



# Disparities in access for melanoma screening by region, specialty, and insurance: A cross-sectional audit study

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**Background:** Early detection of melanoma is critical for positive outcomes. However, access for the diagnosis of melanoma remains problematic for segments of the general population.

**Objective:** To compare the rates of dermatology and family medicine practitioner acceptances for a public insurance (Medicaid) versus private insurance (Anthem Blue Cross) and clinic wait times for an appointment for a changing pigmented skin lesion concerning melanoma in rural and urban regions in California.

**Methods:** Cross-sectional audit study between June 2017 and March 2019; scripted phone calls were made to dermatology and family medicine practices (FMPs).

**Results:** Family medicine and dermatology practices in both regions had significantly decreased acceptance of Medicaid. Dermatology practices had 11.3% to 13.0% Medicaid acceptance rates that were less than FMP rates of 28% to 36%. In both regions, FMP wait times were 2.4- to 3.2-fold longer for public versus private insurance; there were little differences in wait times for the 2 insurance types in dermatology practices, in both regions.

**Limitations:** Assessment of only 2 regions in the state of California.

**Conclusion:** Delays at FMPs and insurance types limit access to melanoma screening in California for underserved segments of the general population, which has implications for melanoma outcomes and health policy. (JAAD Int 2022;7:78-85.)

**Key words:** Bay Area; California; Central Valley; dermatology; family medicine; health disparities; Medicaid; melanoma; private insurance; rural; screening; urban; wait times.

## INTRODUCTION

Melanoma is the fifth most common cancer in California, the most populous state in the United States, with an average of 9139 melanomas diagnosed annually, the highest number diagnosed in any state.<sup>1</sup> Dermatologic care is critical for melanoma

prevention, early detection, and optimal outcome, and place of residence, provider specialty, and insurance status and type can directly influence access to that care.<sup>2</sup>

Urban versus rural residence is linked with differences in melanoma care.<sup>2</sup> Living in rural areas

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may impose barriers to cancer care due to issues such as lack of transportation, poor medical care infrastructure, and decreased overall physician density.<sup>3</sup> Individuals in rural environments are more likely to experience delays in biopsy of melanomas<sup>4</sup> and have their melanomas biopsied by primary care physicians (PCPs) more frequently (26.3%) than those living in urban environments (17.7%).<sup>5</sup> In Sweden and New Zealand, melanoma-associated mortality was significantly increased for individuals living in rural versus urban parts of the country.<sup>6,7</sup> Similarly, in the United States, rural residence was significantly predictive of decreased cause-specific survival for melanoma.<sup>8</sup>

Provider specialty can play an important role in the amount of time it takes to evaluate and treat melanoma. Notably, owing to the greater number of PCPs than that of dermatologists in the United States, PCPs perform the majority of skin screening examinations.<sup>9</sup> Several studies document that dermatologists are effective at detecting melanomas at a thinner depth, which is associated with a better prognosis.<sup>10-12</sup> Melanomas biopsied by dermatologists have a lower probability of delay (defined as interval from the biopsy date to surgical excision date longer than 1.5 months) in referral to surgery (16% delayed) than melanomas biopsied by nondermatologists, for example, PCPs (31% delayed).<sup>13</sup> Notably, the thinnest melanomas are detected when patients are evaluated by both their PCP and dermatologist and are associated with better outcomes.<sup>14</sup>

Enrollment in Medicaid insurance (government-funded public insurance in the United States) has increased by 68% from 2008 to 2019: an increase from 45.2 million to 66 million patients.<sup>15</sup> Since 2004, several studies have suggested a trend for decreasing acceptance of Medicaid.<sup>16-18</sup> In addition to decreased acceptance rates, wait times to see dermatologists also appeared to be impacted.<sup>16,17,19</sup> Medicaid-insured individuals have thicker tumors, more advanced staging, and higher melanoma-related mortality than privately insured patients at the time of diagnosis.<sup>20-23</sup>

To gain further insight into disparities in melanoma care, we compared dermatologists' acceptance rates with that of family medicine physicians in both rural and urban geographies, given the

important role that access to primary care plays in skin cancer screening. We assessed insurance acceptance rates and wait times in 2 major California regions: the urban San Francisco (SF) Bay Area and the more rural Central Valley—the latter is a region with previously documented health inequities.<sup>24</sup>

## METHODS

### Study design

An audit “mystery client” study design was used,<sup>16-18,25</sup> in which family practice and medical dermatology practices were called and asked for an appointment for a concerning, changing, and pigmented skin lesion, using a script (Supplementary Material 1, available via Mendeley at <https://doi.org/10.17632/v4s46mzk2r.1>) that described a lesion suggesting the need for immediate pro-

vider evaluation for melanoma. SF Bay Area counties (SF, Alameda, and Contra Costa) and counties in the Central Valley (Fresno, San Joaquin, Sacramento, Shasta, and Butte)<sup>26</sup> were selected for their increasing melanoma incidence in the last 5 years.<sup>1</sup> The acceptance rate of Medicaid (public insurance) in California was compared with that of Anthem Blue Cross (BC) preferred provider organization, a common and widely accepted private insurance in California.<sup>27</sup> When applicable, the names of the corresponding managed care plans for Medicaid in a given county were used; in the counties where several Medicaid plans were available by differing names, we assessed the acceptance of each type of plan.

### Study subjects

Dermatology clinics were identified by searching the American Academy of Dermatology website for practicing dermatologists within the predetermined counties. Family practice clinics were selected from the physician licensure search engine of the California Medical Board. Data regarding addresses and phone numbers were collected with care; we ensured that the same clinic was not called twice. A randomized list of the practices was generated for calling. Clinics were called a maximum of 3 times and a callback number was left after the third call. If unable to speak to a clinic on this list, the next available clinic was selected. Every medical dermatology practice in the SF Bay Area counties studied and the Central Valley counties studied were

## CAPSULE SUMMARY

- This study adds to the now-growing body of evidence demonstrating that insurance significantly influences access to medical care for melanoma in specialty and primary care.
- Our findings demonstrate the need to expand health insurance policies to support timely, equitable dermatologic care and for the medical education of primary care physicians.

**Abbreviations used:**

BC:	Blue Cross
CI:	confidence interval
FMP:	family medicine practice
OR:	odds ratio
PCP:	primary care physician
SF:	San Francisco

included in this study; 62 practices in the SF Bay Area and 54 practices in the Central Valley were successfully reached. Fifty family medicine practices (FMPs) in the SF Bay Area (comprising 58.7% of all FMPs in the counties studied) and 50 FMPs in the Central Valley were successfully contacted (comprising 55.0% of all FMPs in the counties studied). These practices are specifically for family medicine and not for other types of primary care. Clinics not accepting new patients and cosmetic dermatology practices that do not see patients for medical dermatology concerns were excluded from the study.

**Data collection and statistics**

Ethical approval (exemption status) was granted from the University of California, San Francisco institutional review board in June 2017. Clinics were sampled from June 2017 through March 2019 and had at least a 2-month period between calls to each clinic.<sup>25</sup> During each call, the caller (JC) clearly stated the type of insurance that was being tested before appointments were given. The same caller (JC) made the second phone call to the same clinic, providing the opposite insurance plan on the second call; the order of reported insurance was randomly assigned to each clinic. Wait times were collected for the next available in-person visit, not video visit. Insurance acceptance rates were analyzed using Poisson generalized linear models with a log link. The interval wait times to see a provider were analyzed using linear mixed models. Both types of analysis accounted for the correlation between responses given by the same clinic on the 2 phone calls. Estimates of the differences in the acceptance rates and the wait times by insurance type, practice type, and geographic location and corresponding 95% confidence intervals (CIs) were calculated. Three- and 2-way interactions between covariates were tested and, if significant ( $P < .05$ ), were retained in the final models. SAS version 9.4 (SAS Institute, Inc) was used to perform all analyses.

**RESULTS****Numbers of individuals insured by Medicaid**

Per the US Census Bureau, 19.8% (66 million individuals) in the United States are insured with

Medicaid.<sup>15</sup> Of individuals in California, the percentage insured by Medicaid was 25.4% (10.3 million individuals).<sup>15</sup> Of the population in the SF Bay Area counties that we studied, Medicaid enrollment was 24.3% (1.7 million individuals), and of the population in the Central Valley counties that we studied, enrollment was 38.6% (2.5 million individuals).<sup>28</sup> Thus, 15.6% of all US Medicaid-insured patients are in California, and a calculated 4.2 million individuals are affected by physicians' acceptance policies for Medicaid in the regions that we assessed.

**Acceptance rates**

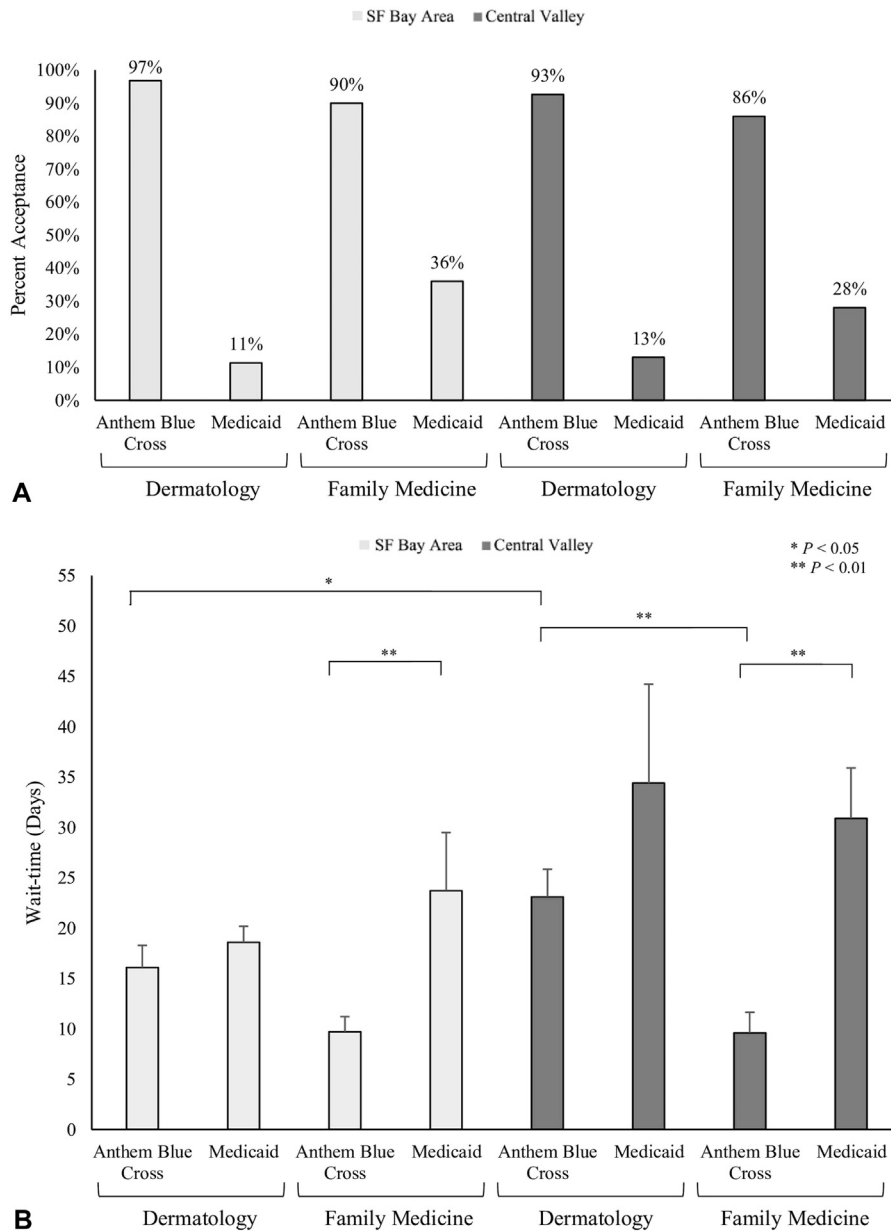
For the SF Bay Area, we found that only 11.3% of dermatology practices accepted Medicaid, whereas 96.8% accepted Anthem BC (private insurance). Acceptance rates at FMPs in the SF Bay Area were 36.0% for Medicaid and 90.0% for Anthem BC (Fig 1, A). In the Central Valley, only 13.0% of dermatology practices accepted Medicaid, whereas 92.6% accepted Anthem BC. Acceptance rates for FMPs in the Central Valley were 28.0% for Medicaid and 86.0% for Anthem BC (Fig 1, A).

When comparing regions, there was no difference in acceptance rates for Medicaid in either specialty and no difference in acceptance rates for Anthem BC in either specialty (Table I, top). When comparing insurance type (Table I, middle), dermatologists in the SF Bay Area and the Central Valley accepted Anthem BC at much higher rates than they accepted Medicaid: odds ratio (OR) = 9.67 (95% CI, 4.53-20.62) for the Bay Area and OR = 9.40 (95% CI, 4.10-21.53) for the Central Valley. Similarly, family practices in the SF Bay Area and the Central Valley accepted Anthem BC at 2.5- and 3.1-fold higher rates, respectively, than they accepted Medicaid.

Comparing practice type (Table I, bottom), dermatology practices accepted Medicaid insurance with lower frequency than FMPs in both the SF Bay Area (OR, 0.28; 95% CI, 0.12-0.65) and the Central Valley (OR, 0.35; 95% CI, 0.14-1.23). Anthem BC was accepted at similar rates for both specialties in both regions. Furthermore, overall, we noted a reduced acceptance of Medicaid in private dermatology and FMPs when compared with public practices; all 7 private equity-backed dermatology practices included in this study did not accept Medicaid (Supplementary Table I, available via Mendeley at <https://doi.org/10.17632/v4s46mzk2r.1>).

**Wait times**

In the SF Bay Area, the average ( $\pm$  standard error) wait time to see a dermatologist for a patient with Medicaid was  $18.6 \pm 1.6$  days, and it was  $16.1 \pm 2.2$  days with Anthem BC; the average wait



**Fig 1. A,** Patient acceptance rates and **(B)** wait times, in days, by region, insurance type, and specialty. *SF*, San Francisco.

time to see a family medicine physician with Medicaid was  $23.7 \pm 5.8$  days, and it was  $9.7 \pm 1.5$  days with Anthem BC (Fig 1, B). In the Central Valley, the average wait time to see a dermatologist with Medicaid was  $34.4 \pm 9.8$  days, and it was  $23.1 \pm 2.7$  days with Anthem BC; the average wait time to see a family medicine physician with Medicaid was  $30.9 \pm 5.0$  days, and it was  $9.6 \pm 2.0$  days with Anthem BC (Fig 1, B).

When comparing the SF Bay Area with the Central Valley, wait times at dermatology practices for Anthem BC were significantly shorter in the SF Bay

Area than in the Central Valley (mean difference in days,  $-6.98$ ; 95% CI,  $-13.49$  to  $-0.48$ ) (Table II, top). In general, wait times were longer in the Central Valley than in the Bay Area, for both specialties and insurances.

Comparing insurance type (Table II, middle), wait times were significantly shorter for Anthem patients at family practices in both the SF Bay Area (mean difference in days,  $-12.04$ ; 95% CI,  $-20.19$  to  $-3.88$ ) and the Central Valley (mean difference in days,  $-19.50$ ; 95% CI,  $-28.91$  to  $-10.10$ ). Family practices wait times for Medicaid, in both the Bay Area and the

**Table I.** Odds ratios for an appointment for concerning pigmented lesion when comparing region, insurance type, and specialty

Category	Comparison		Odds ratio	95% CI	P value
Region	Bay Area	Central Valley			
	Dermatology, Anthem Blue Cross	Dermatology, Anthem Blue Cross	1.05	0.96-1.15	.31
	Dermatology, Medicaid	Dermatology, Medicaid	1.02	0.33-3.15	.97
	Family Medicine, Anthem Blue Cross	Family Medicine, Anthem Blue Cross	1.05	0.91-1.21	.54
	Family Medicine, Medicaid	Family Medicine, Medicaid	1.29	0.72-2.29	.39
Insurance	Anthem	Medicaid			
	Dermatology, Bay Area	Dermatology, Bay Area	9.67	4.53-20.62	<.0001
	Dermatology, Central Valley	Dermatology, Central Valley	9.40	4.10-21.53	<.0001
	Family Medicine, Bay Area	Family Medicine, Bay Area	2.50	1.66-3.76	<.0001
	Family Medicine, Central Valley	Family Medicine, Central Valley	3.07	1.84-5.12	<.0001
Specialty	Dermatology	Family Medicine			
	Anthem Blue Cross, Bay Area	Anthem Blue Cross, Bay Area	1.07	0.97-1.19	.18
	Anthem Blue Cross, Central Valley	Anthem Blue Cross, Central Valley	1.07	0.93-1.23	.32
	Medicaid, Bay Area	Medicaid, Bay Area	0.28	0.12-0.65	.0029
	Medicaid, Central Valley	Medicaid, Central Valley	0.35	0.14-1.23	.029

Central Valley, were 2.4- and 3.2-fold longer, respectively, than those for Anthem BC. In general, wait times were shorter for Anthem BC patients.

Comparing specialties (Table II, bottom), dermatologists had longer wait times than family practitioners for Anthem BC in both regions; the wait time in the Central Valley for Anthem BC for appointments with dermatology practices was significantly longer than for FMPs (mean difference in days, 12.55; 95% CI, 5.51-19.59).

### Physician density in the Bay Area versus the Central Valley accepting Medicaid

On the basis of our acceptance data, we compared actual physician density with the density of physicians accepting Medicaid in the 2 regions under study. We calculated dermatologist physician density (per 100,000) by averaging the physician densities in each of the counties studied here,<sup>29</sup> for both regions. In the SF Bay Area, the dermatologist density was calculated to be  $4.2 \pm 2.1$  per 100,000 and in the Central Valley, it was  $2.8 \pm 1.0$  per 100,000. Family medicine physician density (per 100,000) in the SF Bay Area was calculated as  $16.5 \pm 3.3$ , and it was  $18.4 \pm 6.1$  in the Central Valley (Fig 2).<sup>29</sup>

We subsequently calculated the number of dermatologists in the SF Bay Area counties that we assessed who accepted Medicaid-insured patients with a pigmented skin lesion concern as 7.8 dermatologists for 1.7 million Medicaid-insured patients or 0.46 dermatologists per 100,000 patients; in the Central Valley, there are 9.0 dermatologists available

to see 2.5 million Medicaid-insured patients or 0.36 dermatologists available per 100,000 Medicaid-insured patients. The number of family medicine practitioners available to see Medicaid-insured patients with a pigmented skin lesion concern is calculated at 100.3 physicians for 1.7 million Medicaid-insured patients in the SF Bay Area, or 5.9 per 100,000 patients, and at 130.0 physicians available to see the 2.5 million Medicaid-insured patients in the Central Valley, or 5.2 physicians available per 100,000 patients (Fig 2).

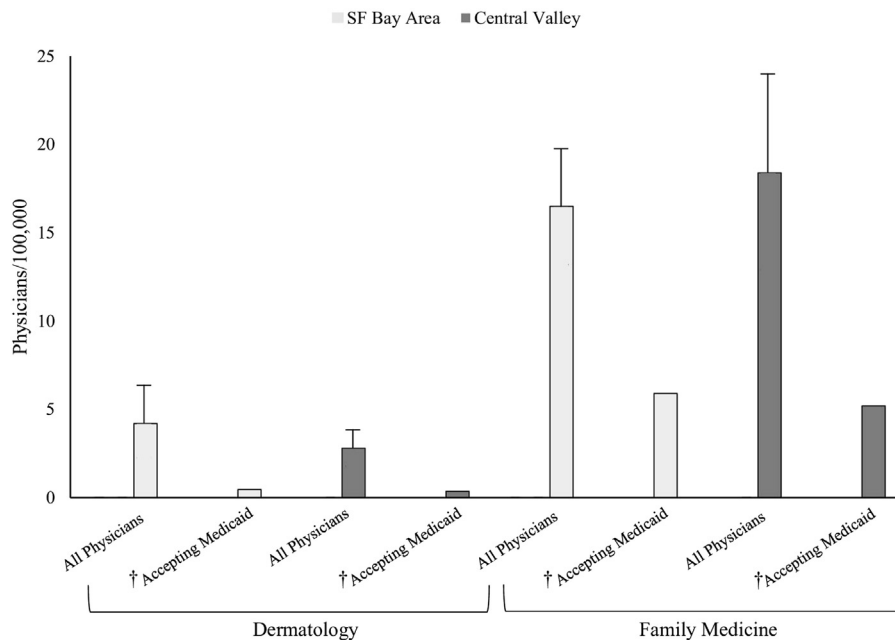
### DISCUSSION

In this study, we assessed the acceptance rates and wait times for patients living in urban versus rural environments at dermatology and family practices for both private (Anthem BC) and public (Medicaid) insurances. We found that the acceptance rates for Medicaid insurance in dermatology and FMPs in both regions were significantly lower than the acceptance rates for Anthem BC. Dermatology practices in the SF Bay Area had significantly decreased acceptance of Medicaid compared with FMPs, and a similar trend was observed in the Central Valley. The level of acceptance of Medicaid by dermatologists in both regions was lower than that reported in a recent study of dermatology practices across the nation.<sup>19</sup> There were no differences in acceptance rates between the urban and rural regions that we studied. Private and private equity-backed practices had low acceptance and no

**Table II.** Differences in wait times between region, insurance type, and specialty

Category	Comparison	Estimated mean difference in wait times, d*	95% CI*	P value	
Region	Bay Area	Central Valley			
	Dermatology, Anthem Blue Cross	Dermatology, Anthem Blue Cross	-6.98	-13.49 to -0.48	<b>.036</b>
	Dermatology, Medicaid	Dermatology, Medicaid	-11.12	-27.87 to 5.64	.19
	Family Medicine, Anthem Blue Cross	Family Medicine, Anthem Blue Cross	-0.75	-7.95 to 6.45	.83
Insurance	Family Medicine, Medicaid	Family Medicine, Medicaid	-8.22	-19.78 to 3.34	.16
	Anthem	Medicaid			
	Dermatology, Bay Area	Dermatology, Bay Area	-2.68	-14.65 to 9.29	.65
	Dermatology, Central Valley	Dermatology, Central Valley	-6.82	-18.84 to 5.21	.26
Specialty	Family Medicine, Bay Area	Family Medicine, Bay Area	-12.04	-20.19 to -3.88	<b>.0051</b>
	Family Medicine, Central Valley	Family Medicine, Central Valley	-19.50	-28.91 to -10.10	<b>.00020</b>
	Dermatology	Family Medicine			
	Anthem Blue Cross, Bay Area	Anthem Blue Cross, Bay Area	6.32	-0.36 to 13.00	.063
	Anthem Blue Cross, Central Valley	Anthem Blue Cross, Central Valley	12.55	5.51 to 19.59	<b>.0010</b>
	Medicaid, Bay Area	Medicaid, Bay Area	-3.04	-17.11 to 11.04	.66
	Medicaid, Central Valley	Medicaid, Central Valley	-0.14	-14.84 to 14.57	.99

\*In days, “-” denotes less wait time.



† = calculated values

**Fig 2.** Regional Medicaid enrollment and physician density in the California SF Bay Area and Central Valley. Average dermatologist and family medicine physician density per 100,000 persons in the counties studied, the SF Bay Area (light gray) and the Central Valley (dark gray).<sup>29</sup> Values coupled to physician density per 100,000 persons who accept Medicaid in the SF Bay Area and Central Valley. *SF*, San Francisco.

acceptance of Medicaid, respectively, which may be attributable to less reimbursement for procedures.

In both regions, acceptance rates for Medicaid were higher for family practices than those for dermatology practices. In addition, family practices had significantly greater wait times for Medicaid versus private insurance, in both the Bay Area and the Central Valley; however, overall, the wait times for both insurance types at dermatology practices were higher than those for family practices. There was no significant difference in wait times for Medicaid versus Anthem BC at dermatology practices, in either region. Wait times were longer for individuals with Anthem BC at dermatology than at FMPs.

We found that the number of physicians available to see Medicaid-insured patients with a concerning pigmented lesion in the SF Bay Area and the Central Valley was markedly below the recommended optimal national levels,<sup>30,31</sup> decreased 10-fold for dermatologists and 5-fold for family practitioners. These low practitioner densities accepting Medicaid are likely contributing to the acceleration of the concentration of the care of these patients in institutions such as county hospitals, community health centers, and academic medical centers.<sup>32</sup>

Patients with ready access to dermatologists may have an advantage in health care, contributing to health inequities. The barriers to health care are concerning, given the incidence of melanoma per 100,000 individuals in the counties sampled was higher in the Central Valley (26.8) than in the SF Bay Area (23.1).<sup>1</sup> Of note, dermatologists have been documented to detect thinner melanomas at earlier stages, compared with nondermatologist physicians and patient self-detection.<sup>33</sup> However, family practitioners perform the majority of skin examinations,<sup>9</sup> and a higher primary care practitioner density has been significantly linked to increased early-stage melanoma diagnosis, emphasizing their important role in early melanoma detection.<sup>34</sup> This study indicates that improved access to dermatologic care is critically needed in significant regions of the most populous state in the United States and that PCPs contribute significantly to melanoma diagnosis and management by providing greater access for Medicaid-insured patients.

A limitation of this study is that we assessed insurance acceptance and wait time in only 2 regions in the state of California. Additionally, this study did not assess several other factors that may concomitantly be affecting access to care, such as socioeconomic status, language barriers, and difficulty navigating the health care system.<sup>2</sup>

## CONCLUSION

This cross-sectional audit study showed that access to screening for melanoma is decreased for patients in the Central Valley compared with their counterparts in the more urban SF Bay Area due to several factors: greater numbers of Medicaid-insured patients in the Central Valley, lower density of dermatologists and family practitioners accepting Medicaid in that region, and increased wait times at family medicine offices. Our findings have implications for the need to expand health insurance policies to support timely, equitable access to dermatologic care and for the medical education of PCPs, with regard to instruction on conducting skin examinations and discerning benign lesions from those concerning malignancy.

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## Conflicts of interest

None disclosed.

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