Physician Effects on Racial and Ethnic Disparities in Patients' Experiences of Primary Care

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BACKGROUND: Few studies have clarified the mechanisms that contribute to racial and ethnic disparities in primary care quality among comparably-insured patients.

OBJECTIVE: To examine relative contribution of “between-” and “within-” physician effects on disparities in patients' experiences of primary care.

DESIGN: Regression models using physician fixed effects to account for patient clustering were specified to assess “between-” and “within-” physician effects on observed racial and ethnic disparities in patients' experiences of primary care.

PARTICIPANTS: The Ambulatory Care Experiences Survey (ACES) was administered to patients visiting 1,588 primary care physicians (PCPs) from 27 California medical groups. The analytic sample included 49,861 patients (31.4 per PCP) who confirmed a PCP visit during the preceding 12 months.

MAIN RESULTS: Most racial and ethnic minority groups were significantly clustered within physician practices ($p < 0.001$). “Between-physician” effects were mostly negative and larger than “within-physician” effects for Latinos, Blacks, and American Indian/Alaskan Natives, indicating that disparities are mainly attributable to patient clustering within physician practices with lower performance on patient experience measures. By contrast, “within-physician” effects accounted for most disparities for Asians and Pacific Islanders, indicating these groups report worse experiences relative to Whites in the same practices. Practices with greater concentration of Blacks, Latinos and Asians had lower performance on patient experience measures ($p < 0.05$).

CONCLUSIONS: Targeting patient experience improvement efforts at low performing practices with high concentrations of racial and ethnic minorities might efficiently reduce disparities. Urgent study is needed to assess the contribution of “within-” and “between-” physician effects to racial and ethnic disparities in the technical quality of primary care.

KEY WORDS: physician effects; primary care; racial disparities; patients' experiences of care; quality improvement.

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INTRODUCTION

When the Institute of Medicine's (IOM) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care outlined research priorities in their influential report, *Unequal Treatment*, they underscored the importance of clarifying the contributions of clinician and organizational factors to quality differences.¹ Several studies have documented the existence of racial and ethnic disparities in patients' experiences of primary care among comparably insured patients,^{2–13} but few have clarified the mechanisms that contribute to these differences.^{14–18}

“Within-physician” effects, or racial/ethnic minority patients reporting worse experiences in the same practices as Whites, might contribute to observed differences. “Within-physician” differences can occur because certain racial and ethnic groups may have negative reporting tendencies shaped by cultural norms. Asian patients' evaluations of care, for example, appear to be consistently lower irrespective of the context that care is received,^{13,19} suggesting that negative reporting tendencies may contribute to differences. Certain racial/ethnic minority groups may also experience unequal treatment. Therefore, “within-physician” effects stemming from discrimination or differential treatment based on race and/or ethnicity could explain disparities. On the other hand, “between-physician” effects, or the clustering of racial and ethnic minority patients within physician practices with low performance on patient experiences measures, might contribute to disparities. For example, patients might receive care in settings that lack patient-centered care or have inadequate appointment access. Our study aims to clarify the extent to which ethnic and racial disparities in patients' experiences of primary care are attributable to the clustering of minority patients in low performing primary care physician (PCP) practices (“between-physician” effects) versus “within-physician” effects, which can provide important information for the effective development and targeting of quality improvement efforts.

Our study contributes to existing knowledge in important ways. First, previous research indicates that Black patients are significantly clustered in the practices of a small number of

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physicians and that these physicians are more likely to report facing difficulties providing high quality care.¹⁷ However, no study has ever examined patients' experiences in practices with varying concentrations of diverse racial and ethnic minority patient groups, including Asians and Latinos, the fastest growing racial/ethnic groups in the United States.^{20,21} Our study assesses physician effects on racial and ethnic differences in interpersonal quality and organizational features of primary care from patients' perspectives. Second, our study is the first to include adequate patient samples per physician,^{16,22} which is necessary for the reliable assessment of individual physician practice effects on patients' experience measures. Third, previous work indicates that "within" health plan effects accounted for a larger proportion of disparities relative to "between" health plan effects,¹⁶ suggesting that other organizational units, e.g., physicians, might explain racial/ethnic disparities in patient experiences of care. As a result, an assessment of physician effects is likely to shed light on the mechanisms contributing to racial and ethnic minority group differences in patients' experiences of primary care.

METHODS

Sampling and Survey Administration

The study draws on commercially-insured patients who had encounters with 1,588 adult PCPs from 27 medical groups in California. The participating physician practices are distributed across 140 diverse primary care service areas²³ that encompass markets with varying percentages of residents at or below 200% of the federal poverty level (median: 24.6%, range: 4.8% to 70.2%). In early March 2006, a random sample of approximately 100 patients per physician who had at least one visit with their PCP between April and December 2005 were mailed the Ambulatory Care Experiences Survey (ACES), a validated survey that measures patients' experiences with a specific, named physician and that physician's practice.²⁴ Mailings included an invitation letter, a printed survey, and a postage-paid return envelope. The survey invitation included a personal online code that gave respondents the option of completing the survey using the internet. Previous analysis has demonstrated the absence of web survey mode effects for items on the ACES.²⁵ The survey invitation listed a toll-free number for patients to obtain surveys in Spanish. A second invitation and questionnaire were sent to non-respondents two weeks after the initial mailing. The data collection effort spanned a period of approximately eight weeks.

Study Questionnaire

ACES Scales and Scoring. ACES is designed to operationalize the IOM's most recent definition of primary care,²⁶ and produces five summary measures of patients' experiences: quality of physician-patient interaction, health promotion support, organizational access, care coordination, and office staff (see Appendix). In addition, the survey included an item assessing patients' willingness to recommend the physician to family and friends. All ACES questions reference care received from that particular physician and the physician's practice over the past 12 months. Composites are computed for each respondent based on the unweighted average of responses to all items comprising the composite and scores range from 0 to 100 points, with higher

scores indicating more favorable performance.²⁴ ACES composites and the willingness to recommend item achieve physician-level reliability of 0.70 or higher with samples of approximately 35 established patients per physician.^{24,27} Patient demographic characteristics, including age, gender, race/ethnicity, primary language spoken at home, education, and self-rated physical and mental health were assessed in the survey.

Analytic Sample

Of 153,816 outgoing surveys, 5,329 (3.5%) were undeliverable because of bad address information or patient death. Surveys were received from 53,524 unique respondents, yielding an adjusted response rate of 36.1% (physician median=38.4%, range=17.8% to 81.6%). The analytic sample included 49,861 unique respondents (average per physician=31.4, standard deviation=12.9) who confirmed having seen their PCP during the prior 12 months. Respondents who did not confirm the named physician as their PCP ($n=1,543$) or indicated that they did not visit the physician during the prior 12 months ($n=2,120$) were excluded from the analysis.

Race, Ethnicity, and Primary Language Categorization

Patient responses to race, ethnicity, and primary language questions were used to generate ten analytic subgroups. Patients were asked whether they were "Hispanic or Latino" and about their racial background (White, Black, Asian, Pacific Islander, American Indian/Alaskan Native, other), and their primary language spoken at home (English, Spanish, other). Respondents who indicated that they were "Hispanic or Latino" were considered Latino, irrespective of their racial background. Latino and Asian respondents were categorized as primarily English speakers ("Latino-English", $n=5,274$; "Asian-English", $n=4,638$) or speakers of another language ("Latino-Spanish", $n=1,445$; "Asian-other language", $n=1,840$) based on their responses to the question that assessed their primary language spoken at home. The remaining patients were categorized based on their response to the question that assessed their racial background. These groups included White ($n=31,556$), Black ($n=1,854$), Pacific Islander ($n=635$), American Indian/Alaskan Native ($n=409$), and other race ($n=1,064$). Respondents who did not answer the race and ethnicity questions were grouped together ("missing race", $n=1,146$).

Statistical Analyses

Respondent characteristics were compared across the ten racial/ethnic patient groupings. Analysis of variance (ANOVA) models were used to compare variables across the analytic subgroups. In order to assess whether the racial and ethnic minority groups were clustered within PCP practices, the intraclass correlation coefficient (ICC) was calculated for each group, using the physician identifier as the class variable. The ICC measures the extent of clustering on a scale from 0 to 1, where 0 indicates no clustering of the patient group within PCP practices beyond what one would expect due to chance and 1 indicates that the patient group is maximally clustered within PCP practices.

To assess the relative contribution of "within-physician" and "between-physician" effects to racial and ethnic disparities in

patients' experiences of primary care, three nested regression models were examined for each survey composite and the willingness to recommend physician item, using White patients as the reference group. All models controlled for patient age, gender, education, self-rated physical, and self-rated mental health. These patient-level case mix adjusters were used because they are generally considered exogenous factors that are beyond the control of clinicians.^{22,28,29} Model 1 assessed differences in scores relative to Whites using OLS regression models. Regression coefficients from Model 1 were considered the "overall" differences relative to Whites. Regression Model 2 was specified using physician fixed effects to account for the clustering of patients within physician practices. Patient group coefficients from Model 2 reflect "within-physician" differences relative to Whites. Estimates of "between-physician" differences, or the extent to which disparities are attributable to physician performance differences, were calculated by subtracting the patient group Model 2 coefficients from Model 1 coefficients.¹⁶ "Within-" and "between-"physician effects were compared to assess their relative contribution to overall observed disparities.

Finally, in order to examine whether the racial and ethnic minority patient concentration of physician practices was associated with performance on patient experience measures, Model 3 further included the percentages of Blacks, Latinos, Asians, and all other minority groups in each PCP practice, using the percentages of White patients as the reference group. Model 3 controlled for practice-level educational attainment and used physician and medical group random effects to account for clustering. Models adjusted standard errors for weighting and the clustered nature of the data. Continuous measures were standardized to a mean of 0 and a variance of 1

so that regression coefficients were comparable. In order to test the sensitivity of results to differential non-response by physician, non-response weights computed as the inverse of the physician response rates, were used.³⁰ All statistical analyses were conducted using STATA 10.0.

RESULTS

Several respondent characteristics varied significantly by racial/ethnic group (Table 1). With the exception of American Indian/Alaskan Natives, minority groups were significantly younger than Whites ($p<0.001$). However, all minority groups rated their physical health lower than Whites ($p<0.001$). Latinos reported shorter term relationships with their PCP compared to Whites ($p<0.001$), irrespective of primary language spoken at home.

All groups were concentrated in PCP practices at levels greater than one would expect by chance (Table 2). Whites (ICC=0.18, $p<0.001$), Latinos who primary speak Spanish (ICC=0.12, $p<0.001$), and Asians who speak a language other than English as their primary language (ICC=0.18, $p<0.001$) were most heavily concentrated in practices with patients from their own race/ethnicity. For example, 50% of Latinos who primarily speak Spanish were clustered in 8.5% of PCP practices, 50% of Asians who primarily speak a language other than English were clustered in 6.9% of PCP practices, and 50% of Blacks were clustered in 10.7% of PCP practices (data not shown), while the mean PCP practice-level concentration of these commercially insured groups was only 3.8%, 4.4%, and 4.0%, respectively (Table 2, column 2).

Table 1. Respondent Characteristics, by Racial/Ethnic Group

	White	Black	Latino- English	Latino- Spanish	Asian- English	Asian-other Language	Pacific Islander	American Indian/ Alaskan Native	Other race	Missing race
N	31,556	1,854	5,274	1,445	4,638	1,840	635	409	1,064	1,146
% of total	63.3	3.7	10.6	2.9	9.3	3.7	1.3	0.8	2.1	2.3
DEMOGRAPHICS										
Age (mean)	54.6 (14.9)	52.2 (12.4) ‡	47.4 (14.0) ‡	47.4 (13.8) ‡	49.1 (13.0) ‡	48.5 (12.0) ‡	45.2 (12.8) ‡	53.3 (13.6)	47.6 (14.2) ‡	55.9 (15.0)*
Male (%)	41.1	36.3‡	36.3‡	42.6	39.4*	43.5*	41.4	42.9	40.9	45.0*
Education										
Less than high school (%)	3.0	3.9*	8.3‡	35.1‡	2.8	8.0‡	2.8	8.6‡	4.1*	5.2‡
High school Only (%)	14.6	12.9*	21.9‡	20.0‡	7.4‡	11.9‡	15.5	19.3‡	11.6‡	12.6
Some College (%)	36.7	46.7‡	42.7‡	26.7‡	25.9‡	23.8‡	41.8‡	48.4‡	32.9*	38.1
4-year college graduate+(%)	45.7	36.6‡	27.1‡	18.3‡	63.9‡	56.3‡	39.9‡	23.7‡	51.4‡	44.1
PCP RELATIONSHIP DURATION										
Less than 6 months (%)	2.6	2.4	3.2*	2.3	3.2*	3.6*	4.1*	3.7	3.1	4.1‡
6 months- 1 year (%)	7.6	8.2	8.0	10.3‡	8.1	8.5	11.2‡	7.9	8.4	7.4
1-2 years (%)	23.0	24.2	25.3‡	30.0‡	23.4	22.5	25.3	22.7	27.2‡	22.7
3-5 years (%)	18.9	19.6	18.8	21.7*	17.6*	19.3	16.1	21.1	19.4	18.0
More than 5 years (%)	47.8	45.5	44.7‡	36.7‡	47.7	46.1	43.2*	44.6	41.8‡	47.8
UTILIZATION										
Annual office visits- (% 2 or more)	82.1	86.6‡	83.3*	85.3‡	77.7‡	79.4‡	81.9	87.5‡	84	81.3
HEALTH STATUS										
Self-rated physical health (mean)	64.2 (23.1)	58.9 (22.4) ‡	60.7 (23.3) ‡	57.9 (22.3) ‡	64.2 (21.7) ‡	58.7 (21.4) ‡	61.8 (21.4)*	55.5 (25.2) ‡	63.5 (22.1)	62.6 (23.7)
Self-rated mental health (mean)	71.9 (24.6)	70.7 (26.0)*	71.4 (24.9)	69.7 (24.0) ‡	73.6 (22.8) ‡	70.1 (22.6) ‡	73.8 (23.0)	68.9 (27.4)*	72.8 (24.0)	73.5 (24.1)

Notes: * $P<.05$, † $P<.01$, ‡ $P<.001$ compared to White patients; results reported as percents reflect column percents; numbers in parentheses are standard deviations.

Table 2. Clustering of Racial/Ethnic Minority Groups within Primary Care Physician Practices

Racial/Ethnic minority group	Physician Practice Mean	Minimum	Median	Maximum	ICC	ICC p-value
White	59.5	0	64.1	100	0.18	<0.001
Black	4.0	0	1.9	79.2	0.09	<0.001
Latino-English	11.3	0	8.9	61.1	0.06	<0.001
Latino-Spanish	3.8	0	0	100	0.12	<0.001
Asian-English	10.2	0	6.3	71.4	0.11	<0.001
Asian-other Language	4.4	0	0	81.0	0.18	<0.001
Pacific Islander	1.3	0	0	20.0	0.01	<0.001
American Indian/Alaskan Native	0.9	0	0	14.3	0.00	0.004
Other race	2.3	0	0	25.0	0.01	<0.001
Missing race	2.4	0	0.6	50.0	0.00	0.41

Note: The intraclass correlation coefficient (ICC) measures the extent of clustering on a scale of 0 (no association of clustering within physician practices beyond chance) to 1 (maximally clustered within physician practices)

We present the unweighted results because the regression coefficients were similar for weighted and unweighted models and the correlation of coefficients was very high (≥ 0.98 for all measures). Table 3 presents the “overall”, “within-physician”, and “between-physician” racial/ethnic differences for each ACES composite and the willingness to recommend physician item. In general, “within-physician” effects were negative and larger than “between-physician” effects for Pacific Islanders, Asians, irrespective of primary language, “other” ethnic/racial groups, and patients without ethnic/racial information (“missing race”). For example, the disparity between Asians (primarily non-English speaking) and Whites was 4.17 points on the 100-point organizational access scale; “Within-physician” effects (4.77 points, $p < 0.001$) accounted for all of the disparity,

while the “between-physician” effects were positive, although not statistically significant. The negative “within-physician” effects indicate that these minority groups report worse experiences relative to Whites in the same PCP practices. Some “between-physician” effects for these patient groups, however, were negative and statistically significant, e.g., the quality of physician-patient interactions and care coordination composites, indicating that a non-trivial amount of overall group differences are attributable to these patient groups being clustered in physician practices with lower scores on patient experience measures.

By contrast, “between-physician” effects were negative and larger than “within-physician” effects for Latinos irrespective of primary language, Blacks, and American Indian/Alaskan

Table 3. Overall, Within-Physician, and Between-Physician Effects on Racial & Ethnic Disparities in Patients' Experiences of Primary Care

	Overall effects	Within-physician Effects	Between-physician Effects	Overall effects	Within-physician effects	Between-physician effects
	Quality of physician–patient interaction			Health promotion support		
Black	0.88	1.75 ‡	−0.87 *	5.32 ‡	3.92 ‡	1.40
Latino–English	−0.25	0.71 *	−0.96 ‡	1.62 †	2.21 ‡	−0.59
Latino–Spanish	−1.19 *	0.65	−1.84 ‡	1.36	1.39	−0.04
Asian–English	−3.37 ‡	−2.54 ‡	−0.83 †	1.63 †	0.46	1.17
Asian–other Language	−5.45 ‡	−3.46 ‡	−1.99 ‡	0.53	0.68	−0.16
Pacific Islander	−1.79 *	−1.61 *	−0.18	3.62 *	2.79 *	0.84
American Indian/Alaskan Native	−1.01	−0.24	−0.77	5.84 †	7.36 ‡	−1.52
Other race	−1.95 †	−1.44 †	−0.52	2.03	1.23	0.80
Missing race	−1.01	−0.63	−0.38	1.11	0.43	0.68
	Care coordination			Organizational access		
Black	1.16	3.06 ‡	−1.90 ‡	1.46 †	2.08 ‡	−0.62 *
Latino–English	−2.05 ‡	−0.36	−1.69 ‡	−2.05 ‡	−0.54	−1.51 ‡
Latino–Spanish	−1.82 *	1.45 *	−3.27 ‡	−5.05 ‡	−1.34 *	−3.71 ‡
Asian–English	−4.62 ‡	−3.37 ‡	−1.25 †	−3.28 ‡	−3.81 ‡	0.53
Asian–other Language	−6.22 ‡	−3.61 ‡	−2.62 ‡	−4.17 ‡	−4.77 ‡	0.60
Pacific Islander	−2.11	−2.30 *	0.18	−0.58	−1.03	0.45
American Indian/Alaskan Native	0.99	2.36	−1.37 *	−1.09	−0.38	−0.70
Other race	−3.31 †	−2.20 *	−1.11	−2.35 †	−2.11 †	−0.24
Missing race	−2.07	−1.66	−0.41	−1.99 *	−1.88 *	−0.12
	Office staff interactions			Willingness to recommend physician		
Black	2.57 ‡	2.91 ‡	−0.34	1.45 *	2.73 ‡	−1.28 †
Latino–English	−0.76 *	0.35	−1.11 †	−0.38	1.07 †	−1.45 †
Latino–Spanish	−0.98	1.23 *	−2.21 ‡	1.21	4.20 ‡	−2.99 ‡
Asian–English	−3.80 ‡	−3.69 ‡	−0.11	−0.65	0.63	−1.28 †
Asian–other Language	−6.25 ‡	−5.49 ‡	−0.75 *	−2.39 ‡	0.65	−3.04 ‡
Pacific Islander	−1.59	−1.98 *	0.39	1.18	1.35	−0.17
American Indian/Alaskan Native	0.51	0.59	−0.08	0.65	1.85	−1.21 *
Other race	−1.84 *	−1.48 *	−0.36	−1.32	−0.38	−0.94
Missing race	−1.80	−1.92 *	0.12	−0.58	−0.16	−0.42

Notes: * $p < 0.05$, † $p < 0.01$, ‡ $p < 0.001$, omitted patient category is white patients; results account for patient age, gender, education, self-rated physical health, and self-rated mental health

Natives, indicating that disparities are mainly attributable to patient clustering within lower performing PCP practices (Table 3). The results indicate that disparities for these groups cannot be due to negative reporting tendencies relative to Whites. The largest “between-physician” effects were for the care coordination and organizational access for Latinos, with the largest effects for Spanish-speaking Latinos. Some “within-physician” effects for these racial and ethnic groups were positive and statistically significant; indicating that patients from these groups report comparable or better experiences than Whites in the same PCP practices. For example, the care coordination disparity between Spanish-speaking Latinos and Whites was 1.82 points; “Within-physician” effects were positive (1.45 points, $p < 0.05$) and “between-physician” effects were larger and negative (−3.27 points, $p < 0.001$). There were no “overall” racial or ethnic disparities in health promotion support and most groups reported better experiences relative to Whites.

Item-level analyses revealed that two patients’ experience measures had the largest negative “between” physician effects for Blacks and Latinos (data not shown). One was an item from the Quality of Physician–Patient Interaction scale (see Appendix) that assessed patients’ experiences with their PCP spending “enough time” with them (range: −3.20 to −1.09, $p < 0.001$). The other item, from the organizational access scale, assessed “how often did visits...start within 15 minutes of your appointment” (range: −6.49 to −1.07, $p < 0.001$). Spanish-speaking Latinos had the largest “between” physician effects for the two items.

Table 4 presents the results from Model 3, which examines the contribution of PCP practice racial composition to individual physician performance differences on patient experience measures, controlling for practice-level educational attainment. Controlling for patient characteristics and practice-level patient educational attainment, higher Black patient concentration (4 of 6 measures), Latino patient concentration (5 of 6 measures), and Asian patient concentration (4 of 6 measures) were associated with lower physician performance on patients’ experiences measures.

DISCUSSION

This study assessing the relative contribution of “between-” and “within-” physician effects to racial and ethnic disparities in patients’ experiences of primary care yields several impor-

tant findings relevant to reducing disparities. First, our results are the first to highlight that, in California, most racial and ethnic minority groups are clustered within PCP practices at levels greater than one might expect by chance. This suggests there is potential for reducing racial and ethnic disparities in primary care quality through targeted interventions aimed at individual physician practices with substantial concentrations of specific patient groups.

Second, “within-physician” differences accounted for the bulk of disparities in patients’ experiences of primary care for Asians and Pacific Islanders. Our findings indicate that Asians and Pacific Islanders are more likely to report worse experiences relative to Whites in the same PCP practices. For some measures, including the quality of physician–patient interactions and care coordination, “between” physician effects account for a non-trivial amount of the overall disparity, particularly for Asians who primary speak a language other than English. In general, however, our findings are consistent with a recent study that finds that “within-physician” differences account for Asian-White disparities in clinical interaction quality.³¹ However, it remains unclear whether disparities in patients’ experiences are mainly attributable to differential treatment by physicians or to cultural norms that influence the reporting tendencies of Asian patients. Future research should clarify the determinants of Asian-White differences.

Finally, “between-physician” effects contributed more to disparities between Whites and Latinos, Blacks, and American Indian/Alaskan Natives than “within-physician” effects. This indicates that patients from these groups are more likely to attend PCP practices with low performance on patient experience measures compared to Whites, possibly because these groups tend to be more residentially segregated or located in markets with low physician supply.^{32,33} In order to significantly reduce disparities in patients’ experiences of primary care, especially with respect to organizational access,^{34,35} it will be important for performance improvement efforts to focus on low performing physician practices with high concentrations of patients from these groups. Our results indicate that Latinos and Blacks were significantly clustered in practices facing time constraints for clinical interactions and long in-office wait times. Previously observed differences in patients’ experiences of primary care might be reduced by ensuring that PCPs treating high percentages of patients from these racial and

Table 4. The Relation of Practice-Level Concentration of Racial/Ethnic Groups to Differences in Patients’ Experiences of Primary Care

	Quality of physician– patient interaction	Health promotion support	Care coordination	Organizational access	Office staff interactions	Willingness to recommend physician
Practice racial/ethnic concentration						
White (%)	–	–	–	–	–	–
Black (%)	−0.32 *	0.32	−0.69 †	−0.54 †	−0.32	−0.54 †
Latino (%)	−0.73 ‡	−0.01	−1.16 ‡	−0.83 †	−0.86 ‡	−1.30 ‡
Asian (%)	−0.96 ‡	−0.16	−1.01 ‡	−0.22	−0.56 †	−1.27 ‡
All others (%)	−0.09	0.13	−0.04	−0.13	0.03	−0.12
Practice educational attainment concentration						
4-year college graduate+(%)	–	–	–	–	–	–
Some college (%)	−0.31	−1.06 †	−0.52 *	−0.67 †	−0.23	−0.35
High school only (%)	−0.09	−1.05 †	−0.23	−0.04	0.08	−0.02
Less than high school (%)	−0.11	−0.86 *	−0.49	−0.53	−0.16	−0.15

Notes: * $p < 0.05$, † $p < 0.01$, ‡ $p < 0.001$; results reflect the effect of a standard deviation change in the physician practice concentration on ACES measures. Results account for patient age, race/ethnicity, gender, education, self-rated physical, and self-rated mental health, and the clustering of patients within physicians and physicians within medical groups using random effects

ethnic groups have adequate appointment access and/or are supported by multidisciplinary teams with strong orientation to patient-centered care.^{36,37}

Inadequate reimbursement might also contribute to the observed performance deficits on patient experience measures for practices with high concentrations of Blacks and Latinos. Physicians who care for high concentrations of minority patients tend to have face appointment access constraints and perceive more challenges with providing high quality care.³⁸ Our study is limited to commercially-insured patients, suggesting that spillover effects or that the low reimbursement from Medicaid and uninsured patients in the physician practices can negatively affect the care commercially-insured patients receive.³⁹ Additional data on physician and practice characteristics, including the extent to which physicians care for Medicaid and uninsured patients, could clarify the extent to which spillover effects occur.

There are some limitations to this study. First, the response rate was modest but comparable to other patient experience performance measurement efforts nationally.⁴⁰ We are unable to assess differential patient non-response bias by race and ethnicity because this information was ascertained in the survey and unavailable for non-respondents. Blacks and Latinos are less likely to be commercially-insured compared to Whites;⁴¹ however, underrepresentation relative to population estimates might reflect differences in insurance coverage status rather than a lower propensity to respond. Moreover, we examined the sensitivity of results to differential non-response by individual physician using non-response weights and results were consistent. Second, there might be unobserved heterogeneity within minority patient categories that explain differences associated with the practice concentration of patient racial/ethnic minority patients. Acculturation measures, for example, could enrich the analyses.⁴² Third, the results might not generalize to states with different demographic distributions and PCP supply. For example, Puerto Ricans and Cuban-Americans, who make up the majority of Latinos in many east coast states, are generally better integrated into primary care practices compared to Mexican-Americans,^{35,43} who constitute the majority of the California Latino population. Finally, we did not assess racial/ethnic disparities in the technical quality of primary care. A study of one physician organization found that racial disparities in the quality of diabetes care were mainly attributable to “within-physician” effects.⁴⁴ Further study, however, is needed to examine the relative contribution of “within-” and “between-” physician effects on the technical quality of primary care.

Our findings have strong parallels with growing evidence that patient clustering can explain racial and ethnic disparities in the technical quality of medical care,^{45–47} dental care,⁴⁸ and patient outcomes.⁴⁸ This study is the first to demonstrate the influence of physician effects on disparities in patients’ experience of primary care and indicates that commercially-insured Latino, Black, and American Indian/Alaskan Native patients are more likely to receive care in PCP practices with low performance on patients’ experience measures compared to Whites. If reducing ethnic and racial disparities in patients’ experiences of primary care is a priority, initiatives might achieve the largest impact by focusing on low performing practices with high concentrations of racial and ethnic minority patients. Markets with high concentrations of Latinos face serious bilingual physician recruitment and retention problems³² so disparity reduction efforts should be sensitive to physician supply constraints when developing solutions.

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REFERENCES

1. Institute of Medicine. Unequal Treatment: Confronting Racial & Ethnic Disparities in Health. Washington, D.C.: National Academy Press; 2002.
2. Fiscella K, Franks P, Doescher MP, Saver BG. Disparities in health care by race, ethnicity, and language among the insured: findings from a national sample. *Med Care*. 2002;40(1):52–9.
3. Hargraves JL, Cunningham PJ, Hughes RG. Racial and ethnic differences in access to medical care in managed care plans. *Health Serv Res*. 2001;36(5):853–68.
4. Haviland MG, Morales LS, Dial TH, Pincus HA. Race/ethnicity, socioeconomic status, and satisfaction with health care. *Am J Med Qual*. 2005;20(4):195–203.
5. Lurie N, Zhan C, Sangl J, Bierman AS, Sekscenski ES. Variation in racial and ethnic differences in consumer assessments of health care. *Am J Manag Care*. 2003;9(7):502–9.
6. Morales LS, Cunningham WE, Brown JA, Liu H, Hays RD. Are Latinos less satisfied with communication by health care providers? *J Gen Intern Med*. 1999;14(7):409–17.
7. Morales LS, Elliott MN, Weech-Maldonado R, Spritzer KL, Hays RD. Differences in CAHPS adult survey reports and ratings by race and ethnicity: an analysis of the National CAHPS benchmarking data 1.0. *Health Serv Res*. 2001;36(3):595–617.
8. Murray-Garcia JL, Selby JV, Schmittiel J, Grumbach K, Quesenberry CP Jr. Racial and ethnic differences in a patient survey: patients’ values, ratings, and reports regarding physician primary care performance in a large health maintenance organization. *Med Care*. 2000;38(3):300–10.
9. Ponce NA, Hays RD, Cunningham WE. Linguistic disparities in health care access and health status among older adults. *J Gen Intern Med*. 2006;21(7):786–91.
10. Saha S, Arbelaez JJ, Cooper LA. Patient-physician relationships and racial disparities in the quality of health care. *Am J Public Health*. 2003;93(10):1713–9.
11. Shi L. Experience of primary care by racial and ethnic groups in the United States. *Med Care*. 1999;37(10):1068–77.
12. Stepanikova I, Mollborn S, Cook KS, Thom DH, Kramer RM. Patients’ race, ethnicity, language, and trust in a physician. *J Health Soc Behav*. 2006;47(4):390–405.
13. Taira DA, Safran DG, Seto TB, Rogers WH, Inui TS, Montgomery J, et al. Do patient assessments of primary care differ by patient ethnicity? *Health Serv Res*. 2001;36(6 Pt 1):1059–71.
14. Doescher MP, Saver BG, Fiscella K, Franks P. Racial/ethnic inequities in continuity and site of care: location, location, location. *Health Serv Res*. 2001;36(6 Pt 2):78–89.
15. Haas JS, Phillips KA, Sonneborn D, McCulloch CE, Baker LC, Kaplan CP, et al. Variation in access to health care for different racial/ethnic groups by the racial/ethnic composition of an individual’s county of residence. *Med Care*. 2004;42(7):707–14.
16. Weech-Maldonado R, Elliott MN, Morales LS, Spritzer K, Marshall GN, Hays RD. Health plan effects on patient assessments of Medicaid managed care among racial/ethnic minorities. *J Gen Intern Med*. 2004;19(2):136–45.
17. Bach PB, Pham HH, Schrag D, Tate RC, Hargraves JL. Primary care physicians who treat blacks and whites. *N Engl J Med*. 2004;351(6):575–84.
18. Kirby JB, Taliaferro G, Zuvekas SH. Explaining racial and ethnic disparities in health care. *Med Care*. 2006;44(5 Suppl):164–72.
19. Saha S, Hickam DH. Explaining low ratings of patient satisfaction among Asian-Americans. *Am J Med Qual*. 2003;18(6):256–64.
20. United States Census Bureau. The American Community-Asians:2004. In: *American Community Survey Reports*. Washington, D.C. 2007.

21. United States Census Bureau. The American Community - Hispanics:2004. In: *American Community Survey Reports*. ed.^eds. Washington, D.C. 2007.
22. **Zaslavsky AM, Zaboriski L, Cleary PD.** Does the effect of respondent characteristics on consumer assessments vary across health plans? *Med Care Res Rev*. 2000;57(3):379-94.
23. **Goodman DC, Mick SS, Bott D, Stukel T, Chang CH, Marth N, et al.** Primary care service areas: a new tool for the evaluation of primary care services. *Health Serv Res*. 2003;38(1 Pt 1):287-309.
24. **Safran DG, Karp M, Coltin K, Chang H, Li A, Ogren J, et al.** Measuring patients' experiences with individual primary care physicians. Results of a statewide demonstration project. *J Gen Intern Med*. 2006;21(1):13-21.
25. **Rodriguez HP, von Glahn T, Rogers WH, Chang H, Fanjiang G, Safran DG.** Evaluating patients' experiences with individual physicians: A randomized trial of mail, internet, and interactive voice response telephone administration of surveys. *Med Care*. 2006;44(2):167-74.
26. Institute of Medicine. Primary Care: America's Health in a New Era. Washington, DC: National Academy Press; 1996.
27. **Rodriguez HP, von Glahn T, Chang H, Rogers WH, Safran DG.** Patient samples for measuring primary care physician performance: Who should be included? *Med Care*. 2007;45(10):989-96.
28. **Zaslavsky AM, Zaboriski LB, Ding L, Shaul JA, Cioffi MJ, Cleary PD.** Adjusting performance measures to ensure equitable plan comparisons. *Health Care Financ Rev*. 2001;22(3):109-26.
29. **Elliott MN, Swartz R, Adams J, Spritzer KL, Hays RD.** Case-mix adjustment of the National CAHPS benchmarking data 1.0: a violation of model assumptions? *Health Serv Res*. 2001;36(3):555-73.
30. **Brick JM, Kalton G.** Handling missing data in survey research. *Stat Methods Med Res*. 1996;5(3):215-38.
31. **Bao Y, Fox SA, Escarce JJ.** Socioeconomic and racial/ethnic differences in the discussion of cancer screening: "between-" versus "within-" physician differences. *Health Serv Res*. 2007;42(3 Pt 1):950-70.
32. **Manetta A, Boker J, Rea J, Stephens F, Koehring N.** A study of the physician workforce supply for the Latino population in California. *Acad Med*. 2007;82(2):127-32.
33. **Baicker K, Chandra A, Skinner JS.** Geographic variation in health care and the problem of measuring racial disparities. *Perspect Biol Med*. 2005;48(1 Suppl):S42-53.
34. **Berdahl TA, Kirby JB, Stone RA.** Access to Health Care for Nonmetro and Metro Latinos of Mexican Origin in the United States. *Med Care*. 2007;45(7):647-54.
35. **Weech-Maldonado R, Fongwa MN, Gutierrez P, Hays RD.** Language and regional differences in evaluations of Medicare managed care by Hispanics. *Health Serv Res*. 2008;43(2):552-68.
36. **Rodriguez HP, Rogers WH, Marshall RE, Safran DG.** Multidisciplinary primary care teams: effects on the quality of clinician-patient interactions and organizational features of care. *Med Care*. 2007;45(1):19-27.
37. **Rodriguez HP, Rogers WH, Marshall RE, Safran DG.** The effects of primary care physician visit continuity on patients' experiences with care. *J Gen Intern Med*. 2007;22(6):787-93.
38. **Reschovsky JD, O'Malley AS.** Do primary care physicians treating minority patients report problems delivering high-quality care? *Health Aff (Millwood)*. 2008;27(3):w222-31.
39. **Pauly MV, Pagan JA.** Spillovers and vulnerability: the case of community uninsurance. *Health Aff (Millwood)*. 2007;26(5):1304-14.
40. Agency for Healthcare Research Quality, American Institutes for Research, Harvard Medical School, Rand Corporation. The Consumer Assessment of Healthcare Providers and Systems (CAHPS®) Clinician and Group Survey: Submission to National Quality Forum, 2006.
41. **Beal AC, Doty MM, Hernandez SE, Shea KK, Davis K.** Closing the Divide: How Medical Homes Promote Equity in Health Care: Results From The Commonwealth Fund 2006 Health Care Quality Survey: The Commonwealth Fund, 2007.
42. **Abraido-Lanza AF, Armbrister AN, Florez KR, Aguirre AN.** Toward a theory-driven model of acculturation in public health research. *Am J Public Health*. 2006;96(8):1342-6.
43. **Burnette D, Mui AC.** Physician utilization by Hispanic elderly persons: national perspective. *Med Care*. 1999;37(4):362-74.
44. **Sequist TD, Fitzmaurice GM, Marshall R, Shaykevich S, Safran DG, Ayanian JZ.** Physician performance and racial disparities in diabetes mellitus care. *Arch Intern Med*. Jun 9 2008;168(11):1145-51.
45. **Schneider EC, Zaslavsky AM, Epstein AM.** Racial disparities in the quality of care for enrollees in medicare managed care. *JAMA*. 2002;287(10):1288-94.
46. **Hasnain-Wynia R, Baker DW, Nerenz D, Feinglass J, Beal AC, Landrum MB, et al.** Disparities in health care are driven by where minority patients seek care: examination of the hospital quality alliance measures. *Arch Intern Med*. 2007;167(12):1233-9.
47. **Jha AK, Orav EJ, Li Z, Epstein AM.** Concentration and quality of hospitals that care for elderly black patients. *Arch Intern Med*. 2007;167(11):1177-82.
48. **Gilbert GH, Shewchuk RM, Litaker MS.** Effect of dental practice characteristics on racial disparities in patient-specific tooth loss. *Med Care*. 2006;44(5):414-20.
49. **Neighbors CJ, Rogers ML, Shenassa ED, Sciamanna CN, Clark MA, Novak SP.** Ethnic/Racial disparities in hospital procedure volume for lung resection for lung cancer. *Med Care*. 2007;45(7):655-63.

APPENDIX

Ambulatory Care Experience Survey (ACES) Composite and Item Content

ACES Measure	Item Content
Quality of physician-patient interaction	In the last 12 months... ...how often did this doctor <i>explain things</i> in a way that was easy to understand? ¹ ...how often did this doctor <i>listen carefully</i> to you? ¹ ...how often did this doctor give you easy-to-understand instructions about <i>what to do to take care of the health problems or concerns</i> that were bothering you? ¹ ...how often did this doctor seem to know the important information about your medical history? ¹ ...how often did this doctor spend enough time with you? ¹ ...how often did this doctor show respect for what you had to say? ¹
Health promotion support	In the last 12 months... ...did you and this doctor talk about a healthy diet and healthy eating habits? ² ...did you and this doctor talk about the exercise or physical activity you get? ²
Care coordination	In the last 12 months... ...how often did this doctor seem <i>informed and up-to-date</i> about the care you got from specialist doctors? ¹ ...when this doctor sent you for a blood test, x-ray or other test, how often did someone from the doctor's office follow-up to give you the test results? ¹
Organizational access	In the last 12 months... ...when you called this doctor's office to get an appointment for care <i>you needed right away</i> , how often did you get an appointment as soon as you thought you needed it? ¹ ...when you made an appointment for a <i>check-up or routine care</i> with this doctor, how often did you get an appointment as soon as you thought you needed it? ¹ ...when you called this doctor's office with a medical question <i>during regular office hours</i> , how often did you get an answer to your question that same day? ¹ ...when you called this doctor's office <i>after regular office hours</i> , how often did you get the medical help or advice you needed? ¹ Wait time includes times spent in the waiting room and exam room. In the last 12 months, how often did your visits at this doctor's office start within 15 minutes of your appointment? ¹
Office staff interactions	In the last 12 months... ...how often were clerks and receptionists at this doctor's office as helpful as you thought they should be? ¹ ...how often did clerks and receptionists at this doctor's office treat you with courtesy and respect? ¹
Willingness to recommend physician	Would you recommend this doctor to your family and friends? ³

Notes: Response Continuums: 1=Never, Almost never, Sometimes, Usually, Almost always, Always; 2=Yes, definitely, Yes, somewhat, No, definitely not; 3=Definitely yes, Probably yes, Not sure, Probably not, Definitely not