

DO SCREENINGS PREVENT MORTALITY IN COLORECTAL CANCER?

LOOKING AT SCREENING, MORTALITY AND INCIDENCE FOR COLORECTAL CANCER ACROSS THE US IN 2014

TOPIC IMPORTANCE

Colorectal cancer affects men and women of all racial and ethnic groups and is most often found in people who are 50 years old or older. Not counting some kinds of skin cancer, colorectal cancer is the third most common cancer in men and women & the third leading cause of cancer-related deaths in the United States (CDC,2021). Screening can find precancerous polyps or abnormal growths in the colon or rectum—that can be removed before they turn into cancer (American Cancer Society, 2022).

DATA SOURCES

Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health
Screenings from BRFFS as age adjusted Prevalence
Mortality from Death Certificates as Average Annual Age Adjusted Rate per 100,000
Incidence from Statewide Central Cancer Registries Average Annual Age Adjusted Rate per 100,000
Demographics: Gender and Race (CDC, 2022)

SUMMARY OF RESEARCH

This research tested the null hypothesis that the amount of screenings does not affect the total mortality rate for states in the US.

Using Mortality rates from Death Certificates in United States in 2014 as the response variable, and screening rates from BRFFS data for US in 2014 as well as gender and incidence rates from statewide central cancer registries in 2014.

Using a one -way ANOVA we found that Screening is associated with Mortality. This is also true when controlling for Gender and for Incidence Rate.

Future Analysis could continue to explore this relationship by using data from other years or other countries. Other demographics could be investigated such as socioeconomic status of the individuals or access to healthcare and health insurance.

QUOTES

“Screening lowers colorectal cancer (CRC) incidence and mortality” (Centers for Disease Control and Prevention, 2011)

“The recommendation that all men and women aged 50 years or older undergo screening for colorectal cancer is supported by a large body of direct and indirect evidence. At present, the available evidence does not currently support choosing one test over another.” (Walsh & Terdiman, 2003)

“Colorectal cancer (CRC) screening among average-risk patients is underused in the US. Clinician recommendation is strongly associated with screening completion.” (Zhu et al., 2022)

REFERENCES

American Cancer Society Inc. (2022, January 11). Colorectal cancer statistics: How common is colorectal cancer? American Cancer Society. Retrieved April 27, 2022, from <https://www.cancer.org/cancer/colon-rectal-cancer/about/key-statistics.html>

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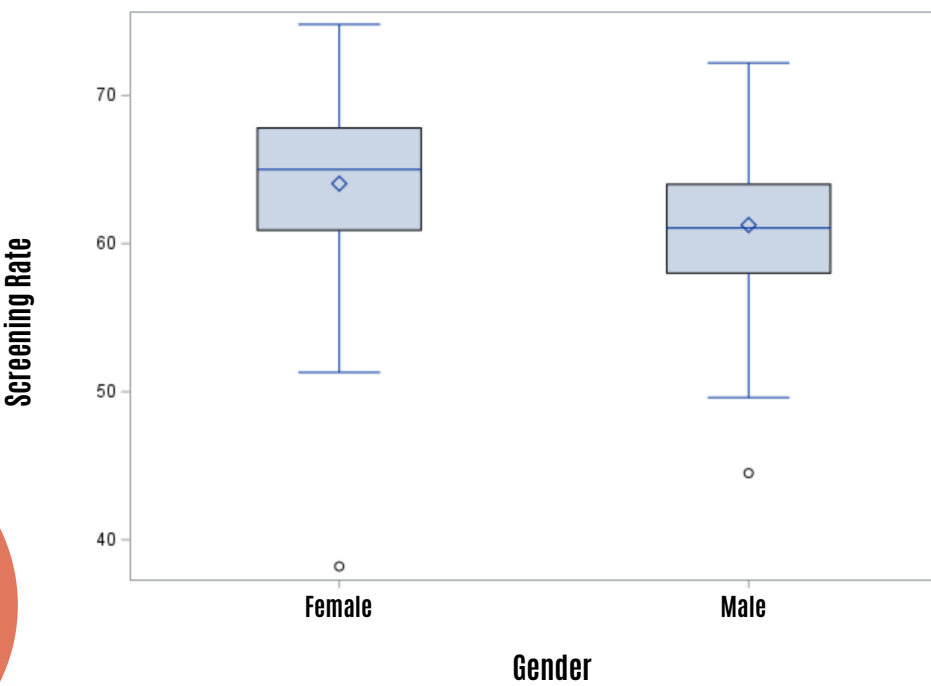
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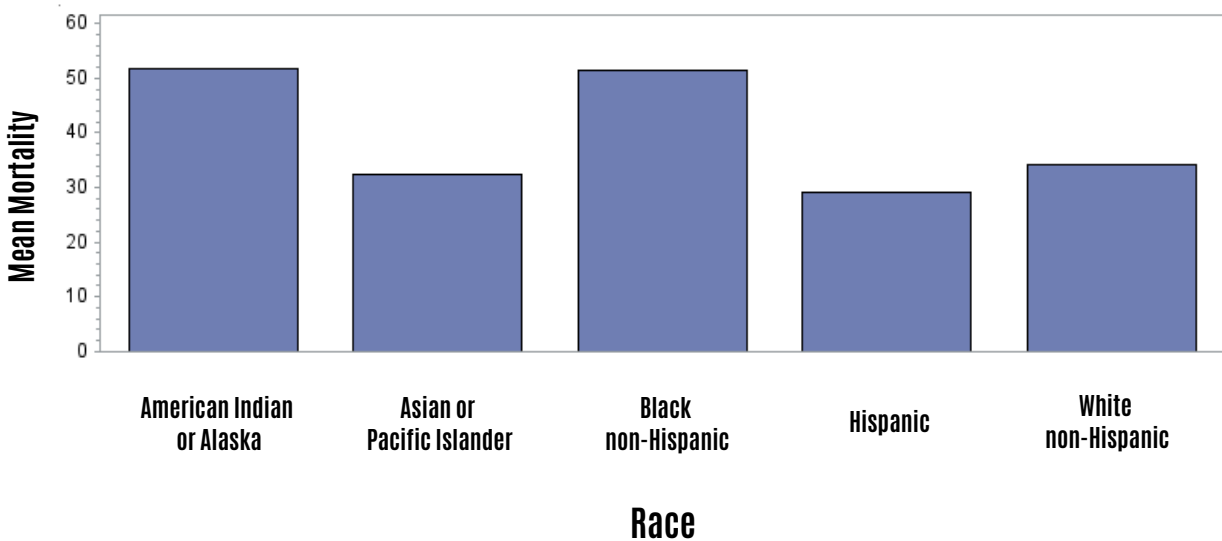
GRAPHS

Screening Rates by Gender



These graphs depict screening rates by gender and mean mortality by race.

Mean Mortality by Race



RESULTS

Demographics		Screening			Mortality			Incidence		
		Mean	Std. Dev	P-Value	Mean	Std. Dev	P-Value	Mean	Std. Dev	P-Value
Gender	Femlae	64	5.9	0.0143	11.7	1.4	<.0001	33.9	3.4	<.001
	Male	61.3	5.7		16.5	2.1		43.7	5.2	
Race	Asian or Pacific Islander			<.0001	8.8	2.1	<.0001	27.9	5.6	<.0001
	Black, Non-Hispanic	64.1	6.5		18.3	2.9		41.2	7.9	
	American Indian or Alaskan Native				14.6	7.8		36.2	19.8	
	White, Non-Hispanic	64.6	4.8		13.5	1.8		37.4	25.2	
	Hispanic	51.4	9.6		9.3	2.5		31.2	6.1	
	Multiracial, Non-Hispanic	59.2	9.1							
	Other, Non-Hispanic	55.1	7.1							

Do screenings prevent mortality when controlling for Incidence?

The GLM Procedure

Dependent Variable: overall_mortality DataValue

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	100.0327580	50.0163790	74.76	<.0001
Error	48	32.1123400	0.6690071		
Corrected Total	50	132.1450980			

Do screenings prevent mortality when controlling for Gender?

The GLM Procedure

Dependent Variable: mortality_rate DataValue

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	659.8223699	329.9111850	129.45	<.0001
Error	101	257.4110916	2.5486247		
Corrected Total	103	917.2334615			

Parameter	Estimate	Standard Error	t Value	Pr > t
Intercept	6.039562788	2.40505789	2.51	0.0155
overall_screening	-0.064084129	0.02724886	-2.35	0.0228
overall_incidence	0.309419328	0.02999726	10.31	<.0001

Parameter	Estimate	Standard Error	t Value	Pr > t
Intercept	26.87191359	2.05448472	13.08	<.0001
screens	-0.16769057	0.03305977	-5.07	<.0001
Gender fema	-4.27640758	0.32849821	-13.02	<.0001
Gender male	0.00000000	B	.	.

CONCLUSION

- Screening does have an impact on colon cancer mortality
 - The low R-square value of .236864 however, draws us to conclude that screening can not predict colon cancer mortality independently
 - the negative estimate shows us that when there are more screenings there is less mortality
- Incidence also has an impact on colon cancer mortality
 - The high R-square of 0.756992 demonstrates a strong association
- While controlling for incidence, the significance of screening goes down but it is still statistically significant and displays a strong relationship
- Gender and screening also proved to be statistically significant with a small p value and a large r-square value of .719361 demonstrating a strong association