**INTRODUCTION**

Squamous cell carcinoma (SCC) is the most common cancer to affect the head and neck, and multiple factors are known to contribute to the incidence of this disease, including tobacco use, alcohol use, male sex, older age, African-American race, and oncogenic human papilloma virus (HPV) status. Another factor that has more recently been shown to contribute to head and neck cancer incidence, both in the United States and in Canada, is socioeconomic status (SES). There is also data to support that individuals from a lower SES have poorer overall survival rates and higher rates of developing second primaries. Patients with oropharyngeal cancer who lack insurance or have Medicaid insurance have been shown to present with more advanced stage disease, including larger primary tumors, and more advanced lymph node stages. To our knowledge, this study is the first to correlate geographic location and SES to overall cancer stage.

**METHODS**

We performed a cross-sectional analysis of 2575 patients treated at the University of Mississippi Medical Center between 1991 and 2012. We included patients with squamous cell carcinoma of the nasal cavity, paranasal sinuses, nasopharynx, oral cavity, oropharynx, hypopharynx, and larynx, and excluded patients with unknown primaries, diagnoses other than SCC, and patients with unknown or missing variables. There were significant (p<0.01) Spearman correlations between overall tumor stage and median household income, percent population with less than a 9th grade education, and percent population with yearly income less than $10,000, race of patient, and sex of patient.

**RESULTS**

There were significant (p<0.01) Spearman correlations between overall tumor stage and median household income, percent population with less than a 9th grade education, and percent population with yearly income less than $10,000, race of patient, and sex of patient. As median income increased, tumor stage tended to decrease. As the percentage making less than $10,000 and percentage below 9th grade education increased, tumor stage tended to increase. Controlling for sex and race, African-Americans tended to have more advanced tumors than Caucasians, and males tended to have more advanced tumors than females. African-American males had significantly advanced cancer stages at presentation than all other groups.

**DISCUSSION**

The maps below illustrate the differences in incidence of Stage 1 versus Stage 4 cancer cases by geographic location within the state of Mississippi. The rate of Stage 1 cancers per 100,000 people tends to be higher in ZIP codes with higher population density, while the rate of Stage 4 cancers tends to be higher in ZIP codes with lower population density.

The data and maps presented here illustrate the correlations between the incidence of higher stage tumors and different geographic locations. Patients presenting with advanced stage cancers tend to come from socioeconomically disadvantaged and rural areas, while patients with early stage cancers are more likely to live in urban areas with higher median incomes and a more educated population.

With all factors controlled for, African-American males presented with more advanced cancers than all other groups combined. This group may be particularly vulnerable and future efforts aimed at decreasing or eliminating this disparity should be investigated.

Limitations include the presence of confounding variables such as tobacco, alcohol use, HPV prevalence, and insurance status which were not specifically addressed in this study. This census data is also based on the geographic location in which the patient lives rather than the patient’s own socioeconomic data.

This data may be useful from a public health standpoint and could be used to direct future health care resources to socioeconomically disadvantaged areas in an effort to decrease health disparities.

**CONCLUSIONS**

This study directly correlates overall stage of head and neck cancer patients with socioeconomic status and illustrates that patients with more advanced cancers are more likely to be African-American males and live in economically disadvantaged areas in the state of Mississippi.

**REFERENCES**