Incidence of Suicide in Patients with Young-Onset Colorectal Cancer

Sydney Taylor, BS, Annmarie Butare, DO, William Irish, PhD, Alexander A. Parikh, MD, MPH, Yuanyuan Fu, MA, MS; Rebecca A. Snyder, MD, MPH

Sydney M. Taylor
Department of Surgery
East Carolina University
Greenville, North Carolina 27858
barngrovers21@students.ecu.edu

INTRODUCTION

- Incidence of colorectal cancer (CRC) has increased significantly among younger patients
- Suicide is a leading cause of death worldwide among those 18 – 24 years of age (Chen et al., 2020)
- Suicide rates increasingly correlated with cancer and depression remains high in young-onset CRC patients

Figure 1. Increasing Incidence of Colorectal Cancer per 100,000 individuals by age and year
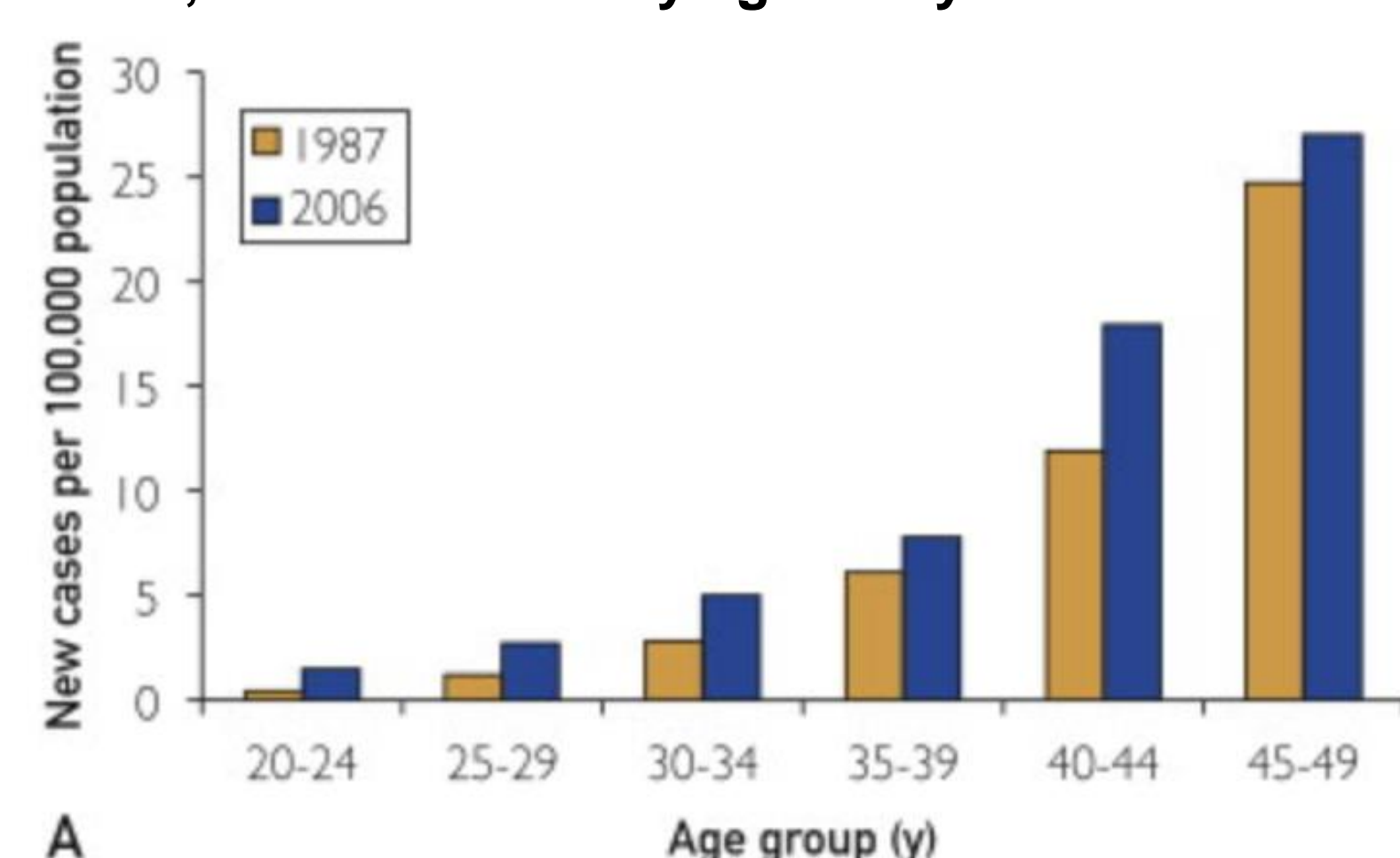
- Few studies have examined mental health and suicide rates among patients with young-onset CRC (< 50 years of age)

Purpose:
- To investigate a potential correlation between a diagnosis of colorectal cancer between 18 and 49 years of age and suicide

Primary Aims:
- Determine the incidence of suicide and uncover potential factors associated with suicide among patients diagnosed with colorectal cancer between the ages of 18 and 49

MATERIALS & METHODS

A retrospective study was conducted using data from the population-based National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database. The study population included individuals aged 18 to 84 years with CRC diagnosed between 2000 – 2018. Standardized mortality ratios will be calculated to compare the risk of suicide in the study cohort with the general population using US census data.

Figure 2. Suicide rates for females, by age group: United States, 2000 and 2016
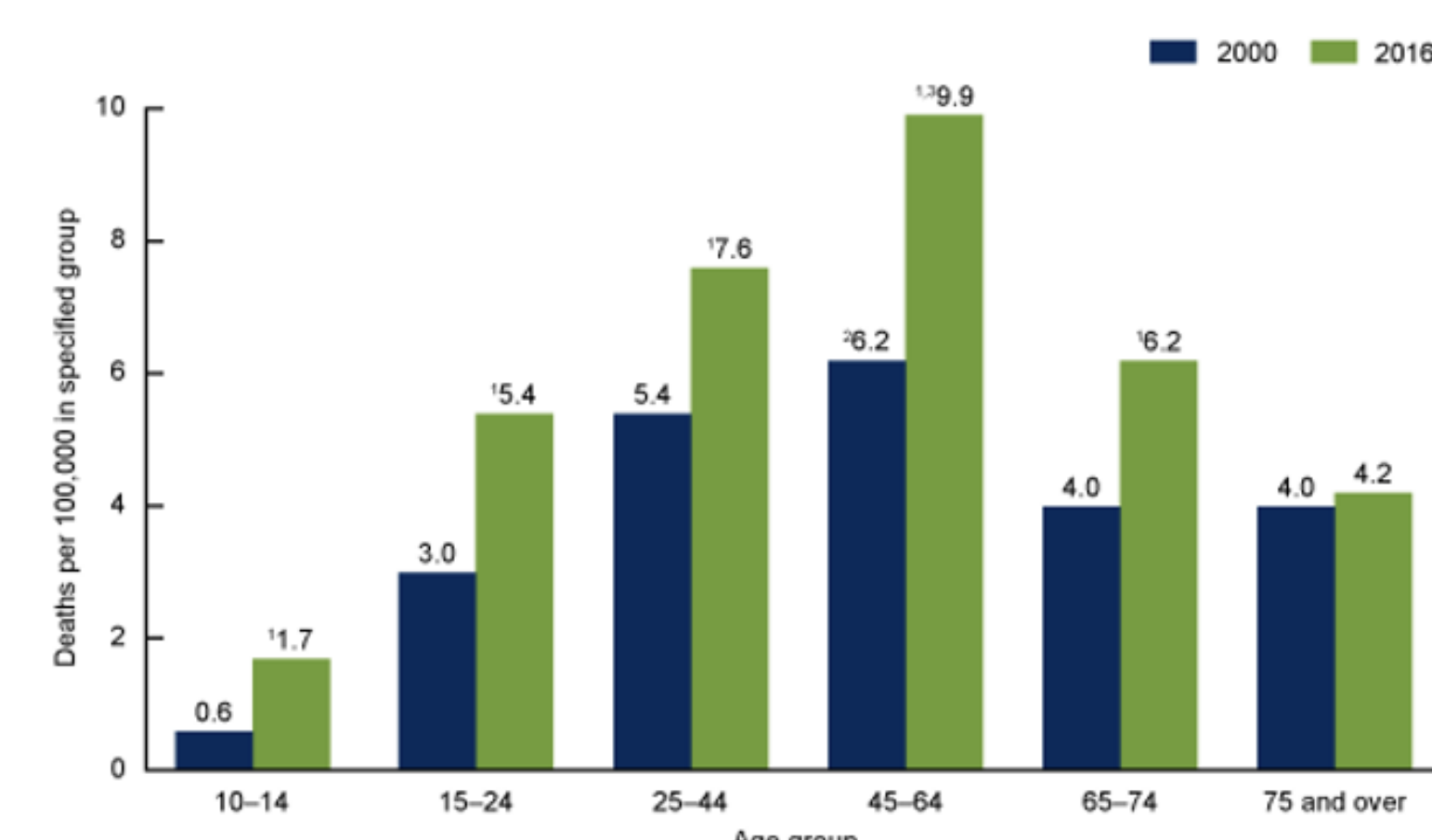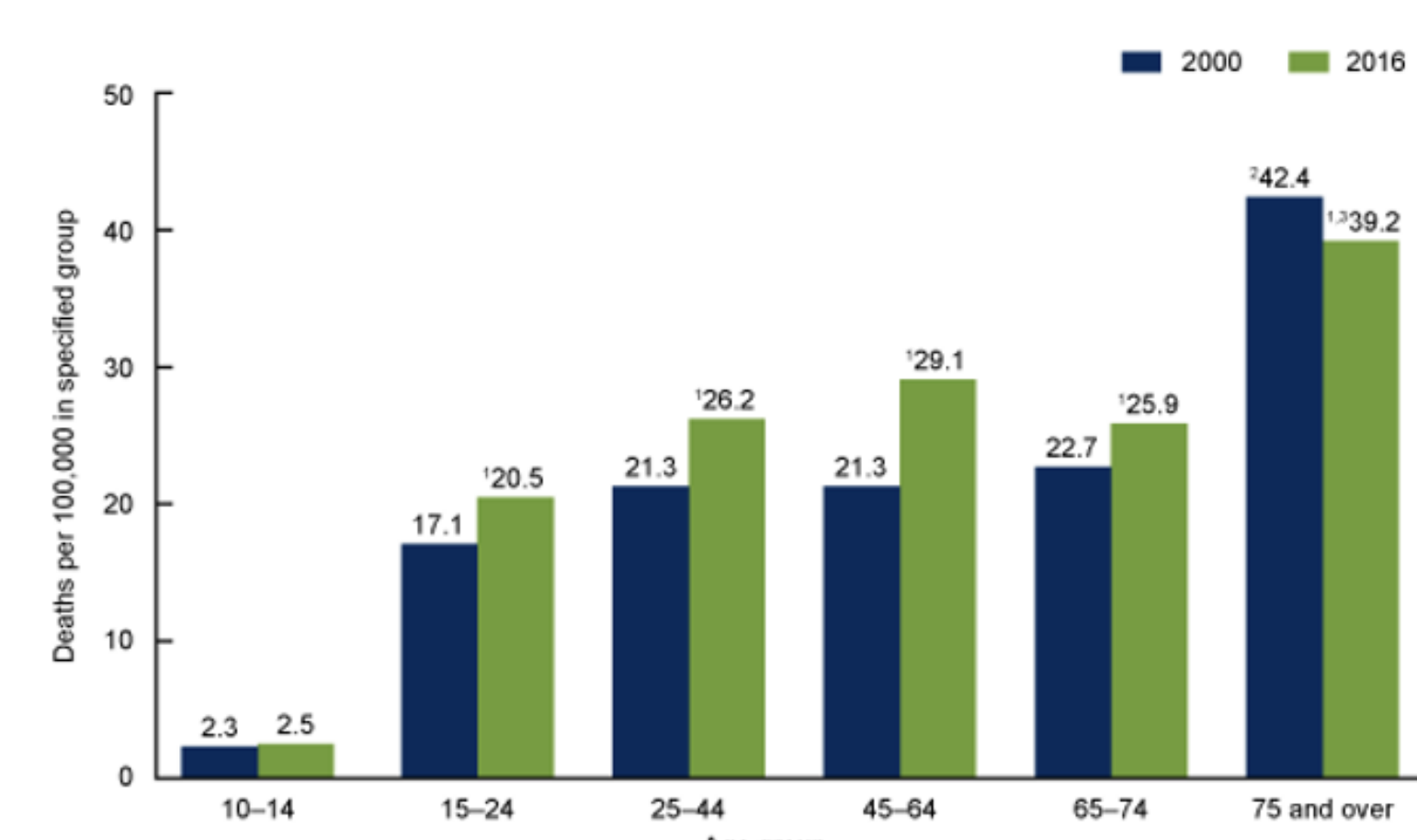

Figure 3. Suicide rates for males, by age group: United States, 2000 and 2016

Note. [1]Significantly different from 2000 rate, p < 0.05.
[2]Significantly higher than rates for all other age groups in 2000, p < 0.05.
[3]Significantly higher than rates for all other age groups in 2016, p < 0.05.
Suicides were identified using International Classification of Diseases, 10th Revision, underlying cause-of-death codes: U03, X60–X84, and Y87.0.

Figure 4. Risk of suicide in each month after a cancer diagnosis (according to site)

Note. Observed/expected (O/E ratio); observed represents the number of patients who died of suicide and expected represents the number of people who committed suicide in a demographically similar population within the same time period. O/E ratio represents the change in the risk for suicide within the year after a cancer diagnosis in comparison with the general US population.

RESULTS

Preliminary data analysis is ongoing. Our hypothesis is that patients with young-onset CRC experience higher rates of suicide than the general population. We further hypothesize that patients aged 20 – 24 years will have the highest level of incidence of suicide. We hypothesize that factors associated with risk of suicide among these patients may include marital status, race, socioeconomic status, and cancer stage.

Table 1. Descriptive statistics for total data.

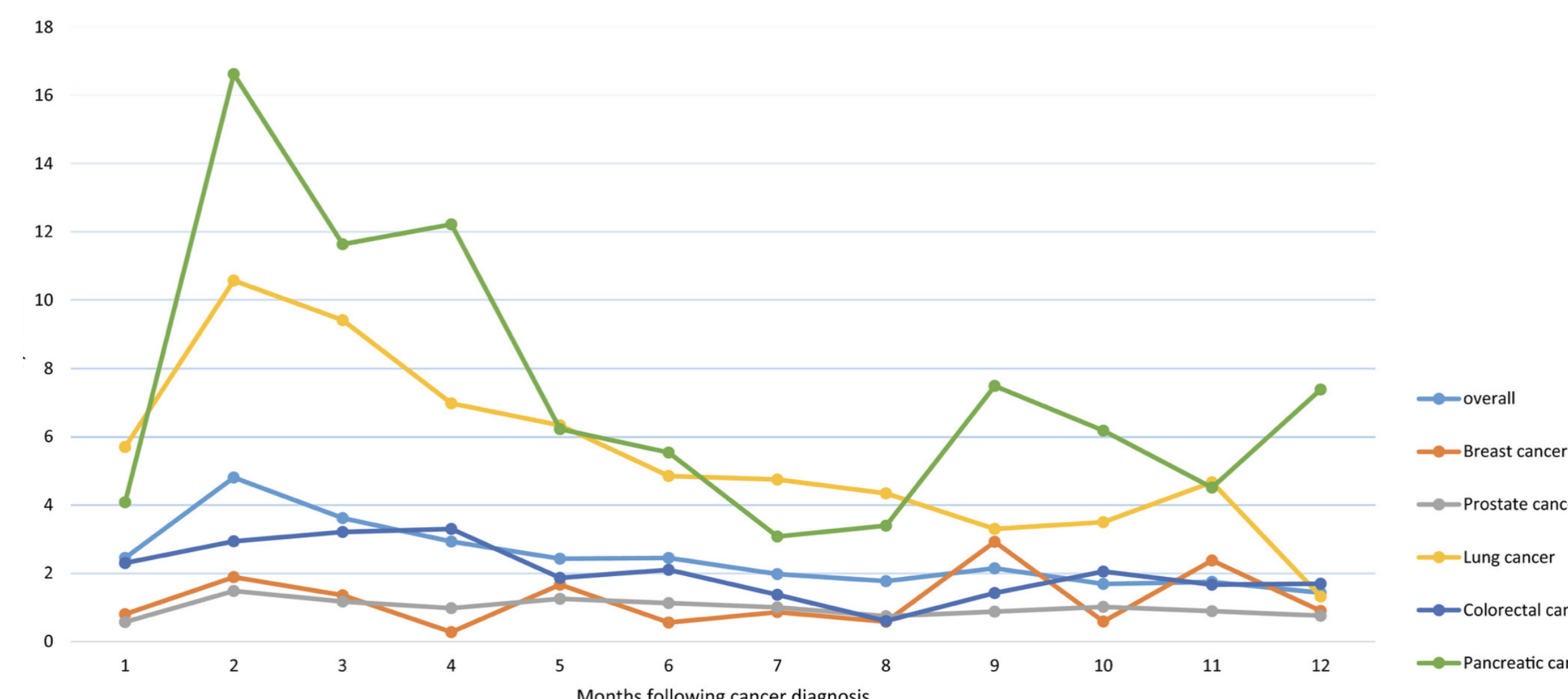| Age Group		15 - 19 years	20 - 24 years	25 - 29 years	30 - 34 years	35 - 39 years	40 - 44 years	45 - 49 years	50 - 54 years	55 - 59 years	60 - 64 years	65 - 69 years	70 - 74 years	75 - 79 years	80 - 84 years	All
Sex																
	Female	62 (44.6)	269 (46.5)	754 (46.5)	1869 (49)	3686 (47.8)	7210 (47.3)	13039 (46)	22116 (43.8)	24342 (41.6)	27640 (41.2)	32548 (43)	34272 (44.8)	37492 (49.3)	36116 (54)	
	Male	73 (52.5)	305 (52.8)	865 (53.5)	1939 (50.9)	4028 (52.2)	8042 (52.7)	15277 (53.9)	28366 (56.2)	34139 (58.4)	39443 (58.8)	43120 (57)	42188 (55.2)	38540 (50.7)	30823 (46)	
	Total	139	578	1623	3812	7718	15255	28320	50486	58484	67086	75671	76463	76035	66942	
Race																
	Non-Hispanic Black	16 (11.5)	73 (12.6)	189 (11.6)	494 (13)	1003 (13)	2139 (14)	3994 (14.1)	7240 (14.3)	8424 (14.4)	9189 (13.7)	9327 (12.3)	8224 (10.8)	6994 (9.2)	5410 (8.1)	
	Non-Hispanic White	71 (51.1)	323 (55.9)	845 (52.1)	2070 (54.3)	4308 (55.8)	8903 (58.4)	17309 (61.1)	31554 (62.5)	37465 (64.1)	44596 (66.5)	52089 (68.8)	55274 (72.3)	57474 (75.6)	52458 (78.4)	
	Non-Hispanic American Indian/ Alaska Native	1 (0.7)	7 (1.2)	19 (1.2)	40 (1)	87 (1.1)	136 (0.9)	278 (1)	414 (0.8)	460 (0.8)	528 (0.8)	492 (0.7)	513 (0.7)	353 (0.5)	246 (0.4)	
	Non-Hispanic Asian or Pacific Islander	9 (6.5)	44 (7.6)	172 (10.6)	348 (9.1)	780 (10.1)	1495 (9.8)	2639 (9.3)	4437 (8.8)	4913 (8.4)	5326 (7.9)	6071 (8.0)	5558 (7.3)	5186 (6.8)	4235 (6.3)	
	Hispanic (All Races)	37 (26.6)	126 (21.8)	376 (23.2)	837 (22)	1486 (19.3)	2492 (16.3)	3930 (13.9)	6407 (12.7)	6860 (11.7)	7076 (10.5)	7355 (9.7)	6596 (8.6)	5835 (7.7)	4471 (6.7)	
	Non-Hispanic Unknown	1 (0.7)	1 (0.2)	18 (1.1)	19 (0.5)	50 (0.6)	87 (0.6)	166 (0.6)	430 (0.9)	359 (0.6)	368 (0.5)	334 (0.4)	295 (0.4)	190 (0.2)	119 (0.2)	
SMR																
	Female	0	28.63	0	1.56	0.67	0.84	0.56	0.699	0.72	1.18	1.5	1.67	1.83	0.71	
	Male	20.59	0	1.87	1.23	2.05	1.71	1.38	1.27	1.02	1.52	1.97	1.68	1.71	1.79	
	Total Female															1.09
	Total Male															1.56

Note. Demographics sex, race, and SMR (standardized mortality ratios) for all data divided among varying age groupings of patients with colorectal adenocarcinoma diagnosis.

Table 2. Comparing demographic data for suicide vs. non-suicide cohorts.

	Suicide	Non-Suicide
Sex		
Female	89	241326
Male	648	286500
Total	737	527826
Race		
Non-Hispanic Black	26	62688
Non-Hispanic White	640	364029
Non-Hispanic American Indian/Alaska Native	2	3571
Non-Hispanic Asian or Pacific Islander	39	41169
Hispanic (All Races)	29	53850
Non-Hispanic Unknown	1	2436

Note. Demographics of those who died by suicide as compared to those who did not within overall data.

DISCUSSION

- Anticipated findings will inform the development of targeted mental health interventions by identifying which patients are at greatest risk
- Uncovering the incidence of suicide in young-onset CRC patients will allow physicians to mitigate worsening mental health or suicidality
- Data will not only inform the field of oncology and surgical oncology, but also will aid mental health professionals within clinical and non-clinical specialties

REFERENCES

- Chen, C., Jiang, Y., Yang, F., Cai, Q., Liu, J., Wu, Y., & Lin, H. (2021). Risk factors associated with suicide among hepatocellular carcinoma patients: A surveillance, epidemiology, and end results analysis. European journal of surgical oncology: the journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology, 47(3 Pt B), 640–648. https://doi.org/10.1016/j.ejso.2020.10.001
- National Cancer Institute Surveillance, Epidemiology, and End Results Program: Overview of SEER. https://seer.cancer.gov/about/overview.html
- https://news.virginia.edu/content/strange-colon-discovery-explains-racial-disparities-colorectal-cancer
- Figure 1: https://doi.org/10.1016/j.mayocp.2013.09.006
- Figures 2 and 3: NCHS, National Vital Statistics System, Mortality.
- Figure 4: Saad, A. M., Gad, M. M., Al-Husseini, M. J., AlKhayat, M. A., Rachid, A., Alfaar, A. S., & Hamoda, H. M. (2019). Suicidal death within a year of a cancer diagnosis: A population-based study. Cancer, 125(6), 972-979.

QR code will lead to the National Suicide Prevention Lifeline site.