


# Separate But Not Equal? A Cross-Sectional Study of Segregation by Payor Mix in Academic Primary Care Clinics



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**BACKGROUND:** At some US Academic Health Centers (AHCs), patients with predominantly Medicaid insurance are seen in one clinic and patients with other insurance are seen in another. The extent of this practice and implications are unknown.

**OBJECTIVE:** To estimate the proportion of AHCs that have at least two primary care internal medicine clinics that differ substantially in proportion of patients with Medicaid and to compare patient demographic, staffing, and operational features.

**PARTICIPANTS:** General internal medicine chiefs and clinic directors at 40 randomly selected US AHCs plus the top 10 AHCs in terms of NIH funding.

**MAIN MEASURE:** An AHC was classified as maintaining clinics that differed substantially in the proportion of patients with Medicaid if any two differed by  $\geq 40\%$  (absolute). Other criteria were used for pre-specified secondary analyses (e.g.,  $\geq 30\%$ ).

**KEY RESULTS:** Thirty-nine of 50 AHCs (78%) participated. Four of 39 (10%; 95% CI, 3 to 24%) had two clinics differing by  $\geq 40\%$  in the proportion of patients with Medicaid, eight (21%; 95% CI, 9 to 36%) had clinics differing by  $\geq 30\%$ , and 15 (38%; 95% CI, 23 to 55%) had clinics differing by  $\geq 20\%$ . Clinics with more patients with Medicaid by any of the three criteria were more likely to employ resident physicians as providers of longitudinal care (with faculty supervision) and more likely to have patients who were Black or Hispanic.

**CONCLUSIONS:** Some US AHCs maintain separate clinics defined by the proportion of patients with Medicaid. Clinics with a higher proportion of patients insured by Medicaid are more likely to employ residents (with faculty oversight), feature residents as providers of longitudinal care, and serve patients who are Black and Hispanic. Further research is needed to understand why some AHCs have primary care clinics distinguishable by insurance mix with the goal of ensuring that racism and discrimination are not root causes.

**KEY WORDS:** primary care; Medicaid; socioeconomic status; ethnicity; medical education

J Gen Intern Med 38(10):2318–25

DOI: 10.1007/s11606-023-08066-x

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## INTRODUCTION

Many Academic Health Centers (AHCs) have clinics that serve socioeconomically disenfranchised and historically underrepresented patients, many of whom have Medicaid for insurance.<sup>1</sup> These clinics are commonly staffed by resident physicians who practice with faculty oversight; they are, therefore, important venues for education.<sup>2,3</sup> At the same time, some AHCs also maintain clinics that include a higher proportion of more affluent patients and a smaller proportion of patients from underrepresented racial and ethnic groups; the patients at these clinics are more likely to have commercial health insurance or Medicare. No prior research that we could identify has documented how commonly AHCs maintain separate clinics serving distinct patient populations as defined by insurance type.

Because separate clinics for primary care may represent remediable discrimination, we undertook this research to determine how often US AHCs maintain at least two primary care internal medicine clinics that are substantially different in terms of the proportion of patients with Medicaid insurance. We compared clinics with high and low proportions of patients with Medicaid according to easily measurable indicators of care process that could further indicate discrimination including services provided (i.e., social work, pharmacy), trainee presence and role, attending physician presence and role, and patient demographics.

Because our research used quantitative and qualitative information that is easily available, leaders at US AHCs can

Received September 21, 2022

Accepted January 27, 2023

Published online February 17, 2023

determine if our findings apply to their institutions. They can then begin the process of examining if differences between primary care clinics might be a manifestation of discrimination or if differences are associated with discriminatory practice. Although our research was not designed to evaluate solutions to discriminatory practice, we offer options.

## METHODS

This study was reviewed by the Institutional Review Board at Yale School of Medicine which found that it was not human subject research and therefore did not require a full IRB review. The final study protocol appears in Supplement 1.

### Selection of Academic Health Centers and Clinics

We surveyed a sample of 50 AHCs in the USA. We defined an AHC as an organization that included an allopathic medical school with at least one affiliated allied health program (e.g., a nursing school or physician assistant program) and at least one affiliated hospital or health system<sup>4</sup>. We oversampled research-intensive AHCs by including the top ten recipients of NIH funding in 2018; our intent was to include institutions with an outsized influence on medical practice and education by virtue of their scientific output and volume of publication on diverse topics, including ethics and education. The remaining 40 were randomly selected from the 140 fully accredited allopathic US medical schools as listed in 2018 by the Liaison Committee on Medical Education (LCME).<sup>5</sup> We did not stratify selection by size, location, or other characteristics of AHCs. One AHC was not eligible for inclusion in the sample because it was the proband for this research.

We identified all adult internal medicine primary care clinics closely associated with each AHC during a structured interview with the AHC's chief of general internal medicine or equivalent. Interviews were conducted by one of two authors (WNK, SFH) using a standardized form (appears in Supplement 2). We considered a clinic as closely associated if it received financial support from a component of the AHC and was staffed by at least one general internist with close ties to the medical school (i.e., their employment was linked to maintaining their academic appointment). We excluded Veterans' Administration clinics because they would have only one non-Medicaid payor. If an AHC had more than three affiliated clinics, we had the option of asking the chief to recommend the two with the highest and lowest proportions of patients with Medicaid. For each clinic identified, we requested the name of the director, contact information, and an introduction. We classified an AHC as participating in this research if we completed the chief interview and an interview with at least one clinic director.

### Data Acquisition and Analysis

We attempted to obtain data for at least two clinics at each AHC. Each clinic director was invited to participate in a structured interview during which we confirmed clinic eligibility and acquired data on selected clinic features. Five of the authors (SFH, WNK, LSD, JLS, MMF) conducted the interviews using a standardized form (appears in Supplement 2). We requested data for July 2018 through June 2019 when available or used a more recent time interval if the director confirmed that no major changes had occurred at the clinic after that interval. For numerical data (e.g., percent of patients with each insurance type, percent of clinic patients who are Black or Hispanic, annual number of patient visits), we asked the director to refer to computer-generated tabulations, but we accepted estimates if tabulations were not available, and directors had confidence in their estimations.

We classified an AHC as having separate adult primary care clinics for patients with different insurance if the proportion of Medicaid recipients at physically distinct clinics differed by at least 40 percentage points. This difference criterion was considered by a consensus of the authors to be the minimum that would indicate with substantial certainty that there was an intra-institutional distinction in clinic purpose. In recognition that 40% was not objectively determined, we pre-specified additional analyses for differences of  $\geq 30\%$ ,  $\geq 20\%$ , and  $\geq 10\%$ . We calculated the proportion of participating AHCs that maintained separate clinics meeting each specified difference and 95% exact confidence intervals around the proportions. For the AHCs meeting each specified criterion for maintaining separate clinics, we examined the characteristics of the clinics with low and high proportions of patients with Medicaid. For this analysis, we pooled data from AHCs meeting the specified criterion. From these AHCs, we pooled data from the clinics with the highest proportion of patients with Medicaid in each AHC and compared that pooled data to pooled data from the clinics that differed from the high clinic (within each AHC) by the specified criterion. We also examined differences in clinic features across quartiles defined by percentage of patients with Medicaid using chi-square, ANOVA, or Wilcoxon rank sum tests as appropriate for the data.

We defined clinics as being physically distinct within an AHC if they were in different physical spaces. During our research, we realized that we had data on six clinics that were really three pairs that shared the same physical space but operated as distinct entities ("clinics within clinics"). Each pair comprised a resident and faculty practice. The faculty and residents (practicing with faculty oversight) at these six clinics had distinctly different patient panels. The practices shared exam rooms. Some shared telephone call at night; others did not. Some cross covered for urgent visits; others did not. In every case, the pairs had separate financial accounting. We collected separate data on the six clinics before we realized they comprised three pairs that shared

space. In our main results, we considered these six clinics as distinct to be consistent with our original data collection. To understand if keeping the three pairs separate could have changed findings for our main research aim, we conducted a sensitivity analysis which combined each pair with the proportion of patients with Medicaid calculated as the weighted average using patient roster size.

## Role of the Funding Source

This study was funded by a patient's bequest to Yale School of Medicine. The patient had no role in the study's design, conduct, or reporting.

## RESULTS

We completed interviews with the chief of general internal medicine or other knowledgeable individuals and at least one clinic director at 39 of the 50 AHCs selected for our study (78%) (Figure in Supplement 3). Participating AHCs were more likely to be among the top NIH funding recipients and be in the northeast (eTable 1 in Supplement 4). Of the 39 participating AHCs, 24 (63%) had a separate faculty practice where residents either did not work at all or did not have their own continuity clinic.

We completed interviews with directors at 95 clinics. One director could not provide insurance data, leaving 94 clinics for our main analysis (Figure in Supplement 3). The number of eligible clinics at the 39 participating AHCs ranged from none to more than five (eTable 2 in Supplement 4). One AHC had no closely affiliated adult primary care internal medicine clinic and six had only one. We obtained data from at least two clinics in each of the other 32 participating AHCs. Data were complete or near complete for key variables (eTable 3 in Supplement 4).

Four of the 39 participating AHCs (10%; 95% CI, 3 to 24%) maintained at least two clinics that differed by  $\geq 40$  percentage points in the proportion of patients with Medicaid. Eight (21%; 95% CI, 9 to 36%) maintained two clinics that differed by  $\geq 30$  points and 15 (38%; 95% CI, 23 to 55%) maintaining two clinics that differed by  $\geq 20$

points (Table 1). AHCs with two clinics that differed more substantially in the proportion of patients with Medicaid (i.e., 30% or 40%) were more likely to be in the northeast and privately owned compared with AHCs with two clinics that differed less (i.e., 10% or 20%) (eTable 4 in Supplement 4).

Features of clinics with high and low proportions of patients with Medicaid insurance within AHCs meeting the 40% and 30% criteria are shown in Table 2. Comparing high and low Medicaid clinics at AHCs meeting the 40% criteria, distance from the main teaching hospital was similar (1.2 miles vs. 0.7 miles). High Medicaid clinics had larger patient panels (mean *N*, 13,512 vs. 10,691) with more annual visits (mean *N*, 35,845 vs. 26,459) and were more likely to have a social worker (100% vs. 33%) and pharmacist (100% vs. 33%) on site. Residents were more likely to work in high Medicaid clinics (100% vs. 33%) and provide continuity of care (with faculty supervision) (100% vs. 33%). Faculty physicians were less likely to provide continuity of care without resident intermediaries in high Medicaid clinics compared with low Medicaid clinics (75% vs. 100%). The high Medicaid clinics had higher proportions of Black (mean %, 54 vs. 14) and Hispanic (mean %, 59 vs. 10) patients and their patients were younger (mean years, 51 vs. 61).

We found similar results when we compared high and low Medicaid clinics at AHCs meeting the 30% criterion as we did at AHCs meeting the 40% criterion (Table 2). Features of clinics for AHCs meeting  $\geq 20\%$  and  $\geq 10\%$  cut points are shown in eTable 5 of Supplement 4.

Across all 94 clinics, with increasing quartile of proportion of patients with Medicaid insurance, the distance from the main teaching hospital declined, clinics were more likely to have social workers and pharmacists on site, and more likely to have residents, and residents were more likely to see patients in continuity (with faculty supervision). Each resident also spent more half-days in clinic/year. Faculty were less likely to have continuity clinics in which they provided care without resident intermediaries. The average percentage of patients who identified as Black and Hispanic increased and average age declined across increasing quartile of patients with Medicaid (Table 3).

**Table 1 Distribution of 39 AHCs by Greatest Difference in % Patients with Medicaid Between Clinics**

Greatest difference in % Patients with Medicaid between clinics	AHCs with specified difference			AHCs with $\geq$ specified difference		
	No.	%	No.	%	(95% CI)*	
$\geq 40$	4	10%	4	10%	(3, 24)	
30–39	4	10%	8	21%	(9, 36)	
20–29	7	18%	15	38%	(23, 55)	
10–19	8	21%	23	59%	(42, 74)	
1–9	9	23%	32	82%	(66, 92)	
0 <sup>†</sup>	7	18%	39	100%		
	39	100%				

\*Exact 95% confidence limits

<sup>†</sup>AHCs with only 0 or 1 clinic

**Table 2 Features of Clinics with High and Low % Patients with Medicaid at AHCs Where at Least Two Clinics Differ by Specified % Patients with Medicaid**

Clinic features	Greatest Difference in % Patients with Medicaid between Clinics							
	≥ 40%				≥ 30%			
	High % Medicaid (n=4 clinics)		Low % Medicaid (n=6 clinics)		High % Medicaid (n=8 clinics)		Low % Medicaid (n=10 clinics)	
Miles to main teaching hospital, mean (SD)	1.2 (2.0)		0.7 (0.5)		0.7 (1.4)		0.7 (0.5)	
Services, no. clinics, %								
After hours answering service	4	100%	6	100%	8	100%	10	100%
Social worker on site	4	100%	2	33%	8	100%	4	40%
Pharmacist on site	2	50%	1	17%	6	75%	3	30%
Evening visits available	3	75%	3	50%	5	63%	5	50%
Weekend visits available	1	25%	0	0%	2	25%	3	30%
Medical students present*, no. clinics, %	4	100%	4	67%	8	100%	8	80%
Physician mix†, no. clinics, %								
Faculty only	0	0%	4	67%	0	0%	7	70%
Resident only	1	25%	0	0%	1	13%	0	0%
Both	3	75%	2	33%	7	87%	3	30%
Internal medicine residents								
Work at clinic, no. clinics, %	4	100%	2	33%	8	100%	5	50%
Work in a continuity clinic, no. clinics, %	4	100%	2	33%	8	100%	3	30%
Work in block rotations, no. clinics, %	4	100%	2	33%	7	88%	5	50%
No. residents, mean (SD)	49	(52)	15	(26)	59	(50)	16	(26)
Half-days per year per resident, mean (SD)	54	(4)	21	(35)	58	(13)	19	(28)
Internal medicine faculty								
Work in a personal continuity clinic, no. clinics, %	3	75%	6	100%	7	88%	10	100%
No. faculty, mean (SD)	18	(8)	13	(20)	24	(13)	13	(15)
Patients in clinic panel								
No. patients, mean (SD)	13,512	(5695)	10,691	(10,160)	14,403	(6493)	12,664	(8401)
Age, mean years (SD)	51	(8)	62	(5)	53	(5)	61	(5)
Race %, mean (SD)								
Black	54	(34)	14	(14)	50	(25)	18	(14)
White	31	(22)	70	(23)	33	(17)	68	(20)
Other	15	(17)	13	(10)	17	(19)	12	(9)
Hispanic ethnicity %, mean (SD)	59	(27)	10	(10)	43	(30)	10	(11)
No. visits, mean (SD)	35,845	(28,761)	26,459	(28,694)	35,390	(24,090)	26,629	(24,301)
Visits per patient, mean (SD)	3	(2)	3	(1)	3	(2)	3	(1)
Primary insurance type %, mean (SD)								
Medicaid	56	(20)	3	(4)	48	(16)	4	(4)
Medicare	15	(7)	45	(15)	22	(11)	40	(14)
Commercial insurance	12	(16)	49	(17)	14	(15)	54	(16)
Self-pay (uninsured)	17	(22)	1	(2)	16	(20)	1	(2)
Direct care payments	0		0		1	(4)	0	
Other	0		1	(2.0)	1	(4)	1	(3)

\*Primary care rotation at clinic

†Faculty only = no residents or no resident continuity panels. Resident only = faculty do not have continuity panels. Both = residents and faculty have separate continuity panels

When clinics were classified by provider mix, we found that the mean proportion of patients with Medicaid differed significantly, from 9% at clinics where only faculty provided continuity of care to 21% at clinics where both faculty and residents (with faculty supervision) practiced to 35% at clinics where only residents practiced as continuity providers (with faculty supervision) (Fig. 1). The mean proportion of patients who are Black increased across these same clinic types (20% to 28% and 44%, respectively) and the mean proportion of patients who are Hispanic also increased (7% to 13% and 18%, respectively) (eFigure in Supplement 4).

We conducted a sensitivity analysis in which we calculated a weighted average of the proportion of patients with

Medicaid for the 3 pairs of clinics that were misclassified as separate. The results are shown in eTable 6 of Supplement 4. In the sensitivity analysis, there was a reduction from 4 to 3 in number of AHCs meeting the 40% criterion.

### DISCUSSION

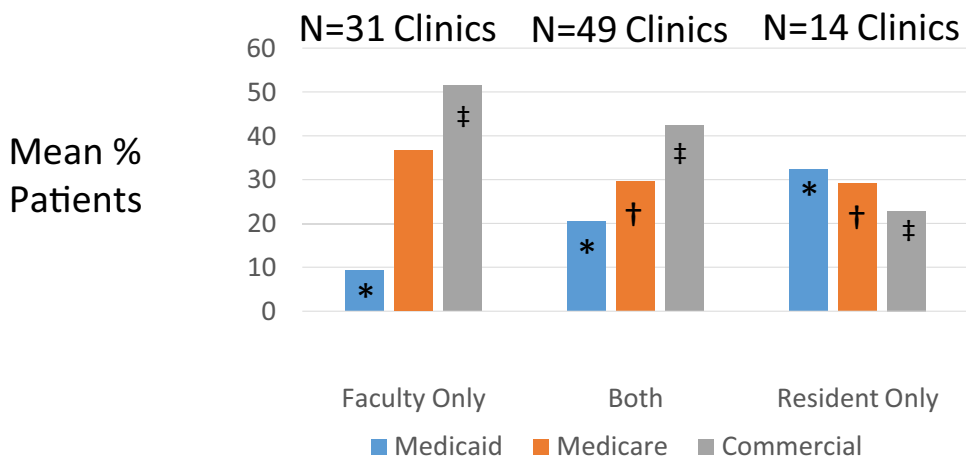
We found that 10% of our sample of US AHCs maintained two clinics that differed by ≥ 40 percentage points in the proportion of patients with Medicaid, 21% (95% CI, 9 to 36%) maintained clinics that differed by ≥ 30 percentage points, and 38% (95% CI, 23 to 55%) maintained clinics that differed by ≥ 20 percentage points. Clinics with a higher proportion of patients with Medicaid coverage

**Table 3 Features of 94 Clinics, Overall and by Quartile of % Patients with Medicaid**

Clinic feature	All clinics	1st Quartile (< 5%)	2nd Quartile (5–11%)	3rd Quartile (12–29%)	4th Quartile (≥ 30%)	p-value
Number	94	25	22	23	24	
Miles to main teaching hospital, mean (SD)	3.7 (4.9)	5.1 (5.0)	5.2 (6.3)	2.9 (3.9)	1.9 (3.5)	0.04
Clinic services, no clinics, %						
After hours answering service	93	100%	100%	96%	100%	0.37
Social worker on site	63	67%	44%	78%	96%	0.0002
Pharmacist on site	52	55%	32%	74%	75%	0.008
Evening visits available	34	36%	48%	26%	25%	0.20
Weekend visits available	23	24%	28%	22%	13%	0.28
Medical students present, * no clinics, %	80	85%	80%	87%	83%	0.75
Physician mix †, no clinics, %						
Faculty only	31	33%	60%	2	3	13%
Resident only	14	15%	4%	6	7	29%
Both	49	52%	36%	15	14	58%
Internal medicine residents						
Work at clinic, no clinics, %	77	82%	60%	22	23	96%
Work in a continuity clinic, no clinics, %	63	67%	40%	21	21	88%
Work in block rotations, no clinics, %	60	64%	48%	18	18	75%
No. residents, mean (SD)	33	(34)	(19)	51	47	(41)
Half-days per year per resident, mean (SD)	41	(41)	(26)	49	59	(66)
Internal medicine faculty						
Personal continuity clinic, no clinics, %	80	85%	96%	17	17	71%
No. faculty, mean (SD)	12	(11)	(7)	16.65	13.13	(11)
Patients in clinic panel						
No. patients, mean (SD)	9967	7652	10769	10751	10941	(7114)
Age, mean years (SD)	54	58	55	51	53	(4)
Race %, mean (SD)						
Black	28	(23)	(17)	32	45	(21)
White	54	(25)	(25)	49	34	(16)
Other	18	(15)	(16)	18	21	(17)
Hispanic ethnicity %, mean (SD)	12	(16)	(9)	6	26	(24)
No. visits, mean (SD)	20165	16170	18376	22690	24311	(19867)
Visits per patient, mean (SD)	2.2	2.4	2.0	2.2	2.5	(1.3)
Insurance type %, mean (SD)						
Medicaid	19	(19)	(1)	19	45	(18)
Medicare	32	(12)	(12)	33	28	(11)
Commercial insurance	43	(21)	(15)	39	20	(13)
Self-pay (uninsured)	6	(10)	(5)	8	10	(15)
Direct care payments	0	(2)	(2)	0	1	(2)
Other	3	(9)	(17)	1	1	(2)

\*Primary care rotation at clinic

†Faculty only = no residents or no resident continuity panels. Resident only = faculty do not have continuity panels. Both = residents and faculty have separate continuity panels



**Figure 1 Insurance distribution by clinic type.** Mean percent of patients with three types of insurance at clinics defined by provider of continuity of care. At faculty only clinics, patients were empaneled only to faculty members; residents might be present but did not see patients in continuity. At clinics with both faculty and residents, patients were empaneled to either a faculty member or resident. At resident only clinics, patients were empaneled only to residents. \* $\dagger p \leq 0.001$  by ANOVA for comparison across clinic types. ‡ $p = 0.02$  by ANOVA for comparison across clinic types.

were more likely to employ residents and less likely to employ faculty physicians as primary providers of continuity care. Patients at clinics with higher proportions of patients with Medicaid insurance were more likely to be Black or Hispanic.

Together, the examination of primary care clinics classified by percentage-difference and quartile of proportion of patients with Medicaid suggests that a substantial number of US AHCs, particularly private institutions in the northeast, have developed different care pathways for patients defined by markers of socioeconomic status, including insurance type, race, and ethnicity.

We did not gather comparative data on access to clinical care, quality, cost, or patient satisfaction that might help in understanding the consequences of separate care according to insurance or provider type, but other researchers have.<sup>6-13</sup> Although findings are variable among institutions, patients cared for by residents (with faculty supervision) are, in general, more likely to be from underrepresented racial and ethnic groups; more likely to have economic adversity, high-risk behaviors, and psychiatric illness; and less likely to be satisfied with care compared with patients cared for directly by university attending physicians<sup>8-10,12,14</sup>. Continuity of care is usually better for faculty patients, but on other markers of quality, faculty care is not always superior.<sup>8,13</sup> There are obvious limits to continuity when residents are the primary provider; residents are less frequently in clinic than physicians who do primary care full time and they leave their patient panel to another resident after they graduate from their training program in 3 years.<sup>3</sup> Disruptions in continuity have been tied to problems in patient satisfaction, care quality, care cost, and hospital utilization<sup>12,15-18</sup>.

Our study has limitations which may have caused us to underestimate the proportion of AHCs that have two

different clinics defined by the proportion of patients with low income (for which Medicaid was our marker). First, we enrolled AHCs from Alabama, Florida, Kansas, North Carolina, Tennessee, and Texas which have not participated in the Medicaid expansion to low-income adults.<sup>19-21</sup> AHCs in these states may be less likely to have two clinics that differ substantially in the proportion of patients with Medicaid but they may still have two clinics that differ substantially in the proportion of patients with low income. In our research, adults with low income in non-expansion states would likely be classified as having no insurance or “other” insurance. Because our methods used Medicaid to classify clinics, we may have underestimated the existence of separate clinic for patients of high and low income in non-expansion states.

Second, our classification of separate clinics at each AHC was based on physical location and this also may have led us to underestimate the proportion of AHCs with two clinics that differed substantially in the proportion of patients with Medicaid. Resident and faculty practices which share space but remain separate in other ways may enroll different populations of patients as defined by socioeconomic condition and underrepresented race or ethnicity. Our sensitivity analysis (for the three AHCs where we identified 6 clinics that were really three pairs that shared the same physical space but operated as distinct entities) confirms that our clinic classification method may have led to the underestimation of the proportion of AHCs with two clinic that differ substantially in Medicaid.

At least one AHC in our sample resided in a county that sponsored dedicated primary care clinics for patients who participated in the state Medicaid program. Primary care clinics affiliated with the AHC capped the number of patients with Medicaid they accepted and referred others to the county clinics. Our data from this AHC confirmed a

relatively low proportion of patients with Medicaid at each of its affiliated primary care clinics.

Another limitation, our acceptance of estimated data in special situations when computer tabulations were not available, might have created risk for error in the estimation of the proportion of AHCs with two primary care clinics that differed in their Medicaid populations.

The limitations of our research indicate opportunities for new research. Future research on how AHCs care for patients across the socioeconomic spectrum should account for limitations of Medicaid as a marker for low income, particularly in states that do not participate in Medicaid expansion, and for county-level systems that pull low-income patients away from AHCs. New research should adopt definitions for clinics that account for the “clinic within clinic” phenomenon that we describe.

Our study was not designed to understand how or why some AHCs came to have separate clinics based on payor mix or why residents are differentially involved at these clinics. We also do not know if the intent was originally noble (e.g., to care for the underserved) or discriminatory (e.g., to keep patients with Medicaid out of clinics serving privately insured patients). We do not know why separate clinics continue to exist. Several explanations are possible, but the most troublesome is that separate clinics may represent discrimination in health care delivery.<sup>3</sup> To mitigate even the appearance of discrimination, AHCs with separate clinics defined by payor mix should examine the origins of, implications of, and reasons for ongoing separation. Where indicated, remediation might include adopting institutional policies that assure (1) all patients in primary care are treated similarly, (2) all patients who seek primary care are provided the same options (without coercion) for clinic and provider assignment, and (3) uniform standards for primary care venues (e.g., services, physical environment, staffing, access). Rebuilding delivery systems to address socioeconomic differences among primary care clinics could promote health equity, improve education, and counter any interpretation that such difference represents discrimination.<sup>22</sup>

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s11606-023-08066-x>.

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**Funding** A patient’s bequest to Yale School of Medicine.

**Declarations:**

**Conflict of Interest:** The authors declare that they do not have a conflict of interest.

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