

# Perceived Discrimination and Reported Delay of Pharmacy Prescriptions and Medical Tests

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**BACKGROUND:** Access to health care varies according to a person's race and ethnicity. Delaying treatment is one measure of access with important health consequences.

**OBJECTIVE:** Determine whether perceptions of unfair treatment because of race or ethnicity are associated with reported treatment delays, controlling for economic constraints, self-reported health, depression, and demographics.

**DESIGN:** Cross-sectional, observational study.

**PARTICIPANTS:** A randomly selected community sample of 181 blacks, 148 Latinos, and 193 whites in Durham County, NC.

**MEASUREMENTS:** A phone survey conducted in 2002 to assess discrimination, trust in medical care, quality of care, and access to care. Treatment delays were measured by whether or not a person reported delaying or forgoing filling a prescription and delaying or forgoing having a medical test/treatment in the past 12 months. Perceived discrimination was measured as unfair treatment in health care and as racism in local health care institutions.

**RESULTS:** The odds of delaying filling prescriptions were significantly higher (odds ratio (OR)=2.02) for persons who perceived unfair treatment, whereas the odds of delaying tests or treatments were significantly higher (OR=2.42) for persons who thought racism was a problem in health care locally. People with self-reported depression and people who reported not working had greater odds of delaying both types of care.

**CONCLUSIONS:** A prospective cohort study with both personal and macro measures of discrimination, as well as more refined measures of treatment delays, would help us better understand the relationship between perceived discrimination and treatment delays.

**KEY WORDS:** perceived discrimination; perceived racism; delay of treatment; pharmacy prescriptions; African American; black; Latino.

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Access to health care varies according to a person's race and ethnicity.<sup>1-5</sup> Poor access to care, in turn, has been linked to poor health outcomes in minority populations.<sup>5</sup> Policies to ameliorate access disparities, such as through universal health insurance or health insurance tax credits, may not

succeed unless other factors explaining disparities are also addressed.

Disparities in access to care are partially explained by differences in income and health insurance coverage among blacks, whites, and Latinos,<sup>2,5</sup> but these factors do not tell the full story. Disparities in access have also been explained by other factors, including a lack of cultural and linguistic competency among providers, a scarcity of providers, provider treatment choices, differences in perceived risk by race and ethnicity, number of comorbidities, patient preferences and beliefs, and perceptions of discrimination based on race or ethnicity (C. Voils et al. unpublished data, 2004).<sup>3,4,6-11</sup>

Perceived discrimination may be a particularly potent barrier to care for blacks given the grim history of care for blacks in the United States.<sup>12,13</sup> Recent studies have highlighted that blacks generally mistrust the health care system,<sup>14,15</sup> receive lower quality of care,<sup>5,16</sup> and use fewer medical services in general than whites.<sup>10,17-20</sup> Language, recency of arrival in the United States, and insurance<sup>21</sup> explain barriers to care for Latinos, but less is known about perceived discrimination and access to care for Latinos.<sup>19</sup>

Delaying treatment is one type of access barrier that can have important health consequences. Delaying filling prescriptions can lead to poor adherence and poor health outcomes,<sup>22,23</sup> whereas delaying medical tests can lead to missed diagnoses and less efficient care. Past research has shown that blacks and Latinos delay seeking treatment compared with whites.<sup>24-29</sup> Medication adherence, sometimes measured as prescription delays, also has been documented to be poorer for blacks and Latinos than for whites.<sup>30,31</sup>

It is not known how perceived discrimination contributes to racial differences in treatment delays. Perceived discrimination has been found to partially explain poorer mental and physical health status in minorities compared with whites,<sup>21,32,33</sup> and is associated with lower satisfaction with care<sup>34</sup>; however, these studies do not make any linkages with treatment delays. We found only 1 study that made a direct linkage: hemodialysis patients with previous experiences of racial discrimination were less likely to be placed on waiting lists for kidney transplants.<sup>35</sup>

The purpose of this study is to determine whether perceived discrimination in the health care system based on race is associated with delays in pharmacy prescriptions or delays in medical tests or treatments (the term *delays* refers to reported delays throughout the paper). We expect perceived

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discrimination to be associated with delays in treatment because it affects the trust and level of buy-in that patients have with the recommendations of their medical provider. Learning whether perceived discrimination contributes to delays in treatment can help inform future interventions, research, and policy as we move from documenting to addressing persistent racial and ethnic access disparities in health care.

## METHODS

### Data Source

A survey of blacks, whites, and Latinos in Durham County, NC, was developed and conducted in 2002 to assess discrimination, trust in medical care, quality of care, and access to care. Survey items were drawn from the previously validated Henry J. Kaiser Family Foundation's (KFF's) survey on race, ethnicity, and medical care,<sup>36</sup> drawn from existing survey items in the literature, and developed for the current survey. The few developed items were evaluated by a group of providers and through cognitive interviews with African Americans and Latinos. The institutional review board of Duke University approved the study.

### Sample

The sampling strategy was designed to obtain a representative sample of each of the main racial groups of Durham County, NC residents: whites, blacks, and Latinos. To be sufficiently powered, we balanced the sample with approximately equal numbers of respondents from each group. The sample was obtained using standard list-assisted random digit dialing (RDD) methodology in which active blocks of phone numbers containing 3 or more residential directory listings were selected with probabilities in proportion to the number of listed phone numbers. After selection, 2 more digits were randomly added to complete the number, assuring coverage of all assigned phone numbers regardless of whether the number is listed, purposely unlisted, or too new to be listed in a phone directory.

Phone exchanges with higher-than-average density of black households were oversampled to increase recruitment of black participants. As there are fewer Latino households in Durham County, a similar phone exchange strategy could not be used. Hence, to oversample Latinos, we used a Durham county list of Latino surname households and RDD methodology. This recruitment method resembled that used in the KFF survey.<sup>36</sup>

Phone interviews were conducted in English or Spanish, according to a respondent's preference, between October 14 and December 16, 2002. Nearly 84% of Latinos were interviewed in Spanish. The response rate was 40%. The final study population consisted of 1,131 individuals.

Owing to concerns about respondent burden, the survey instrument was divided into 3 components: the core survey, split-half sample 1, and split-half sample 2. All subjects completed the core survey items but only 1 of the 2 split-half sets of questions. The split-half set that included the questions of current interest was administered to 586 respondents. We dropped 41 observations from the analysis because of incomplete information on key questions of interest (e.g., race, perceived discrimination, or delays), for a total of 545 respondents: 181 blacks, 170 Latinos, and 194 whites.

## Measures

We measured general perceived discrimination in health care as our primary independent variable. Specifically, we used 2 items to assess perceived discrimination, which were obtained from the rigorously validated KFF's survey on race, ethnicity, and medical care.<sup>37</sup> The first was, "Generally speaking, how often do you think our health care system treats people unfairly based on what their race or ethnic background is? Does this happen very often, moderately often, somewhat often, not too often or never?" Responses of "never" or "not too often" were coded 0, and the rest were coded 1. The second was, "Please tell me if you think racism, that is people being treated worse than others because of their race or ethnicity, is a major problem, a minor problem or not a problem at all in the following institutions in Durham County." The institutions referred to were education, the workplace, health care, and housing. Major and minor responses were coded 1, and not a problem at all was coded 0. Because people report greater group than personal discrimination,<sup>38-41</sup> and because both can have detrimental psychologic and physical health consequences,<sup>42-44</sup> we assessed perceived global rather than personal discrimination.

We also explored several potential independent variables: age, gender, marital status, not being born in the United States, and having less than a high-school education. Economic constraints included dichotomous measures of a person having difficulty paying bills, not working, not owning one's own home, and having no health insurance. Finally, differences in health status were controlled for by self-assessed physical health (1=excellent and 5=poor) and the PRIME-MD 1000 depression measure (1=felt down, depressed, or hopeless in the past 2 weeks and felt little interest or pleasure in doing things in the past 2 weeks, 0=did not).<sup>45</sup> We control for depression because of evidence that depressed patients are less adherent with treatment.<sup>46</sup>

The dependent variables were 2 dichotomous measures of reported treatment delays. Survey participants were asked, "During the past 12 months, did you either delay or not get a prescription that a doctor or provider prescribed for you?" and "During the past 12 months, did you either delay or not get a test or treatment that a doctor or provider ordered?"

## Analysis

The multivariable association of perceived discrimination and treatment delays was estimated in 2 separate logistic models: 1 for prescription delays and 1 for test or treatment delays. We also examined interaction terms of race and perceived discrimination because of the possible race-specific component of perceived discrimination. Preliminary analysis of the multivariable models showed that they were nonsignificant,<sup>47</sup> so interaction terms were not retained.

Before estimating the logistic model, we examined the strength of the bivariate associations between the explanatory variables and delays using independent samples *t* tests for dichotomous variables and Pearson correlations for continuous variables. We included explanatory variables with  $P < .20$  in the multivariable logistic models.

Because the correlation among some of the proposed independent variables was 0.6 or higher, we examined multicollinearity by calculating the variance inflation factor (VIF) of

each variable. Multicollinearity, defined as a VIF score greater than 2.5, existed between the ethnicity variable—Latino—and whether or not an interview was conducted in Spanish. Therefore, we included Latino in the model in lieu of interview language.

Several additional refinements were made. Because the 2 perceived discrimination measures showed significant bivariate associations with delays of prescriptions compared with delays in tests and treatments, we used both measures in the logistic models. The correlation between these 2 measures was low (0.29), so they may be capturing distinct perceptions of discrimination and, at the least, do not introduce multicollinearity by their inclusion.

## RESULTS

On average, respondents were 42 years old, unmarried, female, and had less than a high-school education (Table 1, column 1). Compared with national uninsured rates of about 15%<sup>48</sup> and unemployment rates of 5.5%<sup>49</sup> in 2002, a significantly higher proportion of our respondents had no health insurance and were unemployed. Self-reported health was rated as “good” on average, and nearly 16% of respondents reported depression.

Just over half of this sample felt that race or ethnicity caused unfair treatment in health care either very often, moderately often, or somewhat often (Table 1, column 1). Sixty

percent felt that racism was a major or minor problem in health care institutions in Durham County.

Nearly 17% of the sample reported delaying or not filling an ordered prescription in the past 12 months. Fewer, 8.4%, had delayed or not received a test/treatment that had been ordered (Table 1).

## Bivariate Analyses

Significant differences in delays were found by key independent variables (Table 1). A higher proportion of those who delayed filling prescriptions felt that there was unfair treatment in health care based on race. Differences in delays in tests/treatments, however, did not differ based on perceptions of unfair treatment (Table 1). By contrast, delays in tests/treatments did differ by the second measure of perceived discrimination—whether or not racism was a problem in health care in the county. Prescription delays did not differ by this second measure of perceived discrimination.

## Reported Prescription Delays

The odds of delaying a pharmacy prescription were significantly higher for persons who perceived unfair treatment than for people who did not (odds ratio (OR)=2.02) (Table 2). Being Latino was associated with lower odds (OR=0.45) of delaying filling a prescription compared with whites. Persons who did

Table 1. Characteristics of Respondents by Whether or Not They Delayed Treatment (N=545)

Demographic Variable	Full Sample (N=522)	Prescription		Tests/Treatment	
		Delay (N=92)	No Delay (N=453)	Delay (N=46)	No Delay (N=499)
<b>Demographics</b>					
Black (%)	33	40	32 <sup>†</sup>	39	33
Latino (%)	31	20	33*	22	32 <sup>†</sup>
White (%)	36	40	35	39	35
Female (%)	53	65	50*	61	52
Married (%)	44	40	44	46	43
Urban (%)	79	76	80	80	79
Less than high school (%)	58	66	57 <sup>†</sup>	63	58
Mean age (years)	41.9	42.0	41.9	43.0	41.8
<b>Economic constraints</b>					
Has no health insurance (%)	29	34	28	43	28*
Not working (%)	34	49	31*	59	32*
Has difficulty paying bills (%)	15	22	14 <sup>†</sup>	26	14 <sup>†</sup>
Does not own a home (%)	54	54	55	52	55
Has a usual source of care (%)	82	86	81	83	82
Had transportation problems to doctor's appointments (%)	7	9	6	7	7
<b>Timing of immigration</b>					
Not born in United States (%)	32	26	33 <sup>†</sup>	26	32
Interview in Spanish (%)	27	16	29*	17	27 <sup>†</sup>
<b>Health</b>					
Self-reported health (1=excellent, 5=poor) (%)	3.4	3.2	3.45 <sup>†</sup>	3.2	3.44
Felt down, depressed, hopeless, or felt little interest or pleasure in doing things in past 2 weeks (%)	16	35	13*	35	14*
<b>Perceived discrimination</b>					
Our health care system treats people unfairly based on race or ethnic background (very, moderately, and somewhat often = 1) (%)	51	66	48*	59	51
Racism is a major or minor problem in health care institutions in Durham County (%)	60	63	60	76	59*

\*Indicates significance at the 5% level.

<sup>†</sup>Indicates significance at the 20% level merits inclusion in the logistic model.

not work had significantly greater odds of delaying medication treatment (OR=1.81) compared with persons who worked.

People with self-reported depressive symptoms were also significantly more likely to delay filling prescriptions than those without symptoms (OR=2.71). Holding all else constant, respondents with depressive symptoms had a 29% chance of delaying or forgoing filling a prescription, whereas respondents without depressive symptoms had only a 13% chance.

### Reported Tests/Treatment Delays

Perceiving racism as a problem in health care locally was associated with higher odds of delaying tests/treatments prescribed by a health care provider (OR=2.42), whereas perceiving unfair treatment in health care was not (Table 3). Economic constraints were associated with higher odds of delaying treatments or tests; persons who were not working and persons with no health insurance had greater odds of forgoing or delaying tests and treatments (OR=2.59 and 2.68, respectively).

## DISCUSSION

### Reported Prescription Delays

Delaying filling pharmacy prescriptions can lead to poor medication adherence, and for many diseases, may be detrimental.<sup>22,23,50,51</sup> Adherence is often poorer for blacks than for whites<sup>30</sup> and may contribute to disparities in health outcomes. In our models, once we controlled for perceived discrimination, being black did not explain prescription delays, one facet of treatment adherence. However, because perceiving discrimination was associated with a greater likelihood of a prescription delay, factors such as discrimination—not race itself—may explain adherence differences between blacks and whites. In other studies, being black has been significantly associated

**Table 3. Factors Significantly Related to Delaying or Not Getting a Test or Treatment that a Doctor Ordered in Multivariable Logistic Regression Models (N=545)**

Explanatory Variables	Adjusted OR (95% CI)
<b>Demographics</b>	
Black	0.95 (0.42, 2.12)
Latino	0.40 (0.12, 1.32)
Female	1.30 (0.64, 2.65)
Less than high-school education	1.34 (0.64, 2.81)
<b>Economic constraints</b>	
Has difficulty paying bills	1.35 (0.60, 3.02)
Not working	2.59 <sup>†</sup> (1.32, 5.08)
Has no health insurance	2.68* (1.10, 6.52)
<b>Health variables</b>	
Self-reported health (1 =excellent, 5 =poor)	0.96 (0.69, 1.34)
Felt down, depressed, hopeless, and felt little interest or pleasure in doing things in past 2 weeks	2.28 (1.11, 4.71)
<b>Perceived discrimination</b>	
Thinks our health care system treats people unfairly based on race or ethnic background (very, moderately, and somewhat often =1)	1.03 (0.51, 2.06)
Thinks racism is a major or minor problem in health care institutions in Durham County	2.42* (1.09, 5.36)

\*Indicates significance at the 5% level.

†Indicates significance at the 1% level.

Standard errors are robust.

C-statistic =0.73.

OR indicates the odds ratio; CI, confidence interval.

**Table 2. Factors Significantly Related to Delaying or Not Getting a Prescription in Multivariable Logistic Regression Model (N=545)**

Explanatory Variables	Adjusted OR (95% CI)
<b>Demographics</b>	
Black	0.93 (0.52, 1.63)
Latino	0.44* (0.20, 0.97)
Female	1.44 (0.86, 2.41)
Less than high-school education	1.70 (0.98, 2.97)
<b>Economic constraints</b>	
Has no health insurance	1.67 (0.90, 3.08)
Not working	1.81* (1.08, 3.06)
Has difficulty paying bills	1.24 (0.66, 2.34)
<b>Health</b>	
Self-reported health (1 =excellent, 5 =poor)	0.85 (0.67, 1.08)
Felt down, depressed, hopeless, and felt little interest or pleasure in doing things in past 2 weeks	2.71 <sup>†</sup> (1.58, 4.66)
<b>Perceived discrimination</b>	
Thinks our health care system treats people unfairly based on race or ethnic background (very, moderately, and somewhat often =1)	2.02 <sup>†</sup> (1.11, 3.17)
Thinks racism is a major or minor problem in health care institutions in Durham County	0.93 (0.59, 1.65)

\*Indicates significance at the 5% level.

†Indicates significance at the 1% level.

Standard errors are robust.

C-statistic =0.70.

OR indicates the odds ratio; CI, confidence interval.

with lower utilization (see Mayberry et al.<sup>19</sup> for a review). Yet, in studies that control for race and key variables that differ by race (e.g., perceived discrimination, health beliefs, fatalism, trust), race often has not been associated with utilization or delays.<sup>52,35</sup>

Our findings showed that being Latino was associated with lower odds of delaying filling prescriptions compared with whites, even after controlling for perceived discrimination. Past evidence on treatment delays for Latinos has been mixed. Whereas some studies showed that Latinos were more likely to delay treatment,<sup>26,28</sup> another matched our finding that Latinos were less likely to have prescription medications. The Latinos in our sample are different from those in other national studies; Durham county Latinos consist of recently arrived, young construction or service workers.<sup>53</sup> Thus, our finding could be reflecting the lower demand for prescriptions in general rather than providing evidence of prescription delays.

Our finding that patients with depressive symptoms had higher odds of delaying prescription treatment is consistent with findings that persons with depression are less adherent compared with patients with other diseases.<sup>46</sup>

### Reported Test/Treatment Delays

Of the 2 perceived discrimination variables, only endorsing that racism was a problem in health care institutions in Durham County was associated with more test/treatment delays. In contrast, only perceived unfair treatment was associated with pharmacy delays. This was a post hoc finding as we did not have prior hypotheses about which measure of perceived discrimination would be associated with the different outcomes. This finding underscores the fact that the particular measure of perceived discrimination in multivariable models is important. Future research will need to determine why

different definitions were important for the different types of delays, as we cannot address this question with our data.

Economic constraints—most importantly not working and not having health insurance—were significantly associated with delayed or forgone medical tests/treatments. Comparing across the types of delays, economic constraints were more closely associated with delays of tests/treatments than delays of prescriptions. This makes sense when we consider that the average cost of a medical test or treatment is likely to be much higher than the average cost of a prescription. Our study sample has a larger than national average number of nonworkers and uninsured persons. That said, the relative importance of economic constraints in explaining delays in treatment echoes findings from the KFF survey that “more minority Americans were concerned about the cost of care than racial barriers.”<sup>36</sup>

## Limitations

The interpretation of the results needs to be considered in light of the fact that the data were self-reported. There may also be recall biases or social desirability biases inherent to any survey research. Further, we were not able to interview persons without phones. Because we likely are missing responses from persons with the lowest socioeconomic status, external validity may be limited.

We are unable to discern from our data whether a response of “0” on the delay questions meant that a person did not delay because they filled their prescription/received treatment on time or meant that they simply did not need any prescriptions/treatments in the past 12 months. The general effect of this would be to attenuate our findings as people who did not need care would have reported no delays, regardless of whether they thought there was discrimination in the health care system. There is also some concern that, regardless of health status, persons who perceived discrimination may be less likely to have sought a doctor’s care in the past year and therefore report “0” on the delay questions, which would also attenuate the association (this may explain the results on Latinos being less likely to delay prescriptions). Finally, there is a chance that the treatment model is overspecified because of the small number of persons delaying care ( $n=46$ ) and a large number of explanatory variables. As a part of the sensitivity analyses, we estimated a parsimonious model of treatment delays using perceived discrimination and race as explanatory variables. Because the coefficients on perceived discrimination changed minimally, we feel that overspecification is not a major concern.

## CONCLUSIONS

Perceived discrimination and depression were associated with delays in filling prescriptions and treatments, even after controlling for race, economic constraints, and other factors. The particular measure of perceived discrimination is important based on the type of delay. Being black was not associated with delays; yet, Latinos were less likely to delay filling prescriptions. Because the contextual factors related to perceived discrimination (e.g., improving provider communication or cultural competency) are modifiable and potentially explain racial differences in health care use, they may be more useful to examine than simply race or ethnicity. A prospective cohort study with both personal and macro measures of discrimina-

tion, as well as more refined measures of treatment delays, would help us better understand the relationship between perceived discrimination and treatment delays.

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