



## Introduction

- Recent population-based time-trend analysis of US nationwide databases showed a disproportional increase in non-cardia gastric cancer (NCGC) incidence rates in younger women (<55 years) compared to counterpart men.
- However, the impact of race on the increasing trend in younger women has not been evaluated.
- The aim of this study was to conduct sex and age-specific analysis of NCGC incidence rates among different race groups in a nationally representative US database

## Methods

- NCGC incidence rates per 100,000 population were obtained from the United States Cancer Statistics (USCS) database and were age-adjusted to the 2000 US population using SEER\*Stat software (v8.4.1, NCI) between 2001-2018.
- The rates were stratified by age and sex and evaluated in patients of White, Black, and Asian races.
- Time trends of incidence rates were computed using Joinpoint Regression Software (v4.9.0.1, NCI) utilizing Monte Carlo Permutation analysis to identify the simplest segmented trend.
- Annual percentage change (APC) and average APC (AAPC) were estimated.
- Sex-specific pairwise comparison was conducted to assess identicalness and parallelism between the trends and the absolute AAPC difference was evaluated.
- Further age and sex-specific analysis was conducted in older (≥55 years) and younger adults (<55 years). A p-value cutoff of 0.05 was utilized.

## Results

- A total of 169,517 patients were diagnosed with NCGC between 2001-2018 (45.4% women).
- Figure:** Sex-Specific Trends for Gastric Cancer Mortality Among Different Age Groups.

Age group, y	Cancer cases (N=169,517) <sup>a</sup>	Time period	Trends <sup>b</sup>		Sex-specific AAPC difference (95% CI) <sup>c</sup>	Pairwise comparison P-values <sup>d</sup>		
			APC (95% CI)	AAPC (95% CI)		Sex-specific AAPC difference	Coincidence <sup>e</sup>	Parallelism <sup>f</sup>
<b>White</b>								
<b>All ages</b>								
Women	53,115 (31.3%)	2001-2006	-1.85 (-3.56 to -0.12)	-0.46 (-1.01 to 0.10)	-1.29 (-1.93 to -0.65)	<0.001	<0.001	<0.001
		2006-2018	0.13 (-0.33 to 0.59)					
Men	58,876 (34.7%)	2001-2006	-2.75 (-3.76 to -1.73)	-1.74 (-2.07 to -1.42)	-0.91 (-1.50 to -0.32)	0.002	<0.001	<0.001
		2006-2018	-1.32 (-1.59 to -1.05)					
<b>Aged ≥55</b>								
Women	44,199 (26.1%)	2001-2008	-2.21 (-3.34 to -1.08)	-1.31 (-1.86 to -0.76)	-0.91 (-1.50 to -0.32)	0.002	<0.001	<0.001
		2008-2018	-0.68 (-1.34 to -0.01)					
Men	49,953 (29.5%)	2001-2018	-2.23 (-2.45 to -2.00)	-2.23 (-2.45 to -2.00)				
<b>Aged &lt;55 #</b>								
Women	8,882 (5.2%)	2001-2018	3.19 (2.75 to 3.62)	3.19 (2.75 to 3.62)	-1.60 (-2.23 to -0.97)	<0.001	<0.001	0.002
Men	8,908 (5.3%)	2001-2018	1.58 (1.06 to 2.11)	1.58 (1.06 to 2.11)				
<b>Black</b>								
<b>All ages</b>								
Women	14,945 (8.8%)	2001-2018	-1.04 (-1.50 to -0.57)	-1.04 (-1.50 to -0.57)	-0.73 (-1.32 to -0.14)	0.02	<0.001	0.008
Men	18,118 (10.7%)	2001-2018	-1.77 (-2.20 to -1.34)	-1.77 (-2.20 to -1.34)				
<b>Aged ≥55</b>								
Women	11,969 (7.1%)	2001-2018	-1.57 (-2.08 to -1.05)	-1.57 (-2.08 to -1.05)	-0.36 (-0.98 to 0.27)	0.27	<0.001	0.19
Men	14,494 (8.6%)	2001-2018	-1.92 (-2.36 to -1.48)	-1.92 (-2.36 to -1.48)				
<b>Aged &lt;55 #</b>								
Women	3,624 (2.1%)	2001-2018	1.40 (0.46 to 2.34)	1.40 (0.46 to 2.34)	-2.23 (-3.33 to -1.13)	<0.001	<0.001	0.02
Men	2,976 (1.8%)	2001-2018	-0.83 (-1.55 to -0.11)	-0.83 (-1.55 to -0.11)				
<b>Asian</b>								
<b>All ages</b>								
Women	7,480 (4.4%)	2001-2018	-2.90 (-3.73 to -2.43)	-2.90 (-3.73 to -2.43)	-0.29 (-0.93 to 0.35)	0.37	<0.001	0.17
Men	8,652 (5.1%)	2001-2018	-3.19 (-3.70 to -2.68)	-3.19 (-3.70 to -2.68)				
<b>Aged ≥55</b>								
Women	5,785 (3.4%)	2001-2018	-3.36 (-3.88 to -2.83)	-3.36 (-3.88 to -2.83)	0.01 (-0.65 to 0.67)	0.97	<0.001	0.97
Men	7,100 (4.2%)	2001-2018	-3.34 (-3.83 to -2.86)	-3.34 (-3.83 to -2.86)				
<b>Aged &lt;55 #</b>								
Women	1,694 (1.0%)	2001-2003	11.64 (-7.03 to 34.06)	-0.87 (-4.02 to 2.38)	-1.20 (-4.54 to 2.14)	0.48	0.07	0.24
		2003-2010	-4.81 (-7.50 to -2.04)					
		2011-2013	10.44 (-6.07 to 29.86)					
		2013-2018	-6.23 (-9.34 to -3.02)					
Men	1,550 (0.9%)	2013-2018	-2.07 (-3.09 to -1.05)	-2.07 (-3.09 to -1.05)				

<sup>a</sup> Data are presented as count numbers followed by percentages of the count numbers from the total cases of cancer in the database.

<sup>b</sup> Time-trends were computed using Joinpoint Regression Program (v4.9.0.1, NCI) with 3 maximum joinpoints allowed (4-line segments).

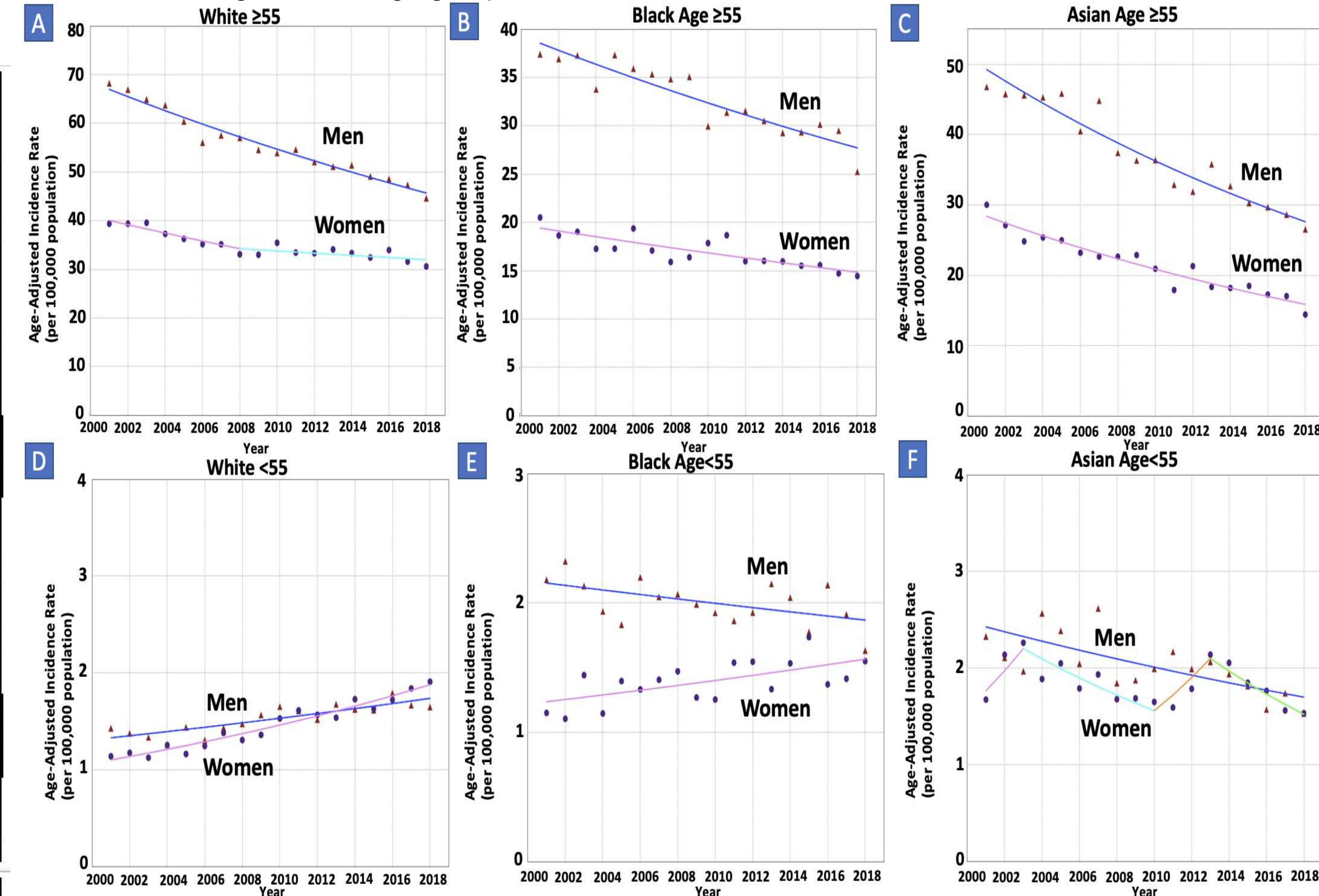
<sup>c</sup> A negative value indicates a greater AAPC in women compared to men.

<sup>d</sup> Tests whether sex-specific trends were identical. A significant P-value indicates that the trends were not identical (i.e., they had different mortality rates and coincidence was rejected).

<sup>e</sup> Tests whether sex-specific trends were parallel. A significant P-value indicates that the trends were not parallel (i.e., parallelism was rejected).

# Primary outcomes.

**Figure:** Sex-Specific Trends and Age-Adjusted Mortality Rates per 100,000 Population for Gastric Cancer Among Different Age groups.



- Among Whites (11,991 patients; 47.4% women), incidence rates were decreasing in the overall age group and in older adults in both sexes.
- In younger White adults (17,790 patients; 49.9% women), incidence rates were increasing in women (AAPC=3.19, p<0.001) at a significantly greater rate than in men (AAPC=1.58, p<0.001) with an absolute AAPC difference of 1.60, p<0.001. Similar results were seen in Black patients with greater absolute AAPC difference between younger Black women and men (2.23, p<0.001). In Asians (16,132 patients; 46.4% women), there was no difference in sex-specific trends.

## Discussion

- Nationwide data from the USCS database, covering ≈100% of US population, showed a greater increase in NCGC incidence among younger White and Black women compared to counterpart men. However, this disproportionate increase was not seen in the Asian race.
- Future research should aim to evaluate risk factors for the increasing trend in younger women.