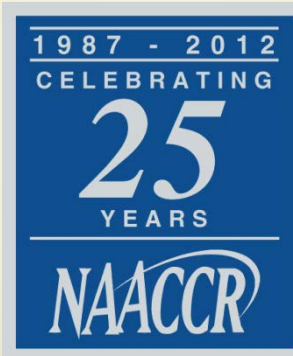


# Demographic Predictors of Delayed-stage Colorectal Cancer Diagnosis in California, 2004-2008

*By John W. Morgan, DrPH, CPH*

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Regions 4 and 5 of California Cancer Registry



*Annual NAACCR Conference*

*Portland, Oregon*

**Section D: Analytic Epidemiology III**

**10:15 – 11:45 am**

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# Background

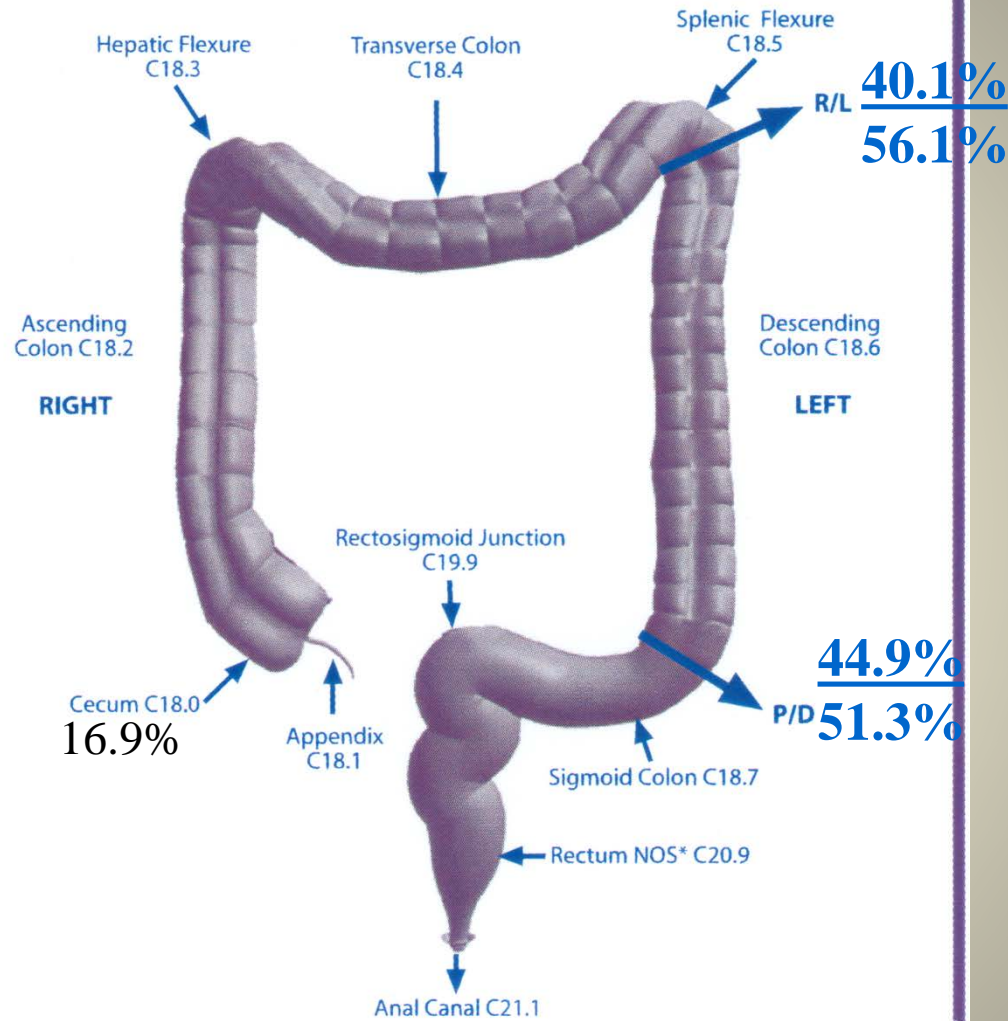
The majority (~98%) of colon and rectum cancer cases in California are adenocarcinomas

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 1/3<sup>rd</sup> 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.**

<b>Variable Category</b>	<b>Stage 0-I</b>	<b>Stage II-IV</b>	<b>OR<sub>II-IV/0-I</sub></b>	<b>Global Test</b>
<b>Age</b>	<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
<b>Sex</b>	Female	10,213	22,158	1.14
	Male	11,869	22,566	1
<b>R/E</b>	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
<b>SES*</b>	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
<b>Bowel Segment‡</b>	Model 1 Right/	8,057	21,724	1.71
	Left Bowel	13,842	21,881	1

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

<b>Variable Category</b>		<b>OR<sub>II-IV/0-I</sub></b>	<b>95% CI</b>
Age	<40	<b>2.58</b>	<b>2.26, 2.94</b>
	40-49	<b>1.71</b>	<b>1.60, 1.83</b>
	50-74	<b>1</b>	
	75+	<b>1.05</b>	<b>1.02, 1.09</b>
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
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Model 1 Right/Left Bowel		1.68	1.63, 1.74



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Bowel Segment‡		
Model 1 Right/Left Bowel	1.68	1.63, 1.74
	1	
Model 2 Proximal/ Distal Bowel	<b>1.67</b> <b>1</b>	<b>1.61, 1.73</b>
Model 3 Cecum & Apndx/ Distal Bowel	1.74 <b>1</b>	1.66, 1.82

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	4	1.08	1.03, 1.14
	5 (highest)	1	
Bowel Segment‡			
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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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} **10,458 or 23.4%**

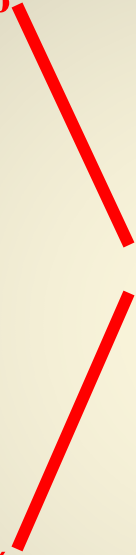
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**SES 1-5**

Count      Column%

<b>Asian/other</b>	5,701	<b>12.7%</b>	 <p><b>34,266 or 76.6%</b></p>
NH Black	3,337	7.5%	
Hispanic	7,121	15.9%	
<b>NH White</b>	<b>28,565</b>	<b>63.9%</b>	
<b>Total</b>	<b>44,724</b>	<b>100.0%</b>	

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

	SES 1-5		<b>SES 1-2</b>		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%	
<b>Total</b>	<b>44,724</b>	<b>100.0%</b>	<b>14,673</b>	100.0%	24,361	100.0%
			<b>32.8%</b>		54.5%	

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			32.8%		<b>54.5%</b>	

# 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!***

