NEW JERSEY COVID-19 ERA (2020-2021) CANCER INCIDENCE COMPARED TO PRE-PANDEMIC (2017-2019) RATES



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BACKGROUND

The COVID-19 pandemic greatly impacted cancer incidence rates in the US, with an estimated 10% decrease in 2020.¹ The Centers for Disease Control and Prevention (CDC) reported that cancer screenings declined at the start of the pandemic due to facility closures and fears of going to medical facilities for nonemergency procedures.² Evaluating pandemic-era cancer incidence can help us better understand how lack of access to cancer screening services during the height of the COVID-19 pandemic and the following year (2020-2021) affected cancer rates.

RESULTS

New Jersey Age-Adjusted Incidence Rate Ratios and 95% Confidence Intervals

Invasive Cancers by Race/Ethnicity and Sex (All Ages)

Compared to Pre-Pandemic Years (2017-2019)

			Colo	rectal	Lung		Urinary Bladder		NHL	
	Year	Race/Eth	Male	Female	Male	Female	Male	Female	Male	Female
	2020	All Race	0.88 (0.83, 0.92)	0.94 (0.90, 1.00)	0.86 (0.83, 0.90)	0.87 (0.83, 0.90)	0.95 (0.90, 1.00)	0.86 (0.78, 0.95)	0.90 (0.84, 0.96)	0.84 (0.78, 0.91)
	2021	All Race	1.02 (0.97, 1.07)	1.03 (0.98, 1.09)	0.89 (0.85, 0.93)	0.90 (0.86, 0.94)	0.95 (0.90, 1.00)	0.89 (0.81, 0.98)	0.95 (0.89, 1.01)	1.04 (0.97, 1.12)
	2020	NHW	0.86 (0.80, 0.91)	0.94 (0.88, 1.00)	0.88 (0.83, 0.92)	0.87 (0.82, 0.91)	0.95 (0.90, 1.01)	0.83 (0.75, 0.93)	0.86 (0.79, 0.93)	0.82 (0.75, 0.90)
	2021	NHW	1.00 (0.94, 1.06)	0.98 (0.92, 1.05)	0.90 (0.85, 0.94)	0.92 (0.88, 0.96)	0.94 (0.89, 1.00)	0.91 (0.82, 1.01)	0.94 (0.87, 1.02)	0.96 (0.88, 1.05)
	2020	NHB	0.96 (0.82, 1.11)	0.97 (0.84, 1.12)	0.87 (0.75, 1.01)	0.89 (0.78, 1.02)	1.17 (0.92, 1.47)	1.08 (0.77, 1.49)	0.94 (0.73, 1.21)	0.85 (0.65, 1.10)
	2021	NHB	1.12 (0.97, 1.29)	1.06 (0.92, 1.21)	0.87 (0.75, 1.00)	0.80 (0.69, 0.92)	0.94 (0.73, 1.20)	0.86 (0.60, 1.21)	0.87 (0.67, 1.12)	1.12 (0.88, 1.42)
	2020	NHAPI	0.96 (0.78, 1.18)	0.88 (0.70, 1.11)	0.66 (0.51, 0.83)	0.91 (0.72, 1.15)	0.94 (0.67, 1.29)	0.84 (0.44, 1.51)	1.02 (0.76, 1.35)	1.10 (0.80, 1.51)
	2021	NHAPI	0.99 (0.81, 1.20)	1.20 (0.98, 1.48)	0.99 (0.81, 1.21)	0.91 (0.72, 1.14)	1.22 (0.91, 1.62)	0.74 (0.39, 1.34)	0.83 (0.60, 1,12)	1.21 (0.89, 1.64)
	2020	Hispanic	0.86 (0.74, 1.00)	1.03 (0.88, 1.19)	0.90 (0.76, 1.06)	0.91 (0.77, 1.07)	0.84 (0.66, 1.05)	0.93 (0.63, 1.34)	1.02 (0.84, 1.24)	0.85 (0.68, 1.04)
	2021	Hispanic	1.02 (0.88, 1.17)	1.20 (1.04, 1.38)	0.81 (0.67, 0.96)	0.88 (0.75, 1.04)	0.88 (0.70, 1.09)	1.05 (0.73, 1.48)	1.02 (0.84, 1.22)	1.24 (1.03, 1.48)
			Melanom	a of Skin	Thyroid		Breast	Uterine	Prostate	Cervical
	Year	Race/Eth	Male	Female	Male	Female	Female	Female	Male	Female
	2020	All Race	0.80 (0.75, 0.85)	0.81 (0.75, 0.88)	0.82 (0.73, 0.93)	0.75 (0.70, 0.81)	0.91 (0.88, 0.93)	0.91 (0.86, 0.96)	0.94 (0.91, 0.96)	0.85 (0.75, 0.97)
	2021	All Race	1.01 (0.95, 1.07)	0.97 (0.90, 1.04)	0.95 (0.85, 1.06)	1.03 (0.97, 1.10)	1.04 (1.01, 1.06)	0.98 (0.93, 1.03)	1.02 (1.00, 1.05)	1.01 (0.89, 1.14)
	2020	NHW	0.79 (0.73, 0.84)	0.81 (0.74, 0.89)	0.79 (0.68, 0.91)	0.76 (0.68, 0.83)	0.91 (0.88, 0.95)	0.93 (0.87, 0.99)	0.94 (0.91, 0.97)	0.83 (0.68, 1.01)
	2021	NHW	0.99 (0.93, 1.05)	0.91 (0.84, 0.99)	0.88 (0.76, 1.01)	1.01 (0.93, 1.11)	1.04 (1.00, 1.07)	0.96 (0.90, 1.03)	1.01 (0.97, 1.04)	0.96 (0.79, 1.15)
	2020	NHB	0.67 (0.19, 2.08)	0.41 (0.10, 1.26)	0.75 (0.42, 1.30)	0.74 (0.55, 0.97)	0.94 (0.87, 1.01)	0.91 (0.78, 1.05)	0.90 (0.94, 0.96)	1.00 (0.75, 1.32)
	2021	NHB	2.06 (0.84, 4.86)	1.08 (0.45, 2.38)	1.17 (0.81, 1.67)	1.07 (0.84, 1.35)	1.03 (0.95, 1.10)	1.07 (0.93, 1.23)	1.00 (0.94, 1.07)	0.95 (0.71, 1.27)
	2020	NHAPI	0.27 (0.03, 1.20)	0.52 (0.05, 2.90)	0.78 (0.50, 1.18)	0.73 (0.57, 0.92)	0.92 (0.83, 1.02)	0.83 (0.66, 1.03)	0.79 (0.69, 0.91)	0.74 (0.43, 1.24)
	2021	NHAPI	0.35 (0.04, 1.44)	1.82 (0.52, 5.99)	1.17 (0.81, 1.67)	1.04 (0.84, 1.27)	1.09 (0.99, 1.20)	0.96 (0.78, 1.19)	1.12 (0.98, 1.25)	1.04 (0.65, 1.53)
	2020	Hispanic	1.20 (0.73, 1.88)	0.95 (0.60, 1.46)	1.02 (0.71, 1.42)	0.78 (0.66, 0.93)	0.82 (0.75, 0.88)	0.86 (0.73, 1.01)	0.91 (0.83, 0.99)	0.79 (0.60, 1.03)
	2021	Hispanic	0.83 (0.51, 1.34)	1.32 (0.89, 1.94)	0.98 (0.70, 1.37)	0.99 (0.85, 1.16)	1.06 (0.98, 1.14)	0.94 (0.81, 1.10)	1.02 (0.94, 1.11)	1.07 (0.84, 1.36)

RESULTS

New Jersey Age-Adjusted Incidence Rate Ratios and 95% Confidence Intervals Invasive Cancers by Region (All Ages) Compared to Pre-Pandemic Years (2017-2019)

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Year	NJ Region	Colorectal	Lung	Urinary Bladder	NHL	Melanoma of Skin		
2020	North	0.90 (0.85, 0.96)	0.88 (0.83, 0.93)	0.90 (0.83, 0.97)	0.92 (0.85, 0.99)	0.80 (0.73, 0.88)		
2021	North	1.02 (0.96, 1.07)	0.93 (0.89, 0.98)	0.94 (0.87, 1.01)	1.07 (0.99, 1.15)	0.95 (0.87, 1.04)		
2020	Central	0.88 (0.83, 0.94)	0.86 (0.82, 0.91)	0.97 (0.90, 1.04)	0.84 (0.78, 0.91)	0.85 (0.79, 0.92)		
2021	Central	1.02 (0.96, 1.08)	0.89 (0.85, 0.93)	0.91 (0.85, 0.99)	0.94 (0.87, 1.02)	1.05 (0.98, 1.13)		
2020	South	0.96 (0.89, 1.04)	0.85 (0.80, 0.90)	0.89 (0.80, 0.98)	0.85 (0.76, 0.95)	0.74 (0.67, 0.82)		
2021	South	1.06 (0.98, 1.14)	0.86 (0.81, 0.91)	0.95 (0.87, 1.05)	0.94 (0.84, 1.04)	0.95 (0.86, 1.04)		
Year		Thyroid	Breast (Female)	Uterine	Cervical	Prostate		
2020	North	0.76 (0.68, 0.84)	0.86 (0.83, 0.90)	0.88 (0.81,0.96)	0.87 (0.71, 1.05)	0.92 (0.88, 0.96)		
2021	North	1.02 (0.93, 1.12)	1.00 (0.96, 1.04)	0.95 (0.87, 1.03)	1.04 (0.86, 1.25)	1.08 (1.04, 1.13)		
2020	Central	0.78 (0.71, 0.86)	0.96 (0.92, 1.00)	0.89 (0.82, 0.97)	0.82 (0.65, 1.02)	0.94 (0.90, 0.99)		
2021	Central	0.98 (0.90, 1.08)	1.09 (1.04, 1.13)	0.95 (0.88, 1.03)	0.93 (0.75, 1.14)	0.99 (0.95, 1.03)		
2020	South	0.76 (0.66, 0.88)	0.89 (0.84, 0.94)	0.97 (0.87, 1.09)	0.87 (0.65, 1.15)	0.96 (0.91, 1.02)		
2021	South	1.04 (0.92, 1.18)	1.02 (0.96, 1.08)	1.08 (0.97, 1.21)	1.09 (0.84, 1.41)	0.99 (0.94, 1.05)		

OBJECTIVES

Describe the incidence of ten common cancers among NJ residents during the pandemic years, 2020 and 2021, by stage, sex, race/ethnicity, and region, using pre-pandemic years 2017-2019 as a reference. • Incidence declined in 2020 for all races combined.

- Female breast and colorectal incidence increased in 2021.
- Incidence remained low in 2021 for lung, female bladder and female melanoma.

New Jersey Age-Adjusted Incidence Rate Ratios and 95% Confidence Intervals

by Race/Ethnicity, Sex, & Stage (Screening Age Only)

			Color	ectal	Lung		Prostate	Breast	Uterine	Cervical
			Ages	45-74	Ages 50-79		Ages 55-69	Ages 40-74	Ages 50-79	Ages 20-64
Year	Race /Eth	Stage	Male	Female	Male	Female	Male	Female	Female	Female
2020	All Race	Early	0.74 (0.66, 0.82)	0.86 (0.77, 0.97)	0.85 (0.76, 0.94)	0.82 (0.75, 0.89)	0.98 (0.94, 1.02)	0.88 (0.85, 0.91)	0.88 (0.82, 0.94)	0.75 (0.58 <i>,</i> 0.95)
2021	All Race	Early	0.91 (0.82 <i>,</i> 1.00)	1.05 (0.95 <i>,</i> 1.17)	0.91 (0.82 <i>,</i> 1.00)	0.91 (0.83, 0.99)	1.07 (1.03, 1.11)	1.06 (1.03, 1.09)	1.00 (0.93, 1.07)	1.00 (0.80, 1.24)
2020	All Race	Late	0.89 (0.82, 0.97)	0.95 (0.87, 1.04)	0.87 (0.82 <i>,</i> 0.93)	0.91 (0.86, 0.97)	0.89 (0.81, 0.97)	0.95 (0.90, 1.01)	1.02 (0.92, 1.14)	1.00 (0.81, 1.22)
2021	All Race	Late	1.10 (1.02 <i>,</i> 1.19)	0.96 (0.87, 1.05)	0.90 (0.85 <i>,</i> 0.96)	0.90 (0.85, 0.96)	1.07 (0.98, 1.16)	1.02 (0.97, 1.08)	1.17 (1.06, 1.29)	1.10 (0.90, 1.34)
2020	NHW	Early	0.65 (0.56 <i>,</i> 0.75)	0.89 (0.77, 1.03)	0.83 (0.74, 0.93)	0.82 (0.74, 0.90)	0.96 (0.91, 1.01)	0.88 (0.85, 0.92)	0.90 (0.83, 0.98)	0.78 (0.55, 1.09)
2021	NHW	Early	0.87 (0.77, 0.99)	0.92 (0.80, 1.06)	0.89 (0.79 <i>,</i> 0.99)	0.92 (0.84, 1.01)	1.01 (0.96, 1.06)	1.07 (1.03, 1.11)	0.98 (0.90, 1.06)	0.91 (0.65, 1.25)
2020	NHW	Late	0.87(0.79, 0.97)	0.92 (0.82, 1.03)	0.89 (0.83 <i>,</i> 0.95)	0.89 (0.83, 0.96)	0.88 (0.97, 0.98)	0.97 (0.90, 1.05)	1.07 (0.94, 1.23)	0.94 (0.67, 1.30)
2021	NHW	Late	1.12 (1.01, 1.23)	0.96 (0.85, 1.07)	0.93 (0.86 <i>,</i> 0.99)	0.93 (0.86, 0.99)	1.02 (0.92, 1.13)	1.04 (0.96, 1.12)	1.15 (1.00, 1.31)	1.07 (0.78, 1.45)
2020	NHB	Early	1.09 (0.82, 1.45)	0.98 (0.71, 1.33)	0.99 (0.68, 1.41)	0.88 (0.64, 1.19)	0.97 (0.88, 1.06)	0.89 (0.81, 0.98)	0.74 (0.59, 0.94)	0.82 (0.44, 1.45)
2021	NHB	Early	1.07 (0.80, 1.42)	1.09 (0.81, 1.46)	0.94 (0.64, 1.36)	0.90 (0.66 <i>,</i> 1.22)	1.12 (1.02, 1.22)	1.06 (0.97 <i>,</i> 1.16)	1.15 (0.94, 1.40)	0.72 (0.34, 1.34)
2020	NHB	Late	0.89 (0.71, 1.12)	1.01 (0.80, 1.23)	0.80 (0.66 <i>,</i> 0.97)	1.00 (0.84, 1.20)	0.86 (0.69 <i>,</i> 1.06)	0.97(0.84, 1.11)	1.09 (0.85, 1.38)	1.13 (0.71 <i>,</i> 1.75)
2021	NHB	Late	1.07 (0.86, 1.32)	1.03 (0.82, 1.28)	0.83 (0.68, 1.00)	0.86 (0.71 <i>,</i> 1.04)	1.08 (0.88, 1.31)	0.96 (0.84, 1.10)	1.30 (1.04, 1.62)	1.09 (0.68, 1.69)
2020	NHAPI	Early	0.96 (0.63, 1.44)	0.67 (0.38, 1.11)	0.68 (0.34, 1.27)	1.15 (0.66 <i>,</i> 1.93)	0.82 (0.65, 1.03)	0.88 (0.79 <i>,</i> 0.98)	0.73 (0.52, 1.02)	1.19 (0.37 <i>,</i> 3.35)
2021	NHAPI	Early	1.40 (0.98, 1.99)	1.56 (1.06, 2.28)	1.46 (0.90, 2.33)	0.70 (0.36, 1.26)	1.22 (1.00, 1.47)	1.08 (0.98, 1.20)	1.01 (0.76, 1.35)	2.19 (0.89, 5.22)
2020	NHAPI	Late	0.95 (0.69 <i>,</i> 1.30)	1.06 (0.73 <i>,</i> 1.52)	0.64 (0.45 <i>,</i> 0.88)	0.95 (0.68, 1.32)	0.92 (0.59 <i>,</i> 1.42)	0.89 (0.72 <i>,</i> 1.09)	0.68 (0.41, 1.08)	0.76 (0.33, 1.56)
2021	NHAPI	Late	0.87 (0.62, 1.20)	0.93 (0.63, 1.35)	0.99 (0.75, 1.29)	0.73 (0.50 <i>,</i> 1.03)	1.67 (1.17, 2.36)	1.08(0.89 <i>,</i> 1.30)	0.98 (0.64, 1.47)	0. 76 (0.34, 1.56)
2020	Hispanic	Early	0.76 (0.56, 1.02)	0.77 (0.55, 1.06)	0.82(0.52, 1.27)	0.71 (0.47 <i>,</i> 1.04)	0.96 (0.85 <i>,</i> 1.08)	0.84 (0.77, 0.92)	0.91 (0.73, 1.14)	0.54 (0.31, 0.90)
2021	Hispanic	Early	0.79 (0.58, 1.05)	1.18 (0.89 <i>,</i> 1.54)	0.83(0.52 <i>,</i> 1.29)	0.89 (0.62 <i>,</i> 1.25)	1.09 (0.97, 1.22)	1.05 (0.97, 1.14)	0.97 (0.78, 1.20)	1.06 (0.70, 1.56)
2020	Hispanic	Late	0.95 (0.75 <i>,</i> 1.19)	0.94 (0.72, 1.21)	0.95(0.76, 1.19)	0.96 (0.75, 1.22)	0.89 (0.67, 1.16)	0.92 (0.79, 1.07)	0.84 (0.57, 1.21)	1.07 (0.71, 0.58)
2021	Hispanic	Late	1.16 (0.94, 1.43)	1.01 (0.78, 1.29)	0.81(0.64, 1.01)	0.88 (0.68, 1.12)	1.11 (0.86, 1.42)	1.00 (0.87, 1.16)	1.19 (0.85, 1.64)	1.18 (0.79, 1.72)

- 2020 cancer incidence rates decreased in Northern, Central, and Southern NJ for all cancer types presented.
- Northern NJ lung cancer continued to decline in 2021, while prostate cancer saw an increased RR in 2021.
- In **Central NJ,** in 2021, rates continued to be lower than pre-pandemic years for lung and urinary bladder, while rates were increased for female breast cancer.
- Southern NJ lung cancer showed a continued decline in 2021.

METHODS

Data Source: The New Jersey State Cancer Registry (NJSCR).

Analytic Cohort: Prostate, female breast, colorectal (CR), urinary bladder, lung, thyroid, uterine and cervical cancers, Non-Hodgkin Lymphoma (NHL) and melanoma of the skin cancers diagnosed in NJ from 2017-2021. Cases with unknown county at diagnosis were excluded. Statistical methods:

- Calculated age-adjusted incidence rates, rate ratios (RR) and 95% confidence intervals (CI) to compare 2020 and 2021 ageadjusted rates to 2017-2019 rates
- EARLY-stage incidence decreased significantly in 2020 for all races combined. This
 was driven by decreases in the incidence of breast cancer in all racial/ethnic groups,
 NHB uterine, and Hispanic cervical cancers.
- LATE-stage cancers **decreased significantly in 2020** for CR and prostate for NHW

LIMITATIONS

 Although delayed reporting may underestimate incidence rates, NJSCR data is estimated to be over 98% for diagnosis year 2021.

• Misclassification and unknown or unspecified race and ethnicity data for recent years may impact race/ethnic-specific rates.

STRENGTHS

- Population-based cancer registry with high-quality data.
- Diverse population of New Jersey.

CONCLUSIONS

- We observed general declines in incidence in 2020 in New Jersey.
- Incidence rates returned close to pre-pandemic rates

using SEER*Stat (Version 8.4.2).
Screening age groups were based on the American Cancer Society (ACS) and the U.S. Preventive Services Task Force screening guidelines.^{3,4} While there is no recommended screening age for uterine cancer (Corpus and Uterus, NOS), we used ages 50-79 as a proxy due to higher risk for this group.

• Early stage includes *in situ* and local stage (except for cervical which only includes local). Late stage includes regional and distant stage.

males and for lung cancer across all race/ethnicities. Lung cancer also declined in females, but only among NHW women.

- Early- and Late-stage lung cancer rates **remained lower in 2021** compared to prepandemic rates among females. Males only had lower rates for late-stage lung cancer.
- **2021 incidence significantly increased** for CR, prostate, breast, and uterine cancers, but only for specific groups:
- CR: NHW late-stage males and NHAPI early-stage females
- Prostate: NHB early-stage and NHAPI late-stage
- Breast: NHW early-stage
- Uterine: NHW and NHB late-stage

Rates are per 100,000 and age-adjusted to the 2000 US standard population. **NHW** = Non-Hispanic White **NHB** = Non-Hispanic Black **NHAPI** = Non-Hispanic Asian/Pacific Islander

Rate Ratios in red font have statistically significant declined.

Rate Ratios in green font have statistically significant increased.

in 2021 for most major cancers, except for lung.

 It is important that we continue to monitor trends in cancer incidence to close the cancer screening gap caused by the COVID-19 pandemic.

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