Does Diversity Matter for Health? Experimental Evidence from Oakland

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with

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Harvard and NBER

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Assess a Recommendation from Leading Medical Institutes

Increase Diversity of Physician Workforce

Recommendation 1: Increase the Racial and Ethnic Diversity of the U.S. Physician Workforce

The AMA works to increase the number of minority physicians to reflect the diversity of the U.S. population through its policies and advocacy work.

The healthcare workforce and its ability to deliver quality care for racial and ethnic minorities can be improved substantially by increasing the proportion of underrepresented U.S. racial and ethnic minorities among health professionals.

This Study

- Tests whether African-American men increase their take-up of preventive care when randomly assigned to an African-American male doctor.

1. AAM lowest life expectancy of major demographic groups in the US.
2. Many deaths are preventable.
3. Preventive care take-up is relatively low.
4. Medical mistrust is relatively high.

Overview of Study Design

Two-stage 'double-blind' randomized design at the individual level

- **Stage One: Pre-Consultation**
  - Subject introduced to randomly assigned doctor via photo on tablet.
  - Subject selects preventive services via tablet.
  - Random subset of subjects also receive flu vaccination incentive.
- **Stage Two: Post-Consultation**
  - Subject interacts with doctor in person.
  - Subject revises service selection.
  - Subject receives services chosen from assigned doctor.

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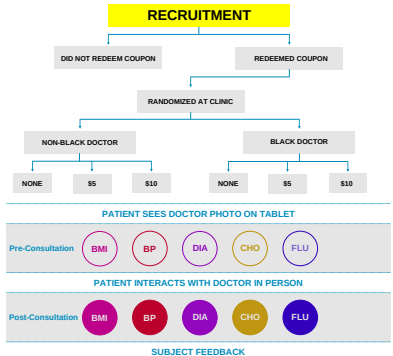
- **Stage Two: Post-Consultation**
  - Subject interacts with doctor in person.
  - Subject revises service selection.
  - Subject receives services chosen from assigned doctor.
- **Hypotheses Tested**
  - Aversion to MD different race $\rightarrow$ Learning MD black via tablet $\uparrow$ demand (Pre).
  - Better within-race pair interaction $\rightarrow$ Meeting with black MD $\uparrow$ demand (Post).

Recruitment

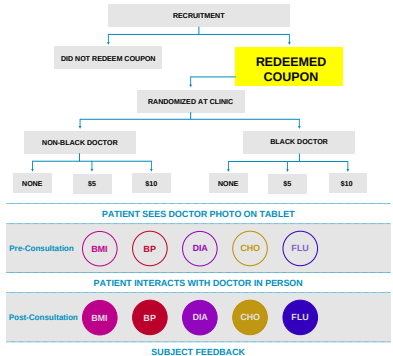
- Black men recruited from ˜20 barbershops and two flea markets around the East Bay.
- Individuals who completed baseline survey (regarding health and demographics) received voucher for free haircut.
- Given a coupon for free health screening.
- Uber donated ride-sharing services.

▸ Coupon



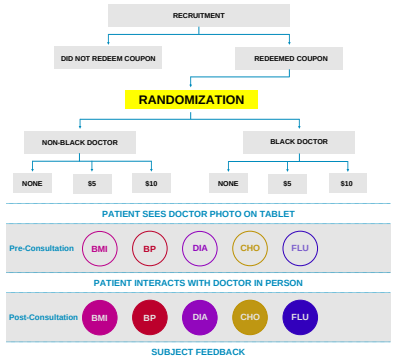
Redeem Coupon at Clinic

- To facilitate our experiment, set up a clinic.
  - Hired 14 doctors and about 25 field/clinic staff.
  - *Oakland Men's Health Disparities Project* (Double blind).
  - Doctors role: encourage all patients to obtain all services, provide services.
  - Worked on "off" Saturdays.



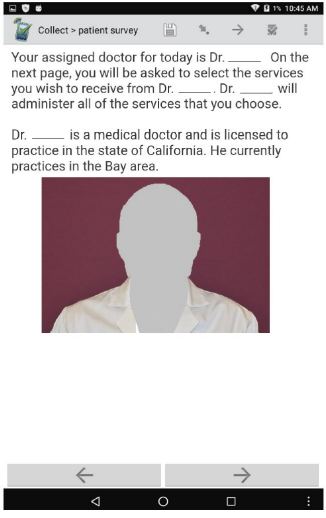
Randomization

- Subjects entered clinic if had valid coupon.
- Escorted to private patient room.
  - Given incentive payment for showing up.
  - Received tablet which did in-form randomization (SurveyCTO) to doctor.

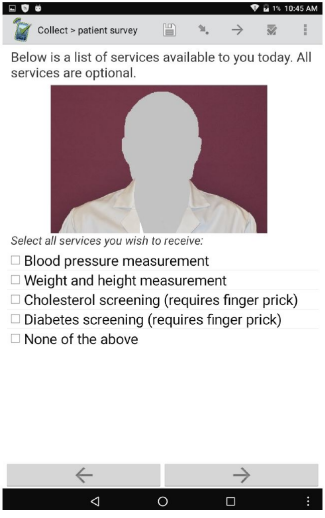


Pre-Consultation Stage - Tablet Screenshots

Panel A

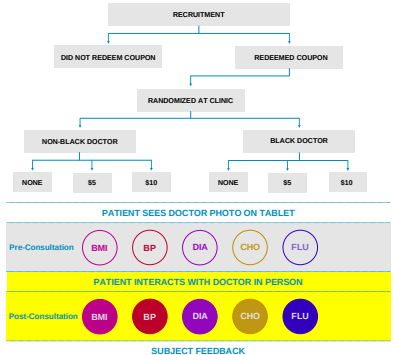


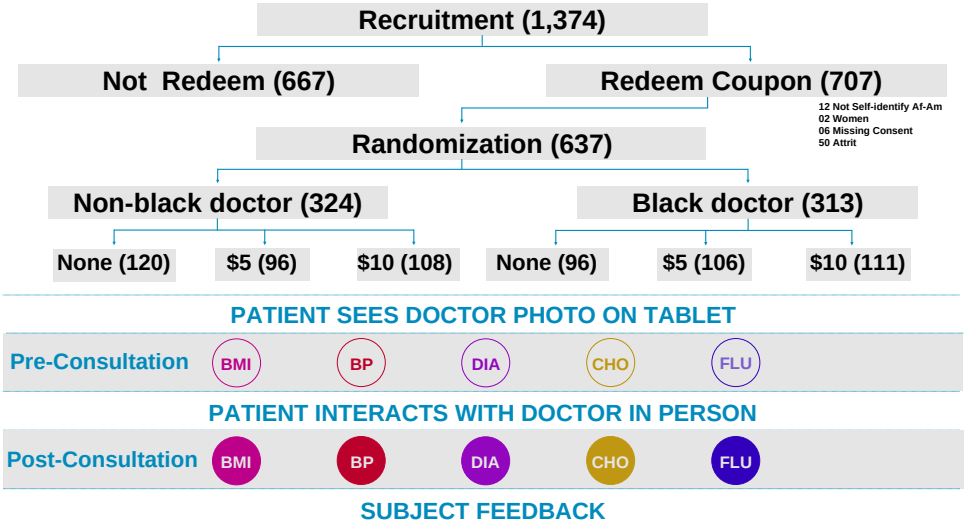
Panel B



Post-Consultation Stage

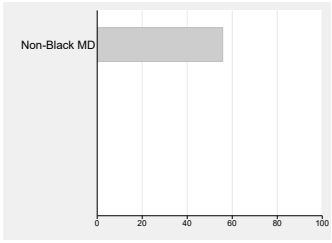
- **Post-Consultation** — patient interacts with doctor in person.
  - Revises choices.
  - Receives chosen services.
  - Fill out feedback form privately.
  - Escorted out of clinic.



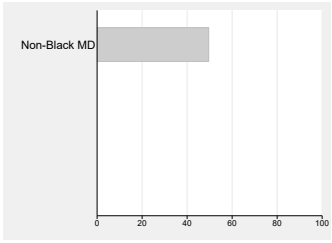


No imbalance across arms or differential attrition.

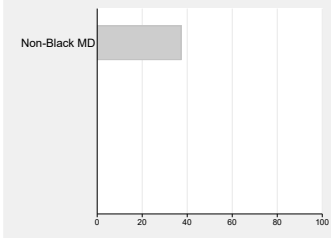
Pre-Consultation Preventives - Non-Black Doctors



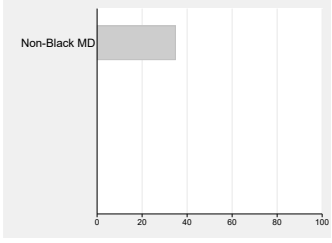
Blood Pressure (56%)



BMI (50%)

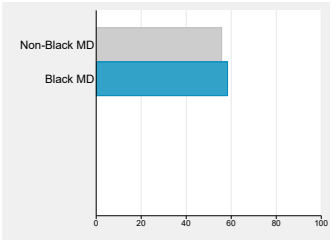


Diabetes (37%)

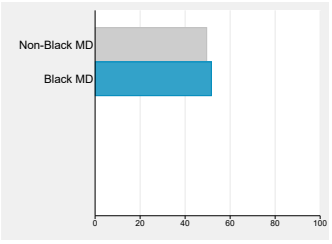


Cholesterol (35%)

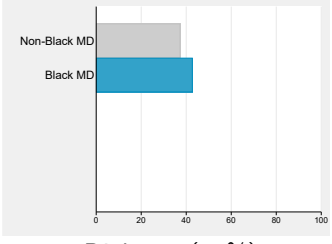
Pre-Consultation Preventives - Black Doctors



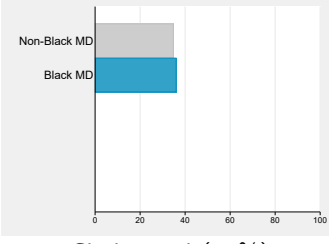
Blood Pressure (58%)



BMI (52%)



Diabetes (43%)



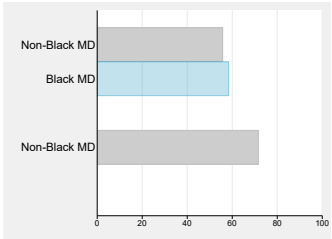
Cholesterol (36%)

Effects on Pre-Consultation Preventives

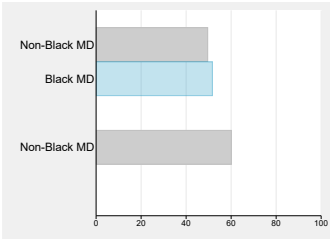
	Blood Pressure	*BMI*	*Diabetes*	*Cholesterol*	*Flu Vaccination*
Black Doctor	0.025	0.023	0.050	0.010	-0.009
	(0.039)	(0.040)	(0.039)	(0.038)	(0.037)
	{0.045}	{0.043}	{0.048}	{0.052}	{0.039}
RI p-value	0.635	0.645	0.431	0.875	0.850
Control Mean	0.56	0.50	0.37	0.35	0.20
Observations	637	637	637	637	637

Robust standard errors in parentheses. Standard errors clustered at the doctor level in curly brackets. RI p-values in row below. ▸ With Incentives

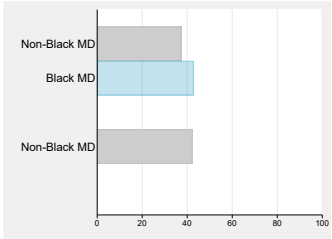
Post-Consultation Preventives - Non-Black Doctors



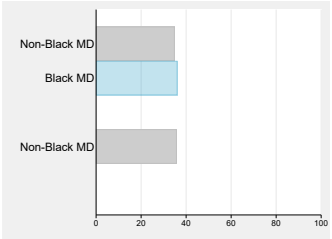
Blood Pressure (56% $\rightarrow$ 72%)



BMI (50% $\rightarrow$ 60%)

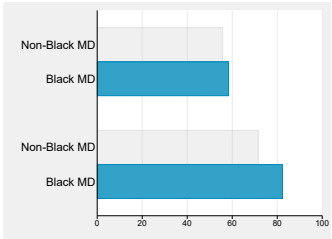


Diabetes (37% $\rightarrow$ 42%)

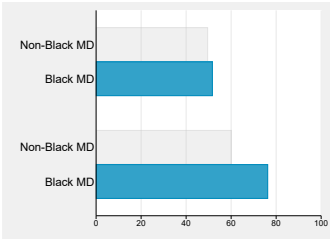


Cholesterol (35% $\rightarrow$ 36%)

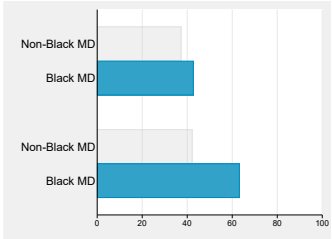
Post-Consultation Preventives - Black Doctors



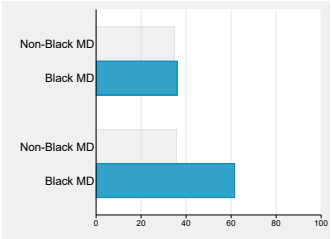
Blood Pressure (58% → 82%)



BMI (52% → 76%)



Diabetes (43% → 63%)



Cholesterol (35% → 62%)

Effects on Post-Consultation Preventives

	Blood Pressure	*BMI*	*Diabetes*	*Cholesterol*	*Flu Vaccination*
Black Doctor	0.107	0.161	0.204**	0.256**	0.100**
	(0.033)	(0.036)	(0.039)	(0.038)	(0.038)
	{0.074}	{0.099}	{0.062}	{0.071}	{0.037}
RI p-value	0.251	0.220	0.039	0.023	0.047
Control Mean	0.72	0.60	0.42	0.36	0.18
Observations	637	637	637	637	637

Robust standard errors in parentheses. Standard errors clustered at the doctor level in curly brackets. Stars based off of RI p-values.

Mechanisms

1. Communication.
2. Quality.
3. Effort.
4. Discrimination.

Communication

- Respondents 10 ppt more likely to talk to black physicians than white physicians.
- Black doctors' notes were 11 char. longer notes than non-black doctors. ▸ table8
- Results accord with non-experimental studies:
  - Qualtrics survey we devised: black and white respondents demonstrated preference for homophily when asked who they felt most comfortable "sharing their concerns with" and who "understood them best". ▸ Communication and Concordance
  - MEPS data: MD-patient concordance associated with 8 ppt increase in "understand my doctor" and agreeing "doctor listens to me". ▸ MEPS

Quality - Doctor Similar on Characteristics/Assessments

	PANEL A: Doctor Characteristics			
	Medical School Rank: Research	*Medical School Rank: Primary Care*	*Internist*	*Experience*
Black Mean	24.00	23.00	0.67	15.17
Non-Black Mean	11.00	16.00	1.00	12.25
p-value	.846	.559	.089	.741
	PANEL B: Doctor Quality			
	Persuade Black Men	*Persuade White Men*	*Most Comply*	*Board Question Performance*
Black Mean	0.50	0.33	0.50	0.78
Non-Black Mean	0.75	0.75	1.00	0.83
p-value	0.30	0.13	0.03	0.66
Observations	14	14	14	14

All doctors were vetted for malpractice suits by Stanford.

Discrimination - Ratings within and outside of Experiment very Similar

- Patients within study did not rate or recommend black doctors more than non-black doctors.
  - 99% recommend doctor and rate 4.8 out of 5.
- Patients oustide study also did not rate doctors differently.
  - Vitals.com ratings: black doctor average $= 4.35$; non-black average $= 4.56$
- No difference in error rates on devices.

Patient Comments

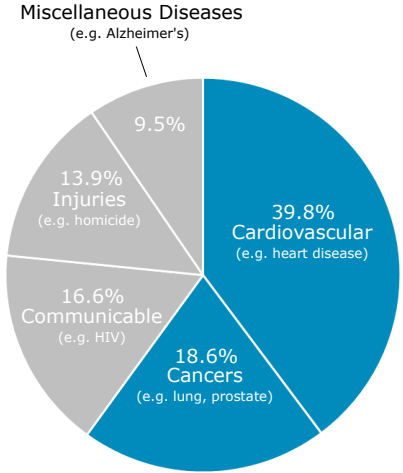
Summary of Evidence on Mechanisms

1. Communication
   - More likely to talk with doctors about other health and personal matters.
   - Concordance strongest for healthcare-related communication questions.
   - Black MD effect greater for those with ↑ mistrust who might be skeptical of information.
2. Quality
   - Rank of medical school: Black doctors' schools ranked lower.
   - Experience: Black MD slightly more est. years, but less likely to be internists.
   - Similar board scores and experience with black male patients.
   - Error rates and malpractice suits: Low/none for both sets of doctors.
   - Performance on subjects not meeting study criteria: Lower for black doctors.
   - Doctor fixed effects: Race most important.
3. Effort
   - Time with patient: similar across treatments after controlling for additional testing.
   - Targeting: no evidence of targeting by disease presence/severity.
4. Discrimination
   - No differences in preventive selections pre consultation.
   - Very high ratings for both sets of doctors post consultation.
   - Distribution of patient test results similar across MD race (no withholding).

Conclusion

- Black men randomized to black male doctors increase their uptake of preventive care.
- Results seem to be driven by better communication during the patient-doctor interaction (though more evidence needed).
- Findings suggest policies that increase the supply of African-American doctors could help narrow racial health gaps.
- Thank you!

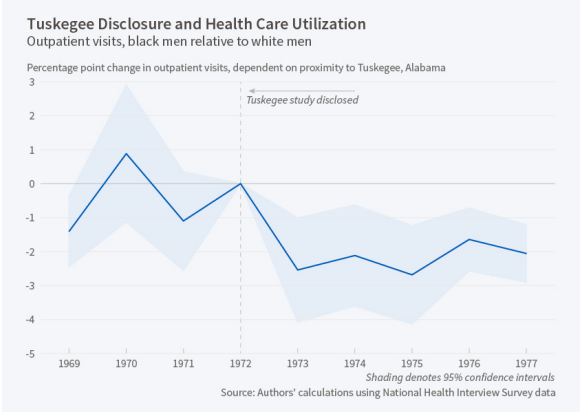
Gap Largely Explained by Cancer and CVD



Source: *Harper et al. (2012) JAMA*

TSUS Event Study

Alsan and Wanamaker (QJE 2017)



▸ Motivation

Utilization in MEPS

Adult Male Sample

	(1)	(2)	(3)	(4)	(5)
	Go To Doctor for Preventive Care				
Black Respondent	-0.008***	-0.007***	-0.005***	-0.005**	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Asian Respondent	0.002	0.002	0.003	0.003	0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Hispanic Respondent	-0.000	0.001	0.004*	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age Categories	No	Yes	Yes	Yes	Yes
Insurance	No	No	Yes	Yes	Yes
Income Categories	No	No	No	Yes	Yes
Education Categories	No	No	No	No	Yes
Observations	76280	76280	76280	76280	76280

▸ Motivation2

Race/Ethnicity of Patients and Doctors in MEPS

	White MD	*Black MD*	*Hispanic MD*	*Asian MD*
White Patient	0.851	0.017	0.039	0.093
Black Patient	0.527	0.257	0.065	0.151
Hispanic Patient	0.381	0.029	0.439	0.151
Asian Patient	0.254	0.009	0.027	0.710

▸ Concordance

- African-Americans make up 12% of population but are only 3.5% of physician workforce.
- 73% (42%) of black doctors seen by black men (women) are male (female).
- Sample includes individuals 18+. Other race is omitted.

Sex of Patients and Doctors in MEPS

Patient	Doctor	
	Female	*Male*
Female	0.34	0.66
Male	0.17	0.83

Concordance

Coupon

Coupon for Free Men's Health Screening

- See a doctor about a free health screening and receive $50
- Receive **free** health screening for:
  1. Diabetes
  2. Cholesterol
  3. Height and Weight (Body Mass Index)
  4. Blood Pressure

Clinic Address:
(See Map on back)

Clinic Hours:
11am-5pm
Saturdays **only** (List dates here)

Subject ID_____

Redeem Coupon

Beliefs

- "Flu shot makes me sick."
- "Fear of being experimented on."
- Diagnosed with diabetes in the past but, "refused to believe it."
- Nutritional or other remedies can ward off illness - no need for screening.

▸ Framework and Hypotheses Tested

Pre-Consultation Stage - Cases

- *Case I: $d > 0$ if $r_{j=w}$ and $d = 0$ otherwise*
  - Fraction of subjects that demand preventives will be strictly greater for those randomized to black versus white doctors.
  - $\Pr(\beta_i > \frac{c+d_{r_{j=w}}}{b} | r_{j=w}) = 1 - \frac{(c+d_{r_{j=w}})}{b} < 1 - \frac{c}{b} = \Pr(\beta_i > \frac{c}{b} | r_{j=b})$
- *Case II: $d > 0$ if $r_{j=b}$ and $d = 0$ otherwise*
  - Black men discriminate against doctors of their own race.
  - $\Pr(\beta_i > \frac{c}{b} | r_{j=w}) > \Pr(\beta_i > \frac{c+d_{r_{j=b}}}{b} | r_{j=b})$.
- *Case III: $d = 0 \; \forall \; r_j$ or $d > 0 \; \forall \; r_j$*
  - No aversion to doctors based on their race, or the same level of aversion to doctors regardless of their race.
  - $\Pr(\beta_i > \frac{c+d}{b} | r_{j=w}) = \Pr(\beta_i > \frac{c+d}{b} | r_{j=b})$.
  - $\Pr(\beta_i > \frac{c}{b} | r_{j=w}) = \Pr(\beta_i > \frac{c}{b} | r_{j=b})$.

▸ Pre Stage (0)

Post-Consultation Stage - Cases

- *Case I:* $\mathbb{1} = \begin{cases} 1 & \text{if } \Delta r_{ji} = 1 \\ 0 & \text{if } \Delta r_{ji} = 0 \end{cases}$ *and* $\delta \in (0, 1)$
  - If patients self-identify as black, then minimizing social distance by pairing such patients with black doctors dominates pairings with white doctors.
  - $\mathbb{E}[U^1 | r_{j=w}] = b - c - \frac{\delta b}{2} < b - c = \mathbb{E}[U^1 | r_{j=b}]$.
- *Case II:* $\mathbb{1} = \begin{cases} 0 & \text{if } \Delta r_{ji} = 1 \\ 1 & \text{if } \Delta r_{ji} = 0 \end{cases}$ *and* $\delta \in (0, 1)$
  - White doctors are viewed as more credible sources of information than black doctors.
  - $\mathbb{E}[U^1 | r_{j=w}] > \mathbb{E}[U^1 | r_{j=b}]$.
- *Case III:* $\delta = 0$ *or* $\delta = 1$ *for all* r_j
  - Either no discounting of information by social distance or the information is discounted fully from both black or white doctors.

▸ Post Stage (1)

Empirical Framework

$$Y_i = \alpha + \beta_1 \cdot \mathbb{1}_i^{BlackMD} + \beta_2 \cdot \mathbb{1}_i^{\$5} + \beta_3 \cdot \mathbb{1}_i^{\$10} + \Gamma' X_i + \epsilon_i \quad (1)$$

where:

- i represents an individual subject
- Y_i is the selection of preventive services
- $\mathbb{1}_i^{BlackMD}$ is an indicator for black MD
- $\mathbb{1}_i^{\$5}$ is an indicator for a \$5 incentive for the flu vaccination
- $\mathbb{1}_i^{\$10}$ is an indicator for a \$10 incentive for the flu vaccination
- X_i are subject characteristics (included in some specifications)
- β_1 is the ITT/TOT (given perfect compliance).
- multiple forms of inference

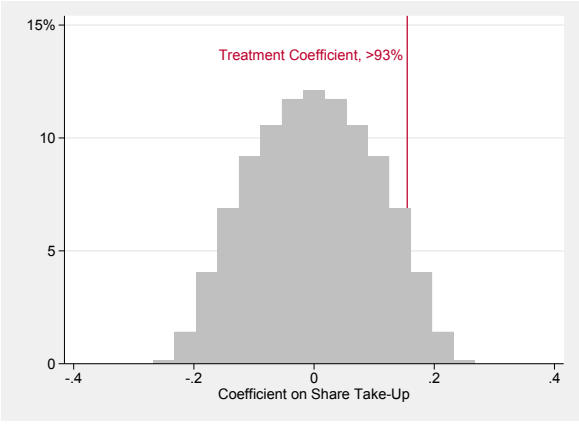
Identification: $E(\epsilon_i | \mathbb{1}_i^T) = 0$

Effects on Pre-Consultation Preventives with Incentives

	Blood Pressure	*BMI*	*Diabetes*	*Cholesterol*	*Flu Vaccination*
Black Doctor	0.025	0.023	0.050	0.010	-0.009
	(0.039)	(0.040)	(0.039)	(0.038)	(0.037)
$5 Incentive	0.028	-0.059	0.085*	0.067	0.192***
	(0.048)	(0.049)	(0.048)	(0.047)	(0.043)
$10 Incentive	-0.023	-0.009	0.028	-0.014	0.299***
	(0.048)	(0.048)	(0.047)	(0.045)	(0.043)
Control Mean	0.56	0.50	0.37	0.35	0.20
Observations	637	637	637	637	637

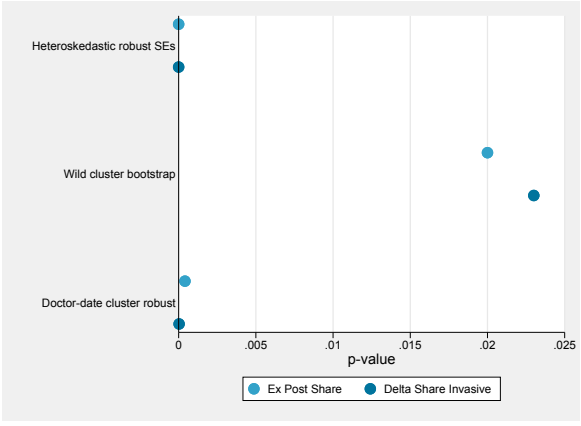
Robust standard errors in parentheses. Pre-Consult

Inference: Exact Test, Delta Share



▸ Exact Test

Other Modes of Inference



▸ Exact Test

Balance Table

	Mean (S.D.)	*Non-Black MD - $5*	*Non-Black MD - $10*	*Black MD - $0*	*Black MD - $5*	*Black MD - $10*	*F-test*	*p-value*	*N*
Self-Reported Health	0.72	-0.033	-0.181***	0.007	-0.016	0.004	2.075	0.067	563
	(0.45)	(0.066)	(0.067)	(0.065)	(0.064)	(0.063)			
Any Health Problem	0.62	-0.026	0.036	-0.015	-0.025	-0.021	0.250	0.940	614
	(0.49)	(0.068)	(0.065)	(0.069)	(0.067)	(0.066)			
ER Visits	1.69	-0.149	0.867	-0.212	0.145	-0.391	1.336	0.247	511
	(3.54)	(0.434)	(0.609)	(0.443)	(0.558)	(0.419)			
Nights Hospital	1.20	-0.392	0.839	1.956	-0.214	0.230	1.332	0.249	511
	(3.52)	(0.415)	(0.734)	(1.490)	(0.466)	(0.663)			
Has Primary MD	0.63	-0.042	0.033	-0.059	0.008	-0.019	0.415	0.838	537
	(0.49)	(0.074)	(0.070)	(0.073)	(0.070)	(0.071)			
Medical Mistrust	1.61	0.162	-0.046	0.032	0.016	-0.034	0.979	0.430	611
	(0.74)	(0.105)	(0.100)	(0.105)	(0.105)	(0.100)			
Age	44.96	-1.051	-0.100	-0.261	-1.109	-0.495	0.109	0.990	620
	(14.76)	(1.973)	(2.001)	(1.982)	(2.048)	(1.944)			
Married	0.14	0.043	-0.037	0.069	-0.015	0.024	1.120	0.348	586
	(0.35)	(0.052)	(0.045)	(0.055)	(0.047)	(0.050)			
Unemployed	0.32	-0.045	-0.008	-0.051	0.008	0.025	0.394	0.853	570
	(0.47)	(0.066)	(0.066)	(0.065)	(0.065)	(0.065)			
High School Education	0.62	0.006	-0.006	-0.029	0.055	0.034	0.344	0.886	556
	(0.49)	(0.070)	(0.070)	(0.072)	(0.068)	(0.068)			
Low Income	0.47	-0.026	-0.033	-0.043	0.022	-0.042	0.258	0.936	571
	(0.50)	(0.072)	(0.071)	(0.072)	(0.070)	(0.069)			
Uninsured	0.22	0.042	0.146**	0.112	0.057	0.010	1.398	0.223	517
	(0.42)	(0.066)	(0.067)	(0.070)	(0.064)	(0.062)			
Attrition	0.03	0.022	0.045	0.031	0.015	-0.029	1.715	0.129	684
	(0.18)	(0.033)	(0.034)	(0.034)	(0.031)	(0.025)			

▸ Attrition

Communication - Table 8

Experimental Evidence

Outcome =	*Subject Talk to MD*		*Length of MD Notes*	
Black Doctor * No Incentive		0.126		7.501
		{0.078}		{5.477}
Black Doctor	0.100	0.058	11.124	8.599
	{0.150}	{0.158}	{6.716}	{6.601}
$5 Incentive	-0.072	-0.012	0.757	4.294
	{0.040}	{0.032}	{2.408}	{2.179}
$10 Incentive	-0.085	-0.027	-0.499	2.993
	{0.054}	{0.045}	{3.423}	{3.564}
$Prob(\lvert \beta^{RI:\ Black\ Dr\ *\ No\ Inc} \rvert > \lvert \beta^{Study\ Est.} \rvert)$		0.126		0.151
$Prob(\lvert \beta^{RI:\ Black\ Dr} + \beta^{RI:\ Black\ Dr\ *\ No\ Inc} \rvert > \lvert \Sigma \beta^{Study} \rvert)$		0.288		0.029
Observations	637	637	637	637

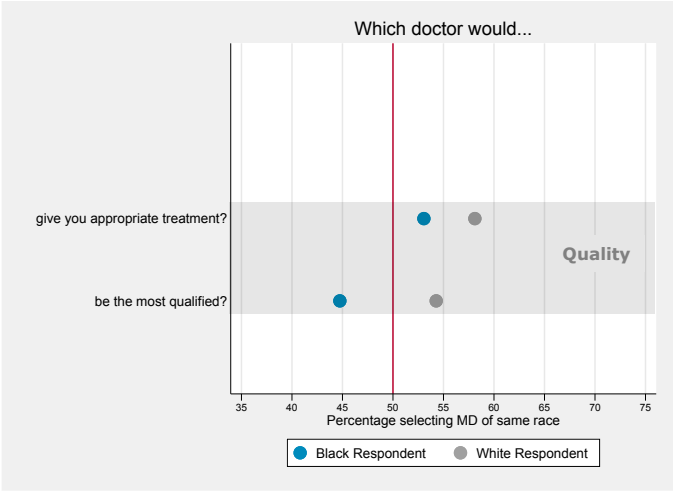
Standard errors clustered at the doctor level in curly brackets. Communication

Further Evidence on Concordance from a Large Scale Survey

- To complement experimental results, we conducted a survey to understand concordance in the general population.
- 1,490 self-identify black and white male respondents.
- Respondents matched educational characteristics of study sample (i.e. 50% had high school education or less).
- Questions regarding World Health Organization (2003) domains of a responsive health system — quality, access and communication.
- Asked respondents which doctor was most likely to meet certain characteristics.

Quality and Concordance

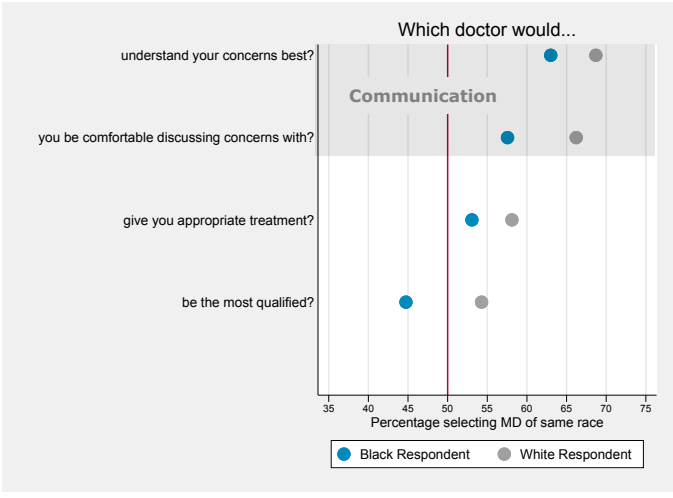
Responses near 50%



▸ Concordance Table

Communication and Concordance

Responses shift right



▸ Communication

Concordance in MEPS

Adult Male Sample

	Go To Doctor for Preventive Care	*Doctor Listens*	*Understand Doctor*
Black Respondent	-0.008*	-0.013	-0.015
	(0.005)	(0.012)	(0.014)
Black MD	-0.012	-0.064**	-0.066*
	(0.009)	(0.025)	(0.040)
Black Resp * Black MD	0.020**	0.082***	0.080*
	(0.009)	(0.026)	(0.041)
Any Insurance	0.004	0.051***	0.022
	(0.003)	(0.010)	(0.013)
Age Categories	Yes	Yes	Yes
Income Categories	Yes	Yes	Yes
Education Categories	Yes	Yes	Yes
Other Ethnic/Race Groups	Yes	Yes	Yes
Observations	32,189	22,118	7,649
Years	2005–2015	2005–2015	2011–2015

Full table

Robust standard errors in parentheses. Stars shown for significant results.

Communication

Heterogeneous Effects

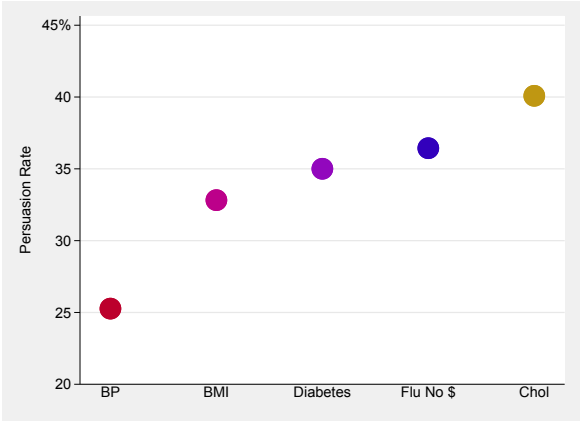
Interaction among those who lack health care experience or are mistrustful of medical field

$X =$	*No Recent Screening*	*ER Visits*	*Medical Mistrust*
Black Doctor * X	0.215*	0.015	0.078
	(0.080)	(0.011)	(0.068)
	{0.053}	{0.008}	{0.055}
X	-0.065	-0.001	-0.050
	(0.052)	(0.002)	(0.036)
	{0.045}	{0.003}	{0.033}
Black Doctor	0.153	0.159	0.177
	(0.028)	(0.033)	(0.029)
	{0.052}	{0.058}	{0.056}
$Prob(\lvert \beta^{\text{RI: Black Dr * X}} \rvert > \lvert \beta^{\text{Study Est.}} \rvert)$	0.057	0.182	0.313
Observations	604	511	611

Robust standard errors in parentheses. Standard errors clustered at the doctor level in curly brackets. Stars based off of RI p-values shown for interaction term.

▸ Communication

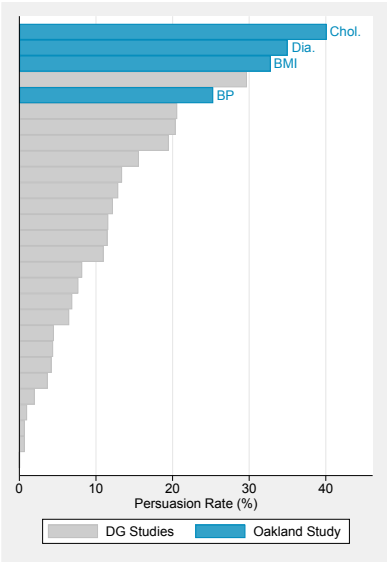
Persuasion Rate



- $f = 100 \cdot \frac{y_T - y_C}{e_T - e_C} \cdot \frac{1}{1 - y_0}$ (DellaVigna and Gentzkow 2010).

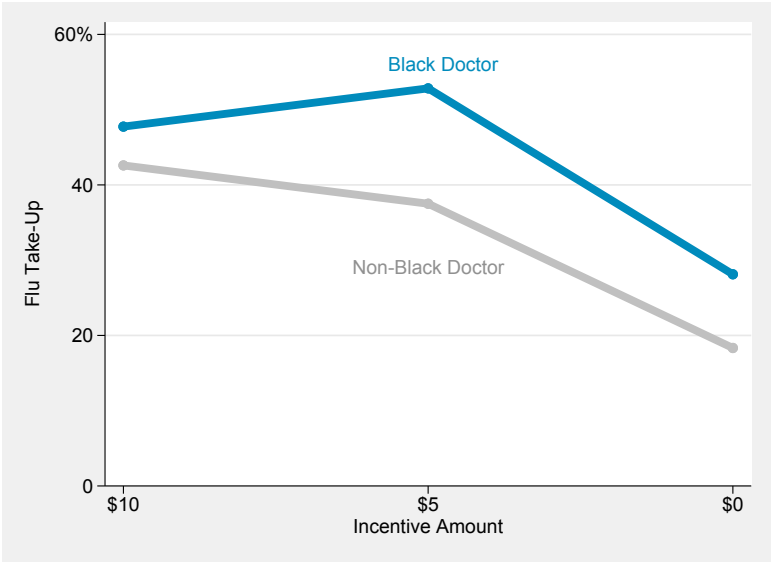
▸ Invasive Tests

Persuasion Rate Comparison



▸ Invasive Tests

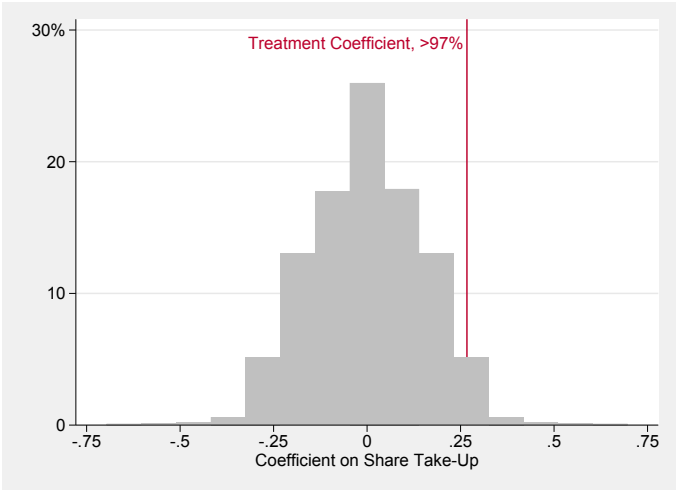
Flu Vaccination - Ex Post, by MD Race



Post Last

Difference-in-Differences, Non-Criteria Subjects

- Delta invasive coefficient on black subject * black MD = .267



▸ Non-Criteria

Alternative Fixed Effects

Main coefficients: $\beta_1^{pre} = 0.027$, $\beta_1^{post} = 0.182$, $\beta_1^{delta} = 0.155$

	Ex Ante	Ex Post	Delta	Ex Ante	Ex Post	Delta	Ex Ante	Ex Post	Delta
	Reception Officer			*Study Date*			*Recruitment Location*		
Black Doctor	0.036	0.191***	0.154***	0.032	0.178***	0.146***	0.035	0.184***	0.149***
	(0.031)	(0.029)	(0.022)	(0.030)	(0.029)	(0.022)	(0.030)	(0.029)	(0.022)
$5 Incentive	0.027	0.062*	0.034	0.032	0.049	0.017	0.026	0.047	0.022
	(0.037)	(0.035)	(0.027)	(0.036)	(0.035)	(0.027)	(0.037)	(0.036)	(0.027)
$10 Incentive	-0.007	0.011	0.018	-0.005	-0.004	0.001	-0.011	-0.007	0.004
	(0.036)	(0.034)	(0.025)	(0.036)	(0.034)	(0.025)	(0.036)	(0.035)	(0.026)
Control Mean	0.44	0.53	0.08	0.44	0.53	0.08	0.44	0.53	0.08
Observations	637	637	637	637	637	637	618	618	618

▸ Robustness

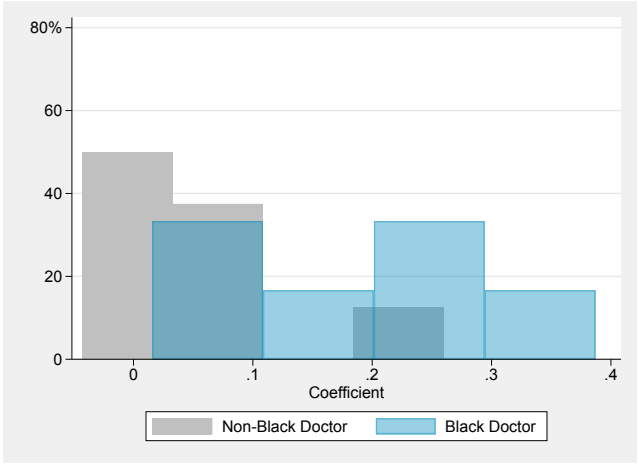
Alternative Samples

Main coefficients: $\beta_1^{pre} = 0.027$, $\beta_1^{post} = 0.182$, $\beta_1^{delta} = 0.155$

	Ex Ante	Ex Post	Delta	Ex Ante	Ex Post	Delta	Ex Ante	Ex Post	Delta
	All Subjects			*Without Assisted Subjects*			*Strict Specification*		
Black Doctor	0.023	0.176***	0.153***	0.016	0.177***	0.161***	0.031	0.179***	0.148***
	(0.030)	(0.028)	(0.022)	(0.031)	(0.029)	(0.023)	(0.032)	(0.030)	(0.023)
$5 Incentive	0.038	0.066*	0.028	0.027	0.064*	0.038	0.033	0.070*	0.037
	(0.037)	(0.035)	(0.028)	(0.038)	(0.036)	(0.028)	(0.039)	(0.037)	(0.028)
$10 Incentive	-0.002	0.006	0.008	-0.009	0.005	0.014	-0.023	-0.005	0.018
	(0.036)	(0.034)	(0.025)	(0.037)	(0.035)	(0.026)	(0.038)	(0.037)	(0.026)
Control Mean	0.44	0.53	0.08	0.45	0.53	0.08	0.45	0.52	0.08
Observations	651	651	651	623	623	623	578	578	578

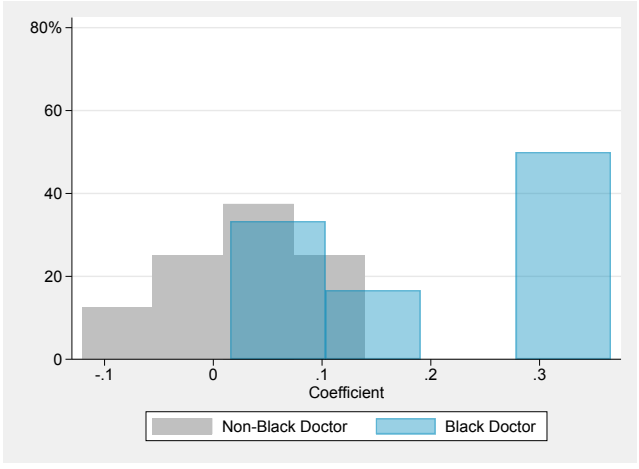
▸ Robustness

Distribution of Doctor Fixed Effects: Delta Share



Doctor Fixed Effects

Distribution of Doctor Fixed Effects: Invasive Services



▸ Doctor Fixed Effects

Concordance Table

	Quality			*Communication*			*Access*			*Communication vs. Quality*
	Which MD most qualified?			Which MD understands me?			Which MD available near me?			
	Black MD	White MD	Race Match	Black MD	White MD	Race Match	Black MD	White MD	Race Match	Race Match
Black Respondent	0.350***		-0.055*	0.531***		-0.001	0.241***		-0.255***	-0.047
	(0.025)		(0.030)	(0.024)		(0.029)	(0.024)		(0.029)	(0.030)
White Respondent		0.273***			0.479***			0.175***		
		(0.029)			(0.027)			(0.030)		
Communication										0.144***
										(0.023)
Mean	0.11	0.27	0.54	0.12	0.19	0.69	0.11	0.43	0.62	0.48
R-squared	0.12	0.08	0.03	0.23	0.24	0.04	0.09	0.04	0.07	0.06
Observations	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	1,490	2,980

▸ Communication

Utilization and Concordance in MEPS

Adult Male Sample

	Go To Doctor for Preventive Care	*Doctor Listens*	*Understand Doctor*
Black Respondent	-0.008*	-0.013	-0.015
	(0.005)	(0.012)	(0.014)
Hispanic Respondent	-0.002	-0.010	-0.012
	(0.005)	(0.013)	(0.016)
Asian Respondent	-0.004	-0.020	-0.035
	(0.007)	(0.019)	(0.024)
Black MD	-0.012	-0.064**	-0.066*
	(0.009)	(0.025)	(0.040)
Black Resp * Black MD	0.020**	0.082***	0.080*
	(0.009)	(0.026)	(0.041)
Hispanic MD	-0.001	-0.028*	0.004
	(0.005)	(0.016)	(0.017)
Hisp Resp * Hisp MD	0.001	0.032*	-0.004
	(0.006)	(0.018)	(0.025)
Asian MD	-0.004	-0.015	0.002
	(0.005)	(0.011)	(0.014)
Asian Resp * Asian MD	0.003	-0.007	-0.002
	(0.008)	(0.021)	(0.028)
White Resp * White MD	-0.003	-0.004	0.004
	(0.005)	(0.013)	(0.016)
Any Insurance	0.004	0.051***	0.022
	(0.003)	(0.010)	(0.013)
Age Categories	Yes	Yes	Yes
Income Categories	Yes	Yes	Yes
Education Categories	Yes	Yes	Yes
Observations	32,661	22,473	7,837
Years	2005–2015	2005–2015	2011–2015

▸ MEPS Concordance

Proxy for Effort: Time Spent with Patient

- What does time spent represent?

Proxy for Effort: Time Spent with Patient

- What does time spent represent?
  - More tests (Rx effect)?

Proxy for Effort: Time Spent with Patient

- What does time spent represent?
  - More tests (Rx effect)?
  - Efficiency (or lack thereof)?

Proxy for Effort: Time Spent with Patient

- What does time spent represent?
  - More tests (Rx effect)?
  - Efficiency (or lack thereof)?
  - Communication?

Effort: No Evidence of Targeting by Black Doctors

	Pre	Post	Delta	Pre	Post	Delta
$X =$	*Increased Risk, High Cholesterol*			*Increased Risk, Diabetes*		
Black Doctor * X	0.039	0.024	-0.016	-0.160	-0.154	0.006
	{0.088}	{0.090}	{0.075}	{0.184}	{0.192}	{0.140}
X	0.018	0.047	0.030	0.031	-0.015	-0.046
	{0.062}	{0.062}	{0.048}	{0.129}	{0.129}	{0.095}
Black Doctor	-0.022	0.234	0.256	0.058	0.202	0.144
	{0.076}	{0.108}	{0.097}	{0.059}	{0.065}	{0.061}
$Prob(\mid \beta^{RI:\ Black\ Dr\ *\ X} \mid > \mid \beta^{Study\ Es\dots}$	0.733	0.825	0.877	0.450	0.606	0.946
Observations	620	620	620	561	561	561

Standard errors clustered at the doctor level in curly brackets.

Discrimination: No Evidence of Differing Thresholds

	Pre	Post	Delta	Pre	Post	Delta
$X =$	*Increased Risk, High Cholesterol*			*Increased Risk, Diabetes*		
Black Doctor * X	0.039	0.024	-0.016	-0.160	-0.154	0.006
	{0.088}	{0.090}	{0.075}	{0.184}	{0.192}	{0.140}
X	0.018	0.047	0.030	0.031	-0.015	-0.046
	{0.062}	{0.062}	{0.048}	{0.129}	{0.129}	{0.095}
Black Doctor	-0.022	0.234	0.256	0.058	0.202	0.144
	{0.076}	{0.108}	{0.097}	{0.059}	{0.065}	{0.061}
$Prob(\mid \beta^{RI:\ Black\ Dr\ *\ X} \mid > \mid \beta^{Study\ Es}$	0.733	0.825	0.877	0.450	0.606	0.946
Observations	620	620	620	561	561	561

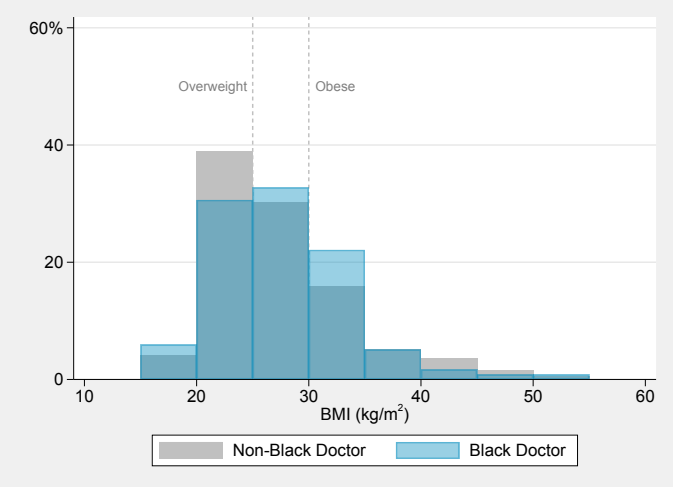
- 'Outcome' test - if threshold to screen higher, then non-black doctors would be predicted to pick up more disease (see Chandra and Staiger 2017).
- No differences in means nor are there differences in distributions.
- Consistent with study doctors following instructions as well as importance of patient autonomy in decisions about preventive healthcare.

Subject values

Subject Discrimination? : Pre-Consultation Results

	Blood Pressure	*BMI*	*Diabetes*	*Cholesterol*	*Flu Vaccination*
Black Doctor	0.025	0.023	0.050	0.010	-0.009
	(0.039)	(0.040)	(0.039)	(0.038)	(0.037)
	{0.045}	{0.043}	{0.048}	{0.052}	{0.039}
RI p-value	0.635	0.645	0.431	0.875	0.850
Control Mean	0.56	0.50	0.37	0.35	0.20
Observations	637	637	637	637	637

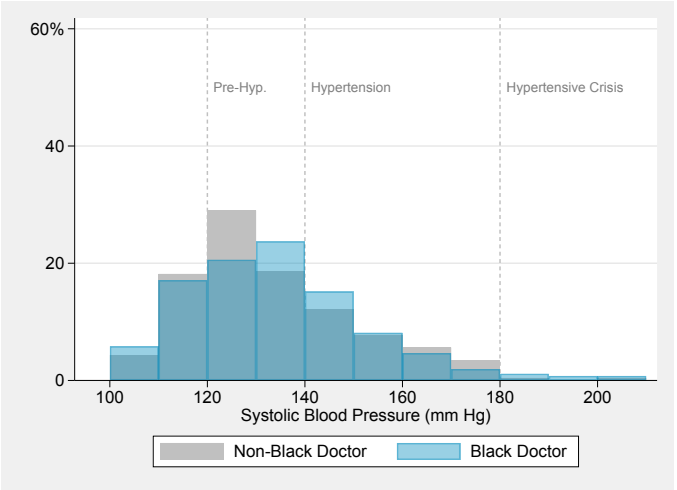
Results from Clinic Encounter: BMI



▸ Threshold

Kolmogorov-Smirnov p-value: 0.638

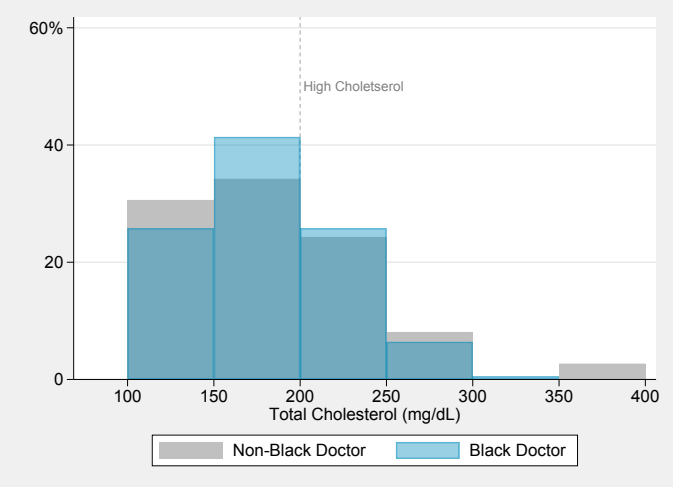
Results from Clinic Encounter: Blood Pressure



▸ Threshold

Kolmogorov-Smirnov p-value: 0.362

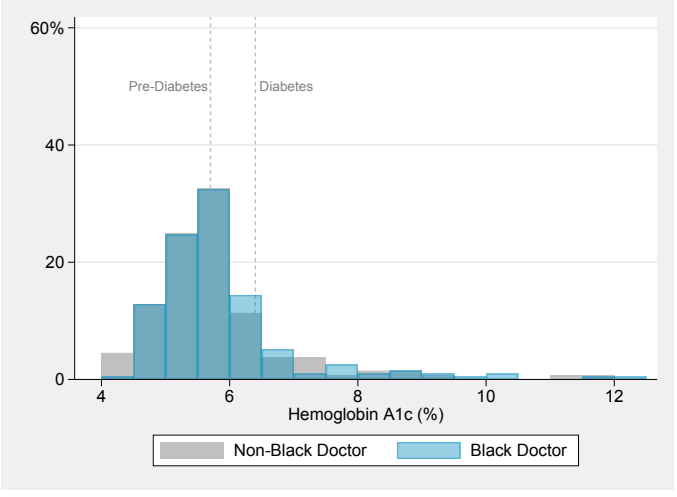
Results from Clinic Encounter: Cholesterol



▸ Threshold

Kolmogorov-Smirnov p-value: 0.757

Results from Clinic Encounter: Diabetes



▸ Threshold

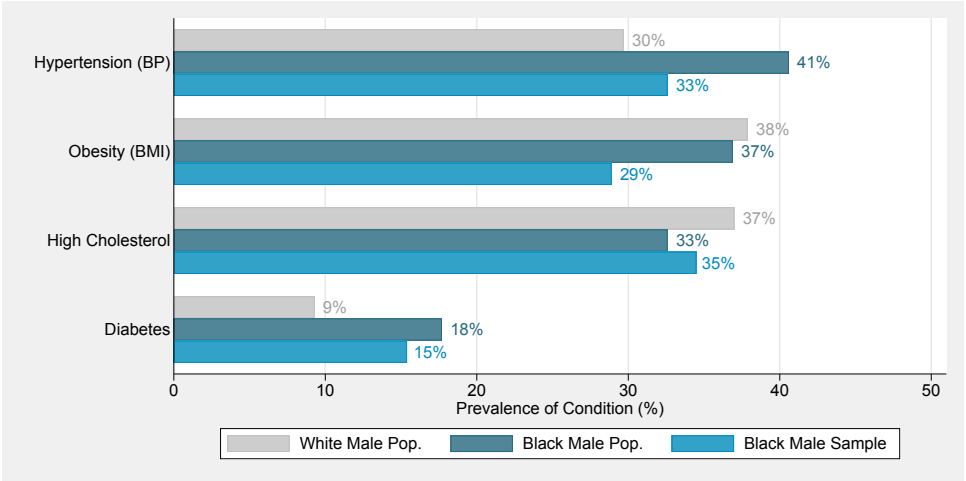
Kolmogorov-Smirnov p-value: 0.887

Sample and Population Characteristics

	U.S., 2016	*Study Sample*
Age	43.21	43.04
≤ High School Education	0.58	0.63
Uninsured	0.17	0.28
Unemployed	0.07	0.31

Source: *U.S. averages are from 2016 ACS*

Disease Prevalence



Back-of-the-Envelope Health Valuation

- Change prob. of flu vaccine take-up by same amount if give patient $\approx$ \$5 or a black doctor.
  - This valuation calculation neglects effect on other services.
  - In setting of misperceptions, demand curve questionable for welfare calculations.
- Use studies that estimate the value of preventive services to estimate health gain associated with intervention. (Kahn et al. 2010, Dehmer et al. 2017).
- Calculations suggest intervention could lead to a 19% reduction in the black-white gap in male mortality rates for cardiovascular disease.
- Does not take into account diseases not included in the study (e.g. screening for HIV, prostate cancer).

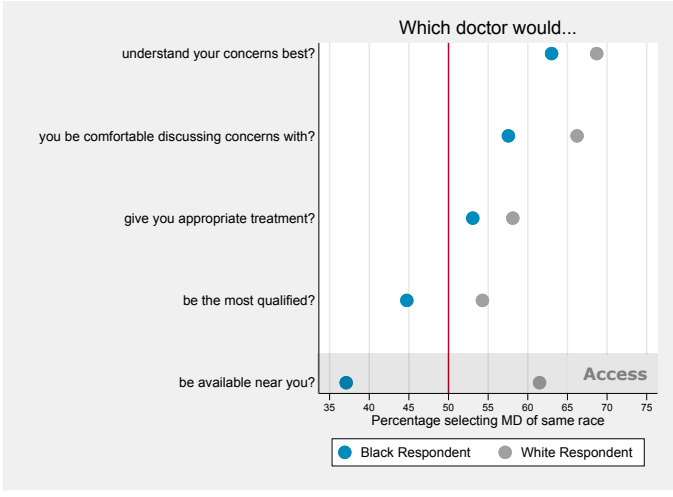
Issues with Back-of-the Envelope Approach

- Based off studies that assume those who screen positive obtain and follow guideline-recommended care.

Issues with Back-of-the Envelope Approach

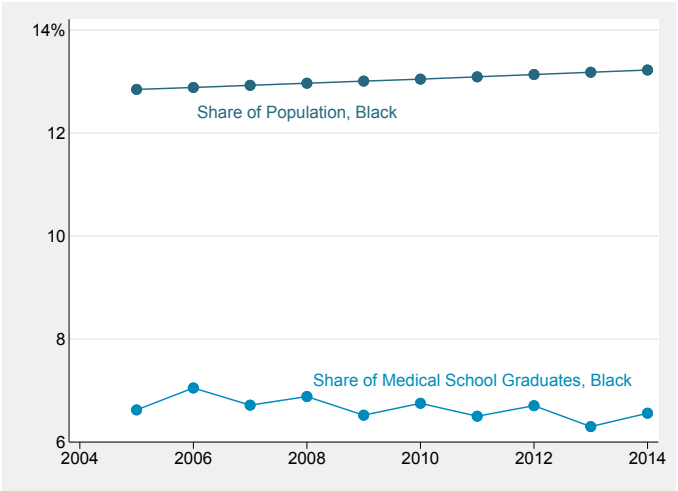
- Based off studies that assume those who screen positive obtain and follow guideline-recommended care.
- Assumes supply of black doctors to treat black patients.

Non-Experimental Survey Respondents



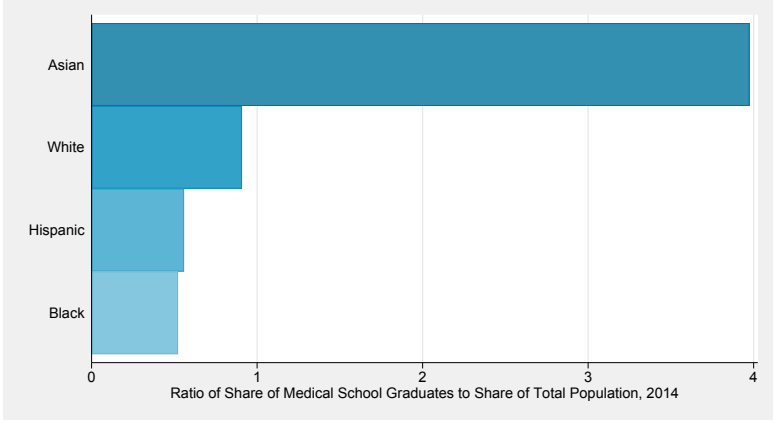
▸ Concordance Table ▸ Consensus Statements

African-American Trends



Source: *AAMC, Census Bureau Population Estimates*

Racial and Ethnic Differences in Medical School Representation



Source: *AAMC, Census Bureau Population Estimates*

Physician Shortages in Minority Communities

- In California, Black/Hispanic communities 4x more likely to be designated physician shortage areas (PSA) regardless of community income.

Table 2. Association of Characteristics of Communities with the Supply of Primary Care Physicians.*

Characteristic	Urban Communities		Rural Communities	
	Regression coefficient	95% CI	Regression coefficient	95% CI
Household income <$15,000 (%)	0.55	−0.14 to 1.3	−0.3	−0.98 to 0.39
Black race (%)	−0.89†	−1.4 to −0.40	−1.35‡	−2.7 to −0.05
Hispanic (%)	−0.9†	−1.2 to −0.56	−0.57†	−0.90 to −0.23
Mean age (yr)	1.57	−1.4 to 4.6	0.09	−2.8 to 3.0
Male sex (%)	−0.24	−2.1 to 1.6	−0.08	−1.4 to 1.3
	$R^2 = 0.18$		$R^2 = 0.21$	

*The data are from the multivariate analysis. CI denotes confidence interval.

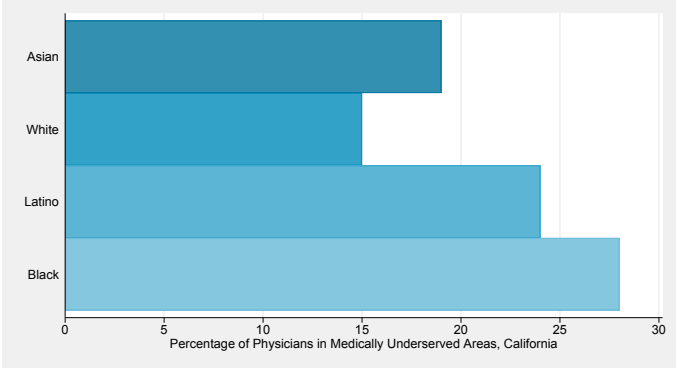
†P≤0.001.

‡P≤0.005.

Source: *Komaromy et al. NEJM*

Practice Location Choice

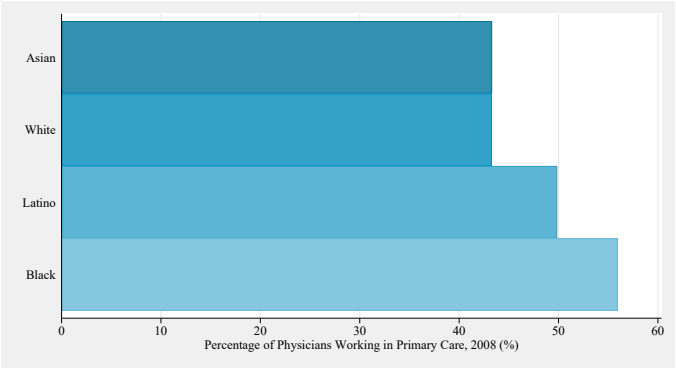
- African-American and Hispanic physicians more likely to practice in MUAs.



Source: *Walker, Moreno, and Grumbach (2012)*

Occupational Choice

- African-American and Hispanic physicians more likely to work in primary care.



Conclusion

Source: *AAMC (2008)*