

Demographic Multivariate Analysis of Oropharyngeal Cancer Rates in Texas Counties

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Background/Introduction

- Oropharyngeal cancer accounts for over 55,000 annual cases and 12,000 annual deaths in the United States each year.¹ The state of Texas has the 3rd highest annual caseload of oropharyngeal cancer in the United States.²
- Texas contains 254 counties, each varying greatly in size, population, income status, medical accessibility, and other distinguishing demographic characteristics.
- The risk factors for oropharyngeal cancer are associated with lifestyle. The use of alcohol and tobacco, as well as infection by the sexually transmitted human papillomavirus are known to be common causes of oropharyngeal cancer.
- These lifestyle-associated risk factors could potentially be reflected in the demographic disparities between Texas counties.

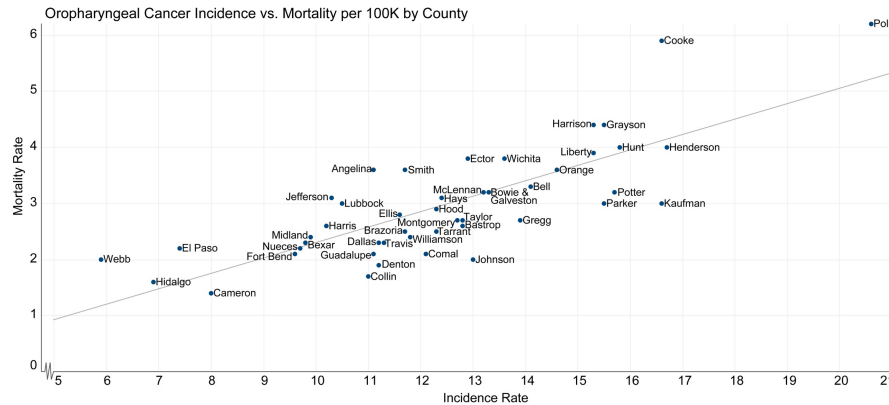
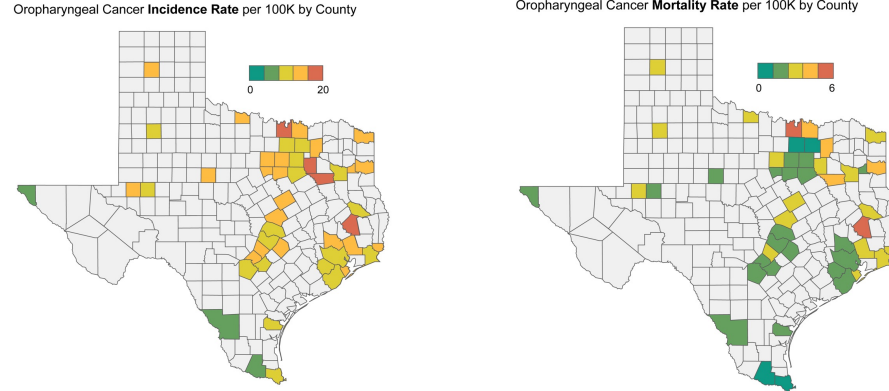
Purpose/Objectives/Hypothesis

- Purpose:** The goal of the study was to determine how the incidence and mortality rates of oropharyngeal cancer in Texas vary geographically, and how those rates compare to demographic statistics.
- Objective 1:** Gather demographic characteristics of select Texas counties
- Objective 2:** Correlate the characteristics of each county to their respective rates of cancer incidence and mortality
- Objective 3:** Predict how changes in demographics may affect cancer rates in the future
- Hypothesis:** Significant variance in oropharyngeal cancer rates will correlate with the demographic trends of each county.

Methods

- Retrospective Observational Review
- Multivariate analysis using oropharyngeal cancer incidence and mortality rates in comparison to average income, age, population, percentage with high school level education, percentage with bachelors level education, and primary care physicians per 100,000 people
- The NIH National Cancer Institute provided incidence and mortality rates for cancers of the Oral Cavity and Pharynx.
- The US Census Bureau provided each county's median household income, average age, population size, percentage of people with a high school education.
- The Texas Health and Human services department provided the number of primary care physicians per 100,000 and the estimated medically uninsured population.

Graphic Illustration



Texas Counties Included in the Study by Population Size

Population Size	Counties
Over 1 million	Harris, Dallas, Tarrant, Bexar, Travis, Collin
500,000 - 999,999	Denton, Fort Bend, Hidalgo, El Paso, Montgomery, Williamson
100,000 - 499,999	Cameron, Bell, Brazoria, Galveston, Nueces, Lubbock, Hays, Webb, McLennan, Jefferson, Smith, Ellis, Johnson, Comal, Guadalupe, Kaufman, Midland, Parker, Ector, Taylor, Grayson, Wichita, Gregg, Potter, Hunt, Bastrop, Liberty
Below 100,000	Bowie, Angelina, Orange, Henderson, Harrison, Hood, Polk, Cooke

Pairwise Correlations

	Incidence	Mortality	Income	Age
Incidence	1.000	0.787*	-0.0860	0.544*
Mortality	0.787*	1.000	-0.379*	0.421*
	Population	Bachelors	High School	PCPs
Incidence	-0.341*	-0.2730	0.295*	-0.1060
Mortality	-0.330*	-0.437*	0.1050	-0.1050

* denotes statistical significance at a p-value of 0.05

Result/Implications

- Residents of high-income and low-income counties were diagnosed with oropharyngeal cancer at similar incidence rates; however, the mortality rates were higher for low-income county residents (-0.08 incidence, -0.38 mortality).
- Less populated counties had residents with higher rates of both acquisition and fatality due to oropharyngeal cancer (-0.34 incidence, -0.33 mortality).
- Percentage of high school educated adults correlated with higher incidence rates (+0.30 incidence, +0.08 mortality) while percentage of Bachelors degree-educated adults correlated lower rates of incidence and mortality (-0.26 incidence, -0.33 mortality).
- Community-level examination of diagnosis, treatment, and follow-up routine could provide insight to regional differences in prognosis.

References

- Oral Cavity & oropharyngeal cancer key statistics 2021. Oral Cavity & Oropharyngeal Cancer Key Statistics 2021 | American Cancer Society. Accessed August 30, 2023.
- Lairson DR, Wu CF, Chan W, Dahlstrom KR, Tam S, Sturgis EM. Medical Care Cost of Oropharyngeal Cancer among Texas Patients. Cancer Epidemiol Biomarkers Prev. 2017.

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