Cancer Statistics, Case Comprehensive Cancer Center Catchment Area

A White Paper from the Case Comprehensive Cancer Center Population Cancer Analytics Shared Resource

population cancer analytics
a shared resource of the Case Comprehensive Cancer Center

Executive Summary

*Here, we summarize the cancer burden of the Case Comprehensive Cancer Center catchment area, which covers a 15-county region of northeast Ohio. Using data from the Ohio Cancer Incidence Surveillance System and SEER*Stat, we provide cancer statistics by major cancer site, by sex, by racial and ethnic groups, and by county. Throughout the report, we also provide state and national comparators to place the catchment area's unique cancer burden in context. Broadly, cancer incidence and mortality in the catchment area substantially exceed those of the nation. We highlight a number of instances in which the burden of specific cancer types in certain groups—within the catchment area as a whole or within single counties—is better or worse than expected. In particular, we highlight the high burden of lung cancer, especially in non-Hispanic Black residents of the catchment area and in Ashtabula County residents; the high mortality from breast cancer in Non-Hispanic Black women; and the high mortality from colorectal cancer in Ashland County.*

Introduction

The Case Comprehensive Cancer Center (CCC) is one of 56 comprehensive cancer centers designated by the National Cancer Institute (NCI). Situated in the northeastern corner of Ohio, the Case CCC catchment area is comprised of 15 counties: Ashland, Ashtabula, Cuyahoga, Erie, Geauga, Huron, Lake, Lorain, Mahoning, Medina, Portage, Stark, Summit, Trumbull, and Wayne (See **Figure 1**). Based on the National Center for Health Statistics (NCHS) urban-rural classification scheme[1], the Case CCC 15-county catchment area centers on a large central metropolitan county (Cuyahoga), with four large fringe metropolitan, five median metropolitan, and five micropolitan (non-metropolitan) counties.

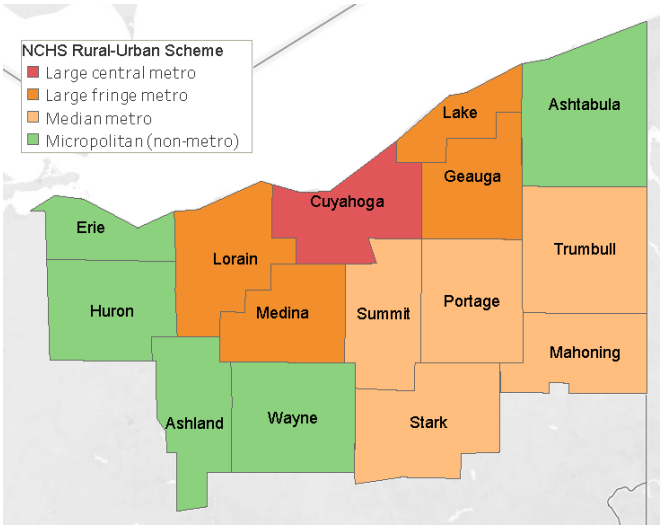

FIGURE 1 – Map of the 15-county Case Comprehensive Cancer Center (CCC) catchment area indicating metropolitan status based on National Center for Health Statistics designations.

With a population of 3,958,168 residents, the Case CCC catchment area comprises about 33.7% of the total population of the state, and records just over a third of the new cancer diagnoses in Ohio each year. While the majority of the population identifies as White (79.3%), there are pockets of high racial and ethnic diversity in urban centers like Cleveland (47% Black) and Akron (26% Black), and in counties like Lorain (11% Hispanic).[2] **Table 1** summarizes the racial and ethnic distribution of Case CCC residents.

The catchment area is characterized by considerable socioeconomic diversity, with poverty rates as low as 6.1% (Geauga county) and 6.4% (Medina county), and as high as 18.1% (Cuyahoga County) and 20.3% (Ashtabula County).[3] The city of Cleveland is reported to be the second poorest urban center in the country with a 31.2% poverty rate[4], disproportionately affecting non-Hispanic (NH) Black residents.[5]

Addressing unique catchment area needs is a vital function of NCI-designated cancer centers and of Case CCC. This can be accomplished on multiple fronts, including by tailoring research to address specific areas of disproportionate cancer

burden or by targeting community outreach and education (COE) activities toward the subpopulations—defined geographically, demographically, or otherwise—with the greatest needs. To pursue these goals strategically requires granular data on catchment area cancer burden. The Case CCC Population Cancer Analytics Shared Resource (PCA-SR) has designed this report to serve the needs of

- Case CCC scientists wishing to frame or focus their research based on the unique cancer epidemiology of the catchment area
- Case CCC scientists or others wishing to understand the size of specific subpopulations of cancer patients in the region
- COE professionals wishing to prioritize and target educational or other interventions aimed at improving catchment area outcomes and reducing cancer disparities
- Community partners who may use the information provided to set priorities, inform the public, or advocate for resources.

We have designed this report to align as closely as possible with the state and national cancer statistics provided in the perennial publication by Siegel et al in *CA: Cancer Journal for Clinicians* (most recently, "Cancer Statistics, 2024"[6]) to facilitate comparison between our region's data and that of other areas of the country, or of the country as a whole.

Racial/Ethnic Category	Total N=3,958,168	Percent
White alone	3.139,419	79.3%
Black/African American alone	610,985	15.4%
Asian alone	92,988	2.3%
American Indian and Alaska Native alone	11,037	0.3%
Native Hawaiian and Other Pacific Islander alone	1,102	0.03%
Two or more races	103,075	2.6%
Hispanic	203,127	5.1%

TABLE 1 – Racial and Ethnic breakdown of Case CCC.[2] Race and ethnicity categories are not mutually exclusive.

Materials and Methods

We report cancer burden statistics at the county, catchment, state, and U.S. levels. Cancer is the only non-infectious mandatory reportable disease in the U.S.[7] When an individual is diagnosed with invasive cancer in the U.S., a hospital based cancer registrar records information about the individual, their cancer diagnosis, their initial treatment, and their survival. Information in hospital-based registries is reported in a standardized format to central, usually state-based, cancer registries. In Ohio, that central registry is called the Ohio Cancer Incidence Surveillance System (OCISS) and is administered by the Ohio Department of Health.[8] OCISS achieves a >95% capture rate of invasive cancer cases[9], and therefore served as the source for cancer burden data for the county, catchment, and state levels for this report. Where possible, we provide state and national level statistics for comparison to county and catchment level figures. National statistics in the figures and tables below come from SEER*Stat, an online tool leveraging the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) and Centers for Disease Control and Prevention's (CDC) National Program of Cancer Registries databases.[10]

We derived cross-sectional case and death counts, and calculated age-adjusted incidence and mortality rates, based on Ohio cancer diagnoses and deaths occurring from January 1, 2016 through December 31, 2020 (the most recent year of data available given that OCISS, like most cancer registries, reports finalized year-end data with a lag greater than two years). We calculated five-year overall survival using data for cases diagnosed January 1, 2011 through December 31, 2015 to allow a minimum of five years of follow-up for all cases. For trend analyses, we captured cases diagnosed from 1996 (the first year of operation for OCISS) through 2020.

Population denominator data for age adjustment was derived from SEER*Stat[10], which derives its population data from the U.S. Census. Age-adjusted incidence and mortality with 95% confidence intervals were calculated using the direct method of age adjustment[11], with the 2000 U.S. standard population as the reference.[12]

For statistics reported by race, we used racial categories of Black, White, and "All other races". The last category combined the less populous categories of American Indian/Alaskan Native and Asian American/Pacific Islander to comply with our Ohio Department of Health Data Use Agreement, which prohibits sharing data based on cell counts smaller than 11 individuals. We used ethnicity categories of Hispanic/Latino and Not Hispanic/Latino.

As mentioned in the Introduction, a useful companion resource for comparison to national statistics is the "Cancer Statistics, 2024" article published in *CA: Cancer Journal for Clinicians* by Siegel et al.[6] These authors use 2016-2020 SEER and National Program of Cancer Registries (NCPR) data to calculate cross-sectional statistics for the nation. We specifically reference some of these statistics throughout the text. Within our table captions and figure legends, we provide links to analogous national tables and figures from Siegel et al.[6]

Selected Findings

Figure 2a depicts the ten most common cancers diagnosed among men and women in the Case CCCC catchment area from 2016-2020. Case and death counts represent five-year totals. While overall, the relative rankings for incident cancer types are similar regionally and nationally, there are some important differences in the proportion of cases attributable to each type. Among men, cancer of the lung and bronchus and urinary bladder cancer represent a higher proportion of total cancer burden regionally (14.2% and 7.5%, respectively) than nationally (11.3% and 6.1%[6]). Among catchment area women, thyroid cancer occurs more frequently than is the case for their national counterparts: 4.4% vs. 3.2% of cases, respectively.[6]

Leading causes of cancer death for catchment area men and women are depicted in **Figure 2b**. Among northeast Ohio women, the share of deaths from liver and intrahepatic bile duct cancers is lower than the national average: 2.7% regionally (the 9th leading cause of female cancer death) versus 3.7% nationally (the 7th leading cause).[6]

Fig2a. Estimated New Cases in the Catchment Area, 2016-2020

Males				Females		
Prostate	15,781	25.2%		Breast	17,901	29.1%
Lung & bronchus	8,883	14.2%		Lung & bronchus	8,574	13.9%
Colon & rectum	5,258	8.4%		Colon & rectum	4,879	7.9%
Urinary bladder	4,683	7.5%		Uterine corpus	4,485	7.3%
Melanoma of the skin	3,763	6.0%		Melanoma of the skin	2,733	4.4%
Non-Hodgkin lymphoma	2,732	4.4%		Thyroid	2,681	4.4%
Kidney & renal pelvis	2,479	4.0%		Non-Hodgkin lymphoma	2,264	3.7%
Oral cavity & pharynx	2,312	3.7%		Pancreas	1,880	3.1%
Pancreas	1,980	3.2%		Kidney & renal pelvis	1,621	2.6%
Leukemia	1,882	3.0%		Leukemia	1,329	2.2%
All Sites	**62,599**	**100%**		**All Sites**	**61,501**	**100%**

Fig2b. Estimated Deaths in the Catchment Area, 2016-2020

Males				Females		
Lung & bronchus	6,320	26.5%		Lung & bronchus	5,281	24.1%
Prostate	2,318	9.7%		Breast	3,249	14.8%
Colon & rectum	1,997	8.4%		Colon & rectum	1,860	8.5%
Pancreas	1,734	7.3%		Pancreas	1,763	8.1%
Liver & intrahepatic bile duct	1,211	5.1%		Ovary	988	4.5%
Esophagus	1,052	4.4%		Uterine corpus	870	4.0%
Leukemia	1,018	4.3%		Leukemia	782	3.6%
Urinary bladder	985	4.1%		Non-Hodgkin lymphoma	683	3.1%
Non-Hodgkin lymphoma	883	3.7%		Liver & intrahepatic bile duct	600	2.7%
Brain & other nervous system	705	3.0%		Brain & other nervous system	518	2.4%
All Sites	**23,879**	**100%**		**All Sites**	**21,896**	**100%**

FIGURE 2 – a) the 10 most commonly diagnosed cancers among men and women in the 15-county Case Comprehensive Cancer Center catchment area, b) the 10 most common causes of cancer death in the catchment area. Click here to view the analogous national figure.[6]

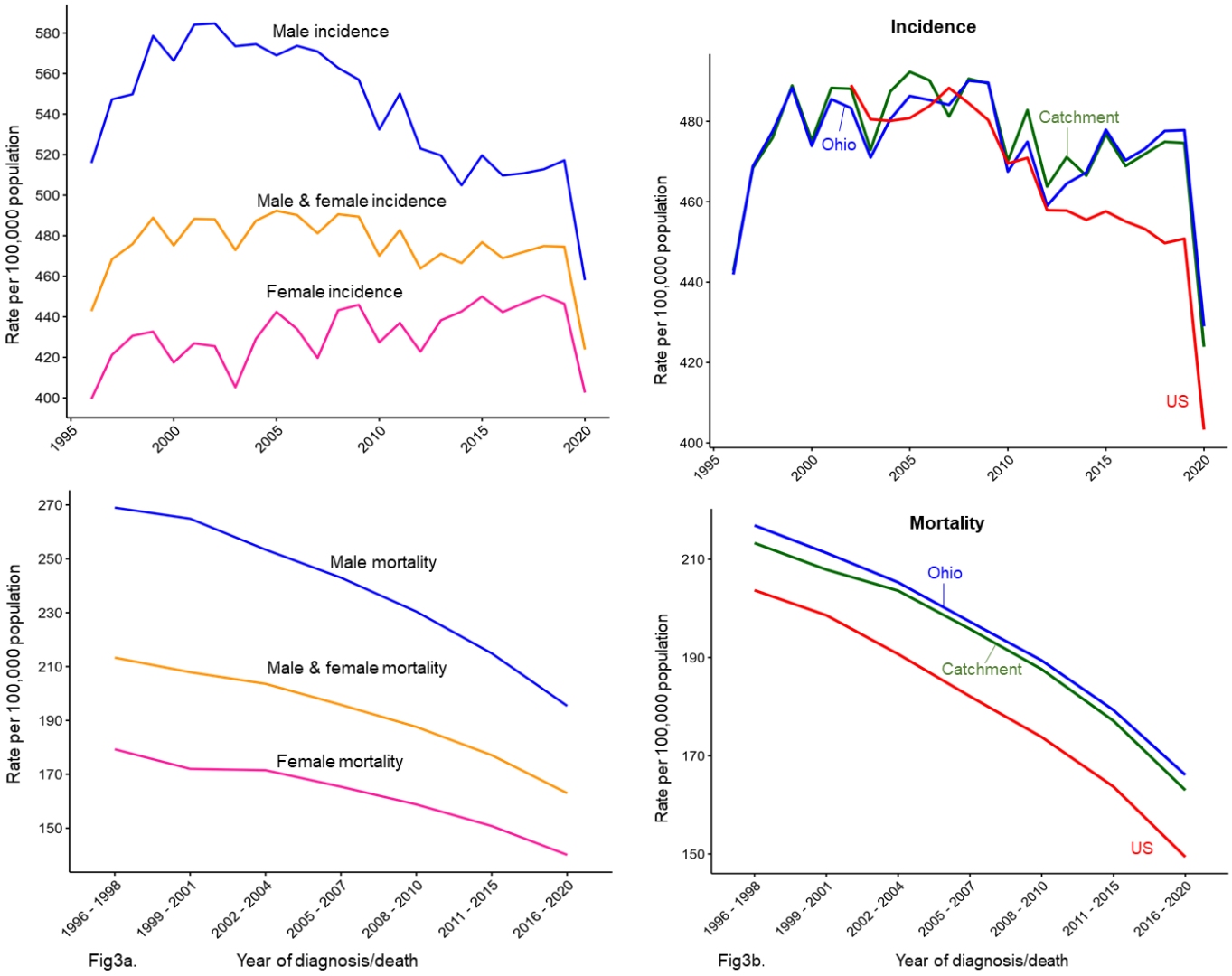

FIGURE 3 – a) 25-year trends in age-adjusted cancer incidence and mortality for men, women, and both sexes combined within the catchment area. Click here to view the analogous national figure.[6] b) 25-year trends in age-adjusted cancer incidence in mortality in the catchment area, state of Ohio, and nation.

Figure 3a traces the 25-year trends in cancer incidence and mortality for males and females in the Case CCC catchment area. The converging male and female incidence, driven primarily by a decline in male incidence beginning in the mid-2000's is a pattern that is also seen at the national level.[6] **Figure 3b** compares catchment area and state incidence and mortality to those of the nation. In the last 25 years for which data is available, the nation has seen a steady decline in cancer mortality rate. This trend is also seen in the state and catchment area, but the substantial gap between the U.S. and (northeast) Ohio has remained essentially constant throughout this timeframe. Both Figures 3a and 3b report a precipitous decline in incidence in 2020 during the early COVID-19 pandemic. This is likely a result of delayed diagnosis and reporting.

Figure 4 displays trends since 1996 in catchment area age-adjusted incidence for seven selected cancers among men and women. These trends qualitatively resemble the trends seen over the same time period at the national level.[6] This includes a declining incidence of diagnosed prostate cancer beginning in the 2000s; a continued downward trend in male lung and bronchus cancer and male and female colorectal cancer (CRC); and gradual upward trends in liver and intrahepatic bile duct cancer, thyroid cancer, and melanoma among both sexes.

Cancer burden by race and ethnicity in the catchment area – **Table 2** displays the age-adjusted cancer incidence rates per 100,000 population for selected common cancers by race/ethnicity categories over the 2016-2020 period. One of

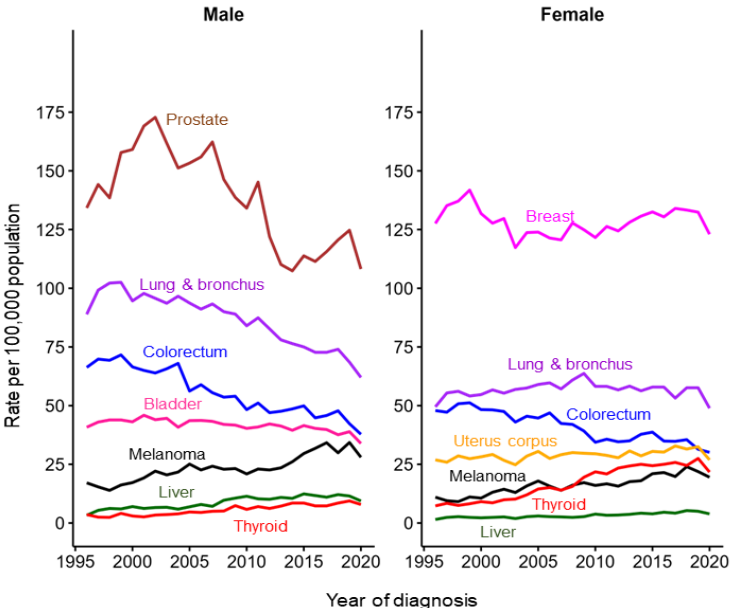

FIGURE 4 – Trends in CCCC catchment area age-adjusted cancer incidence rates for selected cancers by sex. Click here to view the analogous national figure.[6]

the most striking findings from these data is the high incidence of lung and bronchus cancer in the catchment area (61.4 compared to 55.0 nationally over the same period[6]). A large disparity is observed between NH White and NH Black men in the catchment area (69.8 versus 79.1), exceeding the disparity seen nationally (65.7 versus 72.4[6]). An alarming pattern is seen among Black women in the catchment area, with lung and bronchus cancer incidence of 61.4 (versus 45.8 at the national level[6]).

Of note, colorectal cancer incidence is slightly higher than the national average among NH White residents of the catchment area (36.9 vs 35.2 per 100,000 population for men and women combined[6]) but below the national average among non-Hispanic Black individuals (39.6 versus 40.8[6]).

	All Races and Ethnicities	Non-Hispanic White	Non-Hispanic Black	Hispanic	Other
All Sites	462.5	463.6	454.8	265.6	324.7
Male	501.4	496.9	518.7	274.2	341.5
Female	437.5	443.7	410.6	263.0	314.6
Breast (female)	130.5	132.9	126.0	80.4	96.5
Colon & Rectum	37.9	36.9	39.6	21.4	32.0
Male	43.6	42.0	46.5	26.8	41.8
Female	33.3	32.6	34.5	16.8	24.0
Kidney & renal pelvis	15.8	15.7	17.1	11.3	12.3
Male	20.6	20.3	23.1	14.3	14.7
Female	11.7	11.6	12.7	8.2	10.2
Liver & intrahepatic bile duct	7.6	6.8	11.7	10.2	11.0
Male	11.2	9.7	19.3	17.4	19.2
Female	4.6	4.4	6.1	3.9	4.2
Lung & bronchus	61.4	61.4	68.6	25.1	40.4
Male	69.9	69.8	79.1	29.5	50.1
Female	55.0	55.1	61.4	21.9	32.6
Prostate	116.2	108.0	166.9	79.1	63.6
Stomach	6.2	5.7	9.6	7.0	6.7
Male	8.8	8.3	13.0	8.3	10.7
Female	4.2	3.6	7.4	6.0	3.7
Uterine cervix	7.2	7.0	7.6	7.7	4.9
Uterine corpus	30.8	31.2	28.9	26.4	25.6

TABLE 2 – Age-adjusted incidence rates per 100,000 population for selected cancers, stratified by sex where applicable. Click here to view the analogous national table.[6]

Table 3 provides corresponding age-adjusted mortality rates for selected common cancers by race/ethnicity categories for 2016-2020. Similar to incidence rates, lung and bronchus cancer mortality rates in the catchment area are substantially elevated. Overall, lung and bronchus cancer mortality is 44.3 per 100,000 in the catchment area, compared to a national rate of 35.0[6]. Rates are elevated across every racial/ethnic/sex subgroup in the catchment area, but the most extreme elevation is seen among NH Black men, who die at a rate of 68.2 per 100,000 per year. This compares to a national rate among men of all races/ethnicities of 42.2 and a national rate for NH Black men of 51.3[6]. Even among Hispanic residents of the catchment area, who fare significantly better than the national average in terms of overall cancer mortality risk, lung cancer mortality rate was elevated: 20.1 compared to 15.5 nationally.[6]

	All Races and Ethnicities	Non-Hispanic White	Non-Hispanic Black	Hispanic	Other
All Sites	160.9	158.6	189.8	104.0	124.3
Male	195.0	191.7	237.3	118.7	159.2
Female	137.3	135.5	160.3	92.3	98.9
Breast (female)	22.6	21.8	30.2	15.7	13.3
Colon & Rectum	14.7	14.2	19.2	11.9	10.9
Male	17.9	17.3	23.9	10.4	15.7
Female	12.2	11.7	15.8	12.9	7.3
Kidney & renal pelvis	3.6	3.7	3.7	1.1	1.8
Male	5.2	5.3	5.3	2.1	2.1
Female	2.4	2.4	2.7	0.3	1.5
Liver & intrahepatic bile duct	6.8	6.0	11.4	9.7	11.0
Male	10.1	8.7	18.7	16.5	17.8
Female	4.2	3.8	6.2	3.6	5.8
Lung & bronchus	44.3	44.1	50.2	20.1	34.8
Male	55.6	54.8	68.2	25.4	45.0
Female	36.1	36.2	38.6	15.7	27.4
Prostate	21.4	19.5	40.3	11.7	10.7
Stomach	2.8	2.3	5.6	3.8	5.7
Male	4.0	3.3	8.4	3.5	8.8
Female	1.9	1.6	3.8	4.1	2.8
Uterine cervix	2.1	2.0	3.1	2.7	0.4
Uterine corpus	5.9	5.5	9.2	2.4	6.0

TABLE 3 – Age-adjusted mortality rates for selected cancers, stratified by sex where applicable. Click here to view the analogous national table.[6]

Figure 5 compares the stage distribution of selected cancers across NH Black and NH White patients. In general, the prevalence of disease that is metastatic at diagnosis looks similar to national patterns. However, the catchment area has a slightly lower proportion of metastatic disease for two important screening-amenable cancers. Here, 20% of CRC is diagnosed at a metastatic stage, but nationally that proportion rises to 22%.[6] Similarly, lung cancer is diagnosed at a metastatic stage slightly less frequently in the catchment area: 42% for all races combined compared with 44% nationally.[6] This effect is partially driven by substantially lower metastatic proportion among NH Black patients: 42% versus 47% nationally. [6]

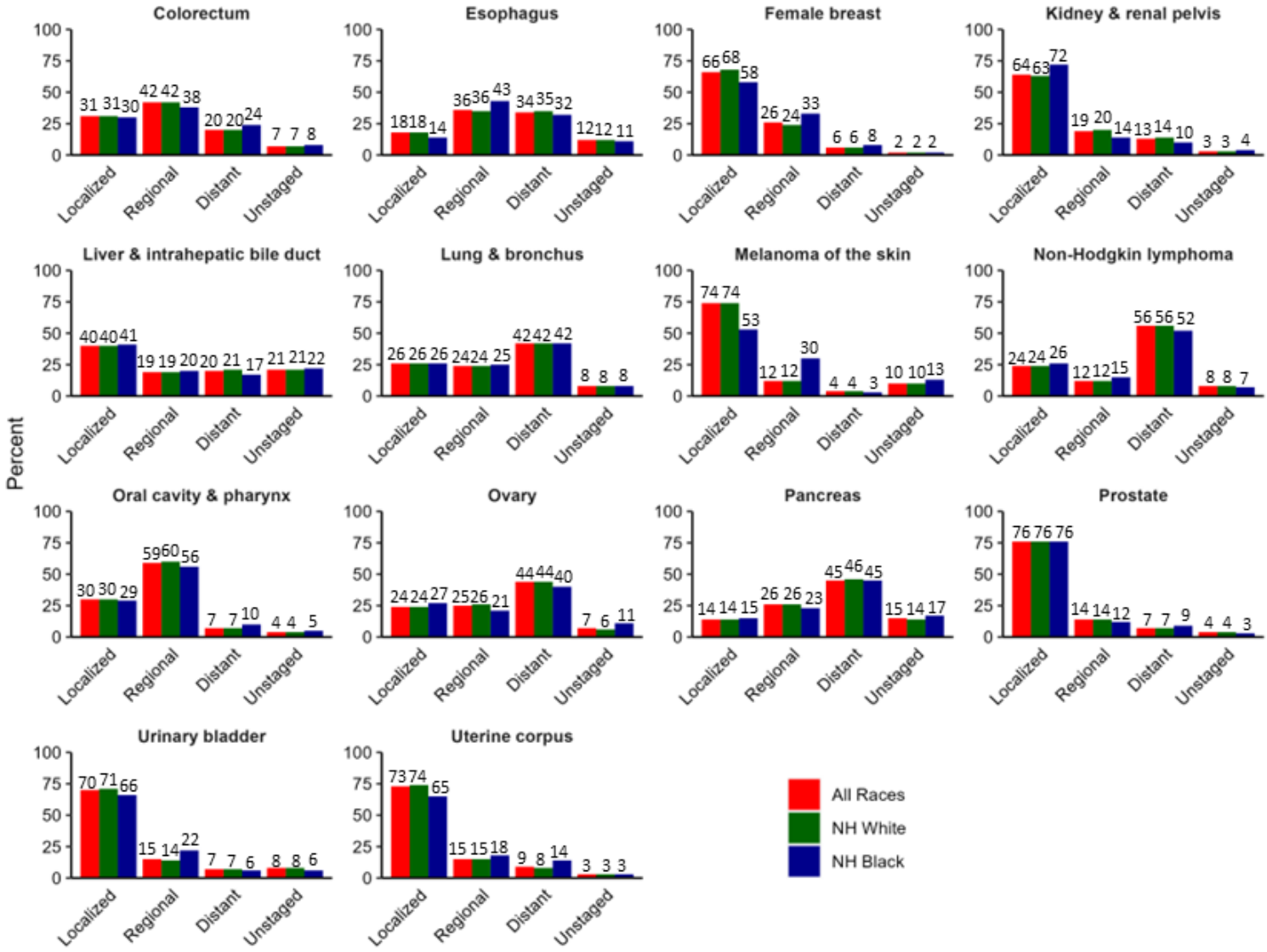

FIGURE 5 – Stage distribution for selected cancers by race, Catchment area, 2016 to 2020. White and Black race categories are exclusive of non-Hispanic ethnicity. Click here to view the analogous national figure.[6]

Figure 6 shows catchment area overall five-year survival for four common cancers by stage in NH Black and NH White patients compared to all races. Some substantial stage-specific survival disparities are apparent in breast and prostate cancer. At every stage, NH Black women with breast cancer in the catchment area fare significantly worse than their NH White counterparts. Only 11% of NH Black women with distant stage breast cancer will avoid dying of their disease by year 5, compared with 20% of NH White women. Among men whose prostate cancer has spread regionally by the time of diagnosis, survival is seven percentage points lower for NH Black patients compared to their NH White counterparts (79% versus 86%).

Table 4 stratifies counts of deaths for the five most deadly cancers among catchment area males and females by age group for the years 2016-2020. Among boys and girls in the catchment area, brain and other nervous system cancers were the most common causes of cancer death (14 deaths in each group in 2016-2020). Among 20-39 year-old adults, leukemia (33 deaths) and breast cancer (77 deaths) were the most frequent cause of cancer death in men and women, respectively. In 40-49 year-olds, lung and bronchus (117 cases) and breast cancer (200 cases) accounted for the most deaths in men and women, respectively. In the 50-64, 65-79, and 80+ year-old age groups, lung and bronchus cancer

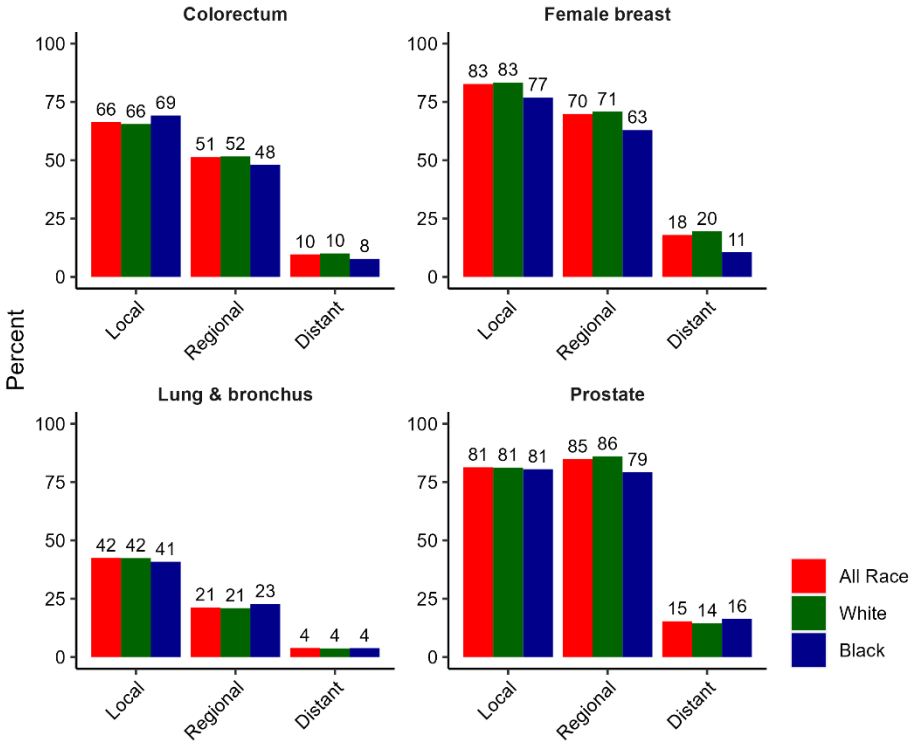

FIGURE 6 – Five-year overall survival for top 4 cancers by race and stage at diagnosis, Catchment area, 2016 to 2020. Click here to view national relative survival.[6]

accounted, by far, for the most deaths in men and women: 1639, 3108, and 1492 in the respective age groups among men, and 1297, 2545, and 1397 in the respective age groups among women.

Tables 5 and **6** list, by county, the age-adjusted cancer incidence and mortality rates per 100,000 population for six commonly incident and six commonly fatal cancer, respectively. The final rows of each table provide catchment area-wide, state-wide, and nationwide rates. Compared to a rate of 480.4 per 100,000 among men nationally, 506.4 per 100,000 Ohio men and 501.4 per 100,000 catchment area men will develop cancer in a given year. While women nationally are diagnosed with cancer at a rate of 416.4 per 100,000, Ohio women will be diagnosed at a rate of 438.2 and catchment area women at a rate of 437.5. Gaps in mortality between the nation, Ohio, and the catchment area are relatively greater: 177.5, 202.1, and 195.0, respectively, for men; and 128.7, 140.9, and 137.3, respectively, for women. Two counties stood out as having aberrantly elevated cancer mortality due to specific cancers. First, men and women in Ashland County suffered the highest rates of CRC death: 30.2 and 20.0 per 100,000, respectively, compared to a catchment average of 17.9 and 12.2, respectively. Second, Ashtabula County men and women exhibited lung and bronchus cancer mortality rates of 72.4 and 44.4, respectively, compared to corresponding catchment averages of 55.6 and 36.1.

Summarizing some key cancer disparities in the Case CCC Catchment Area

Relative to the U.S., cancer incidence and mortality rates are considerably higher in Ohio and, to only a slightly lesser extent, in the catchment area as a whole. A few subgroups stand out as experiencing a particularly disproportionate cancer burden.

Racial disparities in lung cancer – NH Black northeast Ohioans experience disproportionately high rates of lung cancer. The disparities in lung cancer *mortality* in this group are even greater despite a markedly lower probability of having metastases at diagnosis. This suggests that particular areas of focus in cancer control and prevention for NH Black catchment residents should be risk reduction through smoking cessation and ensuring equitable receipt of high quality treatment. That said, and despite a lower metastatic proportion in our catchment area for NH Black lung cancer patients, lung cancer screening should also be a target; with lung cancer screening uptake below 12% in the state (compared to 5.8% nationally)[13], there is ample room to improve screening outcomes.

Geographic disparities in lung cancer – Ashtabula County suffers particularly high mortality from lung cancer—over 70% above the national average for men and over 50% above the national average for women—suggesting an urgent need to understand and address the drivers of lung cancer mortality in the county. Not surprisingly, Ashtabula County has, by far, the highest smoking prevalence of Northeast Ohio counties, estimated at 26.8%, compared to a catchment area average of 19.5% and a national average of 18.1%.[14]

Ranking	All Ages	Birth to 19 years	Aged 20-39 years	Aged 40-49 years	Aged 50-64 years	Aged 65-79 years	Age 80+ years
Male							
All Sites	22,081	59	208	581	5276	9644	6313
1	Lung & Bronchus	Leukemia	Leukemia	Lung & bronchus	Lung & bronchus	Lung & bronchus	Lung & bronchus
	6374	14	33	117	1639	3108	1492
2	Prostate	Brain & ONS	Brain & Other Nervous System	Colon & rectum	Colon & rectum	Prostate	Prostate
	2328	14	30	106	545	923	1152
3	Colon & rectum	Soft tissue (including heart)	Colon & rectum	Pancreas	Pancreas	Pancreas	Colon & rectum
	2012	<119	<30	51	452	836	539
4	Pancreas	Other Endocrine (including Thymus)	Soft tissue (including heart)	Brain & ONS	Liver	Colon & rectum	Urinary bladder
	1731	<11*	<20**	49	417	793	504
5	Liver	Non-Hodgkin lymphoma	Lung & bronchus	Esophagus	Esophagus	Liver	Pancreas
	1219	<11*	<20**	38	324	575	383
Female							
All Sites	20,399	42	264	668	4534	8361	6530
1	Lung & bronchus	Brain & Other Nervous System	Breast	Breast	Lung & bronchus	Lung & bronchus	Lung & bronchus
	5346	14	77	200	1297	2545	1397
2	Breast	Leukemia	Uterine cervix	Lung & bronchus	Breast	Breast	Breast
	3294	<11*	<30**	96	850	1175	992
3	Colon & rectum	Other Endocrine (including Thymus)	Leukemia	Colon & rectum	Colon & rectum	Pancreas	Colon & rectum
	1863	<11*	<30**	68	359	780	725
4	Pancreas	Kidney	Brain & Other Nervous System	Ovary	Pancreas	Colon & rectum	Pancreas
	1778	<11*	<20**	41	334	692	632
5	Ovary	Soft tissue (including heart)	Colon & rectum	Uterine cervix	Ovary	Ovary	Leukemia
	1014	<11*	<20**	39	263	431	356

TABLE 4 – Five leading causes of cancer death in the catchment by age and sex, 2016-2020. Click here to view the analogous national table.[6]

*The Ohio Department of Health requires that cell counts <11 are masked to prevent identification of specific patients.

**The second smallest cell counts in rows with cell counts <11 are masked to prevent identifying small cell counts by subtraction.

Racial disparities in breast cancer – At every stage, NH Black women with breast cancer in the catchment area fare significantly worse than their NH White counterparts. Only 11% of NH Black woman with distant stage breast cancer will

	All Sites		Breast	Colon & Rectum		Lung & Bronchus		Non-Hodgkin Lymphoma		Prostate	Uterus
	Male	Female	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ashland	503.1	458.8	119.7	49.4	47.1	70.3	55.6	18.7	18.2	118.9	28.0
Ashtabula	512.6	428.8	112.1	45.8	27.5	87.6	68.2	25.5	12.7	96.0	33.2
Cuyahoga	527.2	445.3	135.3	49.2	35.5	70.9	56.3	22.9	14.5	134.7	33.9
Erie	478.2	454.3	120.1	42.5	37.7	67.8	54.1	17.2	16.4	98.6	31.2
Geauga	472.8	447.7	139.7	34.4	33.9	52.9	47.2	24.5	16.7	107.7	30.2
Huron	566.0	454.7	130.5	67.7	39.9	79.4	48.3	28.0	16.3	112.9	26.7
Lake	509.2	464.0	138.2	40.6	29.1	64.8	61.2	23.0	17.4	109.0	30.6
Lorain	515.0	454.4	136.2	38.2	32.3	70.6	55.7	25.8	16.8	120.6	31.1
Mahoning	469.1	401.9	117.4	41.9	32.1	66.0	48.2	21.5	16.9	114.2	30.7
Medina	516.9	458.1	137.5	42.0	32.1	61.7	52.8	25.1	22.0	133.0	31.5
Portage	476.2	440.5	126.8	40.7	39.0	67.6	58.7	24.3	15.5	100.1	30.9
Stark	493.9	426.7	125.0	40.3	28.6	75.3	54.4	21.5	14.7	107.1	27.3
Summit	481.3	428.0	132.4	40.4	30.7	65.7	53.2	24.8	14.5	103.4	27.8
Trumbull	466.5	407.6	116.1	43.2	32.7	80.5	56.5	18.3	14.8	95.3	27.5
Wayne	451.3	404.5	121.6	35.9	35.8	70.5	48.0	21.5	15.6	96.7	29.5
Catchment	501.4	437.5	130.5	43.6	33.3	69.9	55.0	23.0	15.5	116.2	30.8
Ohio	506.4	438.2	129.5	44.8	34.2	74.8	57.1	23.2	15.5	114.1	30.9
US	480.4	416.4	126.9	41.7	32.1	61.3	48.8	22.4	15.4	110.2	27.4

TABLE 5 – Incidence rates for selected cancers by county, total catchment area, Ohio, and the U.S., 2016-2020.

avoid dying of their disease by year 5, compared with 20% of NH White women. Given the higher incidence of the more deadly "triple negative" breast cancer among Black women[15], a next logical step in understanding this disparity will be to examine outcomes within hormone receptor status subgroups in northeast Ohio. Also, though our catchment area mammography uptake exceeds that of the nation[14], we must better understand levels and drivers of screening uptake within racial groups.

Geographic disparities in colorectal cancer – Men and women in Ashland County are dying of CRC at far higher rates than the catchment or the national averages (nearly double the respective sex-specific national averages). The proportion of eligible Ashland County residents up to date on CRC screening is estimated at 67.2% compared to a catchment area average of 71.1% and a national average of 70.3%.[14] This screening discrepancy likely does not explain the full disparity in mortality, suggesting the need for further study.

Understanding What Drives Northeast Ohio's Excess Cancer Burden

To comprehensively understand the reasons why cancer incidence and mortality in Case CCC's catchment area outpaces that of the nation will require further investigation on multiple fronts. A starting point can be answering the following questions:

- For what specific cancer sites are we seeing the most excess cases? As discussed above, lung cancer appears to be an important part of the answer to this question. What are the other major contributors?
- Are there subpopulations with high levels of risk behavior for specific cancers that are seen in excess? An example from above is the high prevalence of smoking in Ashtabula County where lung cancer incidence and mortality are significantly elevated.

- Does the histologic distribution of cases for a given site of concern differ from what is seen nationally? This may give clues as to the importance of specific behavioral or environmental exposures.
- Which subpopulations should be targeted most aggressively for screening? The answers to this question turn on an understanding of excess incidence, disproportionate late-stage presentation, and available estimates of screening uptake.
- What are the drivers of excess case fatality (probability of dying given a particular diagnosis)? Are there differences in prevalence of more aggressive histologies? Are we seeing delayed diagnosis in certain groups? Are some groups suffering poor access to timely or high-quality treatment?

Not only can the pursuit of these questions and the act of seeking to improve outcomes in our catchment area reduce regional cancer burden, but doing so can also promote scientific discovery. Understanding what is driving excess cancer incidence and mortality in Northeast Ohio can provide fundamental, generalizable insight about potent risk factor combinations, barriers to receiving cancer-related care, the effectiveness of clinic- or community-based interventions to improve outcomes, and much more.

	All Sites		Breast	Colon & Rectum		Lung & Bronchus		Non-Hodgkin Lymphoma		Pancreas		Prostate
	Male	Female	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Ashland	190.3	137.3	19.2	30.2	20.0	45.0	33.5	9.6	7.3	11.0	11.4	15.7
Ashtabula	212.1	147.0	24.0	19.2	11.4	72.4	44.4	9.3	4.3	16.5	10.6	20.4
Cuyahoga	199.9	141.0	23.8	18.4	12.3	53.9	35.3	8.3	4.3	15.1	12.9	25.0
Erie	186.7	139.2	23.0	18.3	15.9	51.8	37.5	6.5	6.0	12.9	8.7	19.8
Geauga	179.0	127.1	20.5	13.9	11.0	47.2	29.8	12.1	5.5	15.5	12.8	19.8
Huron	209.6	146.8	21.0	16.6	16.1	62.6	35.2	9.2	4.3	16.6	17.1	22.5
Lake	201.4	134.1	19.8	18.6	11.6	54.1	39.8	7.1	4.3	14.7	10.7	22.2
Lorain	200.9	140.6	23.8	18.2	10.6	57.6	39.6	9.1	5.0	14.4	11.4	18.5
Mahoning	180.1	119.5	19.8	17.3	12.7	56.2	30.7	7.4	3.6	14.0	9.7	17.3
Medina	177.4	132.6	18.1	16.0	9.4	49.3	35.8	7.1	6.1	11.4	9.9	20.8
Portage	190.3	152.8	24.2	18.9	14.8	54.8	39.4	8.9	6.4	15.5	13.9	15.0
Stark	202.4	137.0	23.6	17.5	10.9	61.0	34.6	6.4	4.3	16.5	11.2	20.9
Summit	193.3	138.3	23.4	17.5	12.5	53.3	37.0	9.4	4.7	15.2	11.5	21.8
Trumbull	186.0	131.5	20.2	16.8	12.3	62.9	37.6	7.8	2.5	16.1	11.3	16.3
Wayne	191.0	133.9	24.3	16.4	12.2	55.1	32.6	10.5	5.7	15.6	9.2	23.5
Catchment	195.0	137.3	22.6	17.9	12.2	55.6	36.1	8.2	4.5	15.0	11.7	21.4
Ohio	202.1	140.9	22.4	19.0	12.9	58.7	38.3	8.3	4.6	15.5	11.3	21.4
US	177.5	128.7	19.6	15.7	11.0	42.2	29.3	6.7	3.9	12.7	9.6	18.8

TABLE 6 – Mortality rates for selected cancers by county, total catchment area, Ohio, and the U.S., 2016-2020.

Limitations

The analyses herein have relied on cancer registry data for information on cancer burden. While the case capture rate is well above 95% nationally and in Ohio[14], some cases of cancer will inevitably be missed. This may be especially true for cancers for which treatment is normally delivered entirely in the outpatient setting. Also, the methods of ascertaining race, ethnicity, and sex are not known and are likely not consistent across sites reporting to a central cancer registry in Ohio or elsewhere. Finally, the COVID-19 pandemic likely affected results for 2020 statistics. The extent to which decreased case numbers may reflect delayed diagnosis (due to delayed healthcare seeking) versus delayed reporting of

diagnosed cases is unclear at this juncture. Within the catchment area, we compared incidence rates of major cancer types for the periods of 2015-2019 and 2016-2020 as a sensitivity analysis. Overall, differences were minimal.

Conclusions

In this white paper, we have provided detailed cancer statistics for the Case Comprehensive Cancer Center catchment area, which covers a 15-county region of northeast Ohio. We have highlighted a number of instances in which the burden of specific cancer types in certain groups, within the catchment area as a whole or within single counties, is better or worse than expected. In particular, we highlight the high burden of lung cancer, especially in non-Hispanic Black residents, and in Ashtabula County; the high mortality from breast cancer in African American women, and the high mortality from colorectal cancer in Ashland County. These are not the only insights which can be gained from the data. It is our hope that this report will serve as a resource to which researchers and others can turn for answers to specific questions about cancer burden in the catchment area—and that, with this information, they can improve the cancer outcomes for northeast Ohioans.

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