

RUTGERS

Cancer Institute  
of New Jersey

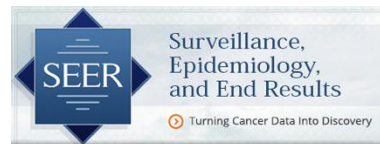


# Overview of Gynecologic Cancers in New Jersey

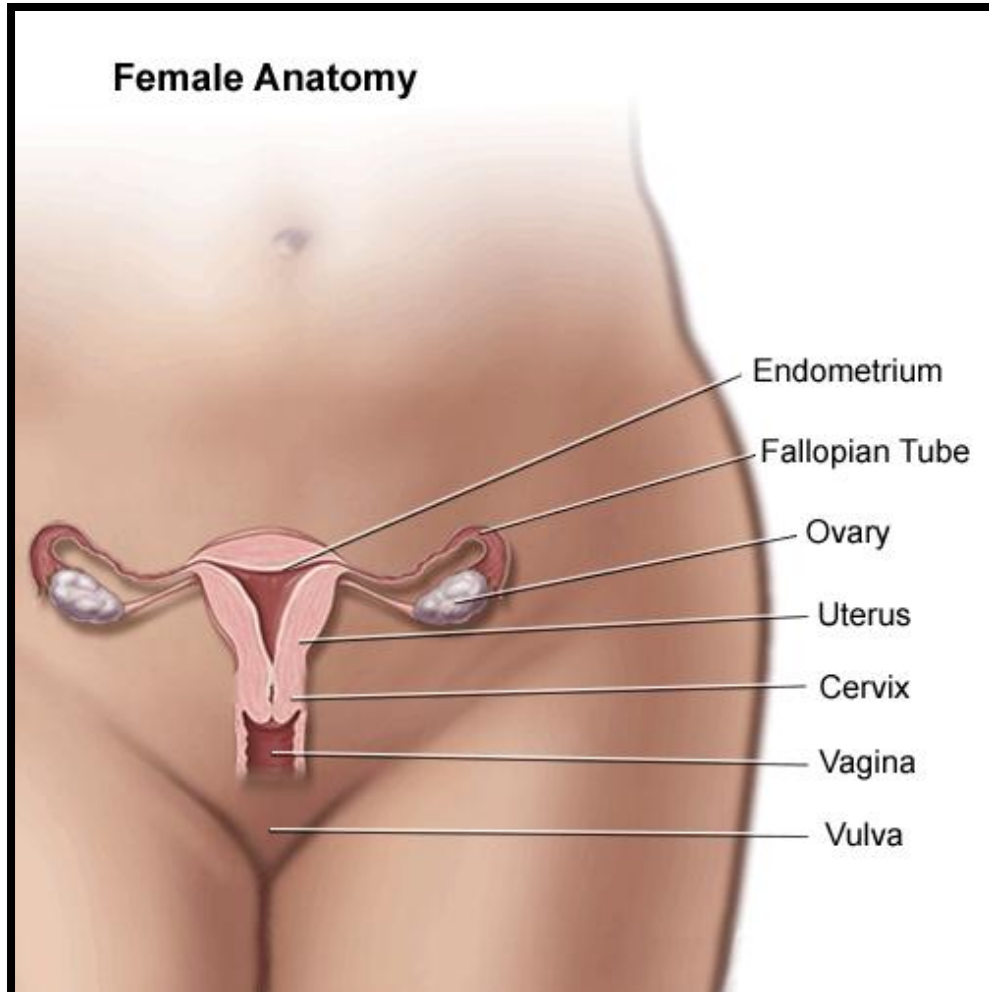
## New Jersey State Cancer Registry

Antoinette M. Stroup, PhD *presented at:*

Gynecologic Cancer Symposium: Striving for a Healthier Tomorrow, Today  
November 19, 2015 West Windsor Township, NJ



# Gynecologic Cancers



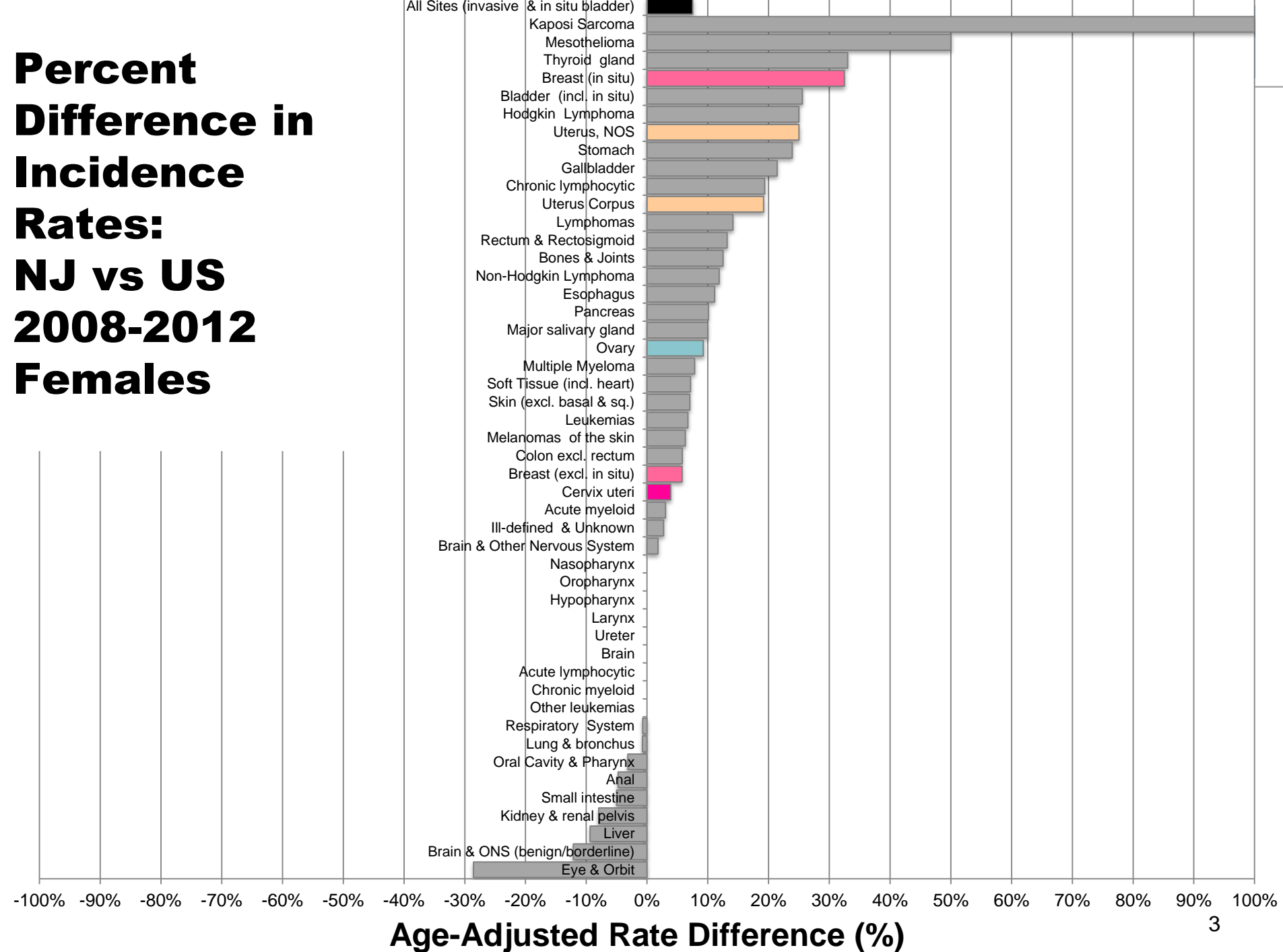
- Cancers of the female genital system
- 90,303 newly diagnosed in the U.S. in 2012 <sup>1</sup>
- 12% of all female cancers
- Age-Adjusted Rate: 48.5/100,000 women (95% CI 48.8-49.1) <sup>1</sup>
- Estimated >98,000 by 2015 <sup>2</sup>

<sup>1</sup> Data Source: United States Cancer Statistics (USCS)  
[www.cdc.gov/uscs](http://www.cdc.gov/uscs)

<sup>2</sup> Data Source: American Cancer Society, Cancer Facts and Figures 2015,  
<http://www.cancer.org/acs/groups/content/@editorial/documents/document/acspc-044552.pdf>

<http://montana.providence.org/layouts/modules/StayWell/Default/GelImage.aspx?imageId=161349>

# Percent Difference in Incidence Rates: NJ vs US 2008-2012 Females





## NEW CASES DIAGNOSED AMONG WOMEN – 2012 US & NJ

Type	US Counts <sup>1</sup>	US Rates <sup>1</sup> (95% CI)	NJ Counts <sup>3</sup>	NJ Rates <sup>3</sup> (95% CI)
All Cancers	761,712	411.7 (410.7-412.6)	24,611	<b>444.9</b> <b>(439.2-450.6)</b>
All Female Genital	90,303	48.8 (48.5-49.1)	3,055	<b>54.7</b> <b>(52.8-56.7)</b>
Cervical	12,042	7.4 (7.2-7.5)	356	7.1 (6.3-7.9)
Ovarian	20,785	11.3 (11.1-11.4)	674	12.1 (11.2-13.1)
Corpus Uteri	47,570	24.9 (24.6-25.1)	1,699	<b>29.8</b> <b>(28.4-31.3)</b>
Uterus NOS	1,584	0.8 (0.8-0.9)	65	1.1 (0.8-1.4)
Vaginal	1,296	0.7 (0.7-0.7)	48	0.9 (0.6-1.2)
Vulvar	4,851	2.6 (2.5-2.7)	154	2.7 (2.3-3.2)

**Est. 2015: 410<sup>2</sup>**

**Est. 2015: 1,850<sup>2</sup>**

Rates are age-adjusted using 2000 US Standard Population, CI=Confidence Interval

<sup>1</sup> Data Source: USCS [www.cdc.gov/uscs](http://www.cdc.gov/uscs)

<sup>3</sup> Data Source: <http://www.cancer-rates.info/nj/>



### CANCER DEATHS AMONG WOMEN – 2011 US\* & NJ

Type	US Counts <sup>1</sup>	US Rates <sup>1</sup> (95% CI)	NJ Counts <sup>3</sup>	NJ Rates <sup>3</sup> (95% CI)
All Cancers	274,457	143.5 (142.9-144.0)	8,462	146.2 (143.1-149.4)
All Female Genital	29,027	15.3 (15.2-15.5)	988	<b>17.3</b> <b>(16.2-18.5)</b>
Cervical	4,092	2.3 (2.3-2.4)	137	2.6 (2.2-3.1)
Ovarian	14,346	7.5 (7.4-7.7)	483	8.4 (7.6-9.2)
Corpus Uteri	3,714	1.9 (1.9-2.0)	125	2.2 (1.8-2.6)
Uterus NOS	4,927	2.6 (2.5-2.6)	182	<b>3.2</b> <b>(2.7-3.7)</b>
Vaginal	428	0.2 (0.2-0.2)	10	0.2 (0.1-0.3)
Vulvar	1,022	0.5 (0.5-0.6)	27	0.4 (0.3-0.6)

Rates are age-adjusted using 2000 US Standard Population, CI=Confidence Interval

1 Data Source: USCS [www.cdc.gov/uscs](http://www.cdc.gov/uscs)

3 Data Source: <http://www.cancer-rates.info/nj/>

\*2012 NJ mortality data not yet available as of 11/15/15. 2012 US mortality similar to 2011.

# Geographic Disparities in NJ: 2008-2012

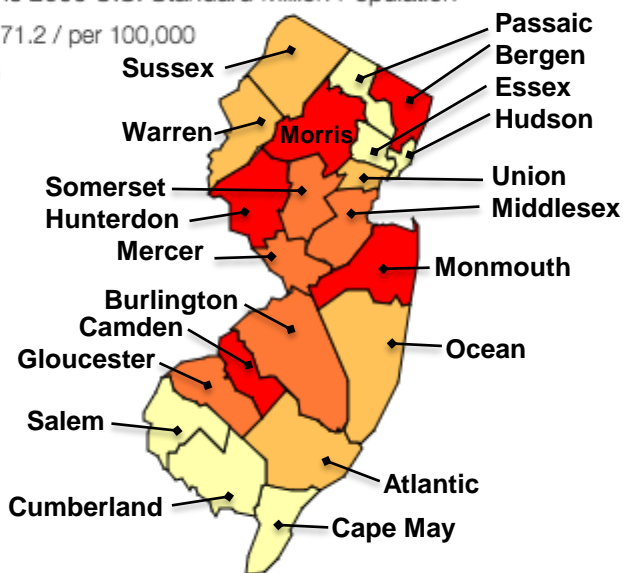
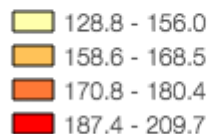
## Age-Adjusted Cancer Incidence Rates in New Jersey

### Breast, Female, 2008 - 2012

By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 171.2 / per 100,000



1. Incidence data for 2012 are considered preliminary due to possible reporting delays.  
 2. Race misclassification could result in an underestimate of Asian and Pacific Islander incidence rate and should be interpreted with caution.

All rates per 100,000.

Data accessed November 15, 2015. Based on February 2015 New Jersey State Cancer Registry Data File.

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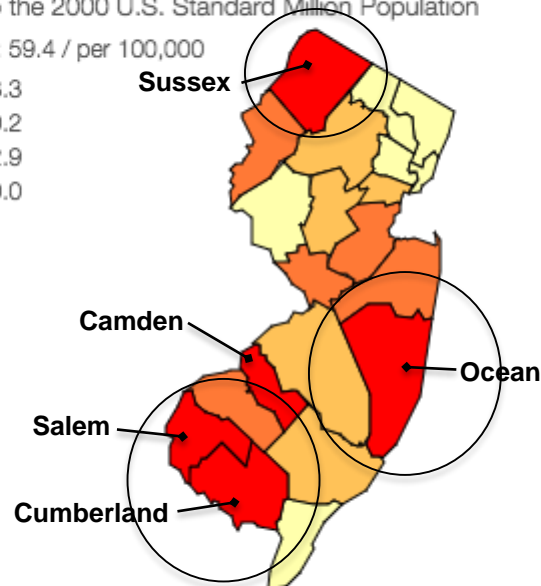
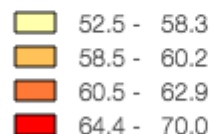
## Age-Adjusted Cancer Incidence Rates in New Jersey

### Female Genital System, 2008 - 2012

By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 59.4 / per 100,000



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All rates per 100,000.

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# Geographic Disparities in NJ: 2008-2012

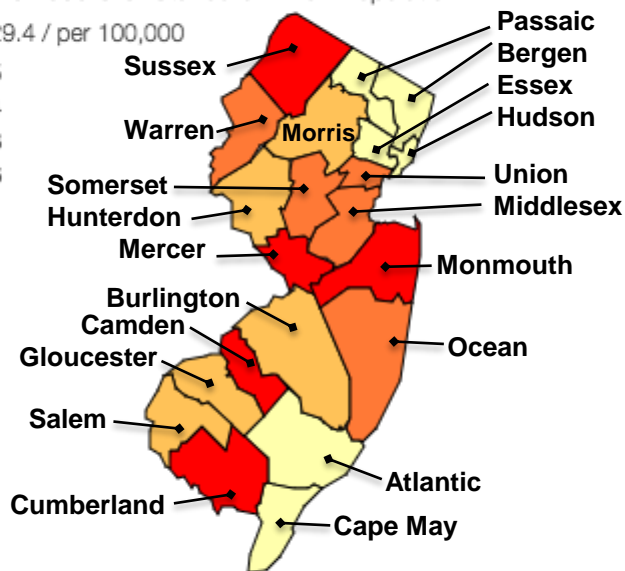
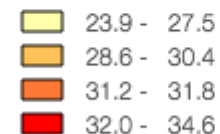
## Age-Adjusted Cancer Incidence Rates in New Jersey

### Corpus Uteri, 2008 - 2012

By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 29.4 / per 100,000



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 2. Race misclassification could result in an underestimate of Asian and Pacific Islander incidence rate and should be interpreted with caution.

All rates per 100,000.

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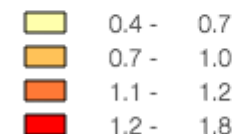
## Age-Adjusted Cancer Incidence Rates in New Jersey

### Uterus, NOS, 2008 - 2012

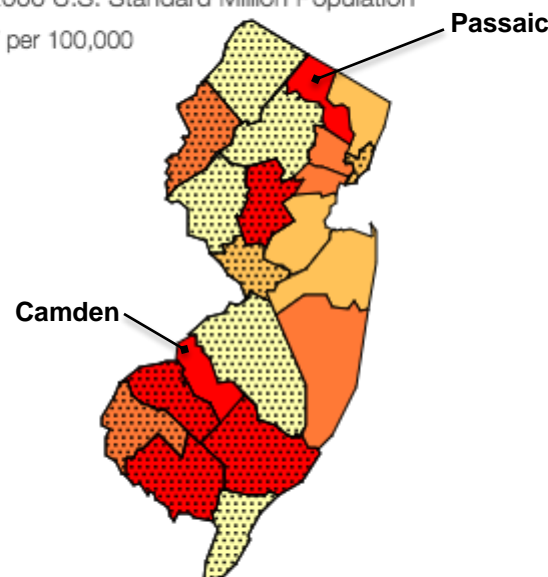
By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 1.0 / per 100,000



Unstable



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All rates per 100,000.

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# Geographic Disparities in NJ: 2008-2012

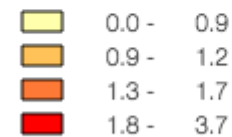
## Age-Adjusted Cancer Incidence Rates in New Jersey

### Vagina, 2008 - 2012

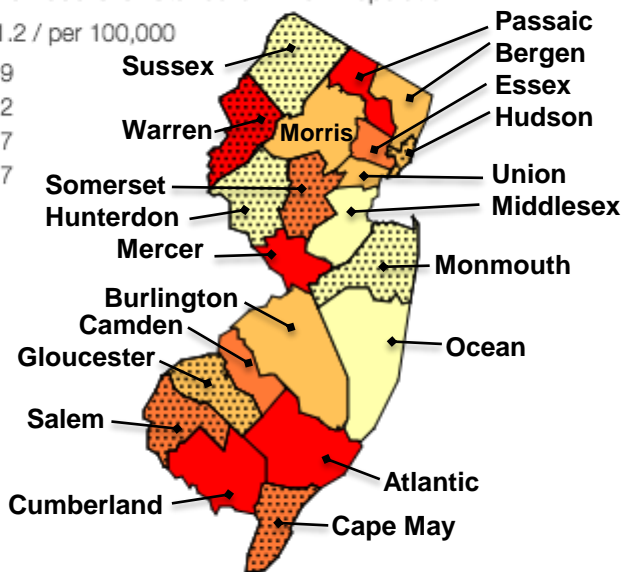
By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 1.2 / per 100,000



Unstable



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All rates per 100,000.

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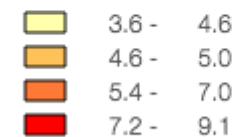
## Age-Adjusted Cancer Incidence Rates in New Jersey

### Vulva, 2008 - 2012

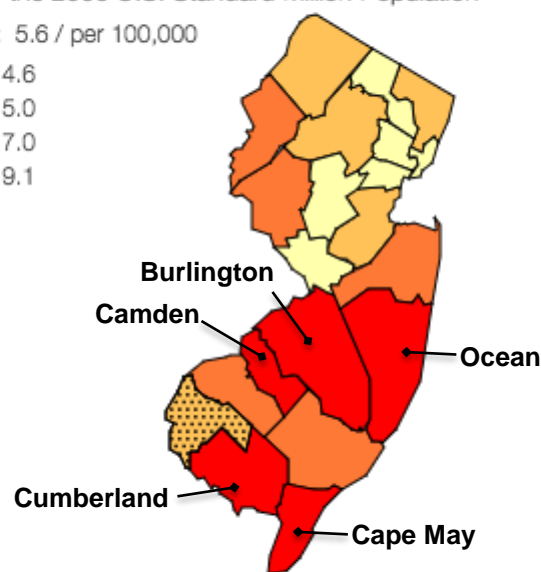
By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 5.6 / per 100,000



Unstable



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All rates per 100,000.

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# Geographic Disparities in NJ: 2008-2012

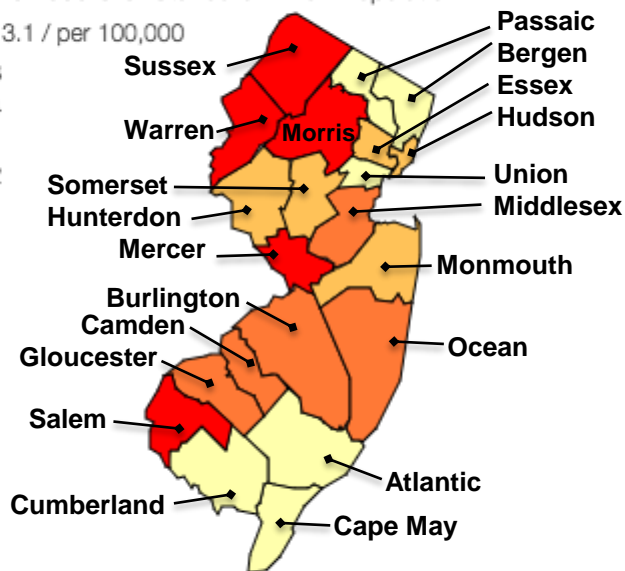
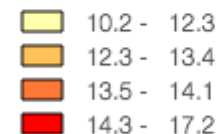
## Age-Adjusted Cancer Incidence Rates in New Jersey

### Ovary, 2008 - 2012

By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 13.1 / per 100,000



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All rates per 100,000.

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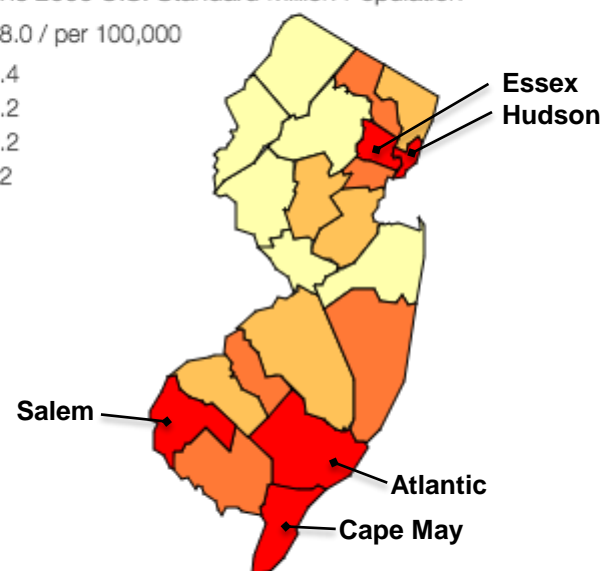
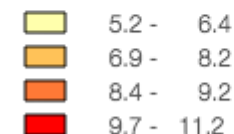
## Age-Adjusted Cancer Incidence Rates in New Jersey

### Cervix Uteri, 2008 - 2012

By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 8.0 / per 100,000



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All rates per 100,000.

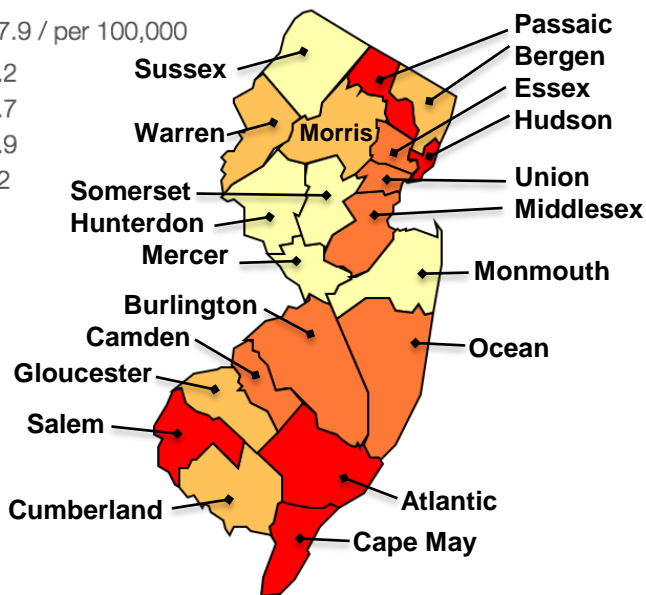
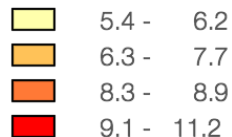
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# Cervix Uteri: White & Black

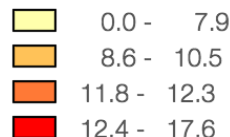
Age-Adjusted Invasive Cancer Incidence Rates in New Jersey  
 Cervix Uteri, **White**, 2008 - 2012  
 By County  
 Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 7.9 / per 100,000

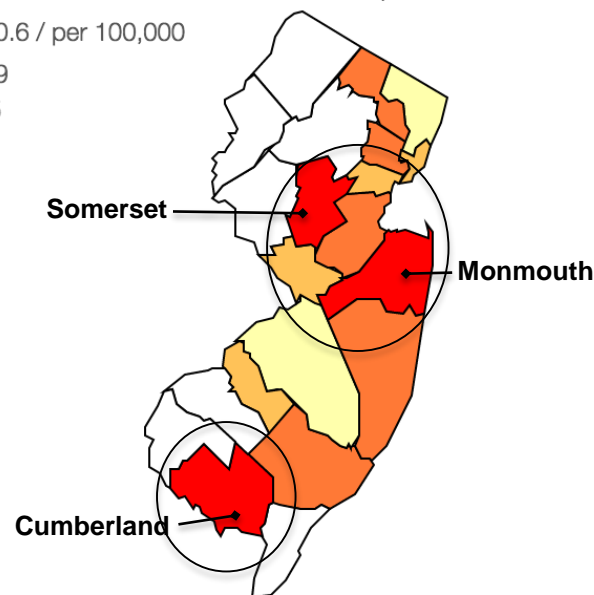


Age-Adjusted Invasive Cancer Incidence Rates in New Jersey  
 Cervix Uteri, **Black**, 2008 - 2012  
 By County  
 Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 10.6 / per 100,000



Risk Population less than 2000



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 2. Race misclassification could result in an underestimate of Asian and Pacific Islander incidence rate and should be interpreted with caution.

All rates per 100,000.

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All rates per 100,000.

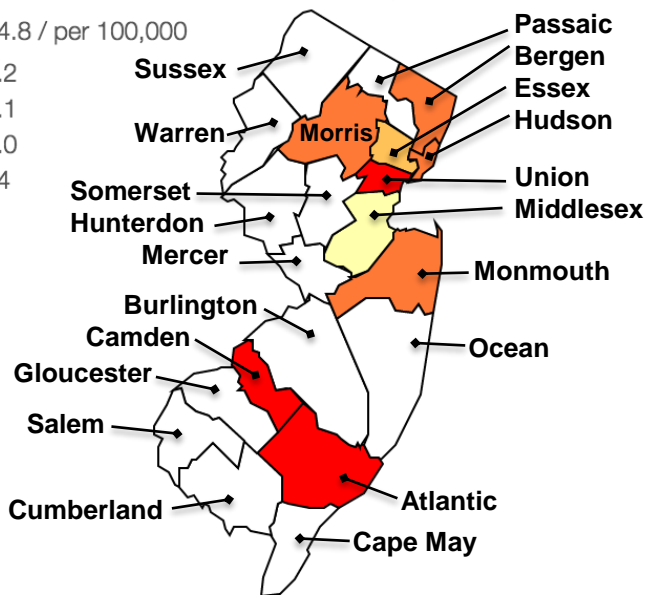
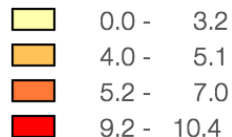
Data accessed August 8, 2015. Based on February 2015 New Jersey State Cancer Registry Data File.

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# Cervix Uteri: Asian/Pacific Islander & Hispanic

Age-Adjusted Invasive Cancer Incidence Rates in New Jersey  
Cervix Uteri, Asian/PI, 2008 - 2012  
By County  
Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 4.8 / per 100,000



1. Incidence data for 2012 are considered preliminary due to possible reporting delays.  
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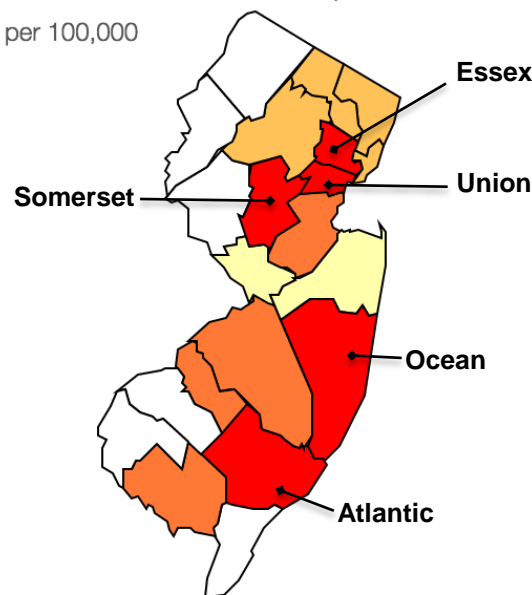
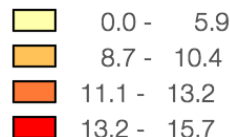
All rates per 100,000.

Data accessed August 8, 2015. Based on February 2015 New Jersey State Cancer Registry Data File.

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Age-Adjusted Invasive Cancer Incidence Rates in New Jersey  
Cervix Uteri, Hispanic, 2008 - 2012  
By County  
Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 10.7 / per 100,000



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All rates per 100,000.

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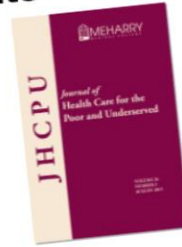
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**Invasive Cervical Cancer Incidence Disparities in New Jersey—a Spatial Analysis in a High Incidence State**

Lisa M. Roche, Xiaoling Niu, Kevin A. Henry

Journal of Health Care for the Poor and Underserved, Volume 26, Number 4, November 2015, pp. 1173-1185 (Article)

Published by Johns Hopkins University Press

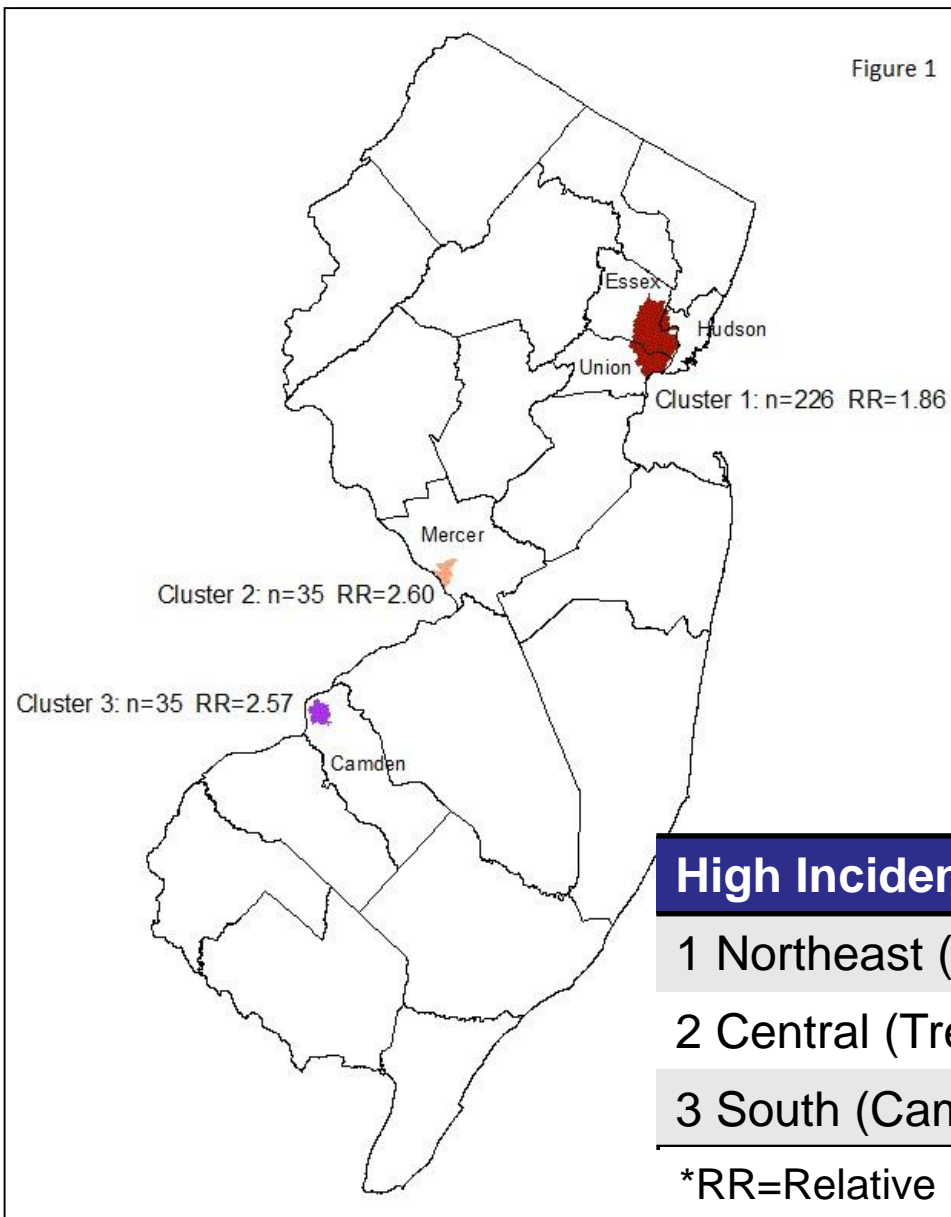


# Look beyond county: The case of cervical cancer in NJ

- Geographic areas with statistically significantly higher than expected invasive cervical cancer incidence.
- All primary invasive cervical cancer cases among NJ women 20 years or older diagnosed in 2005-2009 in the New Jersey State Cancer Registry (NJSCR) were included.
- Cases were geocoded to a census tract based on their address at the time of diagnosis.
- Significant geographic locations with high incidence rates diagnosis were ascertained using a spatial scan statistic (SaTScan software).
- 2,094 were included in the analysis.

# Geographic Disparities – Beyond County

The three significant areas accounted for 14% (n=296) of all cervical cancer cases statewide.



High Incidence Area	RR*	p-value
1 Northeast (Newark, Elizabeth)	1.86	<0.001
2 Central (Trenton)	2.60	0.45
3 South (Camden)	2.57	0.034

\*RR=Relative Risk (Cluster Area vs. Rest of NJ)

# Odds Ratios Comparing Cases in Cluster Areas with Cases in Rest of NJ, 2005-2009

Characteristics	Geographic Area 1 <sup>a</sup> Odds Ratio <sup>b</sup> (95% CI)	Geographic Area 2 <sup>a</sup> Odds Ratio <sup>b</sup> (95% CI)	Geographic Area 3 <sup>a</sup> Odds Ratio <sup>b</sup> (95% CI)
<b>Race</b>			
Black vs. non-Black	<b>12.1 (8.4-17.5)</b>	<b>6.9 (3.2-15.0)</b>	<b>5.8 (2.6-13.1)</b>
<b>Ethnicity</b>			
Hispanic vs. non-Hispanic	<b>6.4 (4.3-9.5)</b>	2.3 (0.9-5.7)	4.4 (1.9-9.9)
<b>Marital Status</b>			
not married vs. married	<b>1.6 (1.1-2.2)</b>	1.87 (0.8-4.5)	2.0 (0.9-4.9)
<b>Insurance Status</b>			
uninsured/Medicaid vs. private insurance	1.2 (0.9-1.7)	<b>3.2 (1.4-7.5)</b>	2.1 (0.9-4.4)
Medicare/other government vs. private insurance	0.9 (0.6-1.4)	1.4 (0.5-4.1)	0.7 (0.2-2.2)

<sup>a</sup>**Geographic Area 1** – primarily Newark, Essex County and Elizabeth, Union County; **Geographic Area 2** – Mercer County primarily Trenton; **Geographic Area 3** – Camden County primarily Camden City. The geographic areas are statistically significant, p<0.05.

<sup>b</sup>Odds ratios and 95% confidence intervals (CI) are from logistic regression models that included all the characteristics listed in the table. The odds ratio is considered statistically significant if the 95% CI does not include 1.

# Cervical Cancer Findings

- Additional efforts to educate all women, provide HPV vaccination to adolescents and PAP screening with follow-up to women are needed in the three high incidence geographic areas, which vary on significant factors associated with cervical cancer.
  - Black, Hispanic, and unmarried in the Newark area cluster
  - Uninsured or Medicaid insurance in Trenton
  - Black and Hispanic in Camden
- NJ health agencies can use these study results to target education and services to the populations in most need and enhance screening in those populations to improve cancer prevention and control.

# Cervical Cancer Findings

County-level measures can mask local disparities when counties contain large heterogeneous populations.

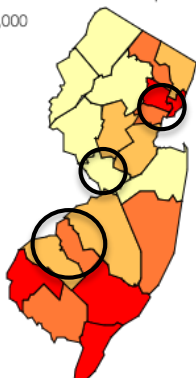
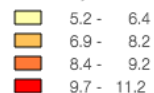
Age-Adjusted Cancer Incidence Rates in New Jersey

Cervix Uteri, 2008 - 2012

By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 8.0 / per 100,000



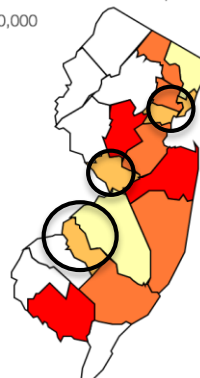
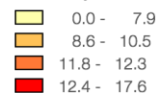
Age-Adjusted Invasive Cancer Incidence Rates in New Jersey

Cervix Uteri, Black, 2008 - 2012

By County

Age-Adjusted to the 2000 U.S. Standard Million Population

New Jersey Rate: 10.6 / per 100,000

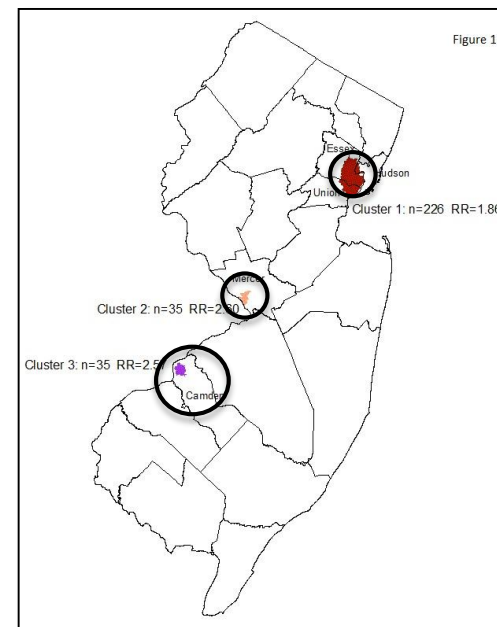


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All rates per 100,000.  
Data accessed November 15, 2015. Based on February 2015 New Jersey State Cancer Registry Data File.  
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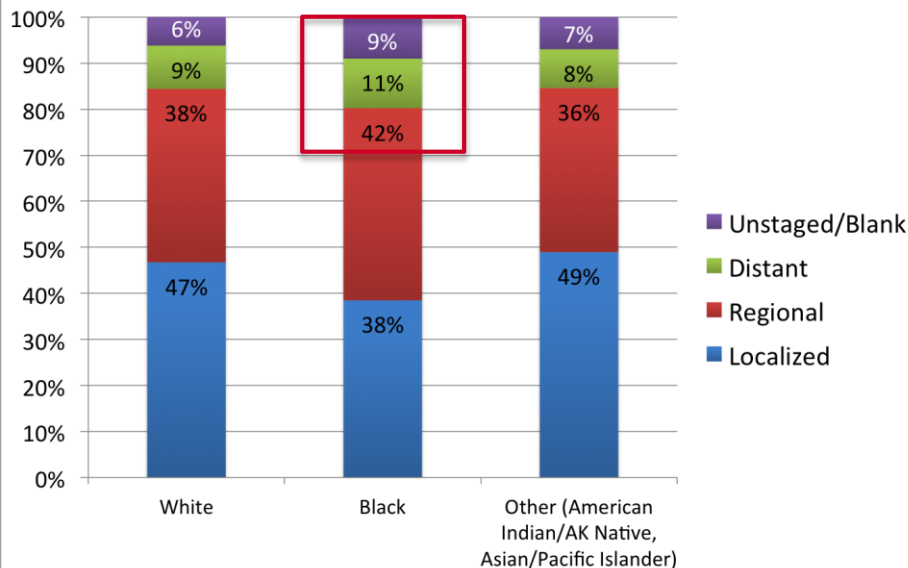


## Gynecologic Cancer Symptoms

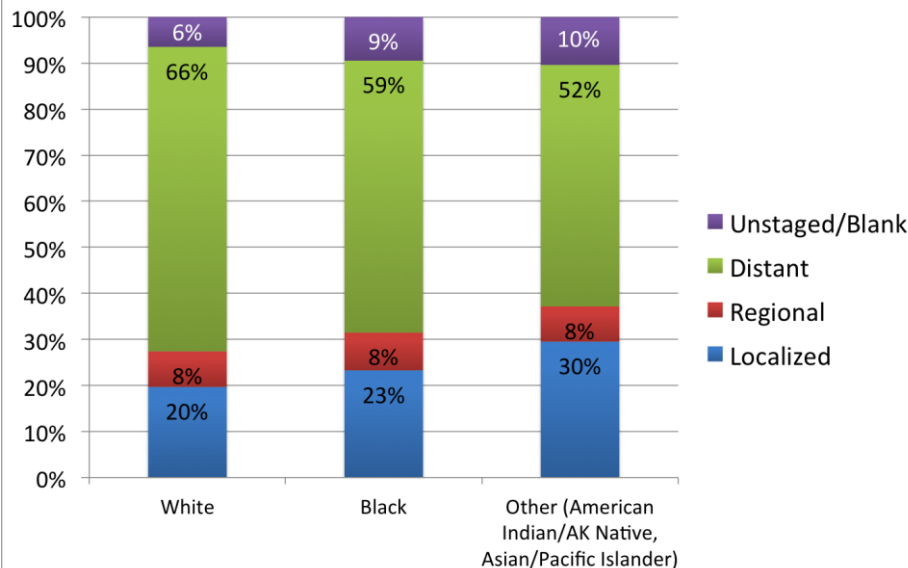
Symptoms	Cervical Cancer	Ovarian Cancer	Uterine Cancer	Vaginal Cancer	Vulvar Cancer
Abnormal vaginal bleeding or discharge	●	●	●	●	
Pelvic pain or pressure		●	●		●
Abdominal or back pain		●			
Bloating		●			
Changes in bathroom habits		●		●	
Itching or burning of the vulva					●
Changes in vulva color or skin, such as a rash, sores, or warts					●

- Effective screening and prevention for cervical
- Non-descript symptoms for ovarian & no effective screening or prevention

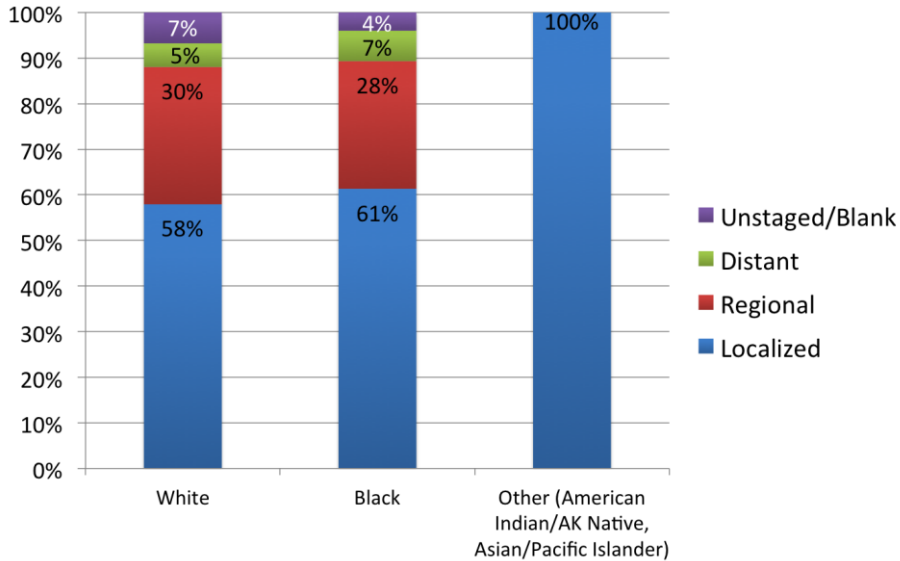
NJ 2000-2007 Cervical Cancer Stage Distribution By Race



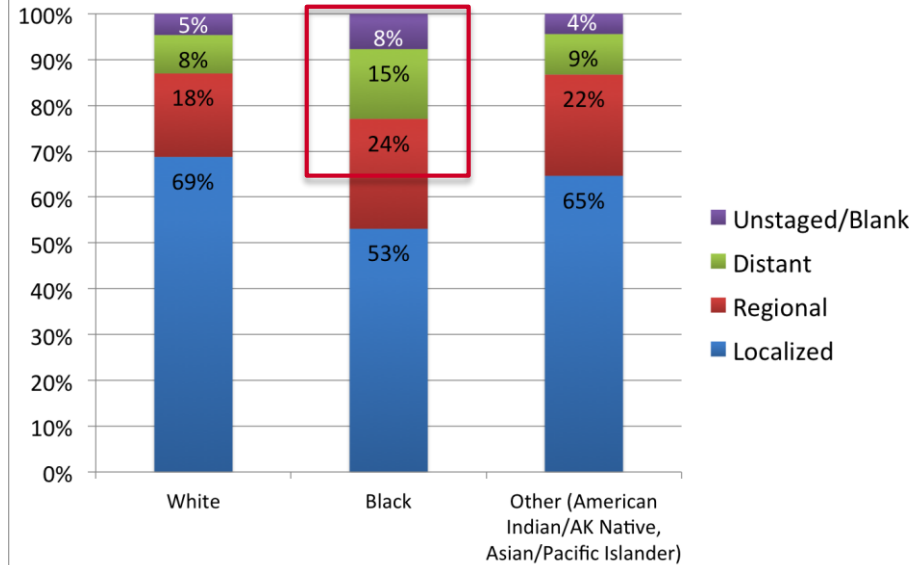
NJ 2000-2007 Ovarian Cancer Stage Distribution By Race



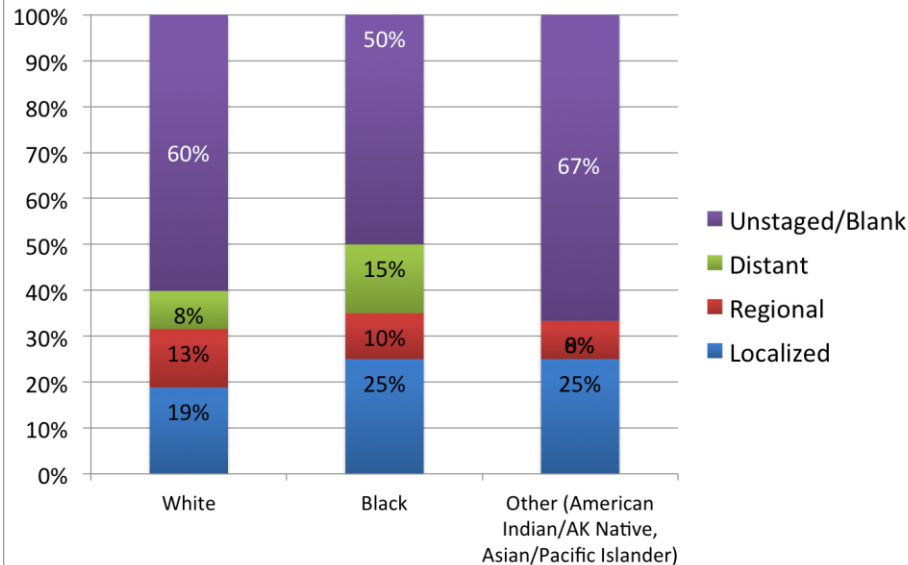
**NJ 2000-2007 Vulvar Cancer Stage Distribution By Race**



**NJ 2000-2007 Corpus Uterus Cancer Stage Distribution By Race**



**NJ 2000-2007 Vaginal Cancer Stage Distribution By Race**



# STAGE AND SURVIVAL

- 5-Year age-adjusted relative survival (actuarial method)
- New Jersey vs. US/SEER (Nov. 2014 Submission)
- Diagnoses from 2000-2007
- Invasive, microscopically confirmed, known age at diagnosis, known stage at diagnosis, actively followed
- Exclude: death certificate and autopsy only, alive with no survival time
- Female Only: All cancers combined, breast, female genital, cervical, ovarian, vaginal, vulvar, uterus
- Stage: Local, Regional, Distant

# 5-Year Age-Adjusted Relative Survival by Cancer Site and Stage at Diagnosis: NJ vs SEER<sup>4</sup>

	Local		Regional		Distant	
	NJ	SEER	NJ	SEER	NJ	SEER
All Sites	92%	91%	63%	63%	20%	19%
Breast	99%	99%	84%	84%	26%	28%
Female Genital	92%	93%	57%	59%	25%	26%
Cervix	82%	81%	49%	50%	11%	13%
Corpus & Uterus NOS	94%	95%	62%	64%	21%	23%
Ovary	92%	91%	58%	67%	28%	28%
Vagina	78%	66%	25%*	53%	25%*	24%
Vulvar	86%	87%	46%	55%	20%	15%

4 SEER\*Stat Nov 2014 Submission

\*Based on small numbers

# New Jersey: 5-Year Age-Adjusted Relative Survival by Cancer Site, Stage at Diagnosis, and Race<sup>4</sup>

	Local			Regional			Distant		
	White	Black	Other	White	Black	Other	White	Black	Other
All Sites	93%	<b>82%</b>	87%	64%	<b>53%</b>	64%	20%	<b>15%</b>	22%
Breast	99%	<b>92%</b>	92%	85%	<b>75%</b>	79%	27%	<b>20%</b>	33%
Female Genital	93%	<b>78%</b>	88%	59%	<b>42%</b>	61%	27%	<b>13%</b>	32%
Cervix	82%	<b>74%</b>	78%	49%	<b>48%</b>	60%	10%	<b>12%</b>	2%
Corpus & Uterus NOS	95%	<b>77%</b>	95%	65%	<b>40%</b>	71%	23%	<b>6%</b>	-
Ovary	92%	<b>87%</b>	82%	60%	<b>34%*</b>	24%	29%	<b>16%</b>	34%
Vagina	75%	<b>71%</b>	-	34%	-	-	-	-	-
Vulvar	87%	<b>79%</b>	-	46%	<b>48%</b>	-	20%	-	-

<sup>4</sup> SEER\*Stat Nov 2014 Submission; Includes all ethnicities; Other=Asian/Pacific Islander, Native American, and Other Races

\*Based on small numbers

# KEY FINDINGS



- Geographic and racial disparities are evident, but need to assess cancer in smaller, local areas to identify specific populations for public health and health care interventions.

- Among female genital cancers, NJ has higher incidence and mortality from uterine cancer than the US.
- NJ Blacks continue to experience delays in cervical and uterine cancer diagnoses.
- NJ has poorer 5-year survival from ovarian and vulvar cancers than the US.
- Blacks have poorer survival for all female reproductive cancers compared to Whites.

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# THANK YOU.