

Disparities in Access to Colorectal Cancer Screening Among US Immigrants



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INTRODUCTION

Colorectal cancer (CRC) is the second most deadly cancer in the United States (US).¹ Research has shown that CRC screening improves mortality outcomes in adults aged 50 and above.¹ Thus, the United States Preventive Services Task Force (USPSTF) recommends regular screening with various diagnostic modalities.¹

Previous studies have shown race and socioeconomic status to be determinants of access to healthcare services.^{2, 3} There is a dearth of studies on access to care in immigrant populations, which make up 13.7% of the US population as of 2018.⁴ Immigrants are a heterogeneous group that may be limited by their citizenship, English proficiency, and opportunities for authorized employment.⁴ These additional barriers may impede their access to health services as compared to US-born citizens. In this study, we present data on CRC screening in the US, specifically focused on immigrant populations.

METHODS

The National Health Interview Survey (NHIS) has been previously used to study cancer screening patterns among marginalized groups in the US.² Sample weight-adjusted prevalence of screening in the NHIS allows inference on national prevalence.

The NHIS was queried for patients aged 50 or above in the years in which data on CRC screening was available: 2010, 2013, 2015, and 2018. Respondents answered questions on birth location and history of CRC screening among others.⁵

Sample weight-adjusted multivariable logistic regressions defined adjusted odds ratios (AOR) and 95% confidence intervals (CI) were calculated to assess differences in answers to questions of ever having CRC screening procedures as recommended by the USPSTF: colonoscopy, CT colonography, flexible sigmoidoscopy, fecal immunochemical test (FIT), stool DNA-FIT, or fecal occult blood test (FOBT).¹ Nativity was the primary independent variable of

interest while controlling for patient demographic factors⁴ (Table 1). Respondents who did not specify a response were excluded from this study. Statistical analyses were conducted using Stata/IC 16.1 (StataCorp) with $\alpha=0.05$. The Washington University in St. Louis Institutional Review Board has granted this study exemption from ethics review (IRB number: 202102111).

RESULTS

A total of 51,519 respondents aged 50 or above were included, with a median age of 64 (IQR 56–72). In this cohort, 79.4% were white, 55.9% were female, 7.0% were uninsured, and 13.8% were foreign-born (Table 1).

Foreign-born participants were less likely to have any CRC screening in their lifetime compared to US-born participants (51.0% vs 67.8%, aOR=0.77, 95% CI, 0.70–0.86, $p<.001$). In the overall cohort regardless of nativity status, Asian race/ethnicity and uninsured status were independently associated with lower rates of CRC screening. In a subgroup analysis of foreign-born individuals, these disparities persisted: among immigrants, Asian race/ethnicity (aOR 0.63), non-US citizenship status (aOR 0.65), and uninsured status (aOR 0.33) were associated with lower odds of having a history of CRC screening.

Participants with a history of cancer, those with a higher level of education, and those with at least double the poverty threshold were more likely to have undergone CRC screening, both in the general cohort and in a foreign-born subgroup analysis (Table 2, $p<.001$).

DISCUSSION

In this study, we found that being foreign-born was independently associated with a lower likelihood to undergo CRC screening after adjusting for other more well-established causes of healthcare disparities such as race, lower socioeconomic status, and lack of health insurance.² In this heterogeneous group, factors which decrease the likelihood of CRC screening included Asian race, non-US citizen status, and lack of health insurance.

Our study is limited by its retrospective nature, reliance on self-reporting, occasional use of translators, limited granularity in race/ethnicity data where diverse groups like Asian Americans are lumped together, divergence from new

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Table 1 Baseline Cohort Demographics

Category	Characteristic	US-born	%	Foreign-born	%	US territory-born	%
Year of survey ^a	2010	8,220	18.7	1,521	21.3	127	24.5
	2013	12,121	27.6	1,988	27.9	160	30.8
	2015	12,614	28.8	2,021	28.3	145	27.9
	2018	10,914	24.9	1,601	22.5	87	16.8
Ever screened for CRC ^a	Yes	30,232	68.9	3,660	51.3	329	63.4
	No	13,637	31.1	3,471	48.7	190	36.6
Sex ^a	Male	19,474	44.4	3,058	42.9	203	39.1
	Female	24,395	55.6	4,073	57.1	316	60.9
Race ^a	White	35,950	82.0	4,514	63.3	451	86.9
	Black/African American	6,286	14.3	676	9.5	48	9.3
	American Indian/Alaska Native	372	0.9	71	1.0	5	1.0
	Asian	538	1.2	1,792	25.1	8	1.5
	Multiple race	723	1.7	78	1.1	7	1.4
Hispanic ^a	Yes	1,918	4.4	3,125	43.8	492	94.8
	No	41,951	95.6	4,006	56.2	27	5.2
US citizen ^a	Yes	43,869	100.0	5,068	71.1	519	100.0
	No	0		2,063	28.9	0	
Region ^a	Northeast	7,291	16.6	1,508	21.2	279	53.8
	North Central/Midwest	10,518	24.0	623	8.7	35	6.7
	South	16,166	36.9	2,307	32.4	168	32.4
	West	9,894	22.6	2,693	37.8	37	7.1
Insurance status ^a	Coverage	41,295	94.1	6,096	85.5	495	95.4
	No coverage	2,574	5.9	1,035	14.5	24	4.6
History of cancer ^a	None	35,679	81.3	6,494	91.1	468	90.2
	With history of cancer	8,190	18.7	637	8.9	51	9.8
Marital status ^a	Currently married	20,206	46.1	3,901	54.7	182	35.1
	Not married	23,663	53.9	3,230	45.3	337	64.9
Education level ^a	Maximum of Grade 8	1,662	3.8	1,681	23.6	120	23.1
	Grade 12 with no diploma	3,956	9.0	638	9.0	98	18.9
	High school diploma	12,555	28.6	1,502	21.1	136	26.2
	Some college education	13,249	30.2	1,316	18.5	99	19.1
	Bachelor's degree	7,352	16.8	1,202	16.9	46	8.9
Socioeconomic status ^{a,b}	Advanced degree	5,095	11.6	792	11.1	20	3.9
	< 1.00	4,942	11.3	1,503	21.1	172	33.1
	1.00–1.99	8,263	18.8	1,692	23.7	147	28.3
Speaks English ^a	≥ 2.00	30,664	69.9	3,936	55.2	200	38.5
	Yes	43,666	99.5	4,735	66.4	364	70.1
Self-reported health status ^a	No	203	0.5	2,396	33.6	155	29.9
	Excellent	7,820	17.8	1,271	17.8	67	12.9
	Very good	13,666	31.2	1,752	24.6	100	19.3
	Good	13,406	30.6	2,356	33.0	161	31.0
	Fair	6,625	15.1	1,330	18.7	136	26.2
	Poor	2,352	5.4	422	5.9	55	10.6

^aAll variables: $\chi^2 p < .005$

^bRatio of family income to poverty threshold

Table 2 History of Colorectal Cancer Screening Among US Participants and Foreign-Born Participants

History of CRC Screening		Had CRC Screening	Raw %	Weighted %	aOR	p value
Year	2010	6,303	63.9%	65.6%	Ref	Ref
	2013	8,769	61.5%	62.1%	0.84	<0.001
	2015	10,094	68.3%	68.8%	1.10	0.016
	2018	9,055	71.9%	70.8%	1.17	<0.001
Nativity	US-born	30,232	68.9%	70.1%	Ref	Ref
	Foreign-born	3,660	51.3%	52.7%	0.77	<0.001
	US territory-born	329	63.4%	69.1%	1.16	0.177
Insurance status	Insured	33,163	69.3%	69.7%	Ref	Ref
	Uninsured	1,058	29.1%	30.3%	0.37	<0.001
Citizenship	US citizen	33,485	67.7%	68.3%	Ref	Ref
	Non-US citizen	736	35.7%	37.3%	0.68	<0.001
Sex	Male	15,042	66.2%	67.3%	Ref	Ref
	Female	19,179	66.6%	66.8%	0.99	0.758
Ethnicity	Non-Hispanic	31,352	68.2%	68.7%	Ref	Ref
	Hispanic	2,869	51.8%	51.8%	0.99	0.855
Race	White	27,815	68.0%	68.3%	Ref	Ref
	Black/African American	4,395	62.7%	63.5%	1.12	0.003
	American Indian/Alaska Native	247	55.1%	54.8%	0.85	0.260
	Asian	1,236	52.9%	53.6%	0.66	<0.001

(continued on next page)

Table 2. (continued)

History of CRC Screening		Had CRC Screening	Raw %	Weighted %	aOR	p value
Marital status	Multiple race	528	65.3%	65.6%	1.17	0.138
	Currently married	16,975	69.9%	69.8%	Ref	Ref
	Not married	17,246	63.3%	62.7%	0.75	<.001
Self-reported health status	Excellent	6,123	66.9%	67.4%	Ref	Ref
	Very good	10,585	68.2%	68.6%	1.06	.126
	Good	10,410	65.4%	65.8%	1.06	.112
	Fair	5,272	65.2%	66.2%	1.28	<.001
Region	Poor	1,831	64.7%	66.2%	1.41	<.001
	Northeast	6,427	70.8%	71.2%	Ref	Ref
	North Central/Midwest	7,689	68.8%	69.2%	0.87	.002
	South	12,092	64.9%	65.6%	0.80	<.001
	West	8,013	63.5%	63.8%	0.77	<.001
Cancer history	None	26,994	63.3%	64.0%	Ref	Ref
	With history of cancer	7,227	81.4%	82.0%	1.86	<.001
Language	English speaking	33,042	67.8%	68.2%	Ref	Ref
	Non-English speaking	1,179	42.8%	42.6%	0.90	.154
Educational level	Maximum of Grade 8	1,694	48.9%	48.8%	Ref	Ref
	Grade 12 w/o diploma	2,654	56.6%	55.7%	1.14	.063
	High school diploma	8,932	62.9%	63.4%	1.43	<.001
	Some college education	10,020	68.3%	68.7%	1.88	<.001
	Bachelor's degree	6,198	72.1%	71.7%	2.21	<.001
	Advanced degree	4,723	80.0%	79.8%	3.14	<.001
Socioeconomic status*	< 1.00	3,410	51.5%	51.4%	Ref	Ref
	1.00–1.99	5,981	59.2%	58.0%	1.03	.548
	≥ 2.00	24,830	71.4%	71.0%	1.48	<.001
Among foreign-born participants						
Year	2010	760	50.0%	65.6%	Ref	Ref
	2013	915	46.0%	62.1%	0.77	.007
	2015	1,058	52.4%	68.8%	0.99	.901
	2018	927	57.9%	70.8%	0.97	.782
	Insured	3,457	56.7%	57.7%	Ref	Ref
Insurance status	Uninsured	203	19.6%	20.2%	0.33	<.001
	Citizenship	2,924	57.7%	58.6%	Ref	Ref
Sex	US citizen	736	35.7%	37.3%	0.65	<.001
	Non-US citizen	1,564	51.1%	53.2%	Ref	Ref
Ethnicity	Male	2,096	51.5%	52.1%	0.95	.409
	Non-Hispanic	2,266	56.6%	57.9%	Ref	Ref
Race	Hispanic	1,394	44.6%	44.4%	0.91	.374
	White	2,367	52.4%	53.3%	Ref	Ref
	Black/African American	357	52.8%	54.5%	0.93	.588
	American Indian/Alaska Native	29	40.8%	50.2%	0.93	.841
	Asian	872	48.7%	50.8%	0.63	<.001
	Multiple race	35	44.9%	37.3%	0.66	.167
Marital status	Currently married	2,039	52.3%	53.7%	Ref	Ref
	Not married	1,621	50.2%	50.2%	0.84	.012
Self-reported health status	Excellent	654	51.5%	53.6%	Ref	Ref
	Very good	931	53.1%	54.6%	1.05	.655
	Good	1,152	48.9%	49.8%	1.02	.876
	Fair	693	52.1%	53.3%	1.24	.058
	Poor	230	54.5%	53.7%	1.18	.312
Region	Northeast	887	58.8%	60.1%	Ref	Ref
	North central/Midwest	336	53.9%	54.6%	0.81	.102
	South	1,161	50.3%	51.3%	0.83	.044
	West	1,276	47.4%	48.6%	0.75	.002
Cancer history	None	3,172	48.8%	50.1%	Ref	Ref
	With history of cancer	488	76.6%	78.7%	2.43	<.001
Language	English speaking	2,662	56.2%	57.1%	Ref	Ref
	Non-English speaking	998	41.7%	41.6%	0.95	.552
Educational level	Maximum of grade 8	683	40.6%	39.7%	Ref	Ref
	Grade 12 with no diploma	279	43.7%	41.9%	1.03	.81
	High school diploma	737	49.1%	49.8%	1.24	.046
	Some college education	714	54.3%	55.0%	1.50	.001
	Bachelor's degree	711	59.2%	60.5%	1.87	<.001
	Advanced degree	536	67.7%	67.9%	2.24	<.001
Socioeconomic status*	< 1.00	624	41.5%	41.9%	Ref	Ref
	1.00–1.99	746	44.1%	42.0%	0.96	.687
	≥ 2.00	2,290	58.2%	58.7%	1.41	.001

All variables included in the multivariable logistic regression are listed on the two tables

*Relative to poverty threshold

USPSTF guidelines to start screening adults for CRC at age 45 instead of 50, and possible confounders not included in the model. Future efforts to address disparities in CRC screening are warranted to provide equal access to high-quality screening regardless of a patient's race or origin of birth.

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Declarations:

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