

## Background

Breast cancer is the most common cancer diagnosed in women in New Jersey and the United States.

Each year approximately 7,500 women in New Jersey are diagnosed with breast cancer, and 1,300 women die of the disease.

Overall, breast cancer survival has improved in the United States, with an estimated five-year relative survival of 75% in women diagnosed from 1975-1977 to 91% in those diagnosed from 2009-2015, but disparities remain.<sup>1</sup>

## Objectives

Characterize time trends in breast cancer survival in New Jersey women

- by race/ethnicity
- by census tract poverty level
- by stage at diagnosis

## Methods

- **Data source:** New Jersey State Cancer Registry (NJSCR)
  - Population-based registry that collects data on all cancers diagnosed in New Jersey residents since 1979.
- **Analytic cohort:** New Jersey females diagnosed with a first primary invasive breast cancer from 1995 to 2011 (n = 94,160 after exclusions), with follow-up through 12/31/2016.
- **Exclusions:** Patients diagnosed with prior cancers, unknown age at diagnosis, reported by death certificate only or autopsy only, or who had zero follow-up time.
- **Statistical methods:**
  - Estimated five-year relative survival by stage at diagnosis, race/ethnicity, and census tract poverty level (CTPL) using the Ederer II method in SEER\*Stat version 8.3.5.
  - Relative survival is the ratio of the observed survival of cancer patients to the expected survival of individuals without cancer.
  - We used state-, county socioeconomic status- and race/ethnicity-specific life tables for the United States population, available from the National Cancer Institute, to estimate expected survival.
  - Census tract of residence at diagnosis was categorized into 4 groups by CTPL: 0%-<5%, 5%-<10%, 10%-<20%, and 20%+. CTPLs are based on the percentage of population living below the poverty level. Cases diagnosed from 1995-2004 were coded based on the 2000 United States Census. Cases diagnosed after 2004 were coded based on the American Community Survey.
  - **Joinpoint regression analysis<sup>2</sup>:**
    - Calculated annual percent changes (APCs) in five-year relative survival in New Jersey women diagnosed with breast cancer and identified points in time when survival rate trends change significantly (joinpoints) using Joinpoint Regression Program, Version 4.6.0.0, April 2018, National Cancer Institute.

## Results

### Characteristics of New Jersey Female Breast Cancer Patients Included in the Analysis, Diagnosed 1995-2011

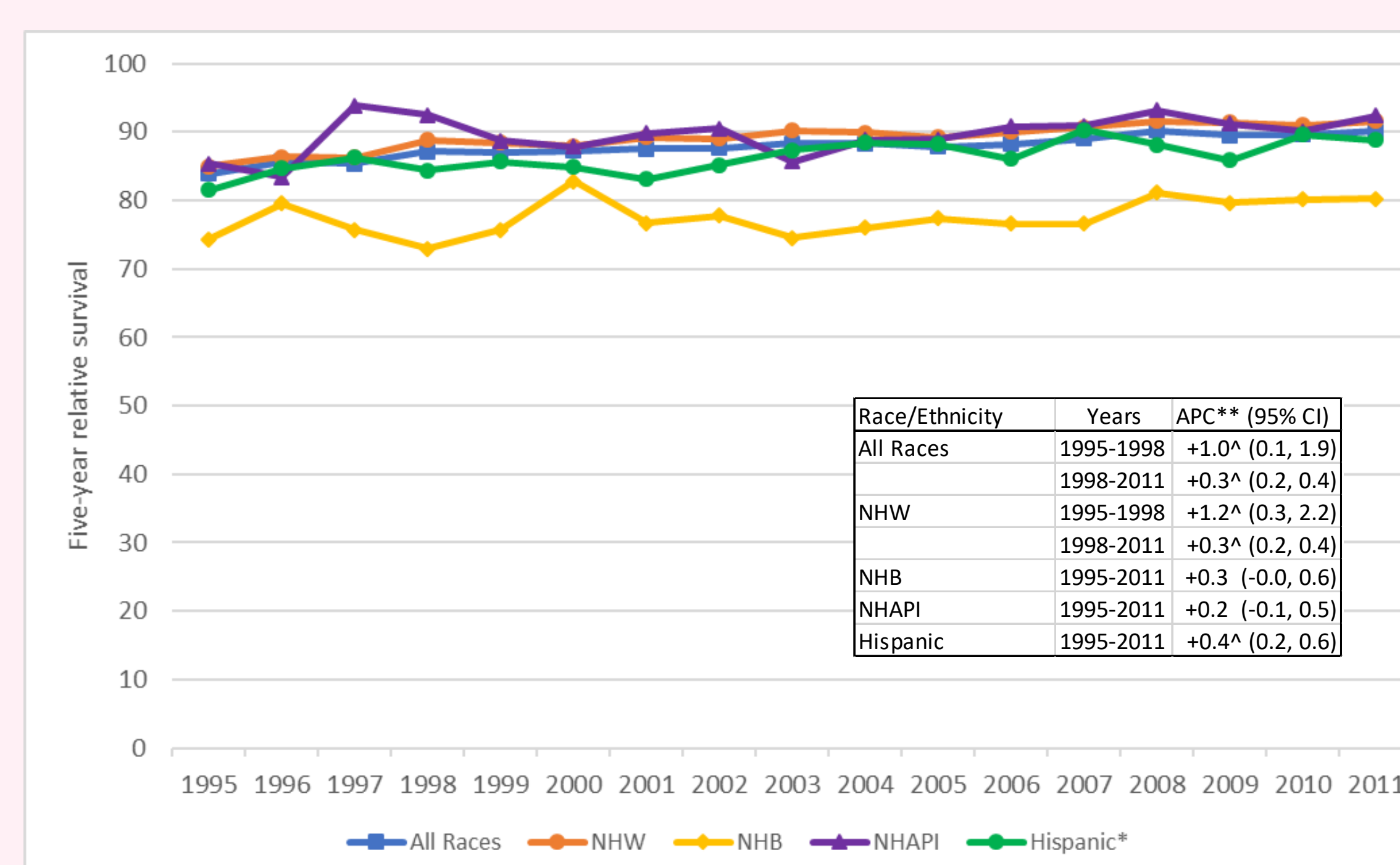
<b>Race</b>	All	94,160
	Non-Hispanic White	73,490
	Non-Hispanic Black	9,983
	Non-Hispanic Asian or Pacific Islander	3,491
	Hispanic*	6,842
	Other/Unknown	354
<b>Census Tract Poverty Level**</b>		
	0% - <5%	49,336
	5% - <10%	23,968
	10% - <20%	13,431
	20%+	6,953
	Unknown	472
<b>Stage at Diagnosis</b>		
	Local	54,571
	Regional	29,276
	Distant	5,847
	Unstaged/Unknown	4,466

\*Persons of Hispanic ethnicity may be of any race or combination of races.

\*\*Residential census tract poverty level at time of diagnosis.

- Overall, five-year relative breast cancer survival rates increased significantly for all New Jersey women (84% for women diagnosed in 1995 increasing to 90% for those diagnosed in 2011).
- Non-Hispanic Black (NHB) women had significantly lower survival compared to women of other racial/ethnic groups.
- Over time, survival has improved significantly in Hispanic (APC=0.4) and Non-Hispanic White women (1995-1998: APC=1.2; 1998-2011: APC=0.3), but not for NHB or non-Hispanic Asian or Pacific Islander women.
- Breast cancer survival increased significantly for New Jersey women diagnosed with local (APC=0.2), regional (1995-2000: APC=1.9, 2000-2011: APC=0.4), and distant stage cancer (APC=2.6).
- Although survival improved significantly in all CTPL groups, survival rates in the areas of highest poverty (20%+) were consistently lower than in areas with lower poverty.

### Trends in Five-Year Breast Cancer Relative Survival Rates in New Jersey Women by Race/Ethnicity, 1995-2011



\*Persons of Hispanic ethnicity may be of any race or combination of races. NHW= Non-Hispanic White, NHB= Non-Hispanic Black, NHAPI= Non-Hispanic Asian or Pacific Islander. Survival rates for individuals of other and unknown race are not shown due to small numbers. They are included in the survival rates for all races.

\*\*APC = annual percent change, CI = Confidence interval.

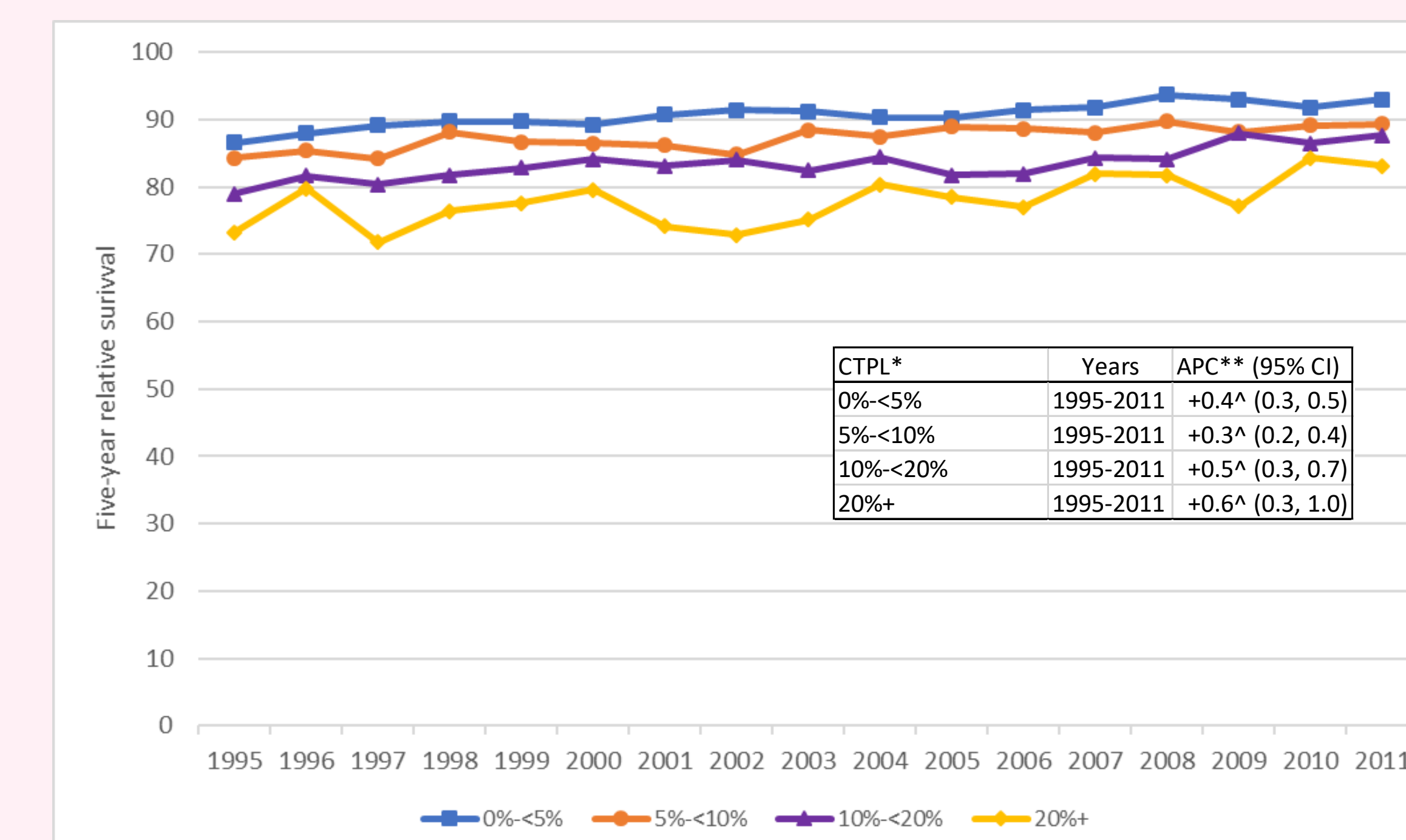
\*The APC based on five-year relative survival rates is significantly different from zero at p < 0.05.

## Acknowledgments

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## Results (2)

### Trends in Five-Year Breast Cancer Relative Survival Rates in New Jersey Women by Census Tract Poverty Level, 1995-2011



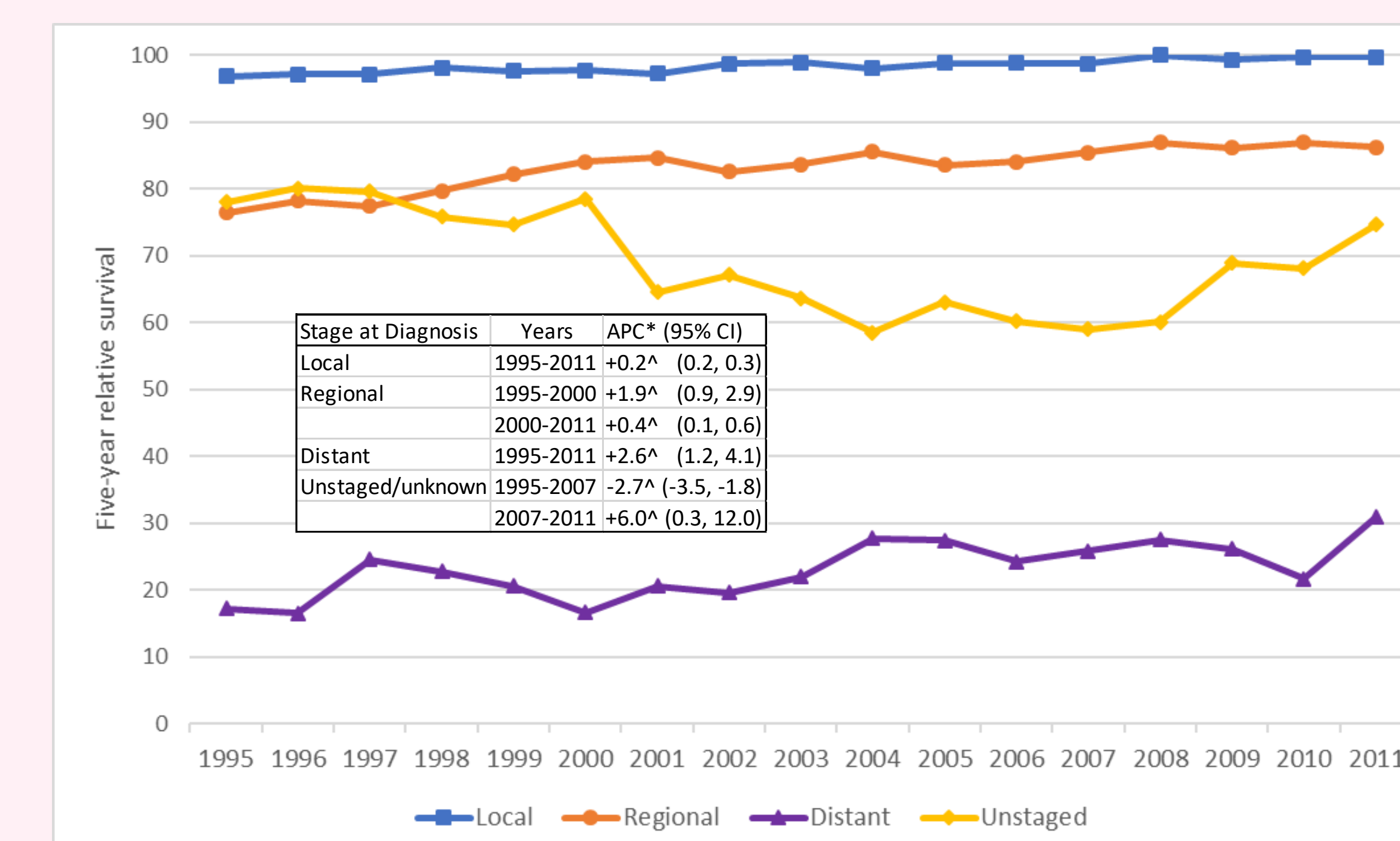
\*CTPL = census tract poverty level.

\*\*APC = annual percent change, CI = Confidence interval.

\*The APC based on five-year relative survival rates is significantly different from zero at p < 0.05.

472 patients with missing census tract poverty level were not included.

### Trends in Five-Year Breast Cancer Relative Survival Rates in New Jersey Women by Stage at Diagnosis, 1995-2011



\*APC = annual percent change, CI = Confidence interval.

\*The APC based on five-year relative survival rates is significantly different from zero at p < 0.05.

## Limitations

- Cases with missing or inaccurate addresses that could not be geocoded to the census tract were excluded from the census tract poverty level analyses (n = 472).
- Patients with a PO Box instead of a street address were geocoded to the centroid of their zip code, which may lead to misclassification of census tract poverty level.
- Small numbers in some racial/ethnic groups

## Strengths

- Population-based cancer registry with high-quality data
- Diverse population of New Jersey
- Long term follow-up to evaluate breast cancer survival trend data

## Conclusions

- Breast cancer survival improved in New Jersey women from 1995-2011, but disparities remain, with worse survival observed in non-Hispanic Black women, women residing in areas of higher poverty, and women diagnosed with late stage cancer.
- Access to breast cancer screening and optimal treatments for all New Jersey women remains an urgent public health issue.

## References

1. Howlander N, Noone AM, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2016. National Cancer Institute. Bethesda, MD. [https://seer.cancer.gov/csr/1975\\_2016/](https://seer.cancer.gov/csr/1975_2016/), based on November 2018 SEER data submission posted to the SEER web site, April 2019.
2. Kim HJ, Pay MP, Feuer EJ, Midthune DN. Permutation tests for joinpoint regression with application to cancer rates. *Stat Med* 2000; 19:335-351 (correction: 2000; 20:655).