

# Examining Disparities in Incidence of Colorectal Cancer by Race, Ethnicity, Sex, Stage, and Site

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## Background

- Over the past 21 years, while the incidence of colorectal cancer in the US has decreased, disparities in race and ethnicity have increased.
- No recent evaluation exists of differences in race and ethnicity by location of primary tumors within the colon and rectum among all age groups.
- Recent literature has shown that there are differences in the rates of colorectal cancer between multiple minority groups; however, many of these studies only compare CRC among White and Black groups.

## Research Questions

- What are the differences in incidence between different age, sex, site, and racial/ethnic groups?
- What do the trends over time tell us about disparities between different age, sex, site, and racial/ethnic groups?
- How will our conclusions allow us to prevent cancer onset for all racial and ethnic groups?

## Methods

**Data Source:** SEER Stat v8.3.9 by using the *Incidence – SEER Research Data, 18 Registries, Nov 2020 Sub (2000-2018)* database.  
**Study Sample –** We examined the incidence rates of colorectal cancer in Non-Hispanic (NH) Whites, NH Blacks, NH American Indians/Alaskan Natives (AIAN), NH Asians/Pacific Islanders (API), and Hispanics. We excluded individuals who were  $\leq 20$ , those with unknown race, and 'In Situ' cases.

**Table 1.** Colorectal Cancer Subsites

Proximal Colon	Distal Colon	Rectum
Cecum	Splenic Flexure	Rectosigmoid Colon
Ascending Colon	Descending Colon	Rectum
Hepatic Flexure	Sigmoid Colon	
Transverse Colon		

**Statistical Analysis:** We used SEER\*Stat version 8.3.9 to calculate age-adjusted incidence rates (2000 population standard) for colorectal cancer, stratified by sex, stage, and subsite. Incidence trends were characterized in terms of annual percent change in rates over the study period, calculated using SEER\*stat.

**Table 2.** Trends in Incidence Between Race, Ethnicity, Site, and Sex

Sex	Stage	Race/Ethnicity	Proximal Colon				Distal Colon				Rectum			
			2000	2018	<sup>1</sup> PC	<sup>2</sup> APC	2000	2018	PC	APC	2000	2018	PC	APC
Males	Local	NH White	11.7	6.8	-41.9	-3*	11.4	5.1	-54.9	-4.7*	12.7	6.6	-48.2	-3.9*
		NH Black	12.7	9.4	-26.2	-2.5*	12.4	5.9	-52.8	-4*	7.9	6.7	-15	-2*
		NH AIAN	7.2	3.8	-47.2	-0.5	7.4	5.4	-26.8	-0.7	6.9	11.2	61.5	0
		NH Asian/PI	6.9	4.6	-33.3	-2.7*	9.1	5.4	-41.3	-3.4*	11.7	6.5	-44	-2.8*
		Hispanic	7.6	6	-21.8	-1.8*	8.2	3.9	-51.7	-3.9*	10	6.5	-34.8	-2.8*
	Regional	NH White	13.7	7.1	-48	-3.8*	9.3	4.7	-49.1	-3.8*	8.9	6.7	-25.5	-1.1*
		NH Black	15.7	8.9	-43.2	-3.8*	11.5	4.9	-57.7	-4.3*	8	5.3	-34	-1.3*
		NH AIAN	7.2	5.7	-21.2	-1	3.4	4.9	43.8	-1.5	3.8	5.1	34.8	1
		NH Asian/PI	9.1	4.6	-49	-3.4*	10.9	5.1	-52.9	-3.7*	9.9	6.8	-31.6	-1.3*
		Hispanic	9.3	5.9	-35.7	-2.6*	6.4	4.3	-33.3	-2.4*	9	5.7	-36	-1.3*
	Distant	NH White	5.2	4	-23	-2*	4.4	3.1	-28.3	-1.9*	4	4	1.7	-0.2
		NH Black	9.1	6.4	-30.2	-1.9*	7.8	5.5	-29.2	-2.5*	4.9	4.4	-11	-0.4
		NH AIAN	0.4	3.4	647.4	0.7	2.5	3.1	24.8	-0.1	6.1	7.1	17	2.6*
		NH Asian/PI	3.2	2.1	-33	-2.6*	3	3.5	15.8	-1.1*	3.8	3.5	-9.9	-1.7*
		Hispanic	4.2	3.5	-17.1	-0.9*	4.1	3.3	-20.4	-1.3*	3.6	3.7	2.1	-0.7
Females	Local	NH White	9.8	6.8	-31	-2.4*	7	3.5	-50.3	-4.2*	7.7	4.6	-40.5	-3*
		NH Black	10.8	7.8	-27.7	-2.2*	7.9	4.4	-43.9	-3.6*	7.4	5.7	-22.1	-1.5*
		NH AIAN	7.7	7.2	-6.2	-1.1	2.2	2.9	35.8	-0.4	2.5	4.2	64.6	0.8
		NH Asian/PI	4.8	3.4	-28	-2.8*	5.1	3.9	-26.1	-3.4*	7.1	4.1	-41.8	-2.8*
		Hispanic	5.6	5.2	-7.9	-1.7*	5.9	3.1	-46.4	-2.8*	6.6	4.5	-31.1	-1.8*
	Regional	NH White	12.4	6.4	-48.3	-3.3*	6.4	3.4	-47.4	-3.6*	5.3	4	-24.5	-1*
		NH Black	12.5	7.9	-37	-3*	8.2	3.4	-58.2	-4.4*	4.9	3.2	-34.8	-2.9*
		NH AIAN	11.8	9.3	-20.9	-1.8	5.6	5.7	2.2	-1.6	6.2	4	-35.2	0.8
		NH Asian/PI	8.7	4.5	-48.3	-3.4*	6.9	4.4	-36	-3.3*	5.4	3.1	-43.1	-2.2*
		Hispanic	8.3	5.2	-36.7	-2.1*	4.7	2.9	-39.4	-2.3*	3.9	3.2	-17.4	-0.7*
	Distant	NH White	4.7	3.6	-23.5	-1.7*	2.7	2.2	-18.4	-2.1*	2.3	2.4	2.8	0.1
		NH Black	8.3	6.5	-21.9	-1.6*	4.7	2.7	-42.6	-3*	2.5	1.9	-24.7	-1.6*
		NH AIAN	3.3	3.3	0.4	~	2.7	2.8	3.6	1.2	3	3.7	25.6	4.4*
		NH Asian/PI	3.8	1.6	-57	-3.6*	2.5	2.2	-14.3	-1.8*	2.2	1.6	-26.7	-1.2*
		Hispanic	4.3	2.7	-37.4	-1.7*	2.4	1.8	-23	-0.4	2	2	-3.8	-0.1

<sup>1</sup>PC - Percent Change

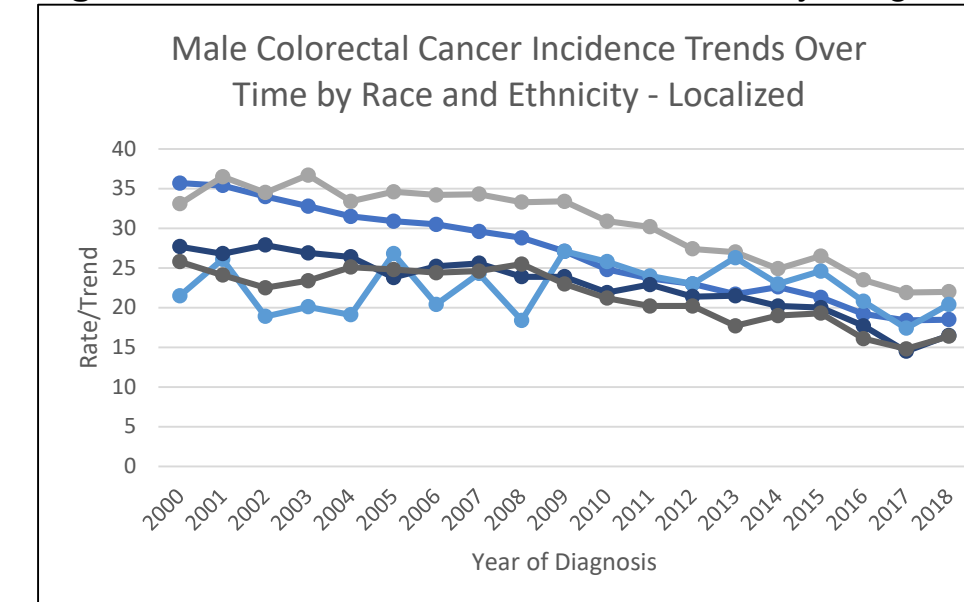
<sup>2</sup>APC - Annual Percent Change

\*Statistically Significant where p<0.5

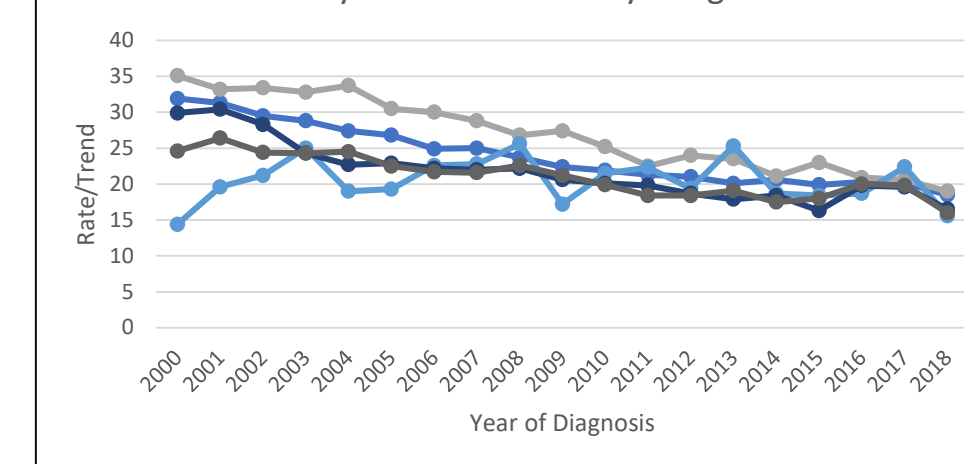
- Most groups experienced higher rates of new cases at the proximal subsite and in the regional stage of diagnosis with little variation by sex.
- In some cases, Whites had the second highest rates of incidence across each subsite and stage of diagnosis but have shown some of the highest annual percent changes.
- Blacks had the highest rate out of all races and ethnicities. There has been annual improvement, but they are not showing the biggest improvement despite having some of the highest rates.
- APIs have consistently shown improvement in incidence rates which has led them to have some of the largest annual percent changes, but they started at a lower rate compared to the other groups; however, APIs have been shown to have higher rates within the rectal diagnosis site across all stages.
- American Indians and Alaskan Natives have had non-consistent results in their trends due to the small population size of the group.
- Hispanics have seen a steady decrease over the time period, but have seen the smallest improvement overall. However, similarly to APIs, their rate of new cases started lower than other groups. They saw the least amount of improvement in the rectum, showing no significant annual change in both males and females.
- Between each racial and ethnic group, sex, stage, and site, the rate of new cases has declined overtime. However, some racial groups experienced higher incidence rates than others and lower annual percent changes.

## Results

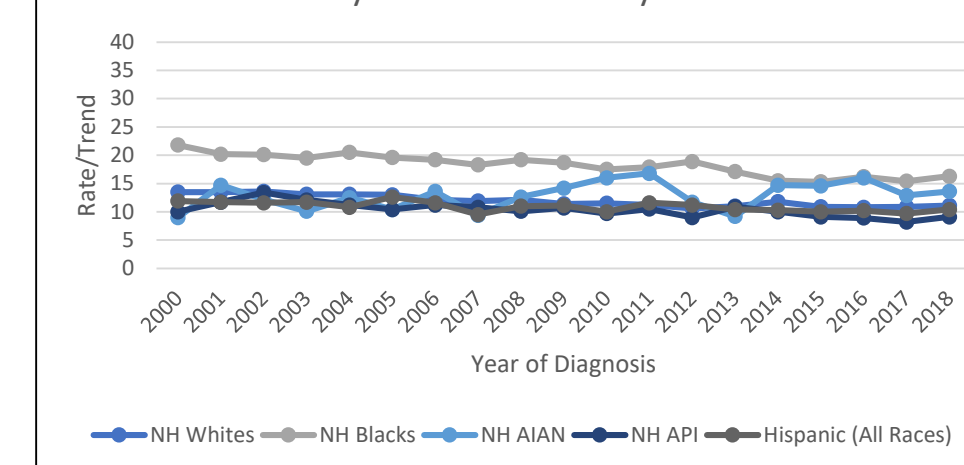
**Figure 1.** Male Colorectal Cancer Trends by Stage



**Figure 2.** Female Colorectal Cancer Trends by Stage



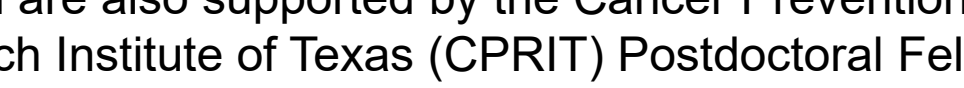
**Figure 3.** Male Colorectal Cancer Incidence Trends Over Time by Race and Ethnicity - Regional



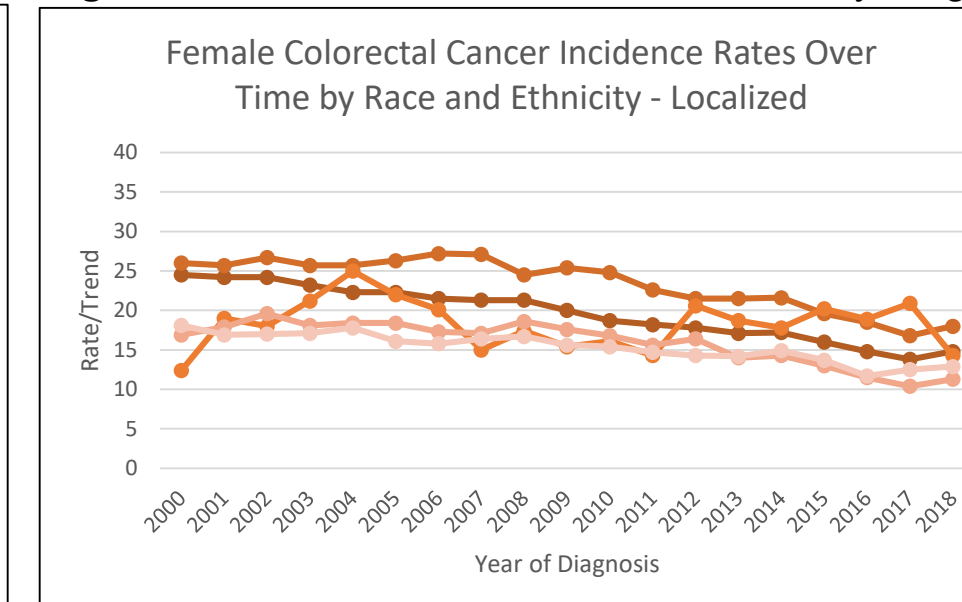
**Figure 4.** Female Colorectal Cancer Incidence Rates Over Time by Race and Ethnicity - Regional



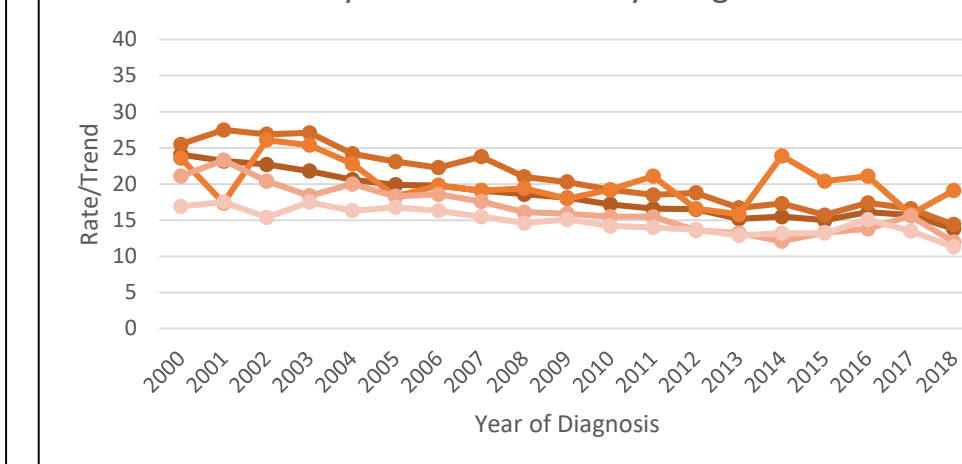
**Figure 5.** Male Colorectal Cancer Incidence Trends Over Time by Race and Ethnicity - Distant



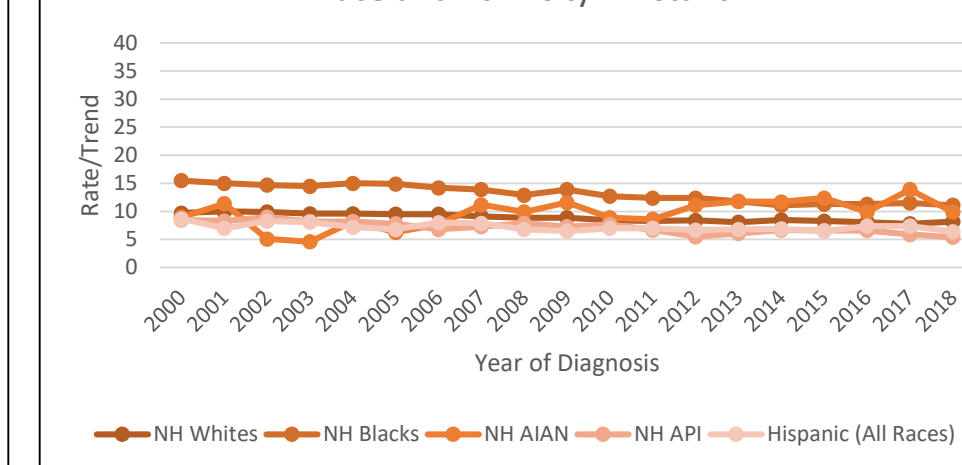
**Figure 6.** Female Colorectal Cancer Incidence Rates Over Time by Race and Ethnicity - Distant



**Figure 7.** Male Colorectal Cancer Incidence Trends Over Time by Race and Ethnicity - Distant



**Figure 8.** Female Colorectal Cancer Incidence Rates Over Time by Race and Ethnicity - Distant



## Conclusions

- As others have reported, we observed declining incidence in colorectal cancer, but found that some racial and ethnic groups experienced higher incidence rates compared to other groups by diagnosis site and the stage of diagnosis.
- Comparing diagnosis at the different subsites, decreases in the proximal colon were the largest.
- Comparing stage of diagnosis, declines were observed for every stage; however, diagnosis at the regional stage was higher than at the other stages.
- For male and female Whites, Blacks, and Hispanics, the largest decrease in incidence was in the distal colon, while for Asians/Pacific Islanders, it was in the proximal colon.

## Responsible Conduct of Research

In order to ensure the proper interpretation of the data, the y-axis scale entitled "Rate/Trend" for each figure is uniform to be a 5-incremented scale bounded from 0-40 to facilitate appropriate comparison across groups.

## Relation to Cancer Prevention

This project allows future investigators to help identify the factors that contribute to these disparities for developing biological, structural, or behavioral interventions to reduce disparities in cancer and promote cancer prevention.

## References

Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER\*Stat Database: Incidence - SEER Research Data, 9 Registries, Nov 2020 Sub (1975-2018) - Linked To County Attributes - Time Dependent (1990-2018) Income/Rurality, 1969-2019 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, released April 2021, based on the November 2020 submission.

Acknowledgements: Andrea Joyce Malabay was supported by an educational grant from the National Cancer Institute (R25CA056452, Dr. Shine Chang, Principal Investigator), this research and Dr. Kristin Primm are also supported by the Cancer Prevention Research Training Program (CP RTP) at The University of Texas MD Anderson Cancer Center and the Cancer Prevention and Research Institute of Texas (CPRIT) Postdoctoral Fellowship in Cancer Prevention (RP 170259, Drs. Shine Chang and Sanjay Shete, Principal Investigators)