, in some cases, area and health care system characteristics that may influence access to and quality of care. The goal of statistical adjustment is to allow comparisons of the care that different racial and ethnic groups receive when other factors—for example, income, insurance and education—are equal. (See Appendix II for additional detail on methods.)

The data sources for the studies reviewed in this Synthesis include surveys and medical records, whose validity and generalizability are affected by several factors (see Appendix II). An additional factor that affects the validity of study findings is the comprehensiveness of the statistical adjustment in the analyses for other variables that may influence access to and quality of health care. Ideally, studies of racial and ethnic disparities in care adjust for individual variables such as age, sex, family structure, socioeconomic status, health insurance coverage, clinical characteristics and health status as well as area variables and, when appropriate, health care system variables. Many studies fall short of this ideal, however, as a result of data limitations. This Synthesis discusses these issues as they arise in conjunction with the findings of particular studies.

What is the size of racial and ethnic disparities in access to care and to what extent are they explained by factors other than race?

Black and Hispanic children and adults have less potential and realized access to care than their white counterparts. Adjusting for insurance status, income and other factors reduces, but in most cases does not eliminate, the disparities.

Access to health care refers to the degree to which people are able to obtain appropriate care from the health care system in a timely manner. Researchers who study access often distinguish between “potential access,” which refers to the presence or absence of barriers to obtaining appropriate and timely care, and “realized access,” which refers to the quantity of care actually received. The focus of this section of the Synthesis will be on a key measure of potential access, having a usual source of care, defined as a health care provider to whom people usually go when they are sick or need advice about their health, and a key measure of realized access, having an ambulatory care visit during the year. When adjusted for medical need—i.e., for health status—differences in the probability of having an ambulatory care visit can signal disparities in people’s ability to realize their access to health care.

Are there racial and ethnic disparities in having a usual source of care?

Black and Hispanic adults and children are less likely than their white counterparts to have a usual source of care.²

Studies consistently find that black and Hispanic adults and children are more likely than their white counterparts to report not having a usual source of care (Figure 1). The only study that focuses exclusively on adults suggests that the unadjusted gap between black and white adults is about six percentage points, whereas the unadjusted gap between Hispanic and white adults is about 19 percentage points (22). (About 18 percent of white adults lack a usual source of care, compared with 24 percent of blacks and 37 percent of Hispanics. Detailed information is found in Table 1, Appendix III available at www.policysynthesis.org.)

² A number of studies have used national surveys, including the Medical Expenditure Panel Survey (MEPS) and Community Tracking Study (CTS) survey, to examine differences in the probability of having a usual source of care across racial and ethnic groups. Because questions about having a usual source of care simply ask respondents whether there is a provider or place where they usually go when they need health care or advice, differences across the surveys in mode of administration and data collection are unlikely to affect responses to these questions. Therefore, the various surveys are expected to provide equally valid data on having a usual source of care.

Findings

Figure 1. Racial and ethnic differences in reporting no usual source of care

Data source		Unadjusted differences, percent		Adjusted differences, percent	
		Black vs. white	Hispanic vs. white	Black vs. white	Hispanic vs. white
Decomposition studies					
Zuvekas and Taliaferro (55)	1998 MEPS	5.4*	15.7*	0.1 [†]	10.6 [†]
Waidmann and Rajan (48)	1997, 1999 NSAF	5.0 [†]	15.4 [†]	0.5 [†]	2.9 [†]
Weinick et al. (50)	1996 MEPS	4.4 [†]	15.5 [†]	1.8 [†]	6.9 [†]
Hadley et al. (15)	1998/99, 2000/01, 2003 CTS	5.9 [†]	11.9 [†]	6.8 [†]	2.5 [†]
Kirby et al. (22)	2000, 2001 MEPS	6.1**	18.8**	0.1 [†]	6.7 [†]
Odds ratio studies					
Weinick and Krauss (49)	1996 MEPS	6**	11**	5**	2
Shi and Stevens (37)	2000 MEPS	6**	12**	5**	8**
Doescher et al. (9)	1996/97 CTS	10**	9**	5**	3**

Notes:

Findings are adjusted for age, sex, insurance, and other sociodemographic factors and health status measures that vary across studies. However, the studies by Kirby et al. (22) and by Weinick and Krauss (49) are the only studies that include language in the adjustment, while the study by Waidmann and Rajan (48) adjusts for nativity and citizenship status, which are correlated with language. Some studies adjusted for area and provider factors as well. See Appendix III for details. Results for Hadley et al. (15) and for Doescher et al. (9) are for English-speaking Hispanics.

*p<.05, **p<.01

[†] Tests of significance not reported.

How are disparities in having a usual source of care reduced when taking into account insurance status, income and other factors?

Adjusting for insurance coverage, income and other characteristics reduces the disparity in having a usual source of care for blacks and Hispanics. The black-white gap is nearly eliminated after adjustment in several studies, but an appreciable black-white gap remains in other studies. The size of the Hispanic-white gap that remains after adjustment depends on whether language is accounted for in the adjustment.

The studies summarized in Figure 1 use multivariate statistical methods to assess the extent to which the observed racial and ethnic differences in the probability of lacking a usual source of care are explained by other factors.³ Studies typically adjust for respondents' demographic characteristics (or parents', when the respondents are children), health insurance coverage, family income, educational attainment, family size and structure, health status, region of the country and urban or rural area. The strongest studies assess the role of language as well, since the inability to speak English may be an important barrier to health care access for many Hispanics. Finally, certain studies assess whether characteristics of the population or the health care system in the areas where respondents reside contribute to explaining racial and ethnic differences in the probability of having a usual source of care.

³ Two types of studies are relied on in this analysis – decomposition studies and odds ratio studies. Decomposition studies are easy to interpret, because they express differences in terms of percentage points and report how these differences shrink or grow as the other factors are adjusted for. Odds ratios studies, by contrast, express differences in terms of the relative odds of lacking a usual source for the two groups that are being compared. However, for this Synthesis odds ratios are converted to approximate percentage point differences for easier interpretation (see Appendix II).

Findings

Studies find that the difference between black and white children and adults in the probability of lacking a usual source of care is reduced by one to six percentage points after adjusting for insurance status, income and other factors (Figure 1). The disparities between blacks and whites in lacking a usual source of care are nearly eliminated after adjustment in several studies (22, 48, 50, 55), although an appreciable black-white gap remains even after adjustment in other studies (9,15, 37, 49). This variability in findings may be partly explained by differences across studies in the included age groups.

Studies find that the difference between Hispanic and white adults in the probability of lacking a usual source of care is reduced by four to 12 percentage points after adjusting for insurance status, income and other factors (Figure 1). Nonetheless, a sizable Hispanic-white gap that approaches seven to 10 percentage points remains after adjustment in the studies that do not take language into account (37, 50, 55).

What is the role of language in the disparity of having a usual source of care?

Studies that assess the importance of language indicate that language matters, although it does not fully account for the Hispanic-white gap in having a usual source of care.

One possible explanation for the persistent disparity in having a usual source of care between Hispanics and whites after adjusting for other factors is language barriers. To assess the role of language, some studies adjust for language but obtain a single estimate (i.e., not distinguishing between Spanish- and English-speaking Hispanics) of the gap between Hispanics and whites. In these studies, the difference between Hispanics and whites in the probability of lacking a usual source ranges from two to seven percentage points after adjusting for all measured individual and area factors, including language (or nativity and citizenship) (22, 48, 49) (Figure 2).

Figure 2. Adjusted Hispanic-white differences (percent) in reporting no usual source of care in studies that include language

	Hispanics vs. whites	English-speaking Hispanics vs. whites	Spanish-speaking Hispanics vs. whites
Kirby et al. (22)	6.7 [†]	–	–
Waidmann and Rajan (48)	2.9 [†]	–	–
Weinick and Krauss (49)	2		
Hadley et al. (15)	–	2.5 [†]	19.9 [†]
Doescher et al. (9)	–	3 ^{**}	8 ^{**}

Notes:

Findings are adjusted for age, sex, insurance and other sociodemographic factors and health status measures that vary across studies. Some studies adjusted for area and provider factors as well. See Appendix III for details.

*p<.05, **p<.01

[†] Tests of significance not reported.

Findings

Especially useful in assessing the role of language are two studies that obtain separate estimates of the gap with whites for English-speaking and for Spanish-speaking Hispanics (9, 15). Doescher et al. (9) find that the difference with whites in the probability of lacking a usual source of care is three percentage points for working-age Hispanic adults who speak English and eight percentage points for Spanish speakers, adjusting for other factors (Figure 2). More strikingly, Hadley et al. (15) find that the adjusted gap for English speakers shrinks to less than three percentage points, whereas the adjusted gap for Spanish speakers is 20 percentage points. Of course, it is impossible to determine the degree to which the large disparity for Spanish-speakers is due to language, *per se*. Unmeasured differences that are correlated with language, such as legal status and access to transportation, may contribute to the estimated effects of language in these studies.

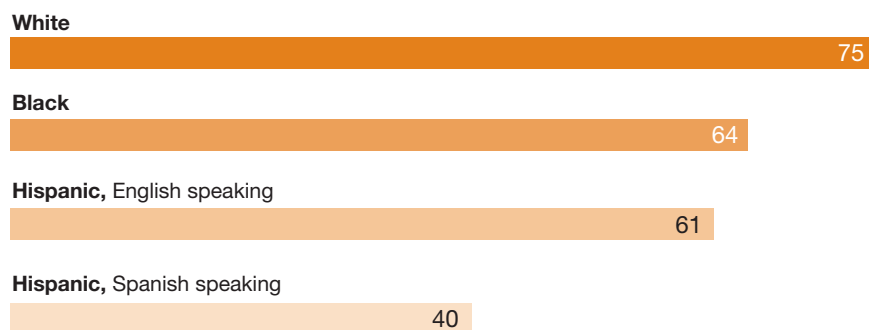
Are there racial and ethnic disparities in the type of usual source of care?

Black and Hispanic adults are less likely than whites to have the types of usual source of care that promote continuity of care.

While having a usual source of care promotes access to care, the type of usual source affects the care people receive as well. Continuity of care is associated with a number of favorable outcomes, including better quality of care and higher satisfaction with care, and is considered a key component of primary care (6, 12, 33, 40). Continuity of care with the same provider is higher when the usual source of care is a physician's office, rather than a facility such as a hospital outpatient department, clinic, or health center (9).

Black and Hispanic adults are less likely than their white counterparts to report that their usual source of care is a physician's office, and these disparities are not explained by differences in insurance, income and other individual characteristics (9, 13) (Figure 3). Doescher et al. (9) also find that racial and ethnic differences in continuity of care with the same provider are fully explained by differences in the types of usual source.

Figure 3. Percent of adults whose usual source of care is a physician's office



Source: Doescher et al. (9)

Findings

Are there racial and ethnic disparities in the probability of having an ambulatory visit during the year?

Blacks and Hispanics are much less likely than whites to have an ambulatory care visit during the year, and Spanish-speaking Hispanics are the least likely to have a visit.

Another frequently studied measure of access to health care is whether people had an ambulatory care visit (other than an emergency department visit) to a health care provider during the year.⁴ The strongest studies find that black and Hispanic adults and children are substantially more likely than their white counterparts not to have an ambulatory care visit during the year (Figure 4). For example, Kirby et al. (22) finds an unadjusted gap between black and white adults of about 13 percentage points, whereas the gap between Hispanic and white adults is about 20 percentage points. (About 22 percent of white adults had no ambulatory visit in the previous 12 months, compared with 35 percent of blacks and 42 percent of Hispanics. Detailed information is found in Appendix III.) Shi and Stevens (37) find an unadjusted gap between black and white children of about 19 percentage points, whereas the gap between Hispanic and white children is about 15 percentage points. (About 27 percent of white children had no ambulatory visit during the year, compared with 46 percent of black children and 42 percent of Hispanic children.)

Figure 4. Racial and ethnic differences in reporting no ambulatory visit

Data source		Unadjusted differences, percent		Adjusted differences, percent	
		Black vs. white	Hispanic vs. white	Black vs. white	Hispanic vs. white
Weinick et al. (50)	1996 MEPS	13.4 [†]	15.4 [†]	9.6 [†]	6.8 [†]
Zuvekas and Taliaferro (55)	1998 MEPS	16.9*	18.9*	9.8 [†]	6.0 [†]
Kirby et al. (22)	2000, 2001 MEPS	12.6**	19.9**	7.3 [†]	-1.7 [†]
Shi and Stevens (37)	2000 MEPS	19**	15**	13**	9**
Weinick et al. (51)	1997 MEPS	16**	14**	13**	7**

Notes:

Findings are adjusted for age, sex, insurance and other sociodemographic factors and health status measures that vary across studies. However, the study by Kirby et al. (22) is the only one that includes language in the adjustment. Some studies adjust for area and provider factors as well. See Appendix III for details. Results for Weinick et al. (51) are for English-speaking Hispanics.

*p<.05, **p<.01

[†] Tests of significance not reported.

4 In contrast to the data on usual source of care, variations across surveys in mode of administration and data collection can influence the validity of the data on ambulatory visits. The strongest studies of ambulatory visits are based on the MEPS, which uses multiple rounds of data collection, with short recall periods, and includes a provider component to ensure collection of accurate information on health care utilization (see Appendix II). Therefore, this Synthesis focuses on studies that use MEPS data.

Findings

How are disparities in ambulatory visits reduced when taking into account insurance status, income and other factors?

Sizable black-white and Hispanic-white gaps in the probability of having an ambulatory visit remain after adjusting for insurance, income and other factors, excluding language.

As with the studies of usual source of care, the studies summarized in Figure 4 use multivariate statistical methods to assess the extent to which racial and ethnic differences in the probability of not having an ambulatory care visit are explained by other factors, including individual characteristics and characteristics of the population or the health care system in the areas where people live.

The strongest studies find that the difference between black and white children and adults in the probability of not having an ambulatory care visit is reduced by three to seven percentage points after adjusting for insurance status, income and other factors. However, these studies find that a sizable gap, ranging from seven to 13 percentage points, remains between blacks and whites even after adjusting for all measured factors (Figure 4).

The studies that do not account for language (37, 50, 55) find that the difference between Hispanic and white children and adults in the probability of not having an ambulatory care visit is reduced by six to 13 percentage points after adjusting for insurance status, income, and other factors (except language). Nonetheless, an adjusted gap of six to nine percentage points remains in these studies. The study by Kirby et al. (22) stands out because the Hispanic-white gap in not having an ambulatory care visit is eliminated after adjusting for other factors (Figure 4). However, this study is unique because language as well as neighborhood characteristics are included in the adjustment. In fact, Kirby et al. (22) find an adjusted Hispanic-white gap of 10 percentage points after adjusting only for insurance and sociodemographic characteristics, and additionally adjusting for language reduces the gap to three percentage points. This gap is fully eliminated only after adjusting for neighborhood characteristics as well.

What is the role of language in the disparity of having an ambulatory visit?

Language contributes to the Hispanic-white gap in the probability of having an ambulatory care visit.

Only two MEPS-based studies of ambulatory care visits take language into account. As noted above, Kirby et al. (22) find that, after adjusting for insurance and sociodemographic characteristics, additionally adjusting for language reduces the gap between Hispanic and white adults by about seven percentage points (Table 2, Appendix III). Weinick et al. (51) find that the adjusted gap for English speakers is seven percentage points, whereas the adjusted gap for Spanish speakers is 10 percentage points.

What is the size of racial and ethnic disparities in quality and appropriateness of health care, and to what extent are these disparities explained by factors other than race?

Racial and ethnic disparities in quality of care are pervasive although not universal.

Many researchers agree that the measurement of technical quality should depend much more on process data than on health outcomes (5). Process data are more sensitive indicators of quality than outcomes, because bad outcomes do not necessarily follow errors in processes of care or may lag behind poor processes by many years. The development of process measures of quality has improved substantially in recent years. Nonetheless, intermediate outcomes—the level of control of physiologic abnormalities and risk factors associated with particular chronic conditions, such as control of blood pressure in patients with hypertension—that are directly linked to identified processes of care are increasingly used to measure quality as well. This Synthesis focuses on racial and ethnic disparities in the quality of care as measured by the receipt of processes of care that adhere to evidence-based recommendations or by favorable intermediate outcomes. Thus numerous studies are excluded that examine rates of utilization of health care services, but without reference to whether the services are appropriate or consistent with guidelines.

Are there racial and ethnic disparities in receipt of screening and preventive services?

Black and Hispanic seniors are less likely than their white counterparts to receive influenza and pneumococcal vaccination, whereas results for other preventive services are mixed.

Studies based on national surveys consistently find that black and Hispanic seniors are less likely than their white counterparts to report receiving pneumococcal (17, 24) and influenza vaccination (16, 24, 30, 34). These studies also find that both black and Hispanic adults are less likely than white adults to be screened for colorectal cancer (19, 24, 38); that Hispanic adults, but not blacks, are less likely than whites to be screened for high blood pressure and high cholesterol (32, 41); and that racial and ethnic differences in breast cancer (21, 24, 32, 35, 42) and cervical cancer (32) screening are small or nonexistent. (See Figure 5 and Table 3, Appendix III). Lees et al. (24) find that Spanish-speaking Hispanics have lower rates than English speakers of influenza vaccination, breast cancer screening and colorectal cancer screening.

Although survey-based studies of screening and preventive services are numerous, these studies rely on respondents' recall to ascertain receipt of appropriate preventive services and are subject to recall bias. Validity studies have found that self-reports tend to overestimate rates of screening tests and vaccines (14, 25, 27, 29, 54). (See Appendix II for additional discussion.)

Findings

Figure 5. Racial and ethnic differences in receipt of influenza vaccination and breast cancer screening

Service	Data source	Unadjusted differences, percent		Adjusted differences, percent	
		Black vs. white	Hispanic vs. white	Black vs. white	Hispanic vs. white
Influenza vaccine					
Hebert et al. (16)	1996 MCBS	-23.3**	-14.1**	-14.8**	-6.4*
Schneider et al. (34)	1996 MCBS ^a	-21.6**	—	-24.9**	—
Schneider et al. (34)	1996 MCBS ^b	-21.6**	—	-18.6**	—
Lees et al. (24)	2000 NHIS	-19**	-7	-14**	-1
Breast cancer screening					
Schneider et al. (35)	1997 HEDIS	-8.0**	—	-1.7 [†]	—
Trivedi et al. (42)	1997 HEDIS	-5**	—	0 [†]	—
Trivedi et al. (42)	2003 HEDIS	-2**	—	3 [†]	—
Lees et al. (24)	2000 NHIS	-7**	-7**	-1	-2

Notes:

Findings are adjusted for age, sex, insurance and other sociodemographic factors and health status measures that vary across studies. Some studies adjusted for area and provider factors as well. See Appendix III for details. Results for Lees et al. (24) are for English-speaking Hispanics.

*p<.05, **p<.01

[†] Tests of significance not reported.

^a Medicare fee-for-service beneficiaries.

^b Medicare managed care beneficiaries.

Two studies use HEDIS data to examine rates of breast cancer screening in Medicare managed care plans (Figure 5) (35, 42). These data are based on health plan records and are not subject to recall bias, but they are limited to the minority of Medicare beneficiaries who enroll in managed care plans and to comparisons between blacks and whites. HEDIS-based studies find that white women in Medicare managed care plans are more likely than their black peers to be screened for breast cancer, but the difference has declined over time to only two percentage points.

How are the disparities in the receipt of screening and preventive services reduced when taking into account insurance status, income and other factors?

Racial and ethnic disparities in the receipt of the influenza vaccination narrow after adjusting for other factors, but a sizable black-white gap remains. By contrast, disparities in the receipt of breast cancer screening are eliminated after adjusting for other factors.

The strongest survey-based studies find that adjusting for other factors reduces but does not come close to eliminating the disparity between blacks and whites in influenza vaccination (16, 24, 34), whereas the Hispanic-white gap is nearly eliminated for both English-speaking and Spanish-speaking Hispanics (24) (Figure 5). By contrast, the survey-based study by Lees et al. (24) and the HEDIS-based studies (35, 42) find that adjusting for other factors, including (in the HEDIS-based

Findings

studies) the health plans that Medicare beneficiaries choose, eliminates the black-white gap in breast cancer screening. This adjustment for health plan is a unique feature of the HEDIS-based studies and indicates that once a Medicare beneficiary enters a health plan, race has no bearing on their likelihood of being screened for breast cancer. (See Appendix II for additional discussion.) Other survey-based studies of screening and preventive care are not strong because they include access measures, such as having a usual source of care and number of visits, in the adjustment for other factors. These studies find that the racial and ethnic gaps in screening for breast and cervical cancer and for high blood pressure and high cholesterol disappear or even reverse after adjustment. The findings must be viewed cautiously, however, because adjusting for access measures may obscure legitimate disparities (see Appendix II). (Studies that adjust for access measures are included in Table 3, Appendix III, but they are not included in Figure 5.)

Are there racial and ethnic disparities in the quality of care for acute and chronic conditions?

A landmark study of processes of care finds that black and Hispanic adults are as likely or more likely than whites to receive recommended care, but the findings of this study are unlikely to be generalizable to all black and Hispanic patients.

Beyond preventive services, there is enormous interest in racial and ethnic disparities in the quality of the clinical processes of care that patients receive for acute and chronic conditions and in their intermediate outcomes. However, obtaining national data on clinical processes of care and on the control of physiologic abnormalities associated with chronic conditions for the general population is extremely difficult and costly. As a result, only one study has attempted to do so. The landmark study by Asch et al. (1) collected data from the medical records of adults in 12 large metropolitan areas and assessed disparities in whether subjects receive care consistent with 439 indicators of the quality of care for 30 medical conditions and for preventive care (26).

The study by Asch et al. (1) finds that black and Hispanic adults are *more* likely than whites to receive recommended processes of care (Figure 6) (Table 4, Appendix III). Thus white adults received 55 percent of recommended processes of care, compared with 56 percent of recommended processes for blacks and 56 percent of Hispanics. Further, the study finds that when the processes of care are classified according to the type of care or to the function of the services blacks and Hispanics receive at least the same percentage of recommended care as whites in every category. In fact, blacks, Hispanics, or both receive a higher percentage than whites of recommended chronic care, preventive care, screening services and treatment services. Adjusting for other factors that may influence quality of care does not change these findings (Figure 6).

Findings

Figure 6. Racial and ethnic differences in receiving recommended processes of care for 30 conditions and preventive care

	Unadjusted differences, percent		Adjusted differences, percent	
	Black vs. white	Hispanic vs. white	Black vs. white	Hispanic vs. white
Overall care	1.9 [†]	1.3 [†]	3.2 ^{**}	2.7 [*]
By type of care				
Acute care	-2.0 [†]	0.4 [†]	0.5	1.9
Chronic care	5.7 [†]	-0.8 [†]	5.3 [*]	0.3
Preventive care	1.3 [†]	2.8 [†]	2.6 [*]	3.7 ^{**}
By function of services				
Screening	0.8 [†]	6.3 [†]	1.0	4.2 [*]
Diagnosis	0.4 [†]	-0.6 [†]	2.2	1.2
Treatment	4.4 [†]	-4.4 [†]	7.3 ^{**}	1.1
Follow-up	-0.5 [†]	-1.2 [†]	2.0	-0.2

Notes:

Findings are adjusted for age, sex, education, income, insurance, self-rated health status, number of acute conditions, number of chronic conditions and metropolitan area fixed effects.

*p<.05, **p<.01

[†] Tests of significance not reported.

The findings of the study by Asch et al. (1) surprised many observers, who expected that blacks and Hispanics would receive worse processes of care than whites. The study is based on very strong methods with regard to the selection of quality indicators and data collection. Nonetheless, the study also has several shortcomings that raise questions about the generalizability of its findings to all black and Hispanic patients. Most important, data on clinical processes of care were only collected for subjects who had made a visit to a health care provider, and the analyses are confined to these subjects. As discussed earlier, black and Hispanic adults are less likely than their white counterparts to have an ambulatory visit to a provider even after adjusting for other factors.

In another national study of the quality of ambulatory care for the general population, Correa de Araujo et al. (8) use data from a supplement to the 2000–2001 MEPS to assess whether care for diabetics is consistent with five indicators of the quality of care for diabetes. The study finds that black diabetics are less likely than their white counterparts to receive care that is consistent with all five quality indicators after adjusting for other factors, but there are no statistically significant disparities between Hispanics and whites.

The most recent studies of Medicare beneficiaries in managed care plans find few differences between blacks and whites in receiving recommended processes of care, but they find substantial black-white gaps in intermediate outcomes.

A small set of studies (35, 42, 43) use HEDIS data to assess quality of care in Medicare managed care plans. These studies are limited by their focus on a narrow group of people—Medicare beneficiaries enrolled in managed care plans—and on disparities between blacks and whites. On the other hand, they use excellent data and strong methods. The quality indicators examined in these studies encompass processes of care as well as intermediate outcomes.

Findings

The HEDIS-based studies find that in the late 1990s black Medicare beneficiaries in managed care plans were less likely to receive recommended processes of care than their white peers (Table 5, Appendix III). However, processes of care improved substantially for all beneficiaries between the late 1990s and 2002–2004, and black-white disparities for most processes narrowed considerably or were eliminated over this period (42, 43) (Figure 7 and Table 5, Appendix III). By contrast, black-white disparities in intermediate outcomes did not diminish over time (42, 43). Further, in most cases these disparities are reduced only slightly after adjusting for other factors, including the health plans beneficiaries choose. These findings imply that, in contrast to the findings for breast cancer screening, the overall disparities in these quality indicators are due in part to gaps that occur within health plans.

Figure 7. Differences in recommended processes of care and intermediate outcomes among blacks and whites in Medicare managed care plans, 2002–2004

	Unadjusted differences, percent	Adjusted differences, percent
	Black vs. white	Black vs. white
Processes of care		
β-blocker after myocardial infarction	-1	-2 [†]
LDL test in cardiovascular disease patients	-9**	-6 [†]
LDL test in diabetics	-2**	-2 [†]
Glycosylated hemoglobin test in diabetics	-2**	-1 [†]
Eye exam in diabetics	-2*	1 [†]
Intermediate outcomes		
LDL control in cardiovascular disease patients	-14.4**	-11.5 [†]
LDL control in diabetics	-9.3**	-7.8 [†]
Control of glycosylated hemoglobin in diabetics	-8.0**	-7.0 [†]
Blood pressure control in hypertensive patients	-6.8**	-6.2 [†]

Notes:

Findings are adjusted for age, sex, Medicaid eligibility and other sociodemographic factors, and health plan or health plan characteristics. See Appendix III for details. LDL=Low-density lipoprotein cholesterol. Results for processes of care are from Trivedi et al. (42). Results for intermediate outcomes are from Trivedi et al. (43).

*p<.05, **p<.01

[†] Tests of significance not reported.

The divergence in findings between quality indicators related to care processes and those related to intermediate outcomes is important, since ultimate effects on health depend on adequate control of physiologic abnormalities and risk factors associated with chronic conditions. Possible explanations for this divergence are that blacks with identified risk factors receive less aggressive treatment than their white counterparts, that blacks have lower adherence with treatment than whites and that risk factors are more difficult to control in blacks than in whites.

Findings

What are the racial and ethnic disparities in the treatment of heart disease?

Disparities in the quality of care for heart disease are sizable for the recommended use of newer therapies and for invasive procedures. Disparities tend to be small or nonexistent for the recommended use of medications.

Heart disease is a major cause of morbidity and mortality for all Americans, and disparities in the quality of care for heart disease are likely to have serious implications for disparities in health. Recently, researchers have used national registries to evaluate racial and ethnic disparities in the quality of inpatient hospital care for heart disease. Studies using the CRUSADE⁵ registry data find that the black and Hispanic patients with acute coronary syndromes are less likely than white patients to receive coronary angiography within 48 hours of hospital admission, as recommended by guidelines (7, 39) (Figure 8) (Table 6, Appendix III). The results for blacks do not change after adjusting for sociodemographic characteristics, health insurance, detailed clinical variables and provider characteristics.

Studies based on the CRUSADE data also find racial and ethnic disparities in receipt of recommended medications within the first 24 hours after hospitalization or at hospital discharge (7, 39) (Figure 8). However, these disparities are generally small and are further reduced or eliminated after adjustment for other factors.

Figure 8. Racial and ethnic differences in receiving recommended processes of care for acute coronary syndromes

Process of Care	Unadjusted differences, percent		Adjusted differences, percent	
	Black vs. white	Hispanic vs. white	Black vs. white	Hispanic vs. white
Coronary angiography within 48 hours	-12.7**	-6.8**	-7.4**	NA
Medications within 24 hours				
Aspirin	1.1**	0.4	1.3**	1.0
Heparin	-5.1**	-4.5**	-1.2*	0.0
β-blocker	-1.3*	-2.1**	0.2	-0.1
Platelet glycoprotein inhibitor	-6.5**	-7.2**	-4.9**	-1.5
Medications at discharge				
Aspirin	-2.0**	-2.1**	0.0	-0.1
ACE inhibitor	6.6**	3.7**	5.1**	4.1**
β-blocker	-1.8**	-2.3**	0.7	-0.1
Statin	-4.0**	-0.4	-3.7**	1.3

Notes:

Findings are adjusted for age, sex, insurance, other sociodemographic factors, detailed clinical variables, and provider characteristics. See Appendix III for details. Results for Hispanics vs. whites are from Cohen et al. (7). Results for blacks vs. whites are from Sonel et al. (39).

*p<.05, **p<.01

¶ Tests of significance not reported.

5 Can Rapid Risk Stratification of Unstable Angina Patients Suppress Adverse Outcomes with Early Implementation of ACC/AHA Guidelines?

Findings

Studies based on the National Registry of Myocardial Infarction (NRM) find that black men and women with acute myocardial infarction are less likely than white men and white women, respectively, to receive acute reperfusion therapy upon hospitalization (47) (Table 6, Appendix III). Further, the average elapsed time between hospitalization and acute reperfusion is longer for blacks (and Hispanics) than for whites (4). Similarly, black men who are ideal candidates for coronary angiography are less likely than their white counterparts to receive the procedure during hospitalization. These findings persist after adjustment for sociodemographic characteristics, health insurance, detailed clinical variables and provider characteristics. By contrast, there are no appreciable black-white gaps in receipt of recommended medications within 24 hours of hospitalization (Table 6, Appendix III).

Finally, a study based on data from the National Heart Failure Project (NHFP) finds no difference in the quality of care provided to black and white fee-for-service Medicare beneficiaries hospitalized for congestive heart failure (31).

Racial differences in the use of invasive procedures for coronary artery disease, including coronary angiography, percutaneous coronary intervention (PCI), and coronary artery bypass surgery (CABS), have received a great deal of attention in the literature on racial disparities in care (11, 20). Consistent with most published studies, the studies by Cohen et al. (5), by Sonel et al. (39) and by Vaccarino et al. (47) find that whites are more likely than blacks to receive these procedures and that these findings are unchanged after adjustment for sociodemographic characteristics, detailed clinical variables and provider characteristics. Neither NRM nor the CRUSADE registry records the clinical data required to determine whether the use of these procedures is consistent with evidence-based guidelines. Consequently, the degree to which these differences in the use of invasive procedures for coronary artery disease reflect gaps in appropriate care for acute coronary syndromes and acute myocardial infarction cannot be determined from these data.⁶

The registry studies use strong methods and adjust for detailed clinical variables that can influence physicians' decisions to use particular treatments, even those recommended by evidence-based guidelines. Thus the findings of the studies are likely to have high internal validity. Whether these findings apply to all patients is unknown, however, because participation in these registries is voluntary on the part of hospitals. It is possible that hospitals which elected not to participate provide lower quality of care to all patients and also have larger racial and ethnic disparities in quality.

What are the racial and ethnic disparities in the treatment of cancer?

Black Medicare beneficiaries with cancer are less likely than whites to receive recommended adjuvant therapy as well as invasive procedures for staging and treatment.

Another important cause of morbidity and mortality is cancer, and disparities in the quality of cancer care are likely to have implications for health disparities as well. Most national studies of racial and ethnic disparities in the management of cancer use data from the Surveillance, Epidemiology, and End Results (SEER) registries. Studies that link the SEER data with Medicare administrative data are the strongest, because they are able to adjust for insurance coverage (not recorded in SEER) as well as measures of socioeconomic status.⁷

⁶ Of note, two studies of Medicare beneficiaries using data from the early 1990s—i.e., prior to the period covered by this Synthesis—found that higher rates of PCI and CABS in whites compared with blacks reflected higher rates of clinical appropriateness among whites and a greater likelihood of failing to receive indicated procedures among blacks (10, 36).

⁷ Studies that use the SEER data alone to assess disparities in cancer treatment in the nonelderly population do not control for insurance coverage or socioeconomic status. Therefore, this Synthesis focuses on studies that use the linked SEER-Medicare data.

Findings

Using the SEER-Medicare data, Baldwin et al. (2) find that black Medicare beneficiaries with stage III colon cancer are less likely than their white peers to receive adjuvant chemotherapy after surgery, which is recommended by evidence-based guidelines. Among patients 66 to 70 years old, this disparity remains after adjustment for sociodemographic factors, provider characteristics, area of residence and detailed clinical variables. Similarly, Morris et al. (28) find that black Medicare beneficiaries with stage II to IV rectal cancer are less likely than whites to receive adjuvant therapy after surgery.

Lathan et al. (23) use the SEER-Medicare data to assess racial and ethnic disparities in the evaluation and treatment of non-small-cell lung cancer, the most common type of lung cancer. They find that black Medicare enrollees with stage I to III lung cancer are less likely than whites to receive invasive procedures for staging, which can result in less accurate staging. Additionally, blacks are less likely than whites to receive potentially curative surgery. These black-white gaps remain after adjustment for other factors that may influence quality of care. Zeliadt et al. (53) find that black Medicare enrollees with local or regional prostate cancer are less likely than their white counterparts to receive aggressive therapy. This finding is harder to interpret than those of the other studies, however, because the optimal treatment for local and regional prostate cancer is controversial.

Conclusions

This Synthesis focuses on key measures of potential and realized access to care and on care processes and intermediate outcomes as indicators of quality of care. Thus numerous studies are excluded that examine rates of utilization of health care services but without reference to whether the services are appropriate or consistent with evidence-based guidelines. Any review of the research on health care disparities is a snapshot in time, and cannot reflect the continuously changing nature of health care delivery. With these provisos, the following conclusions emerge:

- Black and Hispanic adults and children are more likely than their white counterparts to lack a usual source of care, and Spanish-speaking Hispanics are the most likely to lack a usual source.
 - Adjusting for insurance, income and other characteristics nearly eliminates the black-white gap in several studies, but an appreciable gap remains in other studies.
 - Adjusting for insurance, income and other characteristics reduces but does not eliminate the Hispanic-white gap. Studies that assess the role of language show that the largest disparity is between whites and Spanish-speaking Hispanics.
- Black and Hispanic adults are less likely than whites to have the types of usual source of care that promote continuity, and these differences are not explained by health insurance coverage, income or other individual characteristics.
- The strongest studies find that black and Hispanics are much less likely than whites to have an ambulatory care visit during the year, and Spanish-speaking Hispanics are the least likely to have a visit.
 - A sizable black-white gap in the probability of having an ambulatory care visit remains after adjusting for all measured factors including insurance and income.
 - Similarly, a substantial Hispanic-white gap remains after adjusting for other factors excluding language, although additionally adjusting for language leaves only a small gap.

Findings

- Black and Hispanic seniors are less likely than white seniors to receive influenza vaccinations even after adjustment for other factors, but racial and ethnic gaps in screening for breast cancer disappear after adjusting for other factors.
- A landmark study of process quality of care finds that black and Hispanic adults are as likely or more likely than whites to receive recommended care, but this study has limitations that raise questions about the generalizability of the findings. Most salient, the study is limited to subjects who made visits to a health care provider, and blacks and Hispanics are less likely than whites to have such visits.
- Other studies find that racial and ethnic disparities in the quality of care for acute and chronic conditions, including heart disease, cancer, diabetes, and hypertension, are pervasive although not universal. These studies have limitations as well, but the limitations are unlikely to invalidate the findings.
 - Disparities in measures that reflect recommended processes of care, such as laboratory tests and administration of medications, tend to be small or even disappear altogether after adjustment for other factors that may influence quality of care.
 - By contrast, disparities are larger for intermediate outcomes that measure control of physiologic abnormalities and risk factors associated with chronic conditions, and these disparities do not disappear after adjustment for other factors.
 - Disparities are also larger for newer therapies and for invasive procedures.

Implications for Policy-Makers

Racial and ethnic disparities in access to and quality of health care are real and are only partially explained by differences in health insurance coverage, socioeconomic status, or other individual, area and health care system factors. Strategies to diminish and eventually eliminate racial and ethnic disparities in access to and quality of care are a crucial component of any effort to reduce health disparities.

Strategies to reduce racial and ethnic disparities in health care may involve systemic change or targeted initiatives aimed specifically at narrowing disparities. With regard to systemic strategies, the findings from this Synthesis suggest the following:

- Expansions in insurance coverage would reduce, but would not eliminate, racial and ethnic disparities in access to care.
- Initiatives by health plans and health care providers to provide culturally and linguistically appropriate services—in accordance, for example, with the national standards promulgated by the Department of Health and Human Services, Office of Minority Health (45)—might reduce the access barriers experienced by Spanish-speaking Hispanics. Such initiatives should include a strong evaluation component to assess their effectiveness and generalizability.
- Systemic strategies to foster continuity of care might contribute to reducing disparities. Such strategies might focus on promoting use of physicians' offices by black and Hispanic patients. Encouraging and assisting safety net providers—including community health centers—in linking each of their patients with a responsible physician or nonphysician provider might help as well, since minority patients are more likely than whites to receive care from safety-net providers. Medicaid programs could play a key role through the expansion of medical home initiatives. Rigorous evaluation of such efforts would be important for future policy development.
- Increased adherence by providers with evidence-based guidelines is likely to promote better care for all patients and could reduce disparities in quality of care. Indeed, interventions to increase adherence with evidence-based guidelines in primary care—especially reminder systems for screening and preventive care—have been found to improve the care minority patients receive (3). Increased adherence with guidelines might result in improved management of chronic conditions and greater use of recommended newer therapies and invasive procedures by black and Hispanic patients.

These strategies should be complemented by enhanced efforts to raise awareness of racial and ethnic disparities in health and health care among policy-makers, health care providers, and the general public and by initiatives to measure and track disparities. An example of the latter is the *National Healthcare Disparities Report* issued by the Agency for Healthcare Research and Quality (46).

The Need for Additional Information

Future research efforts should focus on important unanswered questions regarding racial and ethnic disparities in health care and on the effectiveness and feasibility of large-scale implementation of the systemic strategies described in the preceding section as well as of certain targeted initiatives that are believed to hold promise for reducing disparities. Specific areas where there is a need for additional information include:

- There is a need for a systematic review and synthesis of the existing research on geographic variations in the size of racial and ethnic disparities in care, to identify the characteristics of communities and regions with small and large disparities and to guide local and state policy-makers.
- Studies are needed to understand the reasons for the divergence in findings regarding racial and ethnic disparities in processes of care versus disparities in intermediate outcomes.
- Studies are needed to assess the effects of cultural competency training for health care providers on access to and quality of care for minority patients. In a related vein, studies are needed to understand whether patients who have providers of the same race or ethnicity receive better care than patients who have providers of a different race or ethnicity.
- Ongoing targeted initiatives by health plans and health care providers to reduce racial and ethnic disparities in care provide opportunities for research on how to tailor such initiatives to particular population groups and on identifying their essential components.
- Studies are needed to determine the role of interventions with patients—e.g., interventions that aim to educate or empower patients—in reducing health care disparities.
- There is also a need for research to assess the effects of trained lay health workers, such as *promotoras* and patient navigators, on access to and quality of care for minority patients. More generally, exploring the benefits and large-scale feasibility of community-based approaches to reducing disparities is an important area for investigation.

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This Appendix discusses a variety of issues regarding the data sources used by the studies included in this Synthesis, the measurement of health care disparities, and the statistical adjustments used in studies of disparities in access to and quality of care.

Literature Search

This Synthesis focuses on research studies that meet three criteria. First, the research is based on data collected over the last decade (since 1996). Second, the research is based on data that have a national scope even if they are not obtained from nationally representative probability samples. Third, the studies use statistical methods to adjust measured disparities for individual and, in some cases, for area and health care system characteristics that may influence access to and quality of care.

The literature was searched through PubMed, using the following search terms in various combinations: Racial, Ethnic, Disparities, Differences, Inequities, Black, African-American, Hispanic, Language, Access, Health care, Quality of care, Screening, Preventive care, Quality of care, Heart disease, Coronary artery disease, Diabetes, Hypertension, Cancer, Stroke, Cerebrovascular disease, HIV, Chronic conditions, Medicare and Managed care. Studies that could be relevant to the Synthesis were initially chosen, then abstracts were screened to exclude studies that clearly failed to meet the three criteria listed in the preceding paragraph. Articles that were not excluded were read in detail to determine their suitability for inclusion in the Synthesis. Additional articles were identified from the reference lists of selected articles.

Data Sources

The data sources for the studies reviewed in this Synthesis include surveys and medical records and other sources of clinical data (e.g., cancer registries). Important factors that affect the validity and generalizability of survey data for assessing racial and ethnic disparities in care include the target population; sample design; mode of administration; psychometric properties of the items including expected recall period and response rate. Similarly, factors that affect the validity and generalizability of medical records data encompass the target population, including both patients and providers; sample design; design of the record-abstraction instrument; response rate and completeness of the records obtained for each subject. Differences across studies in these factors can affect the size of measured disparities.

Surveys

Surveys used in the studies that are included in this Synthesis include the Medical Expenditure Panel Survey Household Component (MEPS-HC), the Community Tracking Study (CTS) Household Survey, the National Survey of America's Families (NSAF), the National Health Interview Survey (NHIS) and the Medicare Current Beneficiary Survey (MCBS). The MEPS-HC is a nationally representative survey that uses an overlapping panel design in which data are collected through a preliminary contact followed by five rounds of interviews over a 2 1/2-year period. Data for two calendar years are collected from each household using computer-assisted personal interviewing (CAPI) technology. MEPS also includes a Medical Provider Component that covers hospitals, physicians, home health care providers and pharmacies identified by MEPS-HC respondents. The data collected through the Medical Provider Component are used to supplement or replace information received from the MEPS-HC respondents about the health care services that were provided to household members during the survey year. The Medical Provider Component questionnaires obtain information on both the medical and financial characteristics of medical events. Response rates range from 63 percent in

2004 to 71 percent in 1996. (See www.meps.abrq.gov/survey_comp/hc_data_collection.jsp.)

The Community Tracking Study (CTS) Household Survey is a cross-sectional survey administered to households in the 60 CTS sites: 51 metropolitan areas and nine nonmetropolitan areas which were randomly selected to be representative of the nation as a whole. The CTS Household Survey has been administered four times since 1996. Data are collected using computer-assisted telephone interviewing (CATI), and households without telephones are provided mobile telephones so they can be included. Response rates range from 57 percent in 2003 to 65 percent in 1996/97. (See webapp.icpsr.umich.edu/cocoon/ICPSR-STUDY/04216.xml.)

The National Survey of America's Families (NSAF) is a cross-sectional survey designed to produce national estimates of the population under 65. Data are collected using computer-assisted telephone interviewing (CATI); households without telephones are provided mobile telephones so they can be included. Response rates range from 52 percent in 2002 to 62 percent in 1997. (See spe.hhs.gov/hsp/06/Catalog-AI-AN-NA/NSAF.htm.)

The NHIS is a nationally representative, cross-sectional survey that oversamples blacks and Hispanics and is conducted annually. Data are collected from each family in the survey sample using a face-to-face interview and CAPI. The response rate for the NHIS is greater than 90 percent of eligible families. (See <http://www.cdc.gov/nchs/nhis.htm>.)

The MCBS is a nationally representative survey of the Medicare population that uses a rotating panel design in which subjects are interviewed every four months for up to four years. The survey samples are obtained from Medicare enrollment files and data are collected using CAPI. The design of the MCBS permits both cross-sectional and longitudinal analyses. (See www.cms.hhs.gov/LimitedDataSets/11_MCBS.asp.)

The data collection procedures used by different surveys render some of them more useful than others for studying particular measures of interest. For instance, studies reviewed in this Synthesis use the MEPS-HC or the CTS survey to examine differences in the probability of having a usual source of care across racial and ethnic groups. Although these surveys differ in mode of administration, the differences are unlikely to affect responses to questions about having a usual source of care. These questions ask subjects whether there is a provider or a place where they go when they are sick or need advice about their health. Therefore, both surveys are expected to provide equally valid data on having a usual source of care.

In distinction to the data on usual source of care, the validity of the data on the probability of having an ambulatory visit during the prior year is likely to vary across surveys due to differences in mode of administration and data collection procedures. The CTS survey, for example, asks whether respondents had a visit in the preceding 12 months. This question is subject to considerable recall bias, and in particular, to “telescoping” bias—the tendency to recall remote events as occurring closer to the time of the survey. By contrast, the MEPS-HC uses multiple rounds of data collection, with short recall periods, and supplements the household surveys with the medical provider component. Consequently, the MEPS-HC is likely to contain much more accurate information on visits—and on health care utilization, more generally—than other surveys. Of note, it is reasonable to assume that telescoping results in understating the size of racial and ethnic disparities in visits. To understand why, suppose that due to telescoping bias a fixed fraction of respondents who did not have a visit in the past 12 months erroneously report that they had such a visit. Then the percentage of all respondents who erroneously report a visit in the past 12 months must necessarily be greater for racial and ethnic groups with lower percentages of respondents who truly had a visit in the past 12 months. This is because these groups have

higher percentages of respondents who in reality did not have a visit, and hence they have more “opportunities” for erroneous reports. This phenomenon would tend to narrow disparities. Survey-based data on the use of preventive health care services are also subject to telescoping bias. Additionally, survey respondents may confuse distinct but similar preventive services with each other or they may have a tendency to provide socially desirable responses. Not surprisingly, validity studies have found that self-reports of pneumococcal and influenza vaccination have high sensitivity but only low to moderate specificity, implying that many respondents who were not vaccinated nonetheless report receiving the vaccines (25, 54). Similarly, studies have found that women’s self-reports of mammograms and Pap smears generally overestimate the use of these tests and underestimate the time since the last test (27). The tendency for self-reports to overestimate screening rates has been documented for other cancer screening tests and for cholesterol screening as well (14, 29). Some studies suggest that white women’s self-reports are more accurate than those of black or Hispanic women (27, 52), although this is not a consistent finding. Whether these reporting biases affect estimates of racial and ethnic disparities in receipt of preventive care services derived from surveys is unknown, but it seems possible, for the reasons described earlier, that they result in understating the size of disparities.

Medical Records and Other Clinical Data

Many studies of quality of care use data collected from medical records or other clinical data sources.

The landmark study by Asch et al. (1) collected data from the medical records of adults in 12 large metropolitan areas that serve as study communities for the Community Tracking Study. The study abstracted the medical records of respondents to the CTS Household Survey in order to assess racial and ethnic disparities in whether subjects received care consistent with 439 indicators of the quality of care for 30 medical conditions and for preventive care (26). The medical records data span a two-year period for each subject and the data collection includes both ambulatory and inpatient care. An important shortcoming of this study is that data on quality indicators were only collected for subjects who had made a visit to a health care provider, but black and Hispanic adults are less likely than their white counterparts to have a visit to a provider even after adjusting for other factors. Another shortcoming is that medical records were obtained for only 37 percent of eligible subjects, and the rate of records retrieval was higher for whites than for blacks or Hispanics. Differential records-retrieval rates could have affected the study findings if, for example, the small minority of blacks and Hispanics whose records were obtained were especially likely to know how to navigate the health care system and secure good care.

Data from the Health Plan Employer Data and Information Set (HEDIS), linked with Medicare administrative data, are used by a few studies to assess processes of care and intermediate outcomes for Medicare beneficiaries enrolled in Medicare managed care plans. HEDIS data are collected by the health plans and reported to Medicare.

Several studies use data from national registries to evaluate racial and ethnic disparities in the quality of inpatient hospital care for heart disease. The registries include the CRUSADE registry, which focuses on patients with non-ST segment elevation acute coronary syndromes (non-ST segment elevation myocardial infarction and unstable angina); the National Registry of Myocardial Infarction (NRMI), and the National Heart Failure Project (NHFP) registry. CRUSADE collected data from 2001 through 2006 in more than 500 hospitals. NRMI began in 1990, has collected data in more than 1600 hospitals, and is currently in its fifth phase (NRMI 1, 2, 3, 4, and 5). The NHFP collected data from 1998–2001. Hospital participation in CRUSADE and NRMI is

voluntary, whereas the NHFP was a quality improvement initiative developed by the Centers for Medicare and Medicaid Services for Medicare fee-for-service beneficiaries hospitalized with congestive heart failure. The registries collect detailed clinical data that enable researchers to assess whether care is consistent with established guidelines.

The heart disease registry studies are able to adjust for detailed clinical variables that can influence physicians' decisions to use treatments, even those recommended by guidelines. Therefore, the findings of these studies are likely to have high internal validity. However, whether the findings are generalizable is unknown. Participation in the NRMI and in the CRUSADE registry is voluntary on the part of hospitals. It is possible that hospitals which elected not to participate provide lower quality of care to all patients and also have larger racial and ethnic disparities in quality.

Studies of racial and ethnic disparities in the quality of care for cancer are based on data from the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute, a set of population-based cancer registries currently covering 18 geographic areas across the nation and about one-fourth of the U.S. population. The population covered by SEER is comparable to the general population with regard to measures of poverty and education. The SEER registries collect data on patient demographics, primary tumor site, tumor morphology, stage at diagnosis, first course of treatment, and follow-up for vital status and are updated annually, but they do not collect data on insurance coverage or socioeconomic status. However, the SEER data have been linked with administrative data from the Medicare program, which enables researchers to adjust for insurance and for measures of socioeconomic status developed from census tract data. The linked data are often used for studies of the quality of cancer care for seniors.

Measuring Racial and Ethnic Disparities in Care

The studies included in this Synthesis use multivariate statistical methods to assess the extent to which the observed racial and ethnic differences in measures of access to or quality of health care are explained by other factors. Two main types of analyses are used to adjust for other factors: decomposition analyses and odds-ratios analyses. Studies that report the findings of decomposition analyses are the easier to interpret. These studies express differences between racial and ethnic groups in terms of percentage points and assess how these differences shrink or grow as the other factors are adjusted for. Odds-ratios studies express differences between racial and ethnic studies in terms of the relative odds for the two groups that are being compared and assess how these relative odds change as the other factors are adjusted for. The disparities that remain after adjusting for other factors may be due to unmeasured variables that influence access to or quality of care or to race and ethnicity, *per se*, through a variety of mechanisms.

In mathematical language, let P_w be the probability of the outcome of interest (e.g., not having a usual source of care) in whites and let P_B be the probability in blacks. Decomposition studies report the difference $\Delta P = P_B - P_w$, which may be unadjusted or adjusted for other factors using multivariate linear regression. Odds-ratios studies report the odds ratio

$$OR = \frac{\frac{P_B}{(1 - P_B)}}{\frac{P_w}{(1 - P_w)}}$$

which may be unadjusted or adjusted for other factors using multivariate logistic regression. Because odds ratios are difficult to interpret, for this Synthesis adjusted odds ratios obtained from odds-ratios studies were converted to approximate adjusted percentage point differences. The method involved solving the following two simultaneous equations for Q_B and Q_W , the approximate adjusted probabilities of the outcome of interest in blacks and whites, respectively:

$$BQ_B + WQ_W = BP_B + WP_W$$

and

$$AOR = \frac{\frac{Q_B}{(1 - Q_B)}}{\frac{Q_W}{(1 - Q_W)}}$$

where P_B and P_W are the unadjusted probabilities of the outcome of interest in blacks and whites, as observed in the data; B and W are the weighted proportions of blacks and whites in the analysis sample; and AOR is the adjusted odds ratio for the outcome in blacks relative to whites, obtained from the reported logistic regression results. The approximate adjusted percentage point difference is given by $\Delta Q = Q_B - Q_W$.

Statistical Adjustments in Studies of Racial and Ethnic Disparities in Care

As noted earlier, the studies included in this Synthesis use multivariate statistical methods to adjust the data for other factors that may influence access to or quality of health care. The validity of the findings of these studies depends in part on the nature and comprehensiveness of these adjustments. Ideally, studies of racial and ethnic disparities in care should adjust for individual variables such as age, sex, family structure, socioeconomic status, health insurance coverage, clinical characteristics and health status and area variables. Although most studies fall short of this ideal, as a result of data limitations, the majority of the studies included in this Synthesis do an excellent job of adjusting for the most important other factors.

Studies of access to care are based on survey data and consequently are able to adjust for respondents' demographic characteristics (or parents', when the respondents are children), health insurance coverage, family income, educational attainment, family size and structure, health status, region of the country and urban or rural area, all of which are reported on the surveys. The best studies assess the role of language as well, since the inability to speak English is an important barrier to health care access for many Hispanics. This can be accomplished in two ways: by adjusting for language just as for other factors that may influence access or by conducting separate analyses for English-speaking and Spanish-speaking Hispanics. The latter approach is more useful because it provides easily interpretable estimates of the disadvantage experienced by Hispanics who have not mastered English. Finally, a few studies additionally adjust for characteristics of the population or the health care system in the areas where the study subjects reside.

Most of the studies of preventive care use survey data and typically adjust for the same variables as access studies, although the precise variables differ across studies. However, a major shortcoming of many of the survey-based studies of preventive care is that they adjust as well for whether respondents have a usual source of care and, in several cases, for utilization measures such as the number of ambulatory visits and whether respondents were hospitalized. These latter adjustments are problematic because access measures themselves reflect how different racial and ethnic groups fare with regard to obtaining care. Consequently, adjusting for access measures

results in “overadjusting;” that is, this approach may mask legitimate and important racial and ethnic disparities in the receipt of preventive services. The strongest studies of preventive care are those that do not adjust for access measures.

Studies of other measures of quality of care, including processes of care and intermediate outcomes, most often use administrative data or data from medical records. These data sources may contain detailed clinical information but only limited sociodemographic information on subjects. Thus studies of processes of care or intermediate outcomes generally adjust for age and sex, health insurance coverage, detailed clinical variables and measured characteristics of health care providers, but they do not adjust for variables such as income, educational attainment, or family structure. To compensate, studies of quality adjust for measures of the income and educational attainment of the population in the area (e.g., census tract) where each subject resides as proxies for the absent data on individual income and education.

Finally, a few studies of quality of care additionally adjust for unmeasured characteristics of health care providers using provider fixed or random effects models. In a fixed effects model, there is a separate intercept for each provider which is intended to capture unmeasured provider attributes that influence the care patients treated by the particular provider receive. The model assumes that the provider effect is constant across patients, but it may be correlated with patient characteristics. This would be the case if, for example, higher quality providers treat sicker patients. A random effects model assumes that the provider effects are random variables and are uncorrelated with (i.e., orthogonal to) the independent variables in the model. The random effects model yields more precise estimates than the fixed effects model; however, if the orthogonality assumption does not hold, the estimated coefficients in the random effects model are biased.

“Overadjustment” in Disparities Studies

As discussed in the preceding paragraphs, most survey-based studies of preventive care adjust for whether respondents have a usual source of care and, in several cases, for utilization measures such as the number of ambulatory visits and whether respondents were hospitalized. Because there are racial and ethnic disparities in access to care, adjusting for access measures results in overadjustment. Some observers might argue that adjusting for socioeconomic status, insurance coverage, area characteristics and provider and health plan characteristics result in overadjustment as well. To a large extent, the answer depends on the goal of the analysis. If the goal is to assess differences in care among racial and ethnic groups, irrespective of the underlying mechanisms, any adjustment can be viewed as overadjustment. In most studies, however, the goal is to assess the “independent” contributions of race and ethnicity to disparities in care, net of other factors that influence the care people receive. In such studies, adjusting for income, insurance coverage, sociodemographic characteristics, and area factors is appropriate. Adjustments for provider and health plan characteristics are more problematic because—like having a usual source of care—provider and health plan characteristics themselves reflect how different racial and ethnic groups fare with regard to obtaining care. In particular, studies that adjust for the particular health plan in which subjects enroll shed light on racial and ethnic disparities among the subjects in a health plan (i.e., within-plan disparities), but provide no information on disparities due to subjects from different racial and ethnic groups enrolling in plans of varying quality (i.e., between-plan disparities). The studies reviewed in this Synthesis should be interpreted with these issues in mind.

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