

**Introduction**

**Incidence Rates and Disparities**

- Lung cancer (LC) remains the leading cause of cancer-related mortality globally
- It is estimated that 226,650 people (110,680 men and 115,970 women) will be diagnosed and 124,730 will die with lung cancer in 2025 (Siegel et al., 2024; CA Cancer J. Clin. 2025)
- Genome-Wide Association Studies (GWAS) have highlighted ancestral differences in non-small cell lung cancer (NSCLC) risk and survival outcomes exclusive of family history of LC
- African American (AA) men experience higher rates of LC incidence and mortality compared to Caucasian men, whereas AA women experience lower rates compared to Caucasian women
- LC incidence and mortality has significantly declined across all demographic groups in recent decades, though disparities persist

**Risk Factors**

**Family History and Genetic Predisposition**

- While smoking is the primary driver for LC, accounting for approximately 85% of LC deaths, family history and inherited risk alleles are independent risk factors

**Body Mass Index (BMI)**

- Obesity is associated with higher risk and reduced survival probability for certain types of cancer
- However, some studies have shown higher BMI to be favorably associated with increased survival in patients with LC

**Histology**

- NSCLC constitutes 85% of LC cases, with adenocarcinoma (50%) and squamous cell carcinoma (30%) as the primary subtypes
- Adenocarcinoma is the predominant histology in never-smoker LC cases (50–60%) and in familial LC, and it is often associated with better survival, especially in early stages

**Objective and Significance**

The goal of the present study is to compare the epidemiological and clinical data of African American and Caucasian patients with family history of lung cancer, and to assess the effects on survival.

**Methods**

Study participants were recruited from southern Louisiana and Detroit. Patients having at least two family members affected with primary lung cancer were eligible for the study.

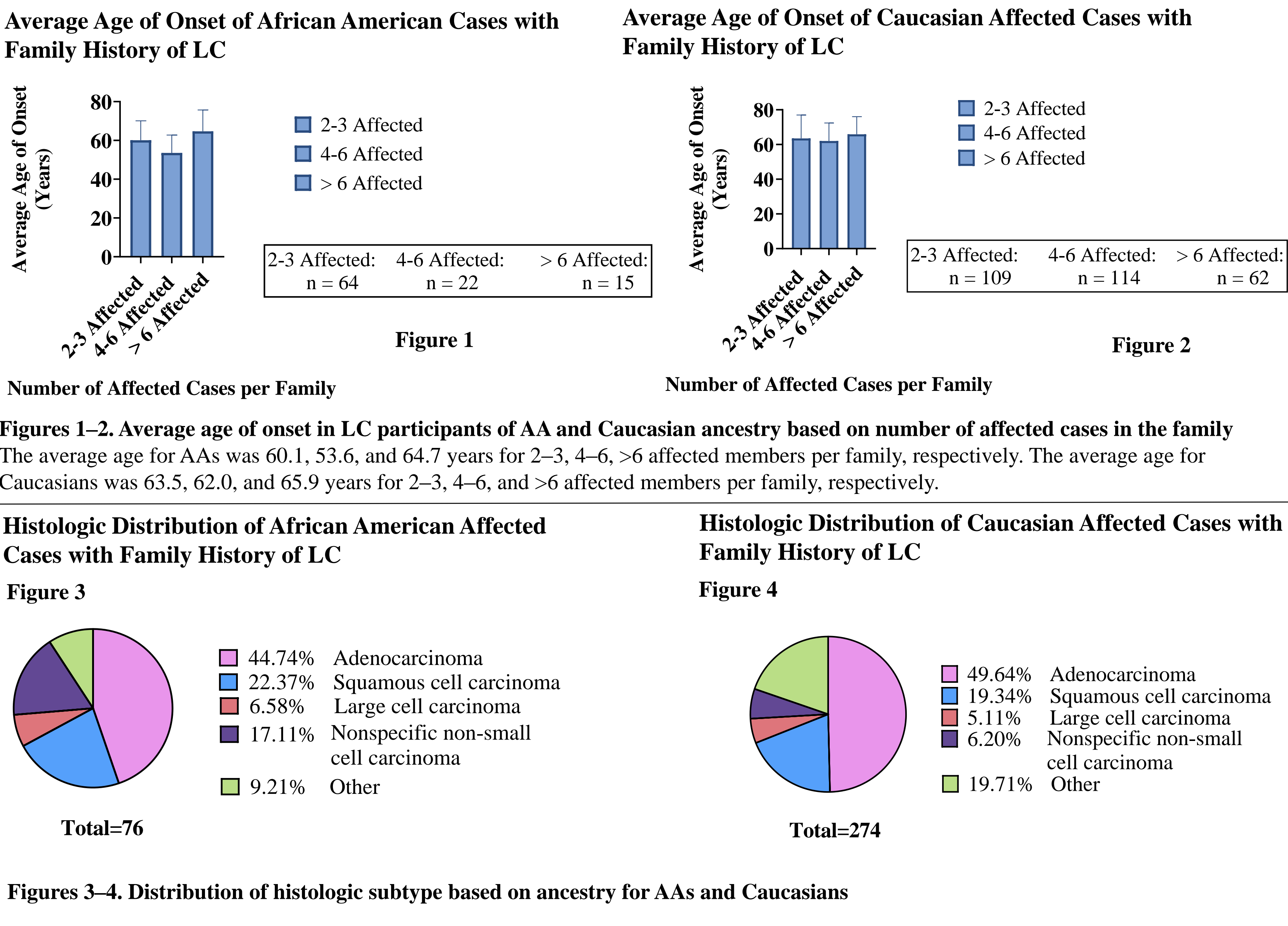
Medical records and pathology reports were used to confirm diagnosis, age of onset, histology, ancestry, sex, smoking history, and BMI. Patient questionnaires were also used.

Data gathered from the medical records, pathology reports, and information supplied by the families were entered into spreadsheets.

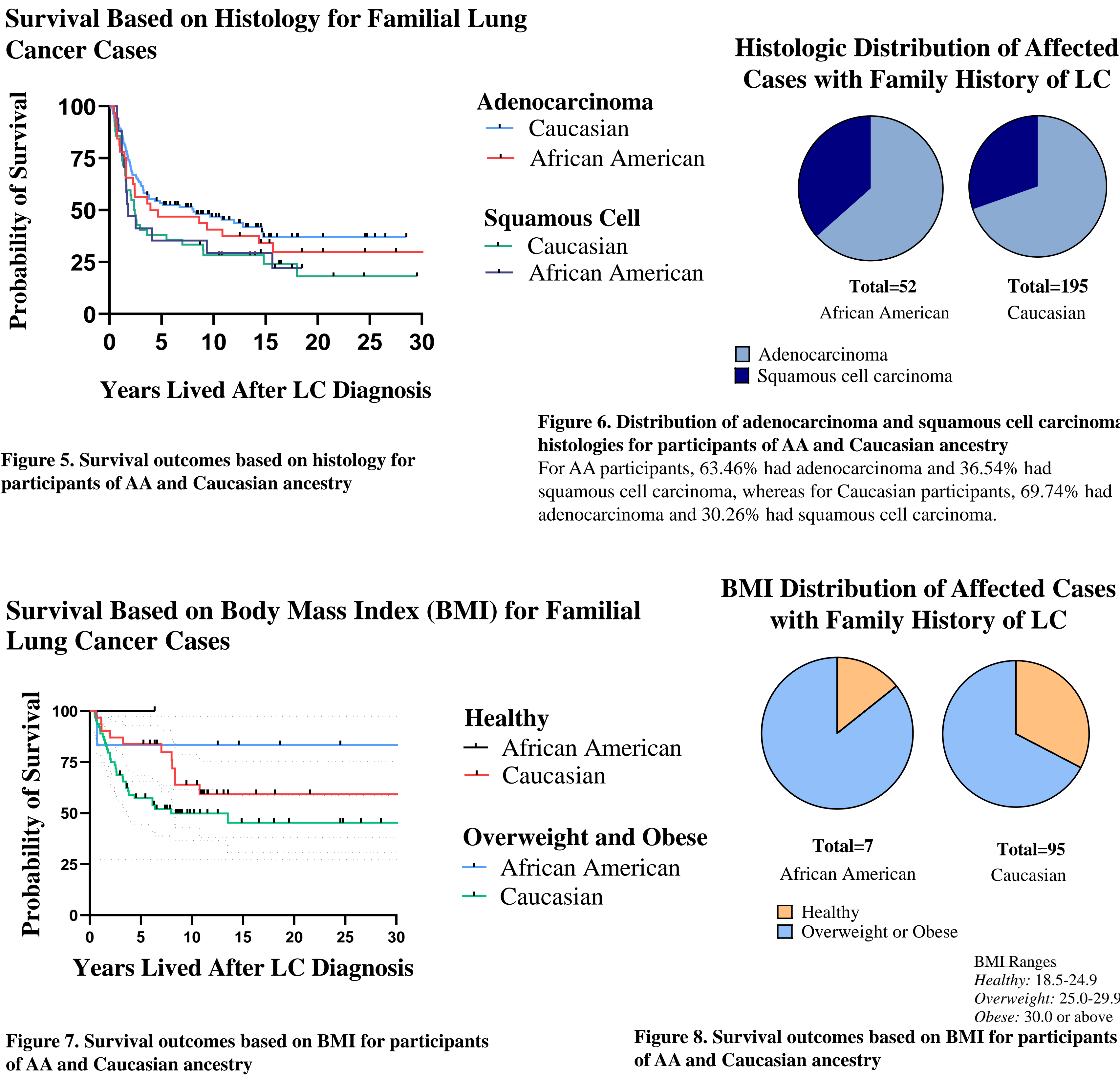
A total of 821 familial LC cases (171 AA and 650 Caucasians) were identified and assessed. Among those 821, age of onset was available for 385 individuals; histologic subtype was available for 350 individuals; BMI was available for 102 individuals; and sex at birth was available for 781 individuals.

Associations between ancestry (AA and Caucasian) and risk factors of interest were analyzed using chi-square tests.

**Results: Family Data**



**Results: Survival Analysis**



**Acknowledgements**

We express our gratitude to the study participants, the collaborating hospitals, the physicians, and the Genetic Epidemiology of Lung Cancer Consortium (GELCC). This work is funded by the NCI/NIH: HHSN268201200007C and 5R01CA243483-05. We also express our gratitude to Dr. Fern Tsien of the Genetics Department for her support.

**Results: Categorical Analysis**

Table 1. Characteristics of the lung cancer patients in this study			
Characteristic	Ancestry		P-Value <sup>b</sup>
	African American	Caucasian	
Sex			
Male	91 (53.85%)	316 (51.63%)	0.00135
Female	78 (46.37%)	296 (48.37%)	
Age of Onset (Years)			
N	101	285	0.064076
Mean ± SD	59.4 ±10.5	63.4 ±11.7	
Range	39–86	21–91	
< 60	52 (51.49%)	95 (33.45%)	
≥ 60	49 (48.51%)	189 (66.55%)	
Smoking Status <sup>c,d</sup>			
Light	5 (8.77%)	17 (12.23%)	0.012226
Moderate	23 (40.35%)	33 (23.74%)	
Heavy	29 (50.88%)	89 (64.03%)	
Histology			
Adenocarcinoma	34 (44.74%)	136 (49.64%)	0.012226
Squamous cell	17 (22.37%)	53 (19.34%)	
Large cell	5 (6.58%)	14 (5.11%)	
Nonspecific non-small cell	13 (17.11%)	17 (6.20%)	
Other <sup>a</sup>	7 (9.21%)	54 (19.71%)	

<sup>a</sup> Inclusive of small cell, oat cell, and other less frequent histological subtypes of LC

<sup>b</sup>  $\chi^2$  test

<sup>c</sup> Number of pack years = [(number of cigarettes smoked per day)(number of years smoked)] ÷ 20

<sup>d</sup> Light smoking: < 20 pack years; moderate smoking: 20 to < 40 pack years; heavy smoking: > 40 pack years

**Discussion and Conclusion**

- African American (AA) familial LC patients had a significantly lower age of onset compared to Caucasians
- Patients with adenocarcinoma exhibited a greater survival rate than patients with squamous cell carcinoma for both ancestral groups
- Caucasian patients with adenocarcinoma showed a noticeably higher survival rate than AAs
- Both overweight–obese AA and Caucasian patients faced a lower probability of survival compared to patients with healthy weight
- Overall, our findings underscore significant racial disparities in the presentation and prognosis of familial LC
- Acknowledging these differences is crucial for developing more targeted screening strategies, improving early detection, and tailoring personalized treatment and surveillance approaches to reduce health disparities in lung cancer care
- The number of AA research participants is limited, and the recruitment of AA LC cases with family history is much needed

**Future Directions:**

- This research highlights the need for continued recruitment of study participants and analysis, particularly concerning ancestry, histological subtypes, and BMI, given the limited data currently available for African Americans with family history of lung cancer