Demographic Predictors of Delayed-stage Colorectal Cancer Diagnosis in California, 2004-2008

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Regions 4 and 5 of California Cancer Registry

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Portland, Oregon

Section D: Analytic Epidemiology III
10:15 – 11:45 am
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Background

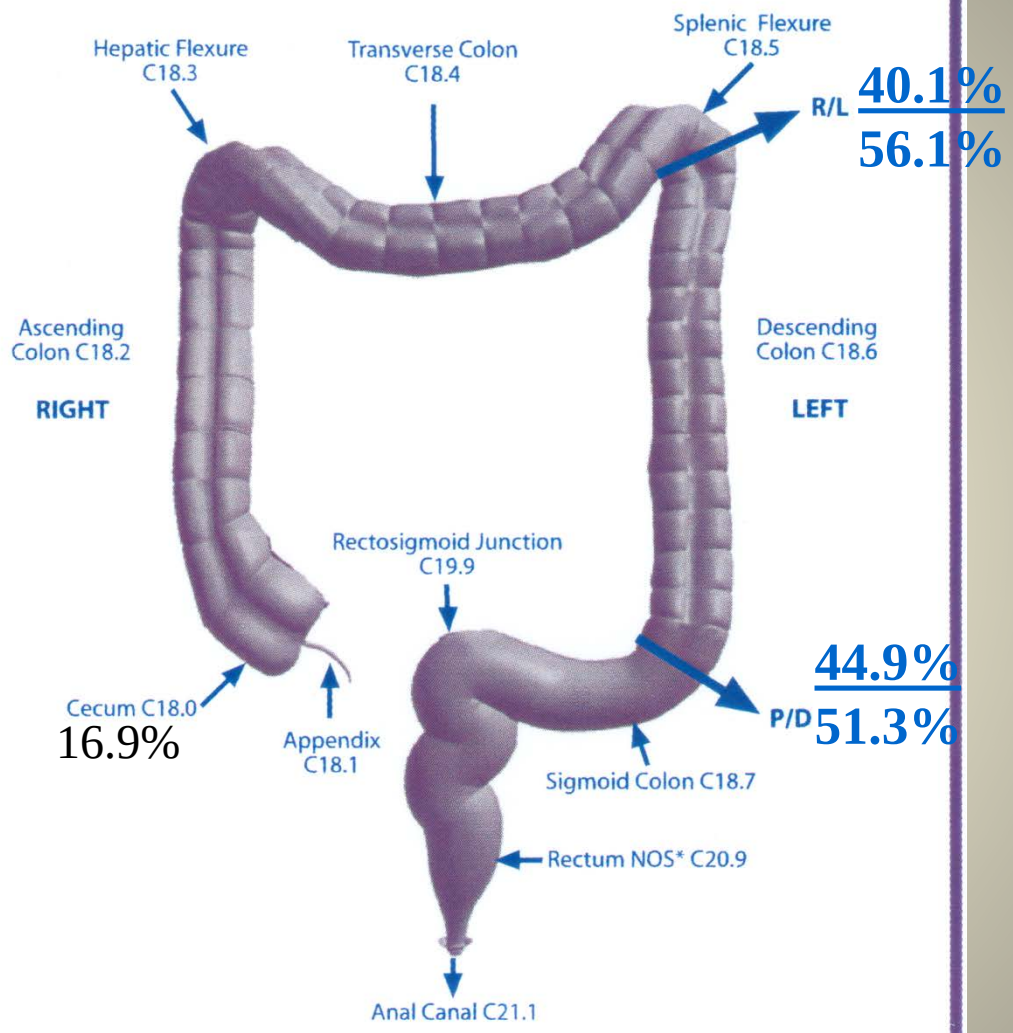
The majority (~98%) of colon and rectum cancer cases in California are adenocarcinomas

Age-adjusted CRC risk & risk of death per 100,000 in California, 2004-2008.

	Risk	Risk of Death
Non-Hispanic Black	58.1	24.5
Non-Hispanic White	44.8	15.6
Asian/Pacific Islanders	39.6	12.3
Hispanic	35.7	13.0

In efforts to reduce mortality, current screening recommendations frequently target members of **non-Hispanic black** and **Hispanic** race/ethnic groups for intensified CRC screening.

Figure 7.1. Illustration of Topographic Subsites in the Bowel With Names and ICD-O-2† (3) Codes.



† ICD-O-2 is the International Classification of Diseases for Oncology, Second Edition (3).
R/L is the division between the right and left bowel.
P/D is the division between the proximal and distal bowel.
* NOS indicates, "not otherwise specified" on the medical record.

Prepared by California Department of Health Services, Cancer Surveillance Section.

Hypotheses:

We sought to distinguish roles of selected demographic characteristics and bowel segments as independent predictors of delayed- to early-stage CRC.

Methods:

We extracted demographic and anatomic subsite information for all 66,806 staged invasive colorectal adenocarcinoma and carcinoma *in situ* cases (CRCA) reported to the California Cancer Registry for 2004-2008.

Cases were classified as delayed-stage (Stage II-IV) and early-stage (*in situ* and stage I) and compared as odds of delayed- to early-stage using logistic regression, evaluating each independent variable.

Findings:

Approximately 1/3rd of the cases were early-stage (22,082), with the remainder (44,724) classified as delayed-stage.

Table 1. Univariate OR for delayed- (II-IV) to early-stage (0-I) CRC.

Variable	Category	Stage 0-I	Stage II-IV	$OR_{II-IV/0-I}$	Global Test
Age	<40	282	1,317	2.55	
	40-49	1,250	3,730	1.63	
	50-74	12,557	23,022	1	
	75+	7,993	16,655	1.14	p<0.001
Sex	Female	10,213	22,158	1.14	
	Male	11,869	22,566	1	p<0.001
R/E	Asian/Other	2,880	5,701	1.01	
	NH Black	1,475	3,337	1.15	
	Hispanic	3,195	7,121	1.13	
	NH White	14,532	28,565	1	p<0.001
SES*	1 (lowest)	2,760	6,179	1.22	
	2	3,937	8,494	1.18	
	3	4,686	9,688	1.13	
	4	5,175	10,256	1.08	
	5 (highest)	5,524	10,107	1	p<0.001
Bowel Segment‡					
Model 1	Right/	8,057	21,724	1.71	
	Left Bowel	13,842	21,881	1	p<0.001

Table 2. Multivariable OR for delayed- (II-IV) to early-stage (0-I) CRC.

Variable	Category	$OR_{II-IV/0-I}$	95% CI
Age	<40	**2.58**	**2.26, 2.94**
	40-49	**1.71**	**1.60, 1.83**
	50-74	**1**	
	75+	**1.05**	**1.02, 1.09**
Sex	Female	1.09	1.06, 1.13
	Male	1	
R/E	Asian/Other	1.05	1.00, 1.10
	NH Black	1.05	0.99, 1.13
	Hispanic	1.08	1.02, 1.13
	NH White	1	
SES*	1 (lowest)	1.21	1.14, 1.28
	2	1.18	1.12, 1.24
	3	1.13	1.08, 1.19
	4	1.08	1.03, 1.14
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	Model 1 Right/Left Bowel	1.68	1.63, 1.74
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R/E		
SES		
Bowel Segment‡		
Model 1 Right/Left Bowel	1.681	1.63, 1.74
Model 2 Proximal/ Distal Bowel	**1.671**	**1.61, 1.73**
Model 3 Cecum & Apndx/ Distal Bowel	1.741	1.66, 1.82

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Counts and % distribution for delayed-stage cases by race/ethnicity (R/E).

	SES 1-5	
	Count	Column%
Asian/other	5,701	12.7%
NH Black	3,337	7.5%
Hispanic	7,121	15.9%
NH White	28,565	63.9%
Total	**44,724**	**100.0%**

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NH White	28,565	63.9%
Total	**44,724**	**100.0%**

10,458 or 23.4%

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Total	**44,724**	**100.0%**

34,266 or 76.6%

Counts and % distribution for delayed-stage cases by race/ethnicity (R/E) and SES.

	SES 1-5		**SES 1-2**		SES 1-3	
	Count	Column%	Count	Column%	Count	Column%
Asian/other	5,701	12.7%	1,763	12.0%	2,881	11.8%
Row%	100.0%		30.9%		50.5%	
NH Black	3,337	7.5%	1,771	12.1%	2,483	10.2%
Row%	100.0%		53.1%		74.4%	
Hispanic	7,121	15.9%	4,004	27.3%	5,414	22.2%
Row%	100.0%		56.2%		76.0%	
NH White	28,565	63.9%	7,135	48.6%	13,583	55.8%
Row%	100.0%		25.0%		47.6%	
Total	**44,724**	**100.0%**	**14,673**	100.0%	24,361	100.0%
			32.8%		54.5%	

Counts and % distribution for delayed-stage cases by race/ethnicity (R/E) and SES.

	SES 1-5		SES 1-2		**SES 1-3**	
	Count	Column%	Count	Column%	Count	Column%
Asian/other	5,701	12.7%	1,763	12.0%	2,881	11.8%
Row%	100.0%		30.9%		50.5%	
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Row%	100.0%		53.1%		74.4%	
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Row%	100.0%		25.0%		47.6%	
Total	**44,724**	**100.0%**	14,673	100.0%	**24,361**	100.0%
			32.8%		**54.5%**	

Conclusions/Discussion:

Our findings reveal that:

1. Age, sex, SES, and bowel segment, each, independently predict odds of delayed- to early-stage CRC diagnosis in California, with a weak delayed-stage effect limited to Hispanics.

2. Targeting the two or three lowest SES quintiles for intensified CRC screening, rather than using race/ethnicity, would have directed resources to 1.4- and 2.4-times, respectively, the number of delayed-stage cases targeted by intensified screening among non-Hispanic blacks and Hispanics.

3. CRC in the right and proximal bowel and, specifically in the cecum presents significant challenges to early-stage diagnosis, independent of age, sex, race/ethnicity, and SES.

I would like to thank my investigators in this research:

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Thank You!