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Describing the prevalence and unique demographic and clinicopathologic features of HPV-negative cervical cancer

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Presenter Information

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Introduction

- Cervical cancer is one of the most common gynecologic cancers in the world and is the second leading cause of cancer death in women between the ages of 20 to 39, killing over 4,000 people in the United States in 2020. [1,2]

- The association between human papillomavirus (HPV) and cervical malignancy is well-documented and understood, which has led to tremendous pharmaceutical and public health advancements.

- While historically all cervical cancer was believed to be secondary to HPV infection, the consensus among researchers today is that cervical malignancies can exist independent of HPV.

- Although often pathologically distinct from the classical HPV-positive type, HPV-negative cervical cancer remains less understood and is associated with poorer prognoses.[3]
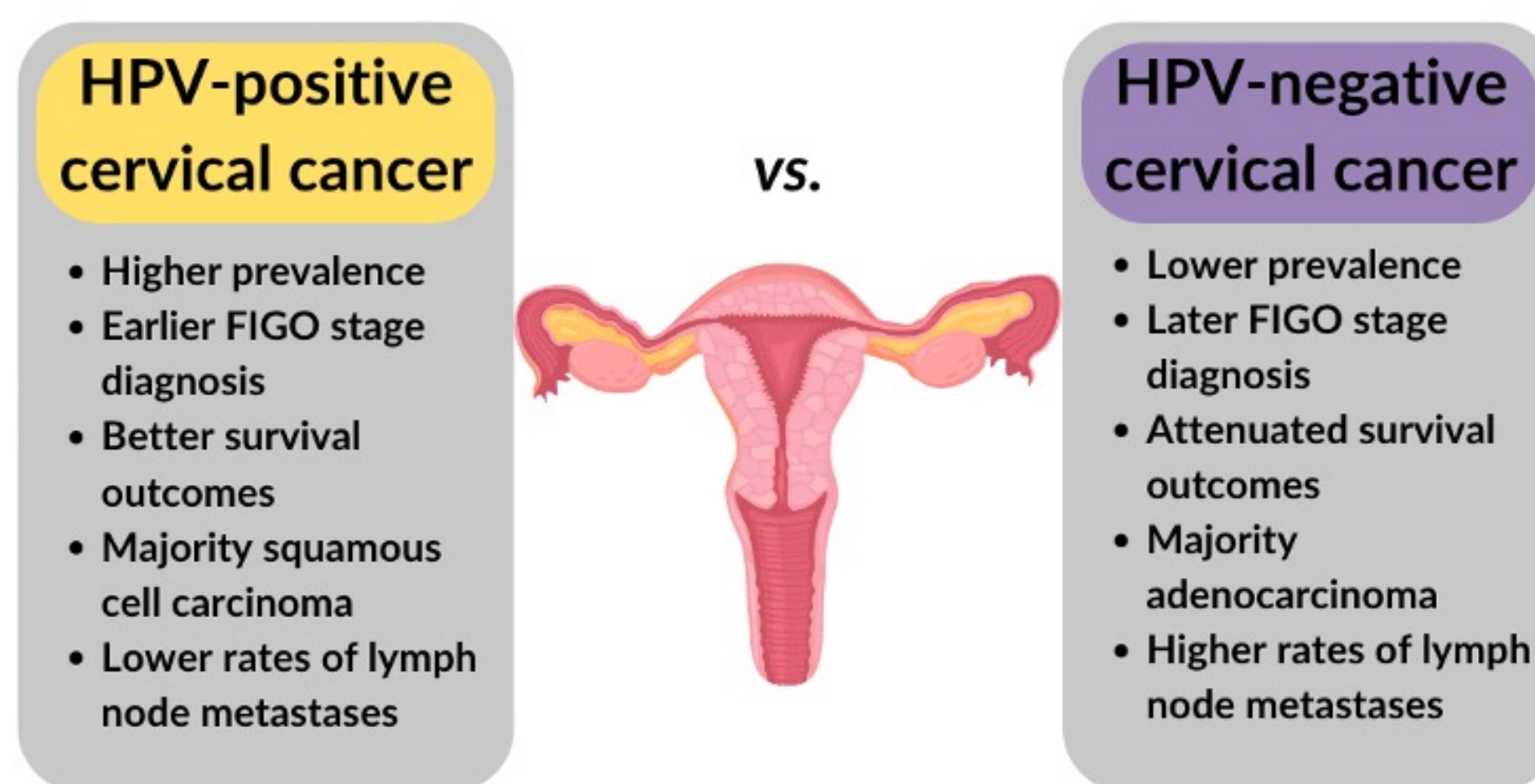

Figure 1. Major differences between HPV-positive and HPV-negative cervical cancer include prevalence, FIGO stage at time of diagnosis, survival outcomes, histopathology, and rates of lymph node metastases.

Methods

- A retrospective chart review of patients treated for cervical cancer at University Medical Center between January 1, 2015 and December 31, 2020 was conducted.
- HPV status was determined by HPV testing within 6 months of histologic diagnosis. HPV-CC was defined as a negative HPV test and HPV+CC was defined as a positive HPV test.
- Demographic, clinical, and cancer diagnosis and treatment details were recorded. Categorical variables were summarized with HPV groups by reporting counts and percentages, while continuous variables were summarized by reporting means and standard deviations.
- Fisher exact tests were used to compare categorical variable distributions across HPV groups, while Wilcoxon-Rank Sum tests were used to compare continuous variables. P-values <0.05 were considered statistically significant. All analyses were conducted in R statistical software version 4.0.2.
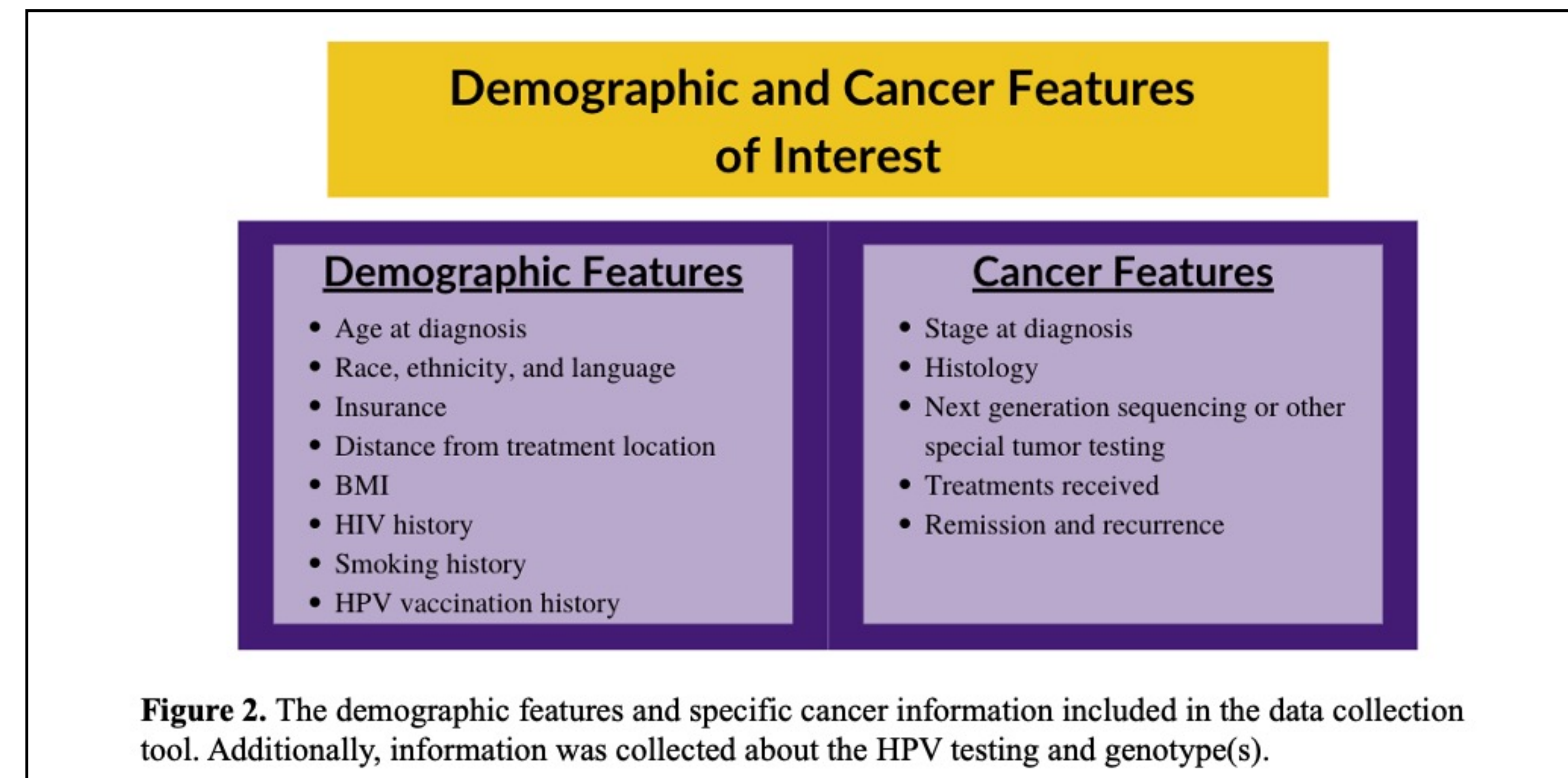
Methods

Figure 2. The demographic features and specific cancer information included in the data collection tool. Additionally, information was collected about the HPV testing and genotype(s).

Results

Preliminary data was collected from 101 cases of cervical cancer. Of the 101 cases reviewed, 29 (28.7%) had HPV testing performed within 6 months of their primary cervical cancer diagnosis. Twenty-two (75.9%) had a positive HPV test and 7 (24.1%) had a negative HPV test. The most common HPV test modality was Roche Cobas (n=14).

HPV subtypes were not specified for 7 patients, but notable for HPV 16 (n=9), non-16/18 high risk (n=9), HPV 18 (n=6), and HPV45 (n=1). Of the 29 patients with HPV test results within 6 months of diagnosis, 10 (34.5%) were stage I, 12 (41.4%) stage II, 3 (10.3%) stage III, 2 (6.9%) stage IV, and 2 (6.9%) stage unknown. Twenty-two (75.8%) were squamous cell carcinoma, 5 (17.2%) were adenocarcinoma, and 2 (6.9%) were other histology. Most (81.8%) of stage I-II cases were HPV+CC, while only 40.0% of Stage III-IV cases were HPV+CC (p = 0.091).
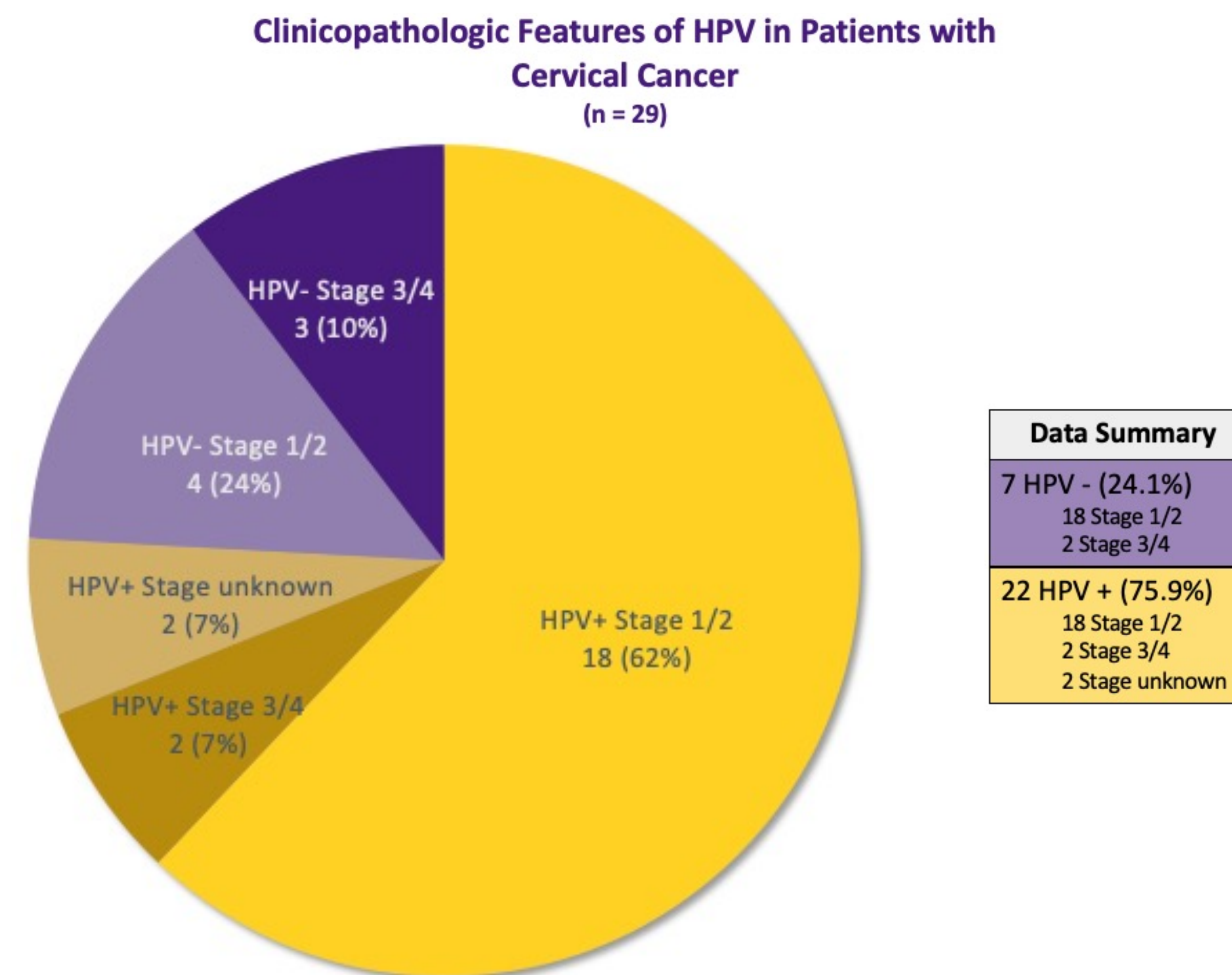

Figure 3. Of 101 cervical cancer cases reviewed, 29 (28.7%) had HPV testing performed within 6 months of their primary cervical cancer diagnosis. Twenty-two (75.9%) had a positive HPV test and 7 (24.1%) had a negative HPV test. Of the 29 patients with HPV test results within 6 months of diagnosis, 10 (34.5%) were stage I, 12 (41.4%) stage II, 3 (10.3%) stage III, 2 (6.9%) stage IV and 2 (6.9%) stage unknown.
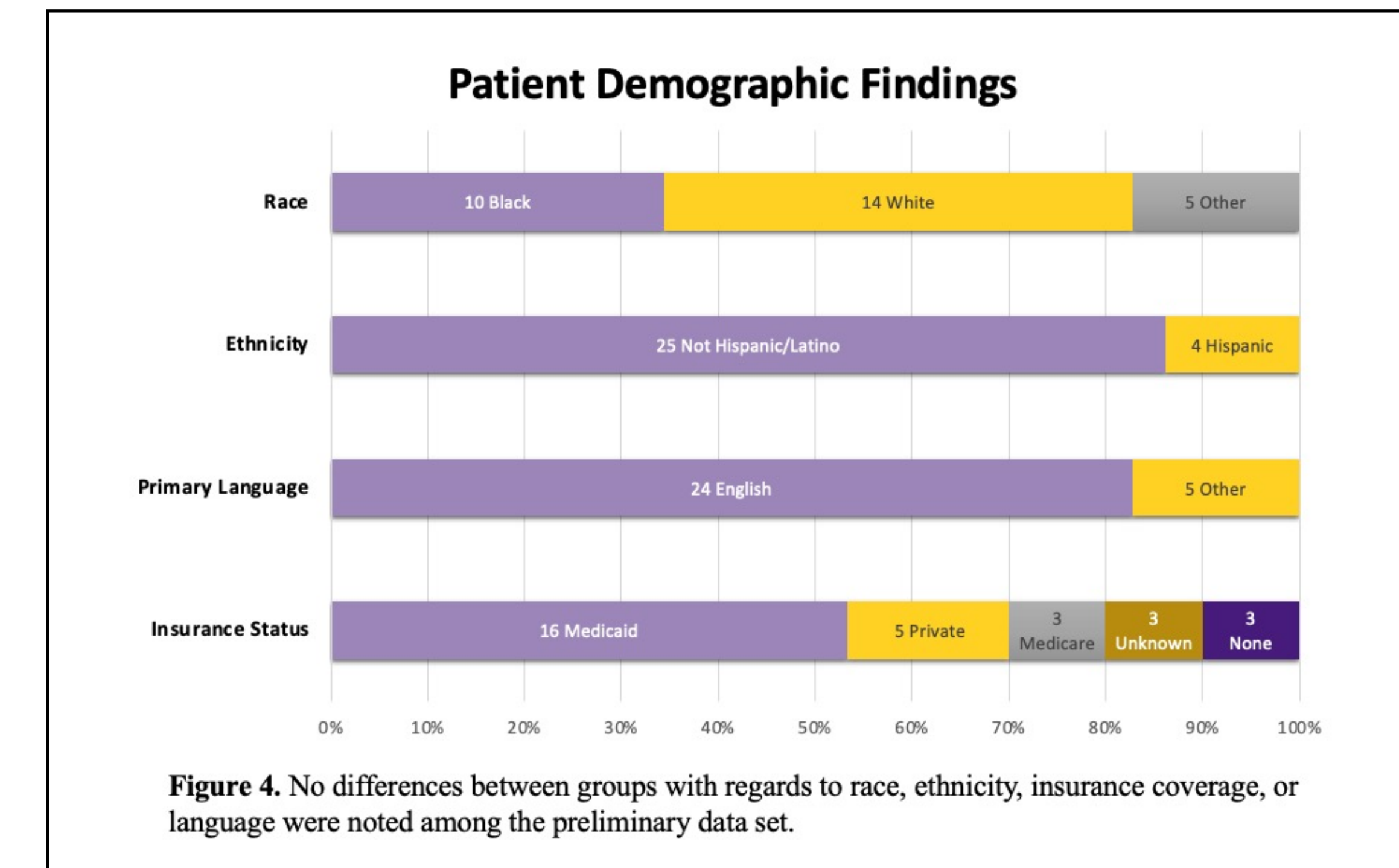
Results

Figure 4. No differences between groups with regards to race, ethnicity, insurance coverage, or language were noted among the preliminary data set.

Conclusion

One quarter of our cervical cancers are HPV-negative, which is higher than the previously reported 5-10%.[4] Furthermore, we note a trend in our preliminary data set concerning a more advanced stage presentation with HPV-negative cancer. While consistent with past literature, collecting more data about the specific features of these late-stage cancers may offer some explanation for this phenomenon. Contemporary HPV based screening practices might be missing aggressive cervical cancers and may need to be re-evaluated.

Although no significant trends have been noted among patient demographics, comparing lifestyle factors and medical histories of HPV-positive and HPV-negative patients may yet provide insight into risk factors for cervical cancer and if or how they differ among the two pathologies. The American Cancer Society reports that Louisiana has one of the highest incidence rates of cervical cancer in the country.[2] Therefore, describing the prevalence and clinicopathologic features of HPV negative cervical cancer at large and locally will be vital to ensuring that our screening and treatment practices match the needs of the women in our community.

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