Geo-mapping & Epidemiology of Uterine Cancers in Eastern North Carolina

Aakanksha Gundu[1], Dmitry Tumin, PhD[1], Emmanuel E. Zervos, MD[3], Jhalak Dholakia, MD[2]

Brody School of Medicine[1], Department of Obstetrics & Gynecology[2], Department of Surgery[3], East Carolina University, Greenville, NC

INTRODUCTION, OBJECTIVE, & METHODS

- Uterine cancer incidence is rising annually; type II histology is often diagnosed at an advanced stage and associated with disproportionate morbidity and mortality.
- Eastern NC has a high burden of T2 uterine cancers, with limited gynecologic oncology providers.

Objective
- To characterize individuals diagnosed with type II uterine cancers in eastern NC and identify trends in disease presentation
- To develop a geospatial analysis tool to explore location and social determinants of health-based trends in disease incidence and outcomes

Methods
- A retrospective chart review was performed using the ENC Cancer Registry between 2008-2023. Patients with histology consistent with type II uterine cancers were included.
- Data collected included patient demographics, surgery date, cancer histology, cancer staging, residential location at time of diagnosis, location of diagnosis, and location type
- Cancer was staged using FIGO 2018 guidelines
- Statistical analysis was performed with Microsoft Excel

DEMOGRAPHICS

Category		Frequency (N)	Percentage (%)
Race	Black/African American	238	65
	White	117	32
	Other	10	3
Age	30-39	1	0
	40-49	4	1
	50-59	31	9
	60-69	180	49
	70-79	115	32
	80-89	29	8
	90-99	4	1
Histology	Uterine Serous Carcinoma	199	55
	Carcinosarcoma	127	35
	Clear Cell Carcinoma	38	10
	Mixed Carcinoma	1	0
Stage	1	152	42
	2	40	11
	3	107	30
	4A	11	3
	4B	52	14

DIAGRAMS

Figure 1: Patient Distribution by Race

All Other 3%
White 32%
Black or African American 65%
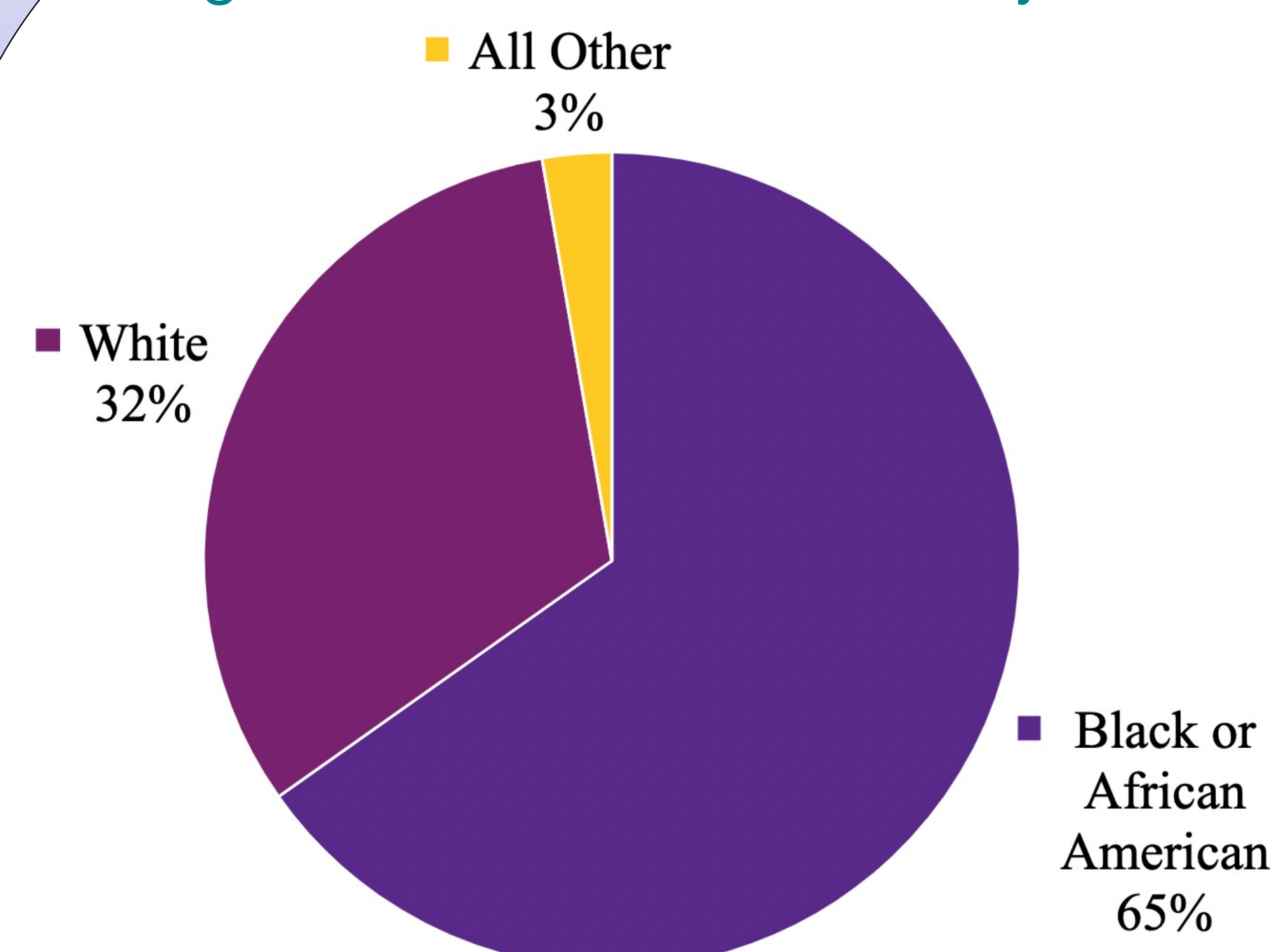
Figure 2: Age at Diagnosis

Number of Patients vs Age Range
[30-39]: 1, [39-49]: 4, (49-59]: 31, (59-69]: 180, (69-79]: 115, (79-89]: 29, (89-99]: 4
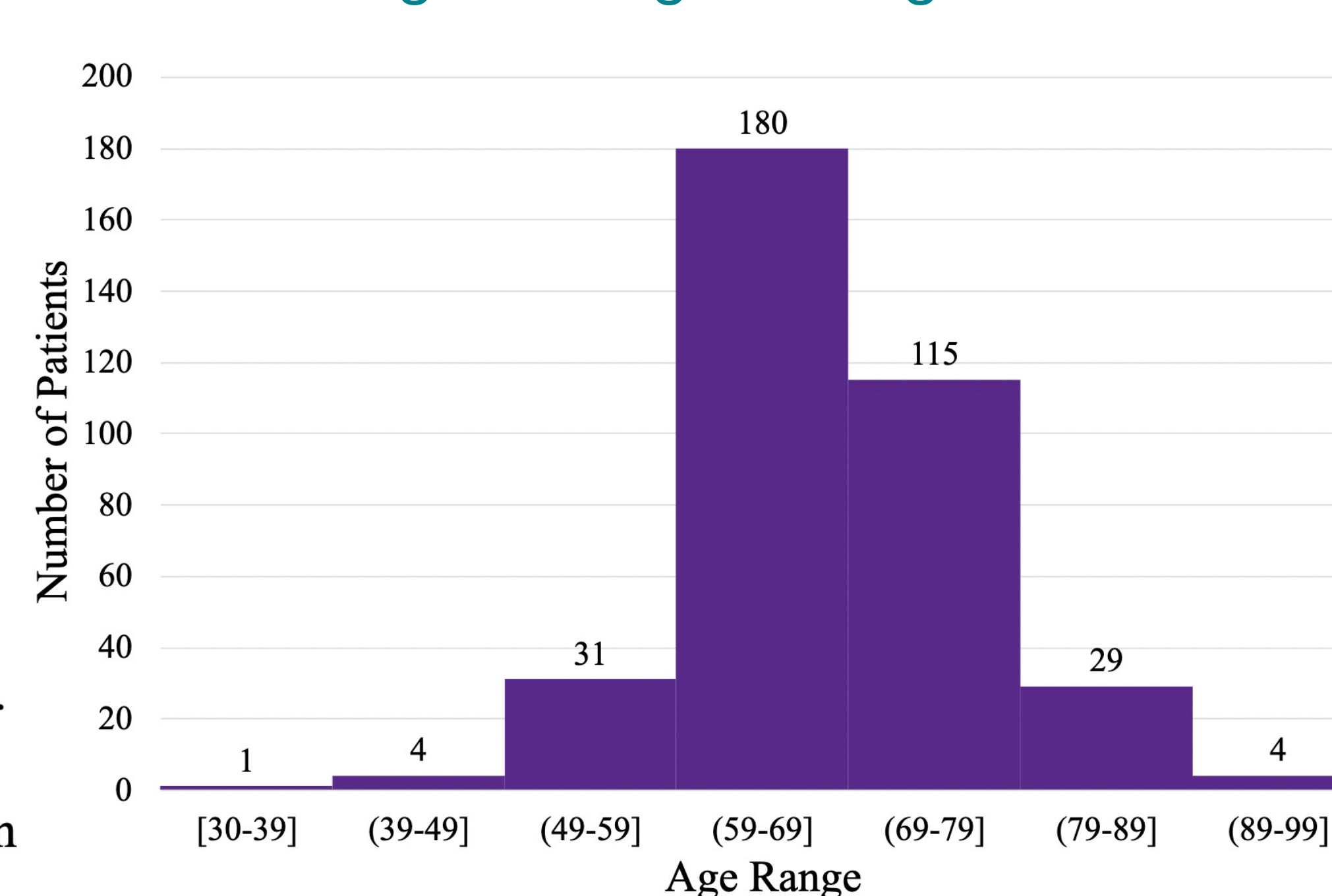
Figure 3: Cancer Stage at Diagnosis (FIGO 2018 Criteria)

Stage 1 42%
Stage 2 11%
Stage 3 30%
Stage 4A 3%
Stage 4B 14%
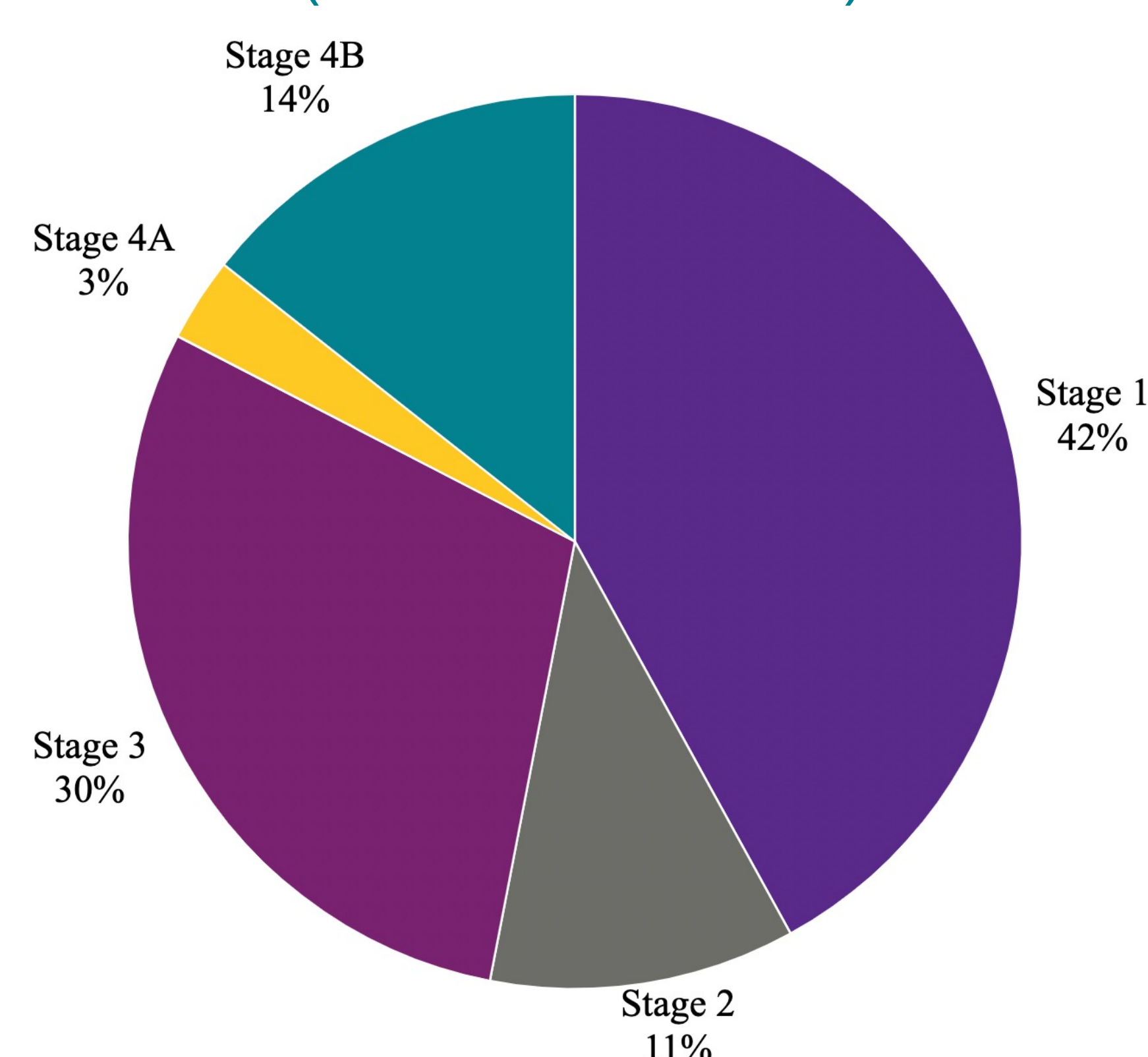
Figure 4: Cancer Histology Distribution

Mixed Carcinoma (Serous and Clear Cell) 0%
Clear Cell Carcinoma 10%
Carcinosarcoma 35%
Uterine Serous Carcinoma 55%
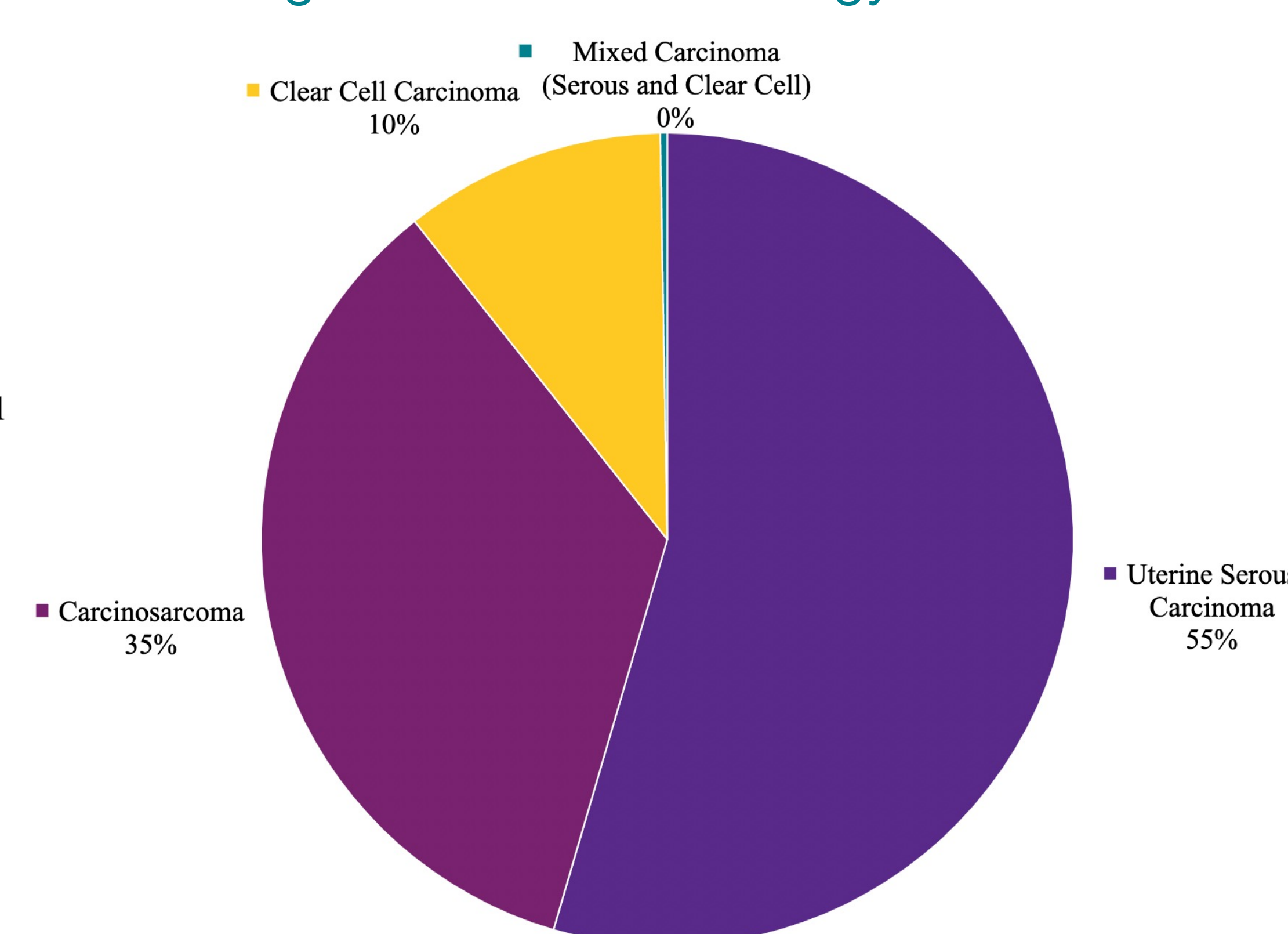
Figure 5: Incidence of Type II Uterine Cancers 2008-2023

Number of Diagnoses vs Year:
2008: 12, 2009: 12, 2010: 10, 2011: 11, 2012: 13, 2013: 21, 2014: 16, 2015: 14, 2016: 16, 2017: 30, 2018: 25, 2019: 27, 2020: 36, 2021: 44, 2022: 30, 2023: 45
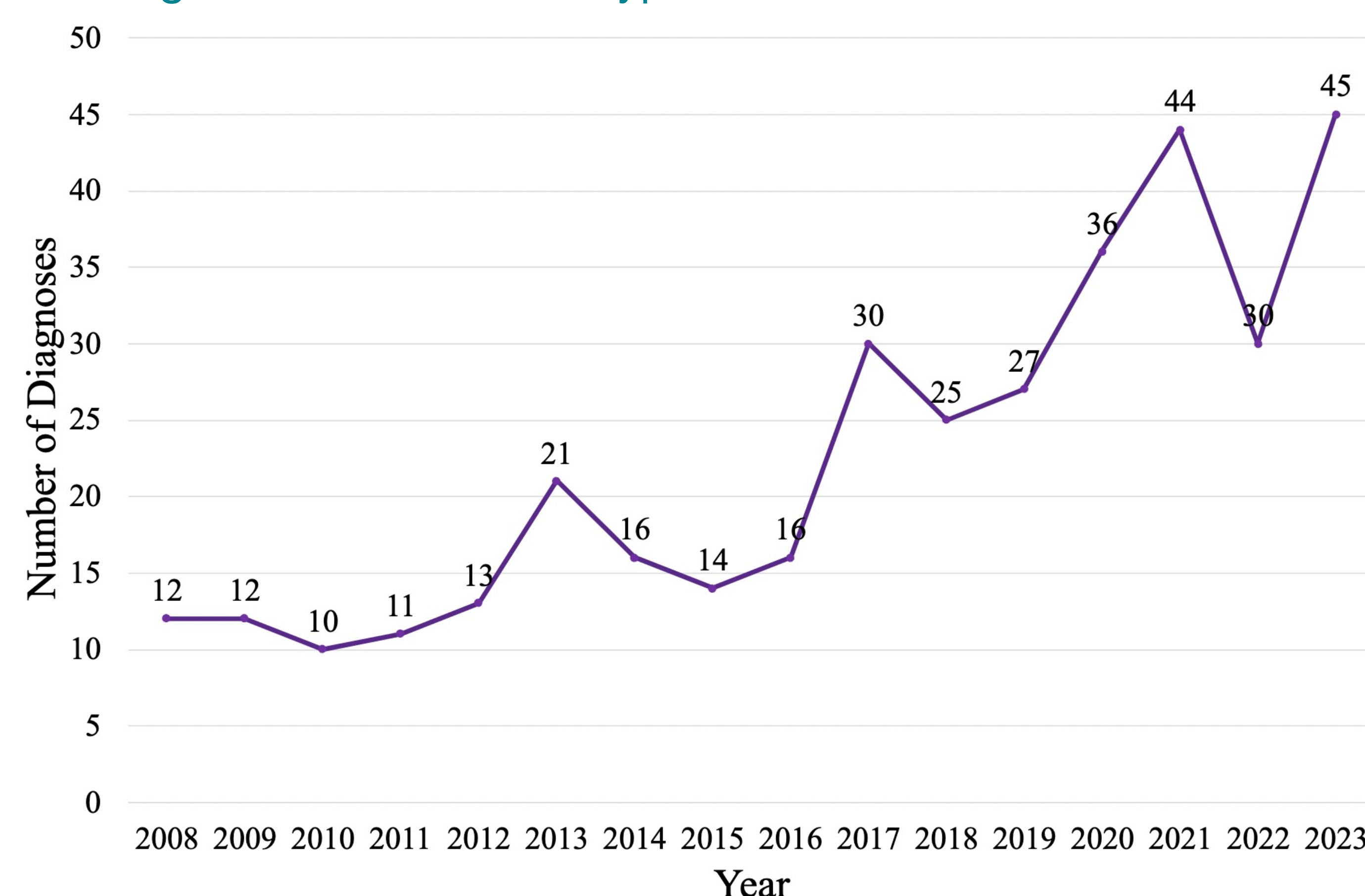
RESULTS & DEMOGRAPHICS

- N=364 patients included in data analysis
- The majority of patients diagnosed with type 2 uterine cancers were Black and 60 years of age or older.
- Most patients were diagnosed at stage 1 (42%) or stage 3 (30%). Two patients were unstaged.
- Uterine serous carcinoma was the most prevalent (55%) histology in the cohort.
- From 2008 to 2023, the annual incidence rate of uterine cancers increased in eastern NC, with almost a 4-fold increase over the timespan.

FUTURE DIRECTIONS

- Preliminary results have been accepted by the Society of Pelvic Surgeons for oral presentation

Next Steps
- Conduct geospatial analysis with Clinical Informatics to determine potential hotspots of type II uterine cancer incidence in ENC
  - Variables: patient residential location at time of diagnosis, location of diagnosis, location type, distance from nearest hospital, OBGYN, and gynecologic oncologist
- Assess the impact of distance traveled and availability of local healthcare resources on stage at diagnosis, treatment received, and survival
- Investigate social determinants of health that may be associated with these trends.
  - Identify potential modifiable influences to improve patient factors and system factors regarding diagnosis and treatment

REFERENCES

- Setiawan, Veronica Wendy, et al. "Type I and II endometrial cancers: have they different risk factors?." Journal of Clinical Oncology 31.20 (2013): 2607-2618.
- Zahnd, Whitney E., et al. "Rural–urban differences in surgical treatment, regional lymph node examination, and survival in endometrial cancer patients." Cancer causes & control 29 (2018): 221-232.