



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 ageadjusted 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 (\geq 55 years) and younger adults (<55 years). A p-value cutoff of 0.05 was utilized.

The Disproportionate Rise of Non-cardia Primary Gastric Cancer Incidence Rates in Younger Women is Driven by Patients of Black and White Race but not of Asian Race: A Population-Based Time-Trend Analysis Using the United States Cancer Statistics Database

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Results

Age group.	Cancer cases	Trends ^b			Sex-specific AAPC	38
y y	(N=169,517) ^a	Time period	APC (95% CI)	AAPC (95% CI)	difference	Se
170					(95% CI) ^c	
						di
				White		
All ages	50 445 (04 00()		4.05 (0.50 (1.00	<u></u>
Women	53,115 (31.3%)	2001-2006	-1.85 (-3.56 to -0.12)	-0.46 (-1.01 to 0.10)	-1.29	
Men	58 876 (34 7%)	2000-2018	-2.75(-3.76 to -1.73)	-1.74(-2.07 to -1.42)	(-1.93 10 -0.05)	
Men	50,070 (54.778)	2006-2018	-1.32 (-1.59 to -1.05)	-1.74 (-2.07 10 - 1.42)		
Aged ≥55						- 222
Women	44,199 (26.1%)	2001-2008	-2.21 (-3.34 to -1.08)	-1.31 (-1.86 to -0.76)	-0.91	-
		2008-2018	-0.68 (-1.34 to -0.01)		(-1.50 to -0.32)	
Men	49,953 (29.5%)	2001-2018	-2.23 (-2.45 to -2.00)	-2.23 (-2.45 to -2.00)		- Si
Aged <55 #						
Women	8,882 (5.2%)	2001-2018	3.19 (2.75 to 3.62)	3.19 (2.75 to 3.62)	-1.60	
Men	8,908 (5.3%)	2001-2018	1.58 (1.06 to 2.11)	1.58 (1.06 to 2.11)	(-2.23 to -0.97)	
				Black		
A.II						
All ages	14 045 (0.00/)	2004 2019	101/150 += 057)	104 (1 50 to 0 57)	0.72	
vvomen Mon	14,945 (8.8%)	2001-2018	-1.04(-1.50 to -0.57)	-1.04(-1.50 to -0.57)	-0.73	
	10,110 (10.7%)	2001-2018	-1.77 (-2.20 10 -1.34)	-1.77 (-2.20 t0 -1.34)	(-1.02 10 -0.14)	3)
Agea ≥55 Women	11 969 (7 1%)	2001-2018	-1 57 (-2 08 to -1 05)	-1 57 (-2 08 to -1 05)	-0.36	-
Men	14 494 (8 6%)	2001-2018	-1.92 (-2.36 to -1.48)	-1.92 (-2.36 to -1.48)	(-0.98 to 0.27)	
Aged <55 #	11,101 (0.070)	2001 2010	1.02 (2.00 to 1.10)	1.02 (2.00 to 1.10)	(0.00000.0.0.0.)	
Women	3 624 (2 1%)	2001-2018	1.40(0.46 to 2.34)	1.40(0.46 to 2.34)	-2.23	
Mon	2,076 (1,8%)	2001-2018	-0.83(-1.55 to -0.11)	-0.83(-1.55 to -0.11)	(-3.33 to -1.13)	
Men	2,970 (1.070)	2001-2010	-0.03 (-1.33 t0 -0.11)	-0.03 (-1.33 (0 -0.11)	(/	
				Asian		
				Asian		
All ages						
Women	7 480 (4 4%)	2001-2018	-2 90 (-3 73 to -2 43)	-2 90 (-3 73 to -2 43)	-0.29	10
Men	8 652 (5 1%)	2001-2018	-3.19 (-3.70 to -2.68)	-3.19 (-3.70 to -2.68)	(-0.93 to 0.35)	
Aged >55	0,002 (0.170)	2001 2010	0.10 (0.10 10 2.00)	0.10 (0.10 10 2.00)	(12
Women	5.785 (3.4%)	2001-2018	-3.36 (-3.88 to -2.83)	-3.36 (-3.88 to -2.83)	0.01	-
Men	7,100 (4.2%)	2001-2018	-3.34 (-3.83 to -2.86)	-3.34 (-3.83 to -2.86)	(-0.65 to 0.67)	
Aged <55 #						
Women	1.694 (1.0%)	2001-2003	11.64 (-7.03 to 34.06)	-0.87 (-4.02 to 2.38)	-1.20	T
	.,	2003-2010	-4.81 (-7.50 to -2.04)	,	(-4.54 to 2.14)	
		2011-2013	10 44 (-6 07 to 20 86)	1	35 33 35	
		2013 2019	$-6.23(-0.34 \pm 0.20)$	1		
Mon	1 550 (0.00/)	2013-2010	-0.23(-9.34(0-3.02))	207 (200 to 105)		
ivien	1,550 (0.9%)	2013-2018	-2.07 (-3.09 to -1.05)	-2.07 (-3.09 to -1.05)		
^a Data are	presented as	count nun	nhers followed hy	v percentages of	the count numb	ers

Age group,	Cancer cases	Trends ^b			Sex-specific AAPC	8 C
У	(N=169,517) ^a	Time period	APC (95% CI)	AAPC (95% CI)	difference	Se
1996					(95% CI) ^c	
						di
				White		
				winte		
All ages		20	~	~		
Women	53,115 (31.3%)	2001-2006	-1.85 (-3.56 to -0.12)	-0.46 (-1.01 to 0.10)	-1.29	
81		2006-2018	0.13 (-0.33 to 0.59)		(-1.93 to -0.65)	
Men	58,876 (34.7%)	2001-2006	-2.75 (-3.76 to -1.73)	-1.74 (-2.07 to -1.42)		
		2006-2018	-1.32 (-1.59 to -1.05)			
Aged ≥55						-
Women	44,199 (26.1%)	2001-2008	-2.21 (-3.34 to -1.08)	-1.31 (-1.86 to -0.76)	-0.91	
Man	40.052 (20.5%)	2008-2018	-0.68 (-1.34 to -0.01)	0.00 / 0.45 to .0.00)	(-1.50 to -0.32)	
ivien	49,953 (29.5%)	2001-2018	-2.23 (-2.45 to -2.00)	-2.23 (-2.45 to -2.00)	9	
Aged <55 #						-
Women	8,882 (5.2%)	2001-2018	3.19 (2.75 to 3.62)	3.19 (2.75 to 3.62)	-1.60	0
Men	8,908 (5.3%)	2001-2018	1.58 (1.06 to 2.11)	1.58 (1.06 to 2.11)	(-2.23 to -0.97)	
				Black		
All ages	44.045 (0.00()	0004 0040	4.04 / 4.50 += 0.57)	4.04 (4.50 to .0.57)	0.70	r
vvomen	14,945 (8.8%)	2001-2018	-1.04 (-1.50 to -0.57)	-1.04 (-1.50 to -0.57)	-0.73	
Men	18,118 (10.7%)	2001-2018	-1.77 (-2.20 to -1.34)	-1.77 (-2.20 to -1.34)	(-1.32 10 -0.14)	5
Aged ≥55	44.000 (7.40/)	0004 0040	4 57 (0 00 1 4 05)	4 57 (0 00 1 4 05)	0.00	6
vvomen	11,969 (7.1%)	2001-2018	-1.57 (-2.08 to -1.05)	-1.57 (-2.08 to -1.05)	-0.36	
Men .	14,494 (8.6%)	2001-2018	-1.92 (-2.36 to -1.48)	-1.92 (-2.36 to -1.48)	(-0.96 to 0.27)	
Aged <55 #						
Women	3,624 (2.1%)	2001-2018	1.40 (0.46 to 2.34)	1.40 (0.46 to 2.34)	-2.23	-
Men	2,976 (1.8%)	2001-2018	-0.83 (-1.55 to -0.11)	-0.83 (-1.55 to -0.11)	(-3.33 to -1.13)	
				Asian		
All ages						
Women	7,480 (4,4%)	2001-2018	-2.90 (-3.73 to -2.43)	-2.90 (-3.73 to -2.43)	-0.29	i c
Men	8,652 (5,1%)	2001-2018	-3.19 (-3.70 to -2.68)	-3.19 (-3.70 to -2.68)	(-0.93 to 0.35)	
Aged >55	0,002 (0.1.10)					2
Women	5,785 (3,4%)	2001-2018	-3.36 (-3.88 to -2.83)	-3.36 (-3.88 to -2.83)	0.01	
Men	7,100 (4,2%)	2001-2018	-3.34 (-3.83 to -2.86)	-3.34 (-3.83 to -2.86)	(-0.65 to 0.67)	
Aged <55 #						
Women	1 694 (1 0%)	2001-2003	11 64 (-7 03 to 34 06)	-0.87 (-4.02 to 2.38)	-1 20	
Women	1,004 (1.070)	2002 2010	1 81 (7 50 to 3 04)	0.07 (-4.02 10 2.00)	(-4.54 to 2.14)	1
		2003-2010	-4.01 (-7.50 (0 -2.04)		(1
		2011-2013	10.44 (-6.07 to 29.86)			1
		2013-2018	-6.23 (-9.34 to -3.02)			1
Men	1,550 (0.9%)	2013-2018	-2.07 (-3.09 to -1.05)	-2.07 (-3.09 to -1.05)		
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		2011-2013	10.44 (-6.07 to 29.86)			1
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ited as count numbers followed by percentages of the count numbe cancer in the database. ^b Time-trends were computed using Joinpoint Regression Program (v4.9.0.1, NCI) with 3 maximum joinpoints allowed (4-line segments). ^c A negative value indicates a greater AAPC in women compared to men. ^d 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). ^e 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.

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.

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> Figure: Sex-Specific Trends and Age-Adjusted Mortality Rates per 100,000 Population for Gastric Cancer Among Different Age groups. Black Age ≥55 Asian Age ≥55 Pairwise comparison P-values^d Men k-specific Coincidence^e Parallelism^f Men < 0.001 < 0.001 A B < 3 < 0.001 0.002 < 0.001 2006 2008 2010 2012 2014 2016 201 Black Age<55 Year < 0.001 0.002 Asian Age<55 White <55 Men 0.008 < 0.001 < 0.001 0.19 Women Women < 0.001 0.02 2004 2006 2008 2010 2012 2014 2016 2018 < 0.001 0.17 • Among Whites (11,991 patients; 47.4% women), incidence rates were decreasing in the overall age < 0.001 0.97 group and in older adults in both sexes. In younger White adults (17,790 patients; 49.9% women), incidence rates were increasing in women 0.24 0.48 (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. from the total cases of



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.

Questions? YazanAbboud.md@gmail.com