# Separate and Unequal

## *Clinics Where Minority and Nonminority Patients Receive Primary Care*

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**Background:** Few studies have examined the influence of physician workplace conditions on health care disparities. We compared 96 primary care clinics in New York, New York, and in the upper Midwest serving various proportions of minority patients to determine differences in workplace organizational characteristics.

**Methods:** Cross-sectional data are from surveys of 96 clinic managers, 388 primary care physicians, and 1701 of their adult patients with hypertension, diabetes mellitus, or congestive heart failure participating in the Minimizing Error, Maximizing Outcome (MEMO) study. Data from 27 clinics with at least 30% minority patients were contrasted with data from 69 clinics with less than 30% minority patients.

**Results:** Compared with clinics serving less than 30% minority patients, clinics serving at least 30% minority patients have less access to medical supplies (2.7 vs 3.4, $P<.001$), referral specialists (3.0 vs 3.5, $P<.005$) on a scale of 1 (none) to 4 (great), and examination rooms per physician (2.2 vs 2.7, $P=.002$) . Their patients are more frequently depressed (22.8% vs 12.1%), are more often covered by Medicaid (30.2% vs 11.4%), and report lower health literacy (3.7 vs 4.4) on a scale of 1 (low) to 5 (high) ($P<.001$ for all). Physicians from clinics serving higher proportions of minority populations perceive their patients as frequently speaking little or no English (27.1% vs 3.4%, $P=.004$), having more chronic pain (24.1% vs 12.9%, $P<.001$) and substance abuse problems (15.1% vs 10.1%, $P=.005$), and being more medically complex (53.1% vs 39.9%) and psychosocially complex (44.9% vs 28.2%) ($P<.001$ for both). In regression analyses, clinics with at least 30% minority patients are more likely to have chaotic work environments (odds ratio, 4.0; $P=.003$) and to have fewer physicians reporting high work control (0.2; $P=.003$) or high job satisfaction (0.4; $P=.01$).

**Conclusion:** Clinics serving higher proportions of minority patients have more challenging workplace and organizational characteristics.

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Minority Americans have poorer health outcomes from chronic conditions such as cancer, asthma, heart disease, and diabetes mellitus.[1] Some of these poorer outcomes are attributable to disparities in health care resulting from a myriad of access, patient, and physician factors.[1] Potential patient-related factors include trust, literacy, attitudes, education, knowledge, preferences, health beliefs, cultural traditions, late-stage presentation of illness, and racial/ethnic concordance with physicians.[2] Disparities can also result from insurance status, health care affordability, inadequate access to care and transportation, and competing demands, such as employment and child care.[2] Finally, physician factors, including bias, poor communication skills, and inadequate training in cross-cultural issues, may also be involved.[2]

Bach et al[3] investigated if disparities in care could be explained by differences in access to resources. They found that a limited number of physicians provided most of the care for African Americans and that physicians caring for these patients reported limited access to health care resources, such as specialists and diagnostic imaging. However, that study provided little information about the work environment of physicians providing care to minority patients.

This study extends the work of Bach et al[3] by comparing the workplace characteristics of primary care clinics having sizeable minority clienteles with those of primary care clinics having mostly nonminority clienteles. We hypothesized that clinics serving more minority patients would have a more complex patient mix, increased adverse outcomes among physicians, and greater challenges in workplace characteristics.

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**Group Information:** Investigators in the Minimizing Error, Maximizing Outcome (MEMO) study are listed at the end of the article.

**Table 1. Structure of the Minimizing Error, Maximizing Outcome (MEMO) Study Clinics**

| Variable | No. (%) Clinics Serving ≥30% Minority Patients (n=27) | No. (%) Other Clinics (n=69) | *P* Value[a] |
|---|---|---|---|
| Clinic type | | | |
| Academic affiliation | 10 (37.0) | 31 (44.9) | .69 |
| Community primary care–only clinic | 14 (51.9) | 32 (46.4) | .73 |
| Community multispecialty clinic | 10 (37.0) | 35 (50.7) | .36 |
| Hospital-based primary care clinic | 3 (11.1) | 2 (2.9) | .25 |
| Clinic financing | | | |
| Health maintenance organization | 6 (22.2) | 33 (47.8) | .11 |
| County | 9 (33.3) | 1 (1.4) | <.001 |
| Hospital | 5 (18.5) | 3 (4.3) | .14 |
| University | 5 (18.5) | 27 (39.1) | .14 |
| Physician owned | 2 (7.4) | 5 (7.2) | .99 |

[a] Adjusted for multiplicity of tests (false discovery rates).

## METHODS

### SUBJECTS AND STUDY DESIGN

Patients, physicians, and clinic managers from 119 primary care clinics participated in the Minimizing Error, Maximizing Outcome (MEMO) study. This 4-year (2001-2005) multimethod longitudinal investigation assessed how health care workplace factors affect the quality of medical care.[4] The 118 practices were located in 5 regions, including inner-city clinics in New York, New York, and Chicago, Illinois; academic and managed care clinics in Milwaukee and Madison, Wisconsin; and small town or rural private practice clinics in central Wisconsin. Practices in these areas were solicited for their diverse patient base, wide range of payers, and high proportions of uninsured patients. We emphasized recruitment of clinics serving large numbers of minority patients to address special issues for these populations. The institutional review board at each participating organization reviewed and approved the research protocol, and all participants (patients, physicians, and clinic managers) provided written consent.

A physician or PhD-level site director in each region facilitated the recruitment process. Eligible physician participants were family practitioners or general internists who spent at least 4 sessions per week providing ambulatory primary care. Clinics were enrolled if at least 50% of their physicians chose to participate. Up to 6 patients for each participating physician were surveyed by local MEMO study researchers via mail or waiting room recruitment. Patient eligibility criteria included age 18 years or older; ability to read in English, Spanish, or Cantonese; at least 2 outpatient visits with a participating physician in the previous 12 months; and a diagnosis of hypertension, diabetes mellitus, or congestive heart failure. The patient surveys and consent forms were created in English, translated into Spanish and Cantonese, and independently back-translated by bilingual professional translators.

### MAIN MEASUREMENTS

This article reports data from surveys of patients, physicians, and clinic managers. The physician survey was derived from the Physician Worklife Survey,[5] supplemented by physician comments from focus groups conducted at the inception of the MEMO study. The physician survey included a single query regarding burnout[6] and a question about the physician's likelihood of leaving the practice within 2 years. Physicians also rated the pace of the office on a 5-point scale ranging from calm to chaotic; clinics with a mean score of 4 or higher were deemed chaotic.

Organizational climate was assessed using a modified version of the multidimensional measure by Kralewski et al.[7] To decrease respondent burden and to ameliorate overlap with other measures, we tested 6 of 9 domains pertinent to the present study as follows: collegiality, cohesiveness, organizational trust, quality emphasis, information emphasis, and organizational identity. Split-sample exploratory and confirmatory factor analysis of the modified measure revealed the following 5-factor structure: (1) alignment between leadership and physician values (8 items, $\alpha = .86$), (2) practice emphasis on quality (6 items, $\alpha = .88$), (3) sense of trust or belonging (5 items, $\alpha = .79$), (4) practice emphasis on information and communication (4 items, $\alpha = .70$), and (5) cohesiveness (3 items, $\alpha = .66$). The values alignment scale was new and was not found in the study by Kralewski et al.

Physicians also provided information about age, sex, marital status, medical specialty, and income range. In compliance with the 1997 Office of Management and Budget standards,[8] they also responded to race/ethnicity queries that included 2 ethnic categories (Hispanic or Latino vs not Hispanic or Latino) and 5 racial categories (White, Asian, black or African American, American Indian or Alaska Native, and Native Hawaiian or Other Pacific Islander).

The organization assessment survey was generated from physician investigators' personal experience and from comments of focus groups convened at the inception of the MEMO study. Clinic managers provided information about clinic structure (eg, payer and patient mix), processes (eg, electronic medical records and bottlenecks), and management (eg, staff meetings and quality management). Clinic managers also provided race/ethnicity and payer mix information.

The patient survey, based in part on comments elicited during patient focus groups,[9] queried about satisfaction with physicians and clinics,[10] health literacy,[11] trust in the physician,[12] overall and disease-related quality of life,[13,14] and symptoms of depression.[15] Patients also provided information about marital status and educational level. Information about race/ethnicity was provided per Office of Management and Budget standards.[8]

### STATISTICAL ANALYSIS

To compare clinics that care for large numbers of minority patients with those that do not, we chose a cut point of 30%. This threshold was selected because it is similar to the proportion of African Americans plus Hispanics in the US population according to 2000 census data.[16] Exact 2-binomial unconditional tests, parametric and nonparametric mean contrasts (where appropriate), and 2-level logistic regression analyses were used to determine differences between the 2 groups of clinics.

Two adjustments were applied to our analyses. First, adjustment was made to our clustered data standard error estimates because traditional estimates can provide negatively biased estimates.[17] For example, physician data nested under organizations and patient data nested under physicians are more likely to be correlated with each other. Therefore, we used the Huber-White sandwich estimator to correct the negatively biased standard errors.[18]

Second, because this analysis incorporates multiple statistical assessments, the chance of making type I errors is increased, and our power for an individual test may become unacceptably low. Instead of highly conservative familywise error rate adjustments (eg, Bonferroni, Sidak, and others), we used the false discovery rate approach to multiple hypothesis testing. The false discovery rate approach controls the expected proportion of incorrectly rejected null hypotheses (type I errors) among all the rejected hypotheses. It provides a good balance between discovery of statistically significant effects and limitation of false-positive occurrences.[19]

**Table 2. Physician and Patient Characteristics in Clinics Serving Larger Proportions of Minority Patients vs Clinics That Do Not[a]**

| Variable | Clinics Serving ≥30% Minority Patients (n=27) | Other Clinics (n=69) | *P* Value[b] |
|---|---|---|---|
| Physicians | (n=162) | (n=226) | |
| General internists, No. (%) | 115 (71.0) | 90 (39.8) | |
| Family practitioners, No. (%) | 47 (29.0) | 136 (60.2) | <.001 |
| Female, No. (%) | 84 (51.9) | 93 (41.2) | .03 |
| Age, mean (SD) | 41 (10) | 44 (9) | <.001 |
| Racial/ethnic minority, No. (%) | 64 (39.5) | 25 (11.1) | <.001 |
| Patients | (n=780) | (n=921) | |
| Racial/ethnic minority, No. (%)[c] | 585 (75.0) | 85 (9.2) | <.001 |
| Black or African American | 339 (43.5) | 49 (5.3) | <.001 |
| Asian | 29 (3.7) | 11 (1.2) | <.001 |
| Other | 99 (12.7) | 14 (1.5) | <.001 |
| Hispanic or Latino | 199 (25.5) | 13 (1.4) | <.001 |
| Female, No. (%) | 424 (54.4) | 536 (58.2) | .03 |
| Educational level, No. (%) | | | |
| ≤High school | 180 (23.1) | 49 (5.3) | <.001 |
| High school graduate | 280 (35.9) | 247 (26.8) | <.001 |
| Some college | 187 (24.0) | 273 (29.6) | .08 |
| College graduate | 84 (10.8) | 170 (18.5) | <.001 |
| Graduate or professional school | 49 (6.3) | 182 (19.8) | <.001 |
| Insurance status, %, mean (SD)[d] | | | |
| Insured | 49 (41) | 75 (33) | .02 |
| Medicare | 26 (19) | 26 (15) | .80 |
| Medicaid | 30 (20) | 11 (8) | <.001 |
| Uninsured or self-pay | 28 (32) | 9 (13) | .048 |
| Medical literacy, mean (SD)[e] | 3.7 (1.0) | 4.4 (0.8) | <.001 |
| Presence of target disease, No. (%) | | | |
| Hypertension | 701 (89.9) | 774 (84.0) | <.001 |
| Diabetes mellitus | 445 (57.1) | 516 (56.0) | .39 |
| Congestive heart failure | 162 (20.8) | 186 (20.2) | .31 |
| >1 Target disease | 358 (45.9) | 436 (47.3) | .55 |
| Limited by disease always or very/fairly often for those who have the disease, No. (%) | | | |
| Patients with hypertension | 139 (19.8) | 64 (8.3) | <.001 |
| Patients with diabetes mellitus | 122 (27.4) | 114 (22.1) | .07 |
| Patients with congestive heart failure | 54 (33.3) | 42 (22.6) | .04 |
| Symptoms of depression (≥7 d in past 2 wk), No. (%) | 178 (22.8) | 111 (12.1) | <.001 |
| Taking antidepressant medication, No. (%) | 177 (22.7) | 243 (26.4) | .09 |

[a] Data are from patient, physician, and clinic manager surveys.
[b] Adjusted for multiple comparisons and dependency (lack of independence of patients clustered under physicians and physicians nested within clinics).
[c] Racial/ethnic categories are not mutually exclusive.
[d] Subcategories do not sum to 100.0% because of aggregate central tendency measures.
[e] On a scale of 1 (low) to 5 (high).

## RESULTS

### PHYSICIAN AND PATIENT CHARACTERISTICS

A total of 443 physicians (58.8% of those approached) consented to participate in the MEMO study, and 422 (95.3%) of these completed the survey. Nonparticipants did not differ substantially in specialty or sex from physicians who chose to participate. The final enrollment of 422 represents 84.4% of our original target sample of 500 physicians. Physician participants practiced in 118 primary care clinics with a diverse patient base, wide range of payers, and large numbers of indigent or uninsured patients. Of 135 clinics where physicians were interested in participating, 118 clinics met the criteria of at least 50% physician participation. Clinics that did not meet the criteria were likely to be smaller, with fewer physicians in the practice. A total of 1795 patients completed the patient survey, a mean of 4 patients per participating physician. Because of institutional review board–mandated differences in patient solicitation methods, the participant rates varied by region and an overall rate could not be calculated. Waiting room solicitation was used in urban clinics because of a lack of computerized patient lists or missing or inaccurate patient addresses. Academic, suburban, and small-town clinics most often opted for mailed invitations. The waiting room method resulted in slightly higher recruitment rates.

This article reports data from 388 physicians and 1701 patients from 96 clinics for which we have complete patient, physician, and clinic manager data (**Table 1**). The 22 excluded clinics were mostly affiliated with health maintenance organizations but did not differ statistically in size or geographic location from the clinics with complete data. Characteristics of the physician and patient participants are summarized in **Table 2**. Data provided by clinic managers revealed that 27 of 96 clinics had a client base composed of at least 30% minority patients. The percentages

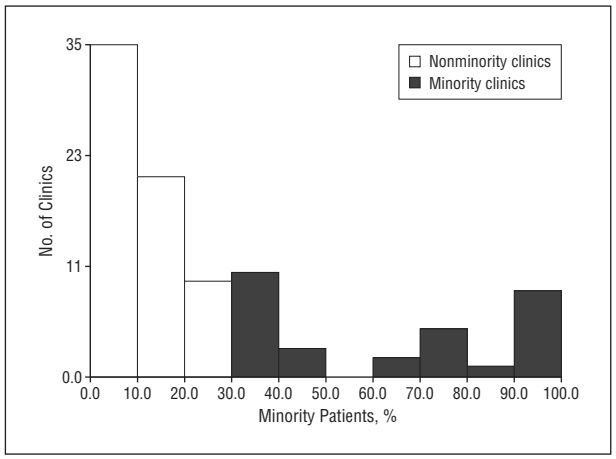


**Figure 1.** Distribution of within-clinic percentages of minority patients across 96 clinics in the Minimizing Error, Maximizing Outcome (MEMO) study.

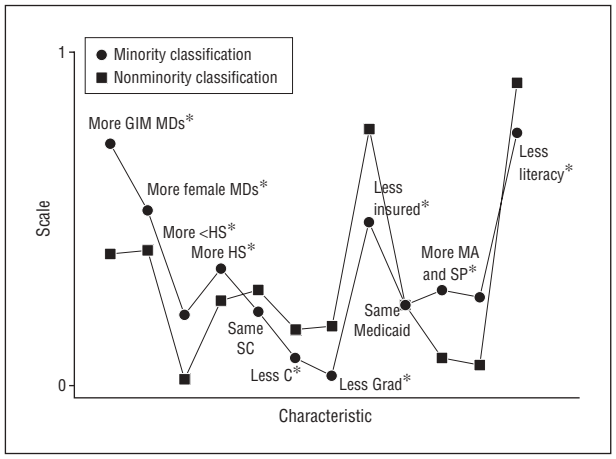


**Figure 2.** Clinic characteristics profile (measures converted to a scale of 0 to 1). C indicates patients with a college degree; GIM MDs, general internal medicine physicians; Grad, patients with a graduate or professional school degree; <HS, patients with less than a high school diploma; HS, patients with a high school diploma; Literacy, patients' self-reported medical literacy; MA, patients covered by Medicaid; SC, patients with some college; and SP, uninsured or self-pay patients. * $P<.05$.

of minority patients in these clinics ranged from 30% to 95% (**Figure 1**). The 27 clinics represented 162 of 388 physician participants (41.8%). **Figure 2** shows characteristics of the clinics where large numbers of minority patients in the MEMO study received primary care. In these clinics, physicians were more likely to be general internists and female, while patients had less insurance, poorer medical literacy, and lower educational levels.

The 27 clinics with at least 30% minority patients represented 780 of 1701 patients (45.9%). Patients from these clinics were significantly more likely to consider themselves limited by their hypertension and congestive heart failure and were more likely to report depressive symptoms (22.8% vs 12.1% in clinics with <30% minority patients).

## WORKPLACE ORGANIZATIONAL FACTORS

**Table 3** contrasts key workplace organizational differences between the 2 groups of clinics. Physicians in both types of clinics had similar workweeks. However, full-time physicians in clinics with larger minority populations saw fewer patients per month and reported fewer days on call per month (4.7 vs 6.3 days) than physicians in clinics with fewer minority patients.

Physicians from 27 clinics with at least 30% minority patients reported less access to medical supplies and to referral specialists than physicians from the other clinics. These 27 clinics had poorer access to pharmacy services, fewer patient examination rooms per physician, and limited written educational materials for patients with hypertension and congestive heart failure. No significant differences in bottlenecks to care were found between the clinic groups regarding telephone access, follow-up appointments, electronic medical records, searching for medical records, patient registration and check-in, test and diagnostic imaging scheduling, insurance approval and preauthorization, access (waiting time for a routine new patient evaluation), and reminder systems for testing, follow-up, and prescriptions related to the 3 target medical conditions. There were trends toward less interpreter access, bottlenecks at check-out, and longer patient waits in examination rooms at the 27 clinics with larger minority clienteles.

## PHYSICIANS' REPORT OF PATIENT MIX

Physicians in clinics with at least 30% minority patients reported higher proportions, in various domains, of difficult-to-serve patients such as those who insist on unnecessary tests or who ignore medical advice (**Table 4**). These physicians also reported significantly more patients who are non–English speaking (27.1% vs 3.4%), have chronic pain (24.1% vs 12.9%), are medically (53.1% vs 39.9%) and psychosocially (44.9% vs 28.2%) complex, and have substance abuse problems (15.1% vs 10.1%).

## WORKPLACE AND PHYSICIAN OUTCOMES

In regression analyses (**Table 5**), we took a conservative approach and adjusted for multiple variables (physician age, sex, and race/ethnicity) in all of the logit models. Findings indicate that physicians from the 27 clinics with at least 30% minority patients were 4 times more likely to report a chaotic workplace. They also reported lower work control significantly more often and were half as likely to report high job satisfaction. We also noted a tendency for these physicians to report more time pressure for follow-up office visits (odds ratio, 2.3) and for physical examinations (2.5) ($P=.06$ for both). Organizational culture scales were similar between the 2 types of clinics. Regression analyses showed a significantly higher rate of burnout among female physicians (odds ratio, 2.5; $P=.003$ [data not shown]), who in the present study were more likely to practice in clinics with more minority patients (Table 2 and Figure 2).

## COMMENT

In a multicenter sample of 388 primary care physicians and 1701 of their patients, we found a complex patient

**Table 3. Workplace Organizational Factors in Clinics Serving Larger Proportions of Minority Patients vs Clinics That Do Not[a]**

| Variable | Clinics Serving ≥30% Minority Patients (n=27) | Other Clinics (n=69) | *P* Value[b] |
|---|---|---|---|
| Total work hours for full-time MD per week, mean (SD) | 48.8 (14.7) | 48.9 (11.8) | .98 |
| Days on call per month, mean (SD) | 4.7 (5.9) | 6.3 (6.6) | .005 |
| Monthly outpatient visits for full-time MD, mean (SD) | 218.0 (148.9) | 286.4 (119.0) | .03 |
| Resource access, mean (SD)[c] | | | |
| Medical supplies | 2.7 (0.8) | 3.4 (0.7) | <.001 |
| Referral specialists | 3.0 (0.9) | 3.5 (0.6) | <.005 |
| Interpreters | 2.1 (0.9) | 2.5 (1.0) | .07 |
| Examination rooms per physician, mean (SD) | 2.2 (0.6) | 2.7 (0.6) | .002 |
| Bottlenecks, mean (SD)[d] | | | |
| Pharmacy services | 2.1 (1.3) | 1.4 (0.7) | .03 |
| Patient registration and check-in | 2.3 (0.9) | 1.9 (0.8) | .11 |
| Patient waiting in examination room | 2.2 (0.9) | 1.9 (0.6) | .07 |
| Interpreter services | 2.0 (1.0) | 1.7 (1.0) | .24 |
| Follow-up appointments | 1.6 (0.6) | 1.4 (0.6) | .36 |
| Patient checkout | 1.6 (0.7) | 1.3 (0.5) | .07 |
| Scheduling tests | 2.0 (0.9) | 2.1 (0.8) | .78 |
| Scheduling diagnostic images | 2.0 (1.0) | 2.2 (0.8) | .50 |
| Insurance approval and preauthorization | 1.6 (0.8) | 2.0 (0.9) | .11 |
| Telephone access | 2.6 (1.0) | 2.2 (0.9) | .12 |
| Searching for medical records | 1.9 (1.0) | 1.9 (0.8) | .82 |
| Waiting time for routine new patient evaluation, wk | 1-4 | 1-4 | .11 |
| Presence of electronic medical record, % | 40.2 | 30.1 | .50 |
| Reminder systems for prescriptions, tests, and follow-up, % | | | |
| For patients with diabetes mellitus | 48.4 | 45.0 | .82 |
| For patients with hypertension | 32.3 | 38.3 | .76 |
| For patients with congestive heart failure | 31.1 | 34.8 | .81 |
| Written patient educational materials, % | | | |
| For patients with diabetes mellitus | 92.8 | 100.0 | .07 |
| For patients with hypertension | 89.2 | 100.0 | .03 |
| For patients with congestive heart failure | 72.9 | 97.2 | .01 |

Abbreviation: MD, doctor of medicine.
[a] Data are from physician and clinic manager surveys and from researcher observations.
[b] Adjusted for multiple comparisons and dependency.
[c] On a scale of 1 (none) to 4 (great).
[d] On a scale of 1 (little) to 4 (large).

**Table 4. Reports From Physicians About Patient Mix in Clinics Serving Larger Proportions of Minority Patients vs Clinics That Do Not**

| Variable | Mean (SD) | | *P* Value[a] |
|---|---|---|---|
| | Clinics Serving ≥30% Minority Patients (n=162) | Other Clinics (n=226) | |
| Frequency of visits with[b] | | | |
| Patients who insist on unnecessary tests | 2.2 (0.5) | 2.1 (0.4) | .01 |
| Patients who insist on unnecessary drugs | 2.2 (0.5) | 2.1 (0.4) | .06 |
| Patients who ignore medical advice | 2.6 (0.7) | 2.3 (0.6) | <.001 |
| Disrespectful patients | 1.7 (0.6) | 1.7 (0.5) | .65 |
| Patients who consistently complain | 2.2 (0.6) | 2.0 (0.4) | .004 |
| Verbally abusive patients | 1.5 (0.5) | 1.5 (0.5) | .81 |
| Patients with unrealistic expectations | 2.2 (0.5) | 2.1 (0.5) | .31 |
| Patients showing dissatisfaction with care | 1.8 (0.4) | 1.9 (0.4) | .55 |
| Special populations, % | | | |
| Female patients | 63.0 (11.9) | 62.3 (15.8) | .70 |
| Older patients | 38.5 (21.4) | 34.4 (20.3) | .24 |
| Patients speaking little or no English | 27.1 (32.1) | 3.4 (3.8) | .004 |
| Patients with chronic pain | 24.1 (20.5) | 12.9 (11.6) | <.001 |
| Medically complex patients | 53.1 (23.2) | 39.9 (23.0) | <.001 |
| Psychosocially complex patients | 44.9 (26.2) | 28.2 (19.3) | <.001 |
| Patients who are frustrating to deal with | 16.1 (15.5) | 10.0 (8.9) | .03 |
| Patients with substance abuse problems | 15.1 (11.6) | 10.1 (8.3) | .005 |

[a] Adjusted for multiple comparisons and dependency.
[b] On a scale of 1 (none) to 4 (often).

**Table 5. Responses From Physicians in Clinics Serving Larger Proportions of Minority Patients vs Clinics That Do Not (Multilevel Regression Analyses)[a]**

| Variable | Odds Ratio (95% Confidence Interval) for Minority Clinic Status[b] | *P* Value[c] |
|---|---|---|
| Need more time than allotted for physical examinations | 2.5 (1.2-5.0) | .06 |
| Need more time than allotted for follow-up visits | 2.3 (1.2-4.3) | .06 |
| Workplace is chaotic | 4.0 (2.0-7.9) | .003 |
| High work control | 0.2 (0.1-0.5) | .003 |
| High job satisfaction | 0.4 (0.2-0.7) | .01 |
| High stress | 1.7 (1.1-2.6) | .11 |
| ≥1 Symptom of burnout | 1.5 (0.9-2.5) | .22 |
| High trust in the organization | 0.8 (0.4-1.7) | .70 |
| High values alignment with leadership | 0.2 (0.1-1.1) | .21 |
| Organizational emphasis on quality | 0.8 (0.4-1.5) | .67 |
| Organizational emphasis on information | 0.6 (0.2-1.7) | .52 |
| Workplace cohesiveness | 0.9 (0.5-1.7) | .93 |
| Likely to leave the practice within 2 y | 1.9 (1.1-3.4) | .09 |

[a] Adjusted for physician sex, age, and race/ethnicity.
[b] Confidence intervals have not been adjusted for false discovery rates.
[c] Probabilities are false discovery rates.

mix, adverse physician outcomes, and more challenging workplace characteristics in 27 clinics serving high proportions of minority patients compared with 69 clinics caring for mostly nonminority patients. The clinics serving minority populations faced greater challenges accessing resources such as medical supplies, referral specialists, and pharmacy services and had fewer examination rooms per physician. Physicians from these clinics reported higher proportions of patients who are difficult to serve, non–English speaking, and medically and psychosocially complex. These physicians also reported less work control, lower job satisfaction, more chaotic clinic environments, and a trend toward insufficient time spent with patients. The findings support our initial hypothesis that clinics serving higher proportions of minority patients have more challenging workplaces, a more complex patient mix, and increased adverse physician outcomes.

## RELATIONSHIP WITH PREVIOUS LITERATURE

The literature supports our findings that clinics where larger proportions of minority patients receive primary care have challenging work conditions that may facilitate care disparities.[2,20,21] For example, a section in *Unequal Treatment* notes that " . . . time pressures on physicians may hamper the ability of providers to accurately assess presenting symptoms of minority patients, especially where cultural or linguistic barriers are present."[1(p140)] Burgess et al[21] used social cognition research to explain provider contributions to disparities in care. They concluded that " . . . stereotyping and bias is not simply a product of the individual provider but is caused by features of the health care setting that decrease cognitive capacity, such as fatigue, overload, and time pressure. Moreover, these conditions have been shown to be more prevalent in settings that predominantly treat minority patients."[21]

The body of work by Bach and colleagues[3,20,22] has confirmed challenges to care for African American patients involving inequities in the health care system, such as limited access to clinical resources and ancillary services. Our work extends the findings by Bach et al, noting challenges to physicians and patients through specific work environment characteristics not previously described (eg, work control and clinic chaos). The combination of our work and that by Bach et al provides a road map of the challenges faced by minority patients and a blueprint for improvements that may address disparate care and outcomes.

## CLINICAL AND POLICY IMPLICATIONS

As part of the national effort to understand sources of racial/ethnic disparities in health care access and outcomes, numerous hypotheses have been examined. These involve patient-level factors such as preference and attitudes, physician-patient interpersonal factors such as communication and racial/ethnic concordance, and issues related to health care access such as insurance status. This study provides evidence of resource and workplace organizational disparities between clinics that serve large numbers of minority patients and clinics that do not. These deficiencies may contribute to physician stress and time pressure, thereby complicating interactions with disproportionately higher percentages of medically and psychosocially complex patients. The combination of time pressure, insufficient resources, and complex patients likely constitutes a "perfect storm" that contributes to the challenges that physicians face in providing quality care to large proportions of minority patients.

Physicians from clinics serving minority clienteles reported more clinic chaos than physicians who provide care in clinics with fewer minority patients. Perceptions of clinic chaos may be exacerbated by low levels of work control and by high time pressure. These adverse work environments may contribute to health care disparities by increasing the risk of provider biases and by stereotyping of minority patients, especially in settings where medical complexity and clinical uncertainty compete with time pressure.[21] Current efforts, such as provider-specific interventions to increase cultural competence and sensitivity, may not fully address these deeper systemic work environment issues.

National strategies to examine and intervene in health care disparities should consider the work environment as a potential determinant of disparities and as a target for interventions to reduce physician burnout, increase work control, and reduce clinic chaos. Strategies to improve care settings for the many complex minority patients in these clinics, including better reimbursement for primary care and more widely available health insurance, may help reduce the burden on these vulnerable systems. Future studies should examine relationships between work environments and delivery of high-quality care for clinics serving minority and nonminority patients. In addition, future studies should assess the relative merits of disparity interventions targeting patient-level factors vs those targeting work environment or other

macro-level structural issues in health care delivery. Attention to issues specific for women physicians, such as patient expectations of more listening and counseling time,[23,24] may have an important role in future studies involving interventions for health care disparities because women constitute a large proportion of physicians who care for minority patients.

### LIMITATIONS

Findings from this study should be interpreted with the following limitations in mind. First, although a widely diverse group of physicians and patients from 5 areas in the United States were included, the results may not be generalizable to other parts of the country or to non–primary care patient populations. Second, many of the data are self-report responses. However, most findings seem internally consistent. Third, the effect of physician-related factors in the MEMO study on patient quality of care or safety has not been analyzed, to our knowledge. Fourth, a 60% enrollment rate and a 56% participation rate are less than optimal; however, they are well within the range of rates for physician surveys, which have a mean response rate of 52% to 54%.[25] Fifth, the fact that these patients had at least 1 of 3 chronic medical conditions may bias our findings toward a more chronically ill patient population. Sixth, we acknowledge that geography cannot be fully discounted as a possible source of our findings.

However, the issue is not whether minority patients, all things being equal, receive care in more challenging circumstances than nonminority patients. It is that minority patients do receive care in these challenging settings. This resonates with the findings by Bach et al[2] that minority patients receive care in limited locations from few physicians. They showed, as we did, that physicians serving minority patients have decreased access to referral specialists and consider themselves less able to provide high-quality care.

## CONCLUSIONS

Significant workplace organizational differences were found between clinics that serve high proportions of minority patients and those that do not. Further study is needed to examine the effects of work environment and physician factors on quality of care. The present findings suggest yet another possible mechanism for observed racial/ethnic disparities in health care access and outcomes.

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