

Supplemental Online Content

Sabbagh S, Herrán M, Hijazi A, et al. Biomarker testing disparities in metastatic colorectal cancer. *JAMA Netw Open*. 2024;7(7):e2419142. doi:10.1001/jamanetworkopen.2024.19142

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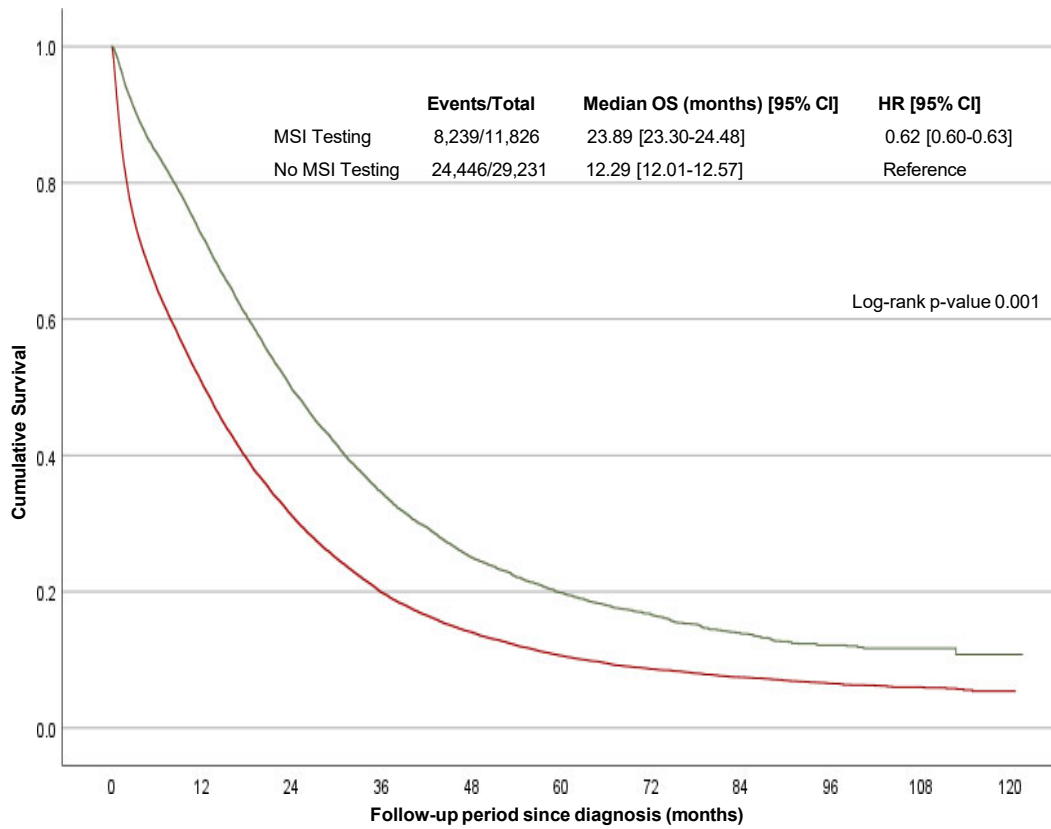
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This supplemental material has been provided by the authors to give readers additional information about their work.

eAppendix. Definition of Socioeconomic and Demographic Factors

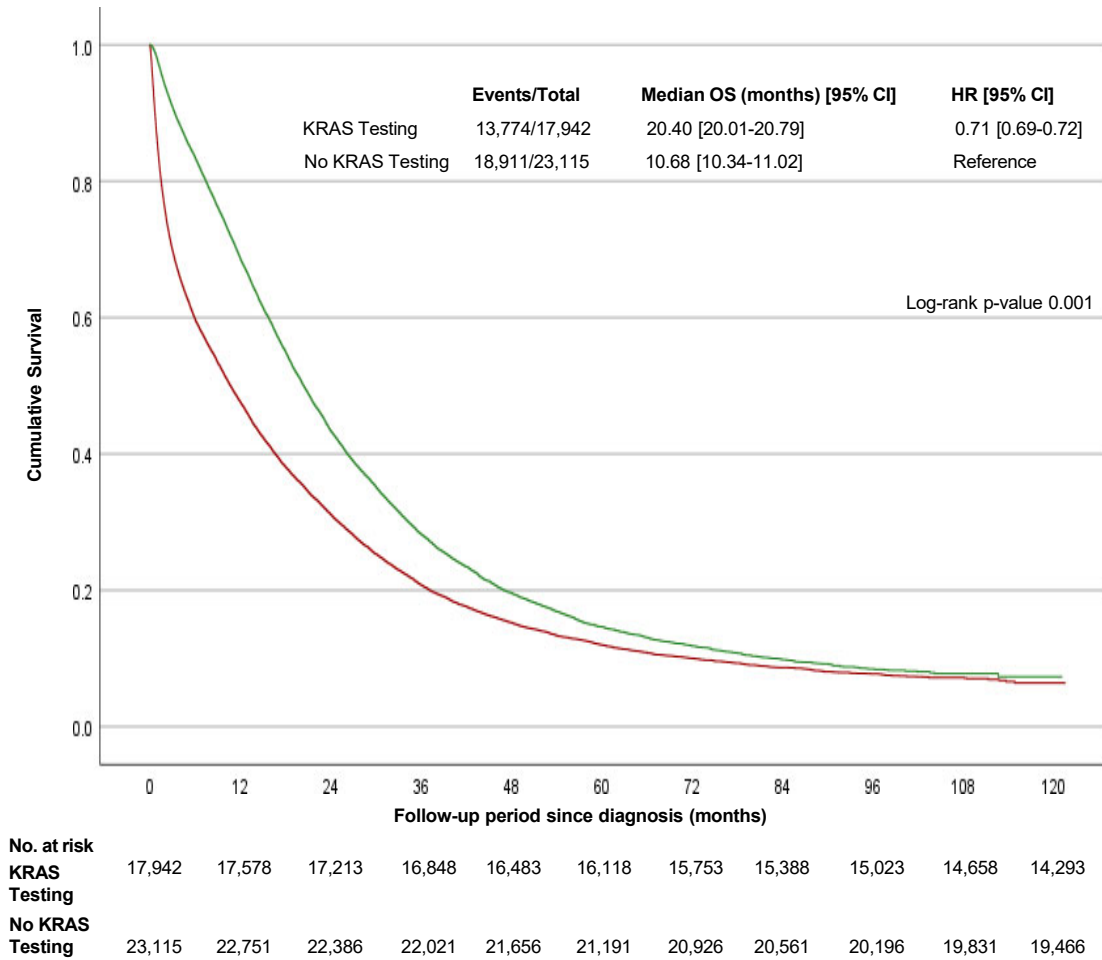
Socioeconomic variables have been defined as factors of a social and economic nature, such as income, education, employment status, and insurance coverage, which collectively serve as indicators of an individual's standing within a community⁴⁰. Demographic variables indicate the characteristics of a population, including age, ethnicity, race, and sex. The area of residence can potentially be classified as demographic, socioeconomic, or even geographic. Meanwhile, facility location and travel distance are considered geographic factors.

eFigure 1. Kaplan Meier Overall Survival Curves Based on MSI Testing

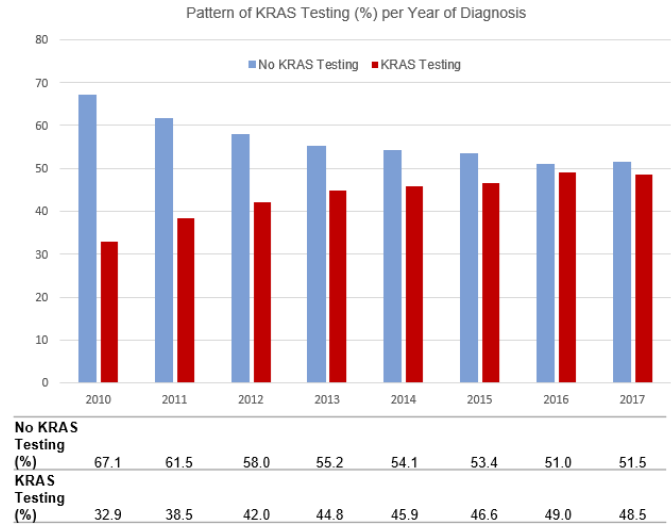
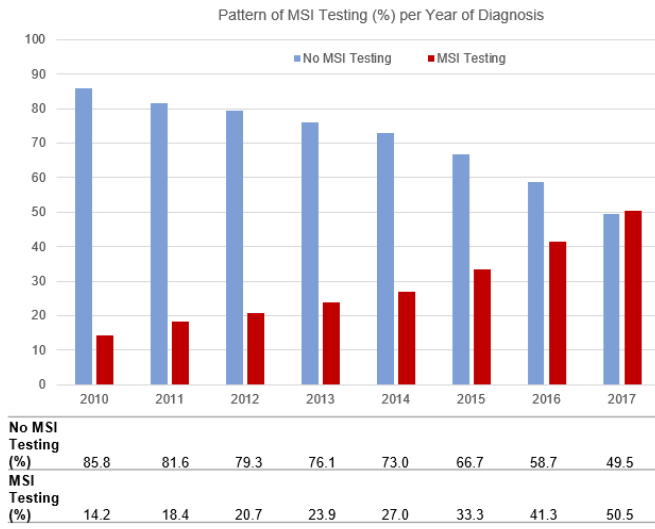


No. at risk	0	12	24	36	48	60	72	84	96	108	120
MSI Testing	11,826	11,462	11,097	10,732	10,367	10,002	9,637	9,272	8,907	8,542	8,177
No MSI Testing	29,231	28,867	28,502	28,137	27,772	27,407	27,042	26,677	26,312	25,947	25,582

eFigure 2. Kaplan Meier Overall Survival Curves Based on KRAS Testing



eFigure 3. Pattern of Biomarker Testing Per Year of Diagnosis



eTable 1. US Census Division of the Regions by States

REGION	STATES INCLUDED
New England	CT, MA, ME, NH, RI, VT
Middle Atlantic	NJ, NY, PA
South Atlantic	DC, DE, FL, GA, MD, NC, SC, VA, WV
East North Central	IL, IN, MI, OH, WI
East South Central	AL, KY, MS, TN
West North Central	IA, KS, MN, MO, ND, NE, SD
West South Central	AR, LA, OK, TX
Mountain	AZ, CO, ID, MT, NM, NV, UT, WY
Pacific	AK, CA, HI, OR, WA

eTable 2. Univariable Association of Factors with MSI Testing

Characteristics	Microsatellite Testing		p-value
	OR	95% CI	
Age, years			
18 - 49	1 [Reference]	–	–
50 - 59	0.64	(0.60 – 0.68)	<0.001
60 - 69	0.48	(0.45 – 0.51)	<0.001
70 - 79	0.37	(0.34 – 0.40)	<0.001
Race			
White	1 [Reference]	–	–
Black	0.82	(0.77 – 0.86)	<0.001
Others ^a	1.18	(1.07 – 1.30)	0.001
Ethnicity			
Non-Hispanic	1 [Reference]	–	–
Hispanic ^b	1.03	(0.95 – 1.13)	0.48
Sex			
Male	1 [Reference]	–	–
Females	1.07	(1.02 – 1.11)	0.003
Insurance Status			
Private insurance	1 [Reference]	–	–
Uninsured	0.56	(0.51 – 0.62)	<0.001
Medicaid	0.77	(0.72 – 0.83)	<0.001
Medicare/Other	0.56	(0.54 – 0.59)	<0.001
Governmental			
Unknown	0.52	(0.41 – 0.65)	<0.001
Education			
<6.3%	1 [Reference]	–	–
6.3%-10.8%	0.84	(0.79 – 0.89)	<0.001
10.9%-17.5%	0.67	(0.63 – 0.72)	<0.001
≥17.6%	0.62	(0.59 – 0.67)	<0.001
Unknown	0.80	(0.64 – 1.00)	0.06
Facility type			
Academic CP ^a	1 [Reference]	–	–
Community CP ^a	0.58	(0.53 – 0.63)	<0.001
Comprehensive CP ^a	0.74	(0.70 – 0.77)	<0.001
Integrated network CP ^a	1.03	(0.97 – 1.10)	0.30
Area of Residence			
Metro	1 [Reference]	–	–
Urban	0.87	(0.82 – 0.93)	<0.001
Rural	0.63	(0.52 – 0.76)	<0.001
Facility Location			
New England	1 [Reference]	–	–
Middle Atlantic	0.71	(0.64 – 0.79)	<0.001
South Atlantic	0.66	(0.59 – 0.73)	<0.001
East North Central	0.66	(0.59 – 0.73)	<0.001
East South Central	0.58	(0.51 – 0.66)	<0.001

Characteristics	Microsatellite Testing		p-value
	OR	95% CI	
West North Central	0.69	(0.61 – 0.78)	<0.001
West South Central	0.58	(0.51 – 0.65)	<0.001
Mountain	0.88	(0.77 – 1.00)	0.06
Pacific	0.87	(0.78 – 0.97)	0.01
Travel distance			
≤5 miles	1 [Reference]	–	–
5.1-10	1.16	(1.09 – 1.23)	<0.001
10.1-25	1.22	(1.15 – 1.29)	<0.001
>25 miles	1.30	(1.23 – 1.38)	<0.001
Year of Diagnosis			
2010	1 [Reference]	–	–
2011	1.37	(1.22 – 1.53)	<0.001
2012	1.58	(1.42 – 1.76)	<0.001
2013	1.90	(1.72 – 2.11)	<0.001
2014	2.24	(2.02 – 2.48)	<0.001
2015	3.02	(2.74 – 3.34)	<0.001
2016	4.26	(3.85 – 4.70)	<0.001
2017	6.17	(5.59 – 6.81)	<0.001
Median Household Income			
≥\$63,333	1 [Reference]	–	–
\$50,354-\$63,332	0.85	(0.8 – 0.9)	<0.001
\$40,227-\$50,353	0.74	(0.7 – 0.78)	<0.001
<\$40,277	0.64	(0.6 – 0.68)	<0.001
Unknown	0.84	(0.68-1.04)	0.12
Charlson Comorbidity Index			
0	1 [Reference]	–	–
1	0.89	(0.84 – 0.94)	<0.001
≥2	0.81	(0.74 – 0.87)	<0.001
Immunotherapy			
Not Administered	1 [Reference]	–	–
Administered	2.79	(2.64 – 2.93)	<0.001
Unknown	1.45	(0.98 – 2.15)	0.06
Chemotherapy			
Not administered	1 [Reference]	–	–
Administered	2.78	(2.63 – 2.94)	<0.001
Unknown	1.72	(1.50 – 1.98)	<0.001
Surgery Primary Site			
No	1 [Reference]	–	–
Yes	4.42	(4.22 – 4.63)	<0.001
Unknown	1.45	(0.79 – 2.66)	0.24
Surgery Non-Primary Site			
No	1 [Reference]	–	–
Yes	2.41	(2.28 – 2.53)	<0.001
Unknown	1.32	(0.67 – 2.60)	0.43

CCI: Charlson Comorbidity Index, CP: Cancer Program

*Other races include patients of American Indian/Aleutian/Eskimo, Asian Indian, Asian Indian/Pakistani, Chamorran, Chinese, Filipino, Fiji Islander, Guamanian, Hawaiian, Hmong, Japanese, Kampuchean, Korean, Laotian, Melanesian, Micronesian, New

Guinean, Other, Other Asian, Pacific Islander, Polynesian, Samoan, Tahitian, Thai, Tongan, Unknown origin, and Vietnamese.

^bHispanic ethnicity includes patients of Mexican, Puerto Rican, Cuban, South/Central American (except Brazil), Dominican Republic, or Spanish origin.

eTable 3. Univariable Association of Factors with KRAS Testing

Characteristics	KRAS Testing		p-value
	OR	95% CI	
Age, years			
18 – 49	1 [Reference]	–	–
50 – 59	0.74	(0.70 – 0.80)	<0.001
60 – 69	0.59	(0.56 – 0.63)	<0.001
70 – 79	0.41	(0.38 – 0.44)	<0.001
Sex			
Male	1 [Reference]	–	–
Females	0.98	(0.94 – 1.02)	0.26
Education			
<6.3%	1 [Reference]	–	–
6.3%-10.8%	1.05	(0.86 – 1.29)	0.62
10.9%-17.5%	0.93	(0.76 – 1.14)	0.46
≥17.6%	0.77	(0.63 – 0.95)	0.01
Unknown	0.73	(0.60 – 0.90)	0.003
Insurance status			
Private insurance	1 [Reference]	–	–
Not insurance	0.63	(0.58 – 0.69)	<0.001
Medicaid	0.73	(0.68 – 0.78)	<0.001
Medicare/Other	0.57	(0.55 – 0.60)	<0.001
Governmental			
Unknown	0.60	(0.50 – 0.72)	<0.001
Facility type			
Academic CP ^a	1 [Reference]	–	–
Community CP ^a	1.02	(1.02 – 1.14)	0.007
Comprehensive CP ^a	0.81	(0.75 – 0.88)	<0.001
Integrated network CP ^a	0.92	(0.87 – 0.97)	0.002
Area of Residence			
Metro	1 [Reference]	–	–
Urban	0.91	(0.86 – 0.96)	<0.001
Rural	0.93	(0.79 – 1.09)	0.34
Facility Location			
New England	1 [Reference]	–	–
Middle Atlantic	0.85	(0.77 – 0.94)	0.002
South Atlantic	0.80	(0.73 – 0.88)	<0.001
East North Central	0.78	(0.70 – 0.86)	<0.001
East South Central	0.64	(0.56 – 0.72)	<0.001
West North Central	1.00	(0.89 – 1.12)	0.99
West South Central	0.72	(0.64 – 0.80)	<0.001
Mountain	0.95	(0.83 – 1.07)	0.40
Pacific	0.92	(0.83 – 1.02)	0.13
Travel distance			
≤5 miles	1 [Reference]	–	–
5.1-10	1.12	(1.06 – 1.18)	<0.001
10.1-25	1.16	(1.11 – 1.23)	<0.001
>25 miles	1.15	(1.09 – 1.21)	<0.001
Year of Diagnosis			
2010	1 [Reference]	–	–
2011	1.30	(1.18 – 1.39)	<0.001
2012	1.47	(1.36 – 1.60)	<0.001
2013	1.66	(1.53 – 1.79)	<0.001
2014	1.73	(1.59 – 1.87)	<0.001
2015	1.78	(1.64 – 1.93)	<0.001

Characteristics	KRAS Testing		p-value
	OR	95% CI	
2016	1.96	(1.80 – 2.12)	<0.001
2017	1.92	(1.77 – 2.08)	<0.001
Median Household Income			
≥\$63,333	1 [Reference]	–	–
\$50,354-\$63,332	0.90	(0.85 – 0.95)	<0.001
\$40,227-\$50,353	0.81	(0.77 – 0.85)	<0.001
<\$40,277	0.72	(0.68 – 0.76)	<0.001
Unknown	1	(0.82 – 1.21)	0.96
Charlson Comorbidity Index			
0	1 [Reference]	–	–
1	0.90	(0.86 – 0.95)	<0.001
≥2	0.64	(0.60 – 0.69)	<0.001
Immunotherapy			
Not Administered	1 [Reference]	–	–
Administered	2.93	(2.78 – 3.09)	<0.001
Unknown	1.29	(0.89 – 1.87)	0.17
Chemotherapy			
Not administered	1 [Reference]	–	–
Administered	5.06	(4.80 – 5.33)	<0.001
Unknown	2.07	(1.82 – 2.36)	<0.001
Surgery Primary Site			
No	1 [Reference]	–	–
Yes	1.88	(1.81 – 1.96)	<0.001
Unknown	0.74	(0.43 – 1.27)	0.27
Surgery Non-Primary Site			
No	1 [Reference]	–	–
Yes	1.65	(1.57 – 1.73)	<0.001
Unknown	1.65	(0.88 – 3.10)	0.12
Race			
White	1 [Reference]	–	–
Black	0.89	(0.85 – 0.94)	<0.001
Others ^a	1.03	(0.93 – 1.12)	0.60
Ethnicity			
Non-Hispanic	1 [Reference]	–	–
Hispanic ^b	0.99	(0.91 – 1.07)	0.75

CCI: Charlson Comorbidity Index, CP: Cancer Program

^aOther races include patients of American Indian/Aleutian/Eskimo, Asian Indian, Asian Indian/Pakistani, Chamorran, Chinese, Filipino, Fiji Islander, Guamanian, Hawaiian, Hmong, Japanese, Kampuchean, Korean, Laotian, Melanesian, Micronesian, New Guinean, Other, Other Asian, Pacific Islander, Polynesian, Samoan, Tahitian, Thai, Tongan, Unknown origin, and Vietnamese.

^bHispanic ethnicity includes patients of Mexican, Puerto Rican, Cuban, South/Central American (except Brazil), Dominican Republic, or Spanish origin.

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