

## Original Research Article

# Racial and Ethnic Disparities in the Evaluation and Management of Pain in the Outpatient Setting, 2006–2015

Dan P. Ly, MD, MPP

Interfaculty Initiative in Health Policy, Harvard University, Cambridge, Massachusetts; VA Boston Healthcare System, West Roxbury, Massachusetts, USA

*Correspondence to:* Dan P. Ly, MD, MPP, Interfaculty Initiative in Health Policy, Harvard University, 14 Story Street, Cambridge, MA 02138. Tel: 617-613-1219; Fax: 617-868-2742; E-mail: danly@g.harvard.edu.

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## Abstract

**Objective.** Much is known about racial and ethnic disparities in receipt of opioids for pain in emergency departments. Less is known about such disparities in the evaluation and management of pain in the outpatient setting.

**Methods.** Using the nationally representative National Ambulatory Medical Care Survey (NAMCS), we estimated disparities in visit time with physicians and opioid receipt in the outpatient setting. We focused on patients whose reason for visiting was abdominal pain or back pain. Our sample included 4,764 white patients, 692 black patients, and 682 Hispanic patients.

**Results.** Back pain visits of Hispanic patients lasted 1.6 fewer minutes than those of white non-Hispanic

patients ( $P = 0.04$  for the difference). Black patients were 6.0% less likely than white patients to receive opioids for abdominal pain ( $P = 0.04$  for the difference) and 7.1% less likely than white patients to receive opioids for back pain ( $P = 0.046$  for the difference). Hispanic patients were 6.3% less likely than white patients to receive opioids for abdominal pain ( $P = 0.003$  for the difference) and 14.8% less likely than white patients to receive opioids for back pain ( $P < 0.001$  for the difference). Hispanic patients were more likely than white patients to receive non-opioids instead of opioids for both abdominal pain and back pain. Differences in opioid receipt did not narrow during the examined time period.

**Conclusions.** Identifying causes of racial and ethnic disparities in the evaluation and treatment of pain in the outpatient setting is important to improving the health and function of patients.

**Key Words.** Disparities; Opioids; Visit time

## Introduction

In 2003, the US Institute of Medicine released its seminal report “Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care” [1]. In reviewing more than a hundred studies, they found that racial and ethnic minorities received lower-quality care than that received by nonminorities. They also found that these differences persisted even after adjusting for differences in access-related factors, needs, preferences, and appropriateness of the intervention; that is, these differences were disparities.

Racial and ethnic disparities in opioid prescribing have been documented extensively, particularly in emergency departments (EDs) [2–6]. These disparities have occurred despite evidence that suggests that minorities have a similar or greater prevalence of and average level of pain than nonminorities [7]. While prescription opioid misuse and overdose have become well-recognized problems and have been associated with recently rising

morbidity and mortality among white non-Hispanic Americans [8], inadequate pain relief is also a concern that physicians must weigh [9].

Opioids are also prescribed in the outpatient setting, and prior studies have shown that from 1992 to 2010, opioid prescriptions in this setting increased [10,11]. Few studies focus on racial and ethnic disparities in opioid prescribing in the ambulatory setting. In addition, before opioids are prescribed, physicians must consider the possible etiologies of a patient's pain. Evaluations of pain include a careful history and physical, which take time. We are aware of few studies examining disparities in visit time with patients presenting with pain; preliminary evidence using computer-simulated patients suggests that in more ambiguous situations involving pain, providers spent more time with white patients than with nonwhite patients [12]. Surveys across all types of visits have found that minority patients are more likely to report inadequate time with physicians and less likely to report that physicians listened carefully to them [13]. In our study, we use national data on visits to primary care physicians to estimate racial and ethnic disparities in the evaluation and management of two common complaints: abdominal pain and back pain.

## Methods

### Data Sources

We used data from the National Ambulatory Medical Care Survey (NAMCS) from 2006 to 2015. The NAMCS is an annual national probability sample of ambulatory visits made to nonfederal, office-based physician practices. The NAMCS, conducted by the Centers for Disease Control and Prevention, National Center for Health Statistics, uses a multistage sample design. In the first stage, 112 geographic primary sampling units are selected from those originally used in the National Health Interview Survey. In the second stage, office-based physician practices are chosen from these primary sampling units. In the third stage, visits are chosen from these practices. More details can be found from the National Center for Health Statistics [14].

### Data Collection and Processing

Census Bureau field representatives complete a patient record form for each sampled visit based on the medical record soon after the visit. Collected information includes patient demographics, insurance type, reasons for the visit, diagnostic tests ordered, and medications prescribed. As part of quality assurance, a 10% quality control sample of patient record forms is independently keyed and coded.

### Study Population

We focused on clinic visits for two common complaints: abdominal pain and back pain. We limited our sample to patients aged 18 years or older visiting outpatient

primary care physicians (general and family practice or internal medicine). We excluded patients with cancer and patients with sickle cell disease. In analyses of visits for back pain, we also excluded patients with "red flags," such as fever, weight loss, neurologic weakness, and urinary retention [15].

### Outcome Measures

The first outcome was visit time spent with a physician during the visit. The second outcome was receipt of an opioid medication, including combination medications. The third outcome was receipt of a nonopioid medication (acetaminophen or nonsteroidal anti-inflammatory drugs [NSAIDs]) instead of an opioid medication.

### Covariates

Our independent variable of interest was race/ethnicity, defined as non-Hispanic white, non-Hispanic black, and Hispanic (we excluded those of other race and ethnicity due to the small sample size). We also controlled for age (continuous), gender, insurance type (defined as private, Medicare, Medicaid, and other), region (defined as Northeast, Midwest, South, and West), metropolitan statistical area (MSA) status, year, acuity of the problem (defined as a new problem [less than three months], routine follow-up of a chronic problem [greater than three months], flare-up [sudden exacerbation of a chronic problem], preventive care, and other), and Elixhauser score (coded from the three outpatient diagnoses that are listed for the visit) [16]. Elixhauser Comorbidity software identifies up to 31 patient comorbidities, such as hypertension and diabetes, based on diagnosis codes found in administrative data, and the Elixhauser score is the sum of these comorbidities.

### Statistical Analysis

We conducted separate analyses for each pain type. We use the weight, strata, and primary sampling unit variables to account for the complex survey design of NAMCS.

We first estimated a multivariable regression (linear for visit time; linear probability model for receipt of opioid) of each outcome measure as a function of race/ethnicity, also controlling for the variables described above. We then estimated trends in the receipt of opioids by pain type and by race and ethnicity between 2006–2010 and 2011–2015, again adjusting for the variables described above.

We performed all analyses using the survey package in Stata, version 15.0 (StataCorp, College Station, TX, USA). We used the subpopulation procedures to incorporate information from the entire NAMCS sample to account for the complex survey design.

The Harvard Medical School Committee on Human Studies determined that this study was exempt from review.

## Results

Our sample included 4,764 white non-Hispanic patients, 692 black non-Hispanic patients, and 682 Hispanic patients visiting an outpatient clinic for abdominal pain or for back pain. Table 1 presents patient and visit characteristics by reason for visit. Black patients were more likely than white patients to have Medicaid across both visit types, while Hispanic patients were more likely than white patients to have Medicaid for back pain visits. White patients were more likely than minority patients to live in a non-MSA area. Hispanic patients were more likely than white patients to present with back pain as a new problem and less likely to present for routine follow-up of back pain as a chronic problem. Elixhauser scores were higher for black patients than white patients across both visit types. The average time with patients ranged between 22 and 25 minutes for abdominal pain visits and between 19.3 and 20.5 minutes for back pain visits. Black patients and Hispanic patients had a lower unadjusted probability than white patients of receiving opioids for abdominal pain, while Hispanic patients, but not black patients, had a lower unadjusted probability than white patients of receiving opioids for back pain. Hispanic patients had a higher unadjusted probability than white patients of receiving nonopioids instead of opioids for both abdominal pain and back pain.

After multivariable adjustment, Hispanic patients, but not black non-Hispanic patients, had shorter visits for back pain than white non-Hispanic patients (Table 2). Visits for back pain were 1.6 minutes shorter for Hispanic patients than white patients ( $P=0.04$  for the difference). There were no differences in visit time across race and ethnicity for abdominal pain visits. Back pain visits for female patients were also statistically significantly longer, as were preventive care visits during which back pain or abdominal pain was discussed. Patients with higher Elixhauser scores also had longer visits for back pain.

After multivariable adjustment, both black non-Hispanic patients and Hispanic patients were less likely to receive opioids across both visit types than white non-Hispanic patients (Table 3). For abdominal pain, black and Hispanic patients were about 6 percentage points less likely to receive opioids than white patients. For back pain, black patients were 7 percentage points less likely to receive opioids than white patients ( $P=0.046$  for the difference), while Hispanic patients were about 15 percentage points less likely to receive opioids than white patients ( $P<0.001$  for the difference). Older patients were less likely to receive opioids for back pain, while those with back pain as a chronic problem were more likely than those with back pain as a new problem to receive opioids. After multivariable adjustment, Hispanic patients were more likely than white patients to receive

nonopioids instead of opioids across both types of visits (Table 4). For abdominal pain, Hispanic patients were about 11 percentage points more likely to receive nonopioids instead of opioids than white patients ( $P=0.005$  for the difference); for back pain, Hispanic patients were about 13 percentage points more likely to receive nonopioids instead of opioids than white patients ( $P=0.001$  for the difference). Figure 1 shows the adjusted trends by race and ethnicity in the receipt of opioids for abdominal pain and for back pain. Differences between white non-Hispanic and black non-Hispanic patients and between white non-Hispanic and Hispanic patients did not close from 2006–2010 to 2011–2015 for abdominal pain visits ( $P=0.95$  for the change in difference between white and black patients across the two time periods and  $P=0.81$  for the change in difference between white and Hispanic patients across the two time periods) or for back pain visits ( $P=0.71$  for the change in difference between white and black patients across the two time periods and  $P=0.48$  for the change in difference between white and Hispanic patients across the two time periods).

## Discussion

Using nationally representative data, we found significant racial and ethnic disparities in patient visit time with physicians and in receipt of opioids for pain in the outpatient setting. In particular, we found that Hispanic patients had shorter visits for back pain than white patients and both black and Hispanic patients were less likely than white patients to receive opioids for abdominal pain and back pain. We also found that Hispanic patients were more likely than white patients to receive nonopioids in lieu of opioids for both abdominal pain and back pain. These disparities persisted across the examined time period and remained after adjustment for patient demographics, insurance type, geography, acuity of the visit, and health status.

Our results demonstrating significant racial and ethnic disparities in opioid receipt are broadly consistent with the literature. Olsen et al.'s [10] study of opioid prescribing trends by primary care physicians from 1992 to 2001 found that Hispanic patients were less likely to receive opioids for pain. In a more recent study of outpatient opioid prescribing trends, Daubresse et al. [11] found that from 2000 to 2010, primary care physicians prescribed opioids less often to Hispanic patients for new musculoskeletal pain. Compared with Daubresse et al.'s study, we examine more recent years during which concerns about opioid-related morbidity and mortality have been heightened, extend their results to abdominal pain, and control for health status, which may be a mediating factor. Furthermore, unlike Olsen et al. [10] and Daubresse et al. [11], we find disparities in opioid prescribing between black patients and white patients. This may be due to our focus on two more specific but common reasons for visits rather than pain or musculoskeletal pain more broadly.

**Table 1** Characteristics of the study population in the National Ambulatory Medical Care Survey by reason for visit and race/ethnicity, 2006–2015

	Reason for Visit: Abdominal Pain				Reason for Visit: Back Pain			
	White		Black		White		Black	
	Non-Hispanic (N = 1, 452)	Hispanic (N = 217)	Non-Hispanic (N = 296)	Hispanic (N = 296)	Non-Hispanic (N = 3, 312)	Hispanic (N = 386)	Non-Hispanic (N = 475)	Hispanic (N = 386)
Mean age, y	51.3	51.9	50.9	0.81	53.4	48.1	50.4	0.02
Female, %	63.3	59.6	63.2	0.57	59.5	52.8	61.9	0.04
Insurance, %								
Private	55.2	49.7	54.4	0.33	49.3	44.4	44.6	0.24
Medicare	26.2	20.1	19.2	0.34	26.4	17.6	24.9	0.69
Medicaid	7.6	20.0	13.7	0.006	8.6	17.5	18.2	0.001
Other	11.1	10.3	12.7	0.78	15.7	20.5	12.3	0.17
Region, %								
Northeast	22.2	35.2	29.8	0.09	15.8	11.9	16.4	0.90
Midwest	27.4	13.0	13.5	0.001	24.4	15.3	16.2	0.01
South	30.5	41.0	23.8	0.12	38.7	39.6	52.3	0.009
West	19.9	10.8	32.9	0.18	21.0	33.2	15.1	0.18
Non-MSA, %	19.3	7.8	3.8	0.006	20.0	10.7	9.7	<0.001
Acuity of problem, %								
New problem	64.8	54.1	67.5	0.054	38.4	52.0	38.9	0.90
Chronic problem, routine	11.1	10.2	9.2	0.75	38.2	23.6	38.4	<0.001
Chronic problem, flare-up	13.3	25.8	11.9	0.007	17.6	16.4	13.6	0.09
Preventive care	3.5	1.9	4.7	0.16	2.9	3.5	2.9	0.99
Other	7.4	8.1	6.7	0.80	2.9	4.4	6.3	0.31
Mean Elixhauser score	0.27	0.48	0.32	0.003	0.36	0.35	0.51	0.003
Mean time with physician, min	22.0	25.0	24.8	0.07	20.5	19.3	20.5	0.94
Receipt of opioids, %	14.4	8.3	7.3	0.02	42.4	27.5	36.0	<0.001
Receipt of nonopioids instead of opioids, %	14.4	18.6	28.8	0.32	19.7	34.6	23.8	<0.001

Author's calculation using data from the National Ambulatory Medical Care Survey (NAMCS) from 2006 to 2015. Estimates use NAMCS-provided weights to account for the complex survey design and are nationally representative. Non-MSA refers to not being a metropolitan statistical area (MSA). MSAs are defined by the US Office of Management and Budget and broadly speaking have a high population density at their core. A new problem is a problem with a less than three-month onset. A chronic problem is a problem with an onset of three months or more. A flare-up is a sudden exacerbation of a preexisting chronic condition. Elixhauser Comorbidity software identifies up to 31 patient comorbidities, such as hypertension and diabetes, based on diagnosis codes found in administrative data, and the Elixhauser score is the sum of these comorbidities. Nonopioids refer to acetaminophen or nonsteroidal anti-inflammatory drugs. Figures are weighted percentages unless stated otherwise.

**Table 2** Association of race and ethnicity with visit time with physician by reason for visit, 2006–2015

	Reason for Visit: Abdominal Pain (N = 1,965) Coefficient	Reason for Visit: Back Pain (N = 4,173) Coefficient
Black non-Hispanic	1.365 (1.091)	−0.262 (0.867)
Hispanic	1.974 (1.036)	−1.643* (0.797)
Age	−0.014 (0.025)	0.010 (0.019)
Female	0.126 (0.695)	1.134* (0.461)
Medicare	−0.563 (1.102)	−0.774 (0.713)
Medicaid	1.388 (1.297)	−0.628 (0.764)
Other insurance	−0.777 (1.148)	1.221 (0.743)
Midwest	−5.826** (1.290)	−2.108** (0.730)
South	−5.194** (1.313)	0.080 (0.775)
West	−5.502** (1.384)	0.347 (0.910)
MSA	0.073 (1.359)	0.632 (0.553)
Chronic problem, routine	−1.096 (1.000)	−0.630 (0.604)
Chronic problem, flare-up	1.931 (1.067)	−0.208 (0.576)
Preventive care	6.248** (1.649)	6.272** (1.900)
Other reason for visit	5.831* (2.502)	0.154 (1.196)
Elixhauser score	0.555 (0.685)	0.726* (0.344)

Author's calculation using data from the National Ambulatory Medical Care Survey (NAMCS) from 2006 to 2015. Standard errors in parentheses. For each type of visit, multivariable linear regressions were performed with visit time with physician as the dependent variable, controlling for the variables listed above (year is also controlled for, but the coefficients on year are not reported). The coefficient on black non-Hispanic therefore represents the adjusted difference in time with physician in minutes between black non-Hispanic patients and white non-Hispanic patients. Regressions account for the complex survey design of NAMCS. For race and ethnicity, white non-Hispanic is the reference category. For type of insurance, private insurance is the reference category. For region, northeast is the reference category. For acuity of visit, new problem is the reference category. Metropolitan statistical areas (MSAs) are defined by the US Office of Management and Budget and broadly speaking have a high population density at their core. A new problem is a problem with a less than three-month onset. A chronic problem is a problem with an onset of three months or more. A flare-up is a sudden exacerbation of a preexisting chronic condition. Elixhauser Comorbidity software identifies up to 31 patient comorbidities, such as hypertension and diabetes, based on diagnosis codes found in administrative data, and the Elixhauser score is the sum of these comorbidities.

\*Significant at the 5% level.

\*\*Significant at the 1% level.

Our more unique contribution to the literature is our finding of disparities in visit time with physicians for pain. Preliminary evidence suggests that in more ambiguous situations involving pain, providers spent more time with white patients than with nonwhite patients

[12]. Unlike this preliminary study, we used data from actual clinical interactions rather than from computer-simulated patients. Other studies find racial and ethnic disparities in perceptions of having enough time with the physician [13]; in our study, we examine self-reported



**Table 3** Association of race and ethnicity with receipt of opioid by reason for visit, 2006–2015

	Reason for Visit: Abdominal Pain Coefficient	Reason for Visit: Back Pain Coefficient
Black non-Hispanic	−0.060* (0.030)	−0.071* (0.035)
Hispanic	−0.063** (0.021)	−0.148** (0.035)
Age	0.000 (0.001)	−0.002** (0.001)
Female	−0.014 (0.022)	−0.020 (0.020)
Medicare	0.029 (0.027)	0.049 (0.028)
Medicaid	0.045 (0.027)	0.056 (0.047)
Other insurance	0.087 (0.050)	0.102** (0.029)
Midwest	0.051* (0.023)	0.052 (0.036)
South	0.091** (0.028)	0.091* (0.038)
West	0.096** (0.030)	0.058 (0.039)
MSA	−0.050 (0.027)	−0.005 (0.044)
Chronic problem, routine	0.052 (0.035)	0.200** (0.026)
Chronic problem, flare-up	0.051 (0.031)	0.131** (0.030)
Preventive care	−0.001 (0.041)	−0.074 (0.045)
Other reason for visit	−0.037 (0.043)	0.063 (0.069)
Elixhauser score	0.007 (0.017)	−0.017 (0.018)

Author's calculation using data from the National Ambulatory Medical Care Survey (NAMCS) from 2006 to 2015. Standard errors in parentheses. For each type of visit, multivariable regressions using linear probability models were performed, with receipt of opioid as the dependent variable, controlling for the variables listed above (year is also controlled for, but the coefficients on year are not reported). The coefficient on black non-Hispanic therefore represents the adjusted difference in percent receiving opioids between black non-Hispanic patients and white non-Hispanic patients. Regressions account for the complex survey design of NAMCS. For race and ethnicity, white non-Hispanic is the reference category. For type of insurance, private insurance is the reference category. For region, northeast is the reference category. For acuity of visit, new problem is the reference category. Metropolitan statistical areas (MSAs) are defined by the US Office of Management and Budget and broadly speaking have a high population density at their core. A new problem is a problem with a less than three-month onset. A chronic problem is a problem with an onset of three months or more. A flare-up is a sudden exacerbation of a preexisting chronic condition. Elixhauser Comorbidity software identifies up to 31 patient comorbidities, such as hypertension and diabetes, based on diagnosis codes found in administrative data, and the Elixhauser score is the sum of these comorbidities.

\*Significant at the 5% level.

\*\*Significant at the 1% level.

time with physicians instead of perceptions of having enough time with physicians and focus on visits for pain instead of visits more generally. Similarly, looking at all visits rather than visits for pain, Ray et al. [17] find no racial or ethnic disparities in visit time with physicians. Our

focus on visits for pain provides a more uniform sample for comparison. We also found that Hispanic patients were more likely than white patients to receive non-opioids instead of opioids. Combined with our finding that Hispanic patients are less likely than white patients

**Table 4** Association of race and ethnicity with receipt of nonopioids instead of opioids by reason for visit, 2006–2015

	Reason for Visit: Abdominal Pain Coefficient	Reason for Visit: Back Pain Coefficient
Black non-Hispanic	0.009 (0.041)	0.042 (0.033)
Hispanic	0.110** (0.039)	0.134** (0.040)
Age	0.002** (0.001)	0.000 (0.001)
Female	0.033 (0.023)	−0.020 (0.019)
Medicare	−0.000 (0.037)	−0.013 (0.026)
Medicaid	0.056 (0.040)	−0.053 (0.032)
Other insurance	−0.011 (0.032)	−0.031 (0.027)
Midwest	0.008 (0.032)	0.027 (0.030)
South	−0.041 (0.029)	−0.027 (0.025)
West	−0.003 (0.041)	0.052 (0.030)
MSA	0.026 (0.030)	−0.011 (0.022)
Chronic problem, routine	−0.033 (0.035)	−0.129** (0.022)
Chronic problem, flare-up	−0.023 (0.047)	−0.068* (0.028)
Preventive care	0.114 (0.059)	−0.029 (0.048)
Other reason for visit	−0.066 (0.058)	0.011 (0.082)
Elixhauser score	0.000 (0.027)	0.016 (0.016)

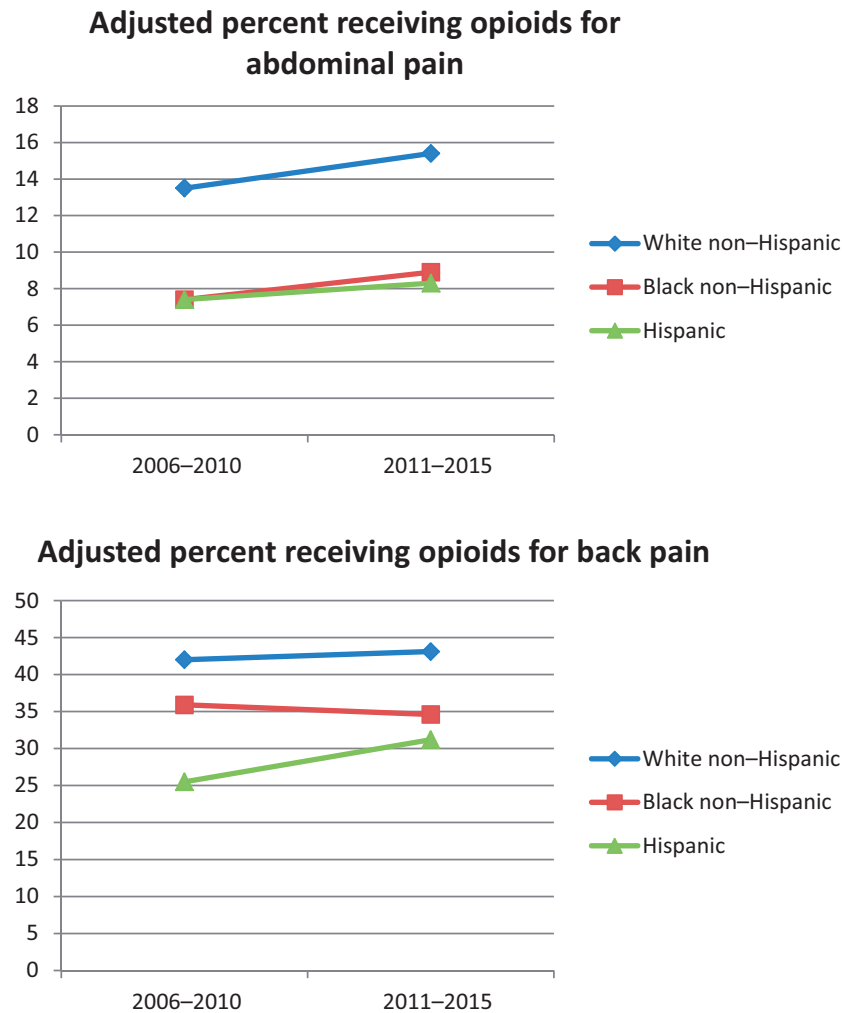
Author's calculation using data from the National Ambulatory Medical Care Survey (NAMCS) from 2006 to 2015. Standard errors in parentheses. For each type of visit, multivariable regressions using linear probability models were performed with receipt of nonopioid (acetaminophen or nonsteroidal anti-inflammatory drugs) instead of opioid as the dependent variable, controlling for the variables listed above (year is also controlled for, but the coefficients on year are not reported). The coefficient on black non-Hispanic therefore represents the adjusted difference in percent receiving nonopioids instead of opioids between black non-Hispanic patients and white non-Hispanic patients. Regressions account for the complex survey design of NAMCS. For race and ethnicity, white non-Hispanic is the reference category. For type of insurance, private insurance is the reference category. For region, northeast is the reference category. For acuity of visit, new problem is the reference category. Metropolitan statistical areas (MSAs) are defined by the US Office of Management and Budget and broadly speaking have a high population density at their core. A new problem is a problem with a less than three-month onset. A chronic problem is a problem with an onset of three months or more. A flare-up is a sudden exacerbation of a preexisting chronic condition. Elixhauser Comorbidity software identifies up to 31 patient comorbidities, such as hypertension and diabetes, based on diagnosis codes found in administrative data, and the Elixhauser score is the sum of these comorbidities.

\*Significant at the 5% level.

\*\*Significant at the 1% level.

to receive opioids, our results suggest that for Hispanic patients compared with white patients, physicians may be substituting opioids with nonopioids.

Several factors related to the patient presentation do not appear to be driving the differences we observe. Black patients have similar rates to white patients of



**Figure 1** Trends in adjusted percentage of visits for abdominal pain and for back pain receiving opioids by race and ethnicity, 2006–2015. Author’s calculation using data from the National Ambulatory Medical Care Survey (NAMCS) from 2006 to 2015. Estimates account for the complex survey design of NAMCS. Estimates control for age, gender, insurance (private, Medicare, Medicaid, and other), region (Northeast, Midwest, South, and West), MSA status, year, acuity of the problem (defined as new problem, routine follow-up of a chronic problem, flare-up of a chronic problem, preventive care, and other), and Elixhauser score (coded from the three outpatient diagnoses that are listed for the visit). Metropolitan statistical areas (MSAs) are defined by the US Office of Management and Budget and broadly speaking have a high population density at their core. A new problem is a problem with a less than three-month onset. A chronic problem is a problem with an onset of three months or more. A flare-up is a sudden exacerbation of a preexisting chronic condition. Elixhauser Comorbidity software identifies up to 31 patient comorbidities, such as hypertension and diabetes, based on diagnosis codes found in administrative data, and the Elixhauser score is the sum of these comorbidities.

visits for abdominal pain and for back pain as a new problem, while Hispanic patients have rates similar to those of white patients of visits for abdominal pain as a new problem. And while Hispanic patients were more likely to present with back pain as a new problem, adjustment for acuity of the problem did not eliminate the disparities in visit time with the physician or in receipt of opioids.

One possible reason for the disparities in visit time for Hispanic patients with back pain is that Hispanic patients are better historians than white patients, reducing diagnostic uncertainty and leading to shorter visits. We are unable to assess for this possibility in our data, but we are unaware of any literature that finds this to be the case. Similarly, it is possible that minority patients ask for opioid medications less frequently than white



patients do. Again, we are unable to assess for this possibility, but one study found that Hispanic patients have similar expectations of pain relief as white patients [18]. However, we cannot exclude the possibility that racial and ethnic differences in preferences for opioids may drive some of our results. Differences between patient and physician in primary language spoken, which we are unable to examine, may also mediate some of the differences we observed. Patients who do not primarily speak English may have difficulty conveying the history of their pain [19]. It is possible that this difficulty could lead to a lower probability of opioid receipt for such patients. However, we would expect differences in primary language spoken to lead to longer, not shorter, visits.

One possible mediating factor of these disparities is differential levels of physicians' trust in their patients by race and ethnicity. In a survey of primary care physicians regarding their socially marginalized patients (patients with HIV who were undomiciled or marginally housed), physicians had lower trust scores (which included a question asking how confident the physician was that the patient would "not manipulate the office visit for secondary gain [e.g., for inappropriate disability certification or prescription of controlled substances]") with regards to their nonwhite patients than they did with regards to their white patients [20]. This difference in trust scores occurred despite the lack of difference in current illicit drug use or opioid misuse by race or ethnicity. In fact, a recent study found that white patients were more likely than minority patients to have an opioid use disorder [21]. Some hypothesize that this lower trust may mediate racial and ethnic disparities in opioid prescribing [22].

Our study has several limitations. First, details of the history and the physical exam were not recorded in the NAMCS. It is possible that differences in the history and physical exam may have driven some of these differences in care. Second, as noted before, we were not able to control for racial and ethnic differences in patient demand. Third, we were unable to control for differential state and regional trends in opioid misuse, which may have interacted with race and ethnicity. Fourth, these outpatient surveys only include three diagnoses, so we may not have fully controlled for health status when adjusting for Elixhauser score. Fifth, visit times are self-reported.

In sum, we found significant racial and ethnic disparities in the evaluation and treatment of pain in the outpatient setting, even after adjustment for patient demographics, access-related factors, acuity of the problem, and health status. Identifying the causes of these disparities, including disparities in visit time with the physician, which have been less explored, requires further investigation.

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## References

- 1 Smedley BD, Stith AY, Nelson AR. Unequal treatment: Confronting racial and ethnic disparities in health care. 2003. Available at: <http://www.nap.edu/catalog/10260/unequal-treatment-confronting-racial-and-ethnic-disparities-in-health-care> (accessed February 2018).
- 2 Pletcher MJ, Kertesz SG, Kohn MA, Gonzales R. Trends in opioid prescribing by race/ethnicity for patients seeking care in US emergency departments. *JAMA* 2008;299:70–8.
- 3 Meghani SH, Byun E, Gallagher RM. Time to take stock: A meta-analysis and systematic review of analgesic treatment disparities for pain in the United States. *Pain Med* 2012;13(2):150–74.
- 4 Goyal MK, Kuppermann N, Cleary SD, Teach SJ, Chamberlain JM. Racial disparities in pain management of children with appendicitis in emergency departments. *JAMA Pediatr* 2015;169(11):996–1002.
- 5 Shah AA, Zogg CK, Zafar SN, et al. Analgesic access for acute abdominal pain in the emergency department among racial/ethnic minority patients. *Med Care* 2015;53(12):1000–9.
- 6 Singhal A, Tien YY, Hsia RY. Racial-ethnic disparities in opioid prescriptions at emergency department visits for conditions commonly associated with prescription drug abuse. *PLoS One* 2016;11(8):e0159224.
- 7 Mossey JM. Defining racial and ethnic disparities in pain management. *Clin Orthop Relat Res* 2011;469(7):1859–70.
- 8 Case A, Deaton A. Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century. *Proc Natl Acad Sci U S A* 2015;112(49):15078–83.
- 9 Institute of Medicine. Relieving pain in America: A blueprint for transforming prevention, care, education, and research. 2011. Available at: <http://www.nationalacademies.org/hmd/Reports/2011/Relieving-Pain-in-America-A-Blueprint-for-Transforming-Prevention-Care-Education-Research.aspx> (accessed February 2018).
- 10 Olsen Y, Daumit GL, Ford DE. Opioid prescriptions by U.S. primary care physicians from 1992 to 2001. *J Pain* 2006;7(4):225–35.
- 11 Daubresse M, Chang H, Yu Y, et al. Ambulatory diagnosis and treatment of non-malignant pain in the United States, 2000–2010. *Med Care* 2013;51(10):870–8.

- 12 Hirsh A, Hollingshead N, Ashburn-Nardo L, Kroenke K. Evidence of racial disparities in time spent with patients in pain. *J Pain* 2015;16(4):S96.
- 13 Blendon RJ, Buhr T, Cassidy EF, et al. Disparities in physician care: Experiences and perceptions of a multi-ethnic America. *Health Aff* 2008;27(2):507–17.
- 14 National Center for Health Statistics. Scope and sample design. 2015. Available at: [http://www.cdc.gov/nchs/ahcd/ahcd\\_scope.htm](http://www.cdc.gov/nchs/ahcd/ahcd_scope.htm) (accessed February 2018).
- 15 Chou R, Qaseem A, Snow V, et al. Diagnosis and treatment of low back pain: A joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Ann Intern Med* 2007;147(7):478–91.
- 16 Elixhauser A, Steiner C, Harris DR, Coffey RM. Comorbidity measures for use with administrative data. *Med Care* 1998;36(1):8–27.
- 17 Ray KN, Chari AV, Engberg J, Bertolet M, Mehrotra A. Disparities in time spent seeking medical care in the United States. *JAMA Intern Med* 2015;175(12):1983–6.
- 18 Lee WW, Burelbach AE, Fosnocht D. Hispanic and non-Hispanic white patient pain management expectations. *Am J Emerg Med* 2001;19(7):549–50.
- 19 Schyve PM. Language differences as a barrier to quality and safety in health care: The Joint Commission perspective. *J Gen Intern Med* 2007;22(S2):360–1.
- 20 Moskowitz D, Thom DH, Guzman D, et al. Is primary care providers' trust in socially marginalized patients affected by race? *J Gen Intern Med* 2011;26(8):846–51.
- 21 Han B, Compton WM, Jones CM, Cai R. Nonmedical prescription opioid use and use disorders among adults aged 18 through 64 years in the United States, 2003-2013. *JAMA* 2015;314(14):1468–78.
- 22 Burgess DJ. Addressing racial healthcare disparities: How can we shift the focus from patients to providers? *J Gen Intern Med* 2011;26(8):828–30.