# No racial disparities in stage at diagnosis – Is Nevada doing better for Cervical Cancer?

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## Abstract

Cervical cancer (CC) is one of the most preventable cancers as a consequence of screening and early detection. Nonetheless, disparities in access to CC screening may result in a higher proportion of advanced stage at diagnosis and unfavorable prognosis in some minority groups. This study aims to assess if racial differences exist in CC stage at diagnosis among Black Nevadan females compared to Whites.

We identified 1,334 women who were diagnosed with CC between 1995 and 2008 from the Nevada Central Cancer Registry data. After adjustment for patient demographic and clinical characteristics, Blacks were not significantly more likely to be diagnosed at an advanced stage of cervical cancer than White women in Nevada.

From the social justice stand point, this is a positive result; however, our findings suggest unfavorable patterns of early detection among White Nevadan females, rather than a favorable pattern for Black Nevadans.

## Introduction

Cervical cancer is one of the most preventable cancers, yet it was estimated that 12,170 new cases of invasive CC were diagnosed and that 4,220 women died of the disease in the U.S. in 2012.

Cervical cancer incidence and mortality have been declining by 2% per year from 2000 to 2009. This decline is largely attributed to screening with Papanicolaou (Pap) test, which detects precancerous lesions. Moreover, the introduction of the HPV vaccine may further contribute to a fall in CC incidence in the future.

Stage at diagnosis is used to guide primary or adjuvant treatment choices and to evaluate treatment results. It is, therefore, a major predictor of cervical cancer prognosis. Regional and distant stages have the poorest outcomes in terms of survival.

Given the known higher incidence of cervical cancer in minority groups (Blacks and Hispanics) in Nevada, the aim of this study is to assess whether racial disparities exist in terms of cervical cancer stage at diagnosis between Black and White females in the Silver state.

## Methods

❖The study population consisted of 1,334 women diagnosed in 1995- 2008, identified through the Nevada Central Cancer Registry (NCCR) (figure 1).

❖Frequencies of the characteristics distribution were examined by race/ethnicity.

❖Multiple logistic regression modeling was used to examine the odds of being diagnosed with CC at an advanced (regional & distant) vs. localized stage [SEER definition] controlling for age, diagnosis period, marital status, insurance status at diagnosis, social economic status (SES), and histology.

❖We conducted a side analysis to compare Nevada patterns in relation to racial disparities in CC stage at diagnosis to the rest of the nation. For this purpose we used data from the Surveillance, Epidemiology and End Results (SEER) 18 areas from 2007-2010. We used the same variables as in the NV analysis (except for SES). The outcome variable was advanced vs. localized stage at diagnosis adjusted for age, marital status, and the newly added insurance variable; period of diagnosis; histology; in addition to SEER registry (N= 9,263).

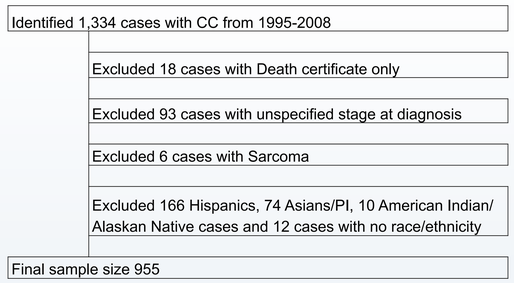


**Figure 1. Construction of the final sample NV 1995-2008**

## Results

Black Nevadan females were more likely to be diagnosed with cervical cancer at an early age, to be single at diagnosis, to be of low social economic status, and to be insured through Medicaid compared to Whites. In terms of stage at diagnosis, Blacks were more likely to present at an advanced stage (14.4%) compared to Whites (11.1%) (Table 1).

After adjustment for clinical and socio-demographic characteristics in the multivariate logistic regression, we were not able to ascertain racial disparities in terms of CC stage at diagnosis in Nevadan Black females compared to Whites (Table 2). Although not statistically significant, Blacks showed somewhat favorable outcomes, that is, they were less likely to be diagnosed at an advanced stage than Whites.

From the SEER 18 analysis, we found opposing results. Blacks were 13% more likely to be diagnosed at an advanced stage than Whites [aOR=1.129; 95% CI, 1.000-1.275].

## Results

**Table 1. Cervical Cancer Patients' Demographic and Clinical Characteristics by Race/Ethnicity**

| Characteristics | Total | | Whites | | Blacks | | P** |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| **Total** | 1054 | | 964 | 91.46 | 90 | 8.5 | |
| **Age at Diagnosis** | | | | | | | 0.333 |
| **15-44** | 421 | 39.9% | 384 | 39.8% | 37 | 41.1% | |
| **45-54** | 232 | 22.0% | 207 | 21.5% | 25 | 27.8% | |
| **55-64** | 196 | 18.6% | 179 | 18.6% | 17 | 18.9% | |
| **65-74** | 119 | 11.3% | 112 | 11.6% | 7 | 7.8% | |
| **75+** | 86 | 8.2% | 82 | 8.5% | 4 | 4.4% | |
| **Diagnosis Period** | | | | | | | 0.010 |
| **1995-1999** | 349 | 33.1% | 330 | 34.2% | 19 | 21.1% | |
| **2000-2004** | 388 | 36.8% | 355 | 36.8% | 33 | 36.7% | |
| **2005-2008** | 317 | 30.1% | 279 | 28.9% | 38 | 42.2% | |
| **Insurance Status at Diagnosis** | | | | | | | 0.067 |
| **Private** | 473 | 44.9% | 436 | 45.2% | 37 | 41.1% | |
| **Uninsured** | 99 | 9.4% | 90 | 9.3% | 9 | 10.0% | |
| **Medicaid** | 80 | 7.6% | 67 | 7.0% | 13 | 14.4% | |
| **Medicare*** | 19 | 1.8% | 19 | 2.0% | 0 | 0.0% | |
| **Unknown** | 383 | 36.3% | 352 | 36.5% | 31 | 34.4% | |
| **Histology** | | | | | | | <0.001 |
| **SCC** | 717 | 68.5% | 649 | 67.9% | 68 | 75.6% | |
| **ADK** | 185 | 17.7% | 178 | 18.6% | 7 | 7.8% | |
| **Adenosquamous** | 30 | 2.9% | 30 | 3.1% | 0 | 0.0% | |
| **Carcinomas** | 92 | 8.8% | 81 | 8.5% | 11 | 12.2% | |
| **Others** | 22 | 2.1% | 18 | 1.9% | 4 | 4.4% | |
| **Marital status at Diagnosis** | | | | | | | 0.001 |
| **Married** | 458 | 43.5% | 432 | 44.8% | 26 | 28.9% | |
| **Single** | 235 | 22.3% | 198 | 20.5% | 37 | 41.1% | |
| **Separated/ Divorced** | 169 | 16.0% | 158 | 16.4% | 11 | 12.2% | |
| **Widowed** | 113 | 10.7% | 104 | 10.8% | 9 | 10.0% | |
| **Unknown** | 79 | 7.5% | 72 | 7.5% | 7 | 7.8% | |
| **SES (ecological)** | | | | | | | <0.001 |
| **High** | 142 | 13.5% | 135 | 14.0% | 7 | 7.8% | |
| **Low** | 588 | 55.8% | 516 | 53.5% | 72 | 80.0% | |
| **Middle** | 308 | 29.2% | 298 | 30.9% | 10 | 11.1% | |
| **Unknown** | 16 | 1.5% | 15 | 1.6% | 1 | 1.1% | |
| **Stage at Diagnosis** | | | | | | | 0.859 |
| **Localized** | 499 | 47.3% | 458 | 47.5% | 41 | 45.6% | |
| **Regional** | 340 | 32.3% | 312 | 32.4% | 28 | 31.1% | |
| **Distant** | 122 | 11.6% | 109 | 11.3% | 13 | 14.4% | |
| **Unspecified** | 93 | 8.8% | 85 | 8.8% | 8 | 8.9% | |

*Medicare without private support
**P value based on likelihood ratio chi-square

**Table 2. The determinants of stage at diagnosis in Nevadan females**

| Patient Characteristics | aOR* | 95% CI** | |
|---|---|---|---|
| | | Lower | Upper |
| **Age at Diagnosis** | | | |
| 15-44 | 1 | | |
| 45-54 | 1.83 | 1.28 | 2.62 |
| 55-64 | 2.85 | 1.95 | 4.16 |
| 65-74 | 3.53 | 2.21 | 5.63 |
| 75+ | 4.13 | 2.24 | 7.61 |
| **Diagnosis Period** | | | |
| 1995-1999 | 1 | | |
| 2000-2004 | 0.74 | 0.53 | 1.04 |
| 2005-2008 | 1.19 | 0.82 | 1.73 |
| **Histology** | | | |
| SSC | 1 | | |
| ADK | 0.38 | 0.26 | 0.55 |
| Adenosquamous | 1.42 | 0.63 | 3.22 |
| Carcinomas | 1.28 | 0.71 | 2.31 |
| Others | 2.71 | 0.99 | 7.41 |
| **Insurance** | | | |
| Private | 1 | | |
| Uninsured | 1.86 | 1.13 | 3.05 |
| Medicaid | 2.89 | 1.68 | 4.99 |
| Medicare | 0.48 | 0.15 | 1.49 |
| Unknown | 0.88 | 0.63 | 1.23 |
| **Race/Ethnicity** | | | |
| Whites | 1 | | |
| Blacks | 0.93 | 0.58 | 1.51 |

*aOR: adjusted odds ratio
** CI: confidence interval
SES and marital status were not statistically significant at a 0.5 significance level
SSC: squamous cell carcinoma, ADK: Adenocarcinoma.

## Discussion

Assessment of disparities in cervical cancer stage at diagnosis in Nevada showed lack of significant differences between Blacks and Whites. In contrast, Black women in SEER geographic areas were more likely to present with advanced stage CC compared to their White counterparts.

Given the unique demographic composition of the Silver State population in terms of diversity and proportion of minority groups, a new research question emerges: **does the lack of racial disparities reflect (1) progress in public health (positive finding) or (2) an unfavorable pattern of early detection among Whites in Nevada (negative finding)?**

In Nevada, Non-Hispanic Whites represent over half of the population followed by Hispanics (26.5%), Blacks (7.7%), and other minority groups. The comprehensive 2012 report "Cancer in Nevada" found that White women in Nevada were unfavorably afflicted by cancer in general, with low survival and later stage at diagnosis for more common cancers compared to White females from other states.

Results of our study reinforce the finding that White females in Nevada have poorer levels of prevention and early detection of most common cancers, particularly, cervical cancer. For instance, the prevalence of Pap test screening in White Nevadan females was estimated to 78.7%; which is moderately lower compared to the national average of White females (81.9%) and substantially below the Healthy People 2020 national target of 97.0%.

## Conclusion

Findings from this study are of special interest to public health officials and clinicians in the Silver state. Lack of racial disparities in this context suggests unfavorable patterns of early cervical cancer detection among Whites.

There is a clear need to target early detection and prevention intervention efforts with additional focus on White Nevadan residents.

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