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CANCER IN NORTHEASTERN PENNSYLVANIA:

INCIDENCE AND MORTALITY OF COMMON CANCERS

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Dear Community Members,



The Northeast Regional Cancer Institute, a community-based nonprofit organization, is pleased to present this report on cancer incidence and mortality in Northeastern Pennsylvania. For over **30** years, the Cancer Institute has worked to ease the burden of cancer by focusing on the areas of community & patient services and survivorship. The Cancer Institute invests **100%** of its resources in this region.

The Cancer Surveillance Program at the Cancer Institute compiled this report using data from the organization's Regional Cancer Registry, the Bureau of Health Statistics and Research of the Pennsylvania Department of Health, and the National Cancer Institute Surveillance Epidemiology and End Results (SEER) Program. This report describes cancer incidence and mortality in Northeastern Pennsylvania relative to the United States for the **23** most common cancer sites. For the purpose of this report, Northeastern Pennsylvania is defined as the **six counties** of Lackawanna, Luzerne, Pike, Susquehanna, Wayne and Wyoming. Data from the SEER program were taken as representative of incidence and mortality rates for the United States as a whole.

In April 2023, the SEER Program reported effects of the Covid-19 pandemic on cancer incidence statistics for the year 2020. Reported incidence was down in April and May but returned to pre-Covid levels by June 2020. As a result, reported cancer incidence rates for 2020 were lower than expected based on 2019 and earlier data. The deficit in incidence varied by cancer site, but for all sites combined was approximately 9.3%. An examination of cancer incidence data for Northeastern Pennsylvania showed a similar drop in cancer cases reported in April and May of 2020, resulting in a 6.3% decrease in incidence for the year as a whole. Because of the small difference between SEER and Northeastern Pennsylvania in the covid-related drop in incidence and the Standardized Incidence Ratios (SIRs) in this report are based on data for a five-year period (2016-2020), any effects of Covid-19 on the calculated SIRs are expected to be quite small. Consequently, no adjustments were made to account for the possible effects of Covid-19 on the SIRs presented here.

The Northeast Regional Cancer Institute uses these cancer surveillance data to focus the organization's community and patient services to have the greatest possible impact. Similarly, we hope that the information contained in this report is helpful to you in support of patients at risk of or diagnosed with cancer and their loved ones.

Sincerely,

Samuel Lesko, MD, MPH
Medical Director

November 2023

Table 1. Standardized incidence ratios by primary cancer site and sex, Northeast Pennsylvania[¶], 2016-2020

Primary site	Cases No.	SIR [†]		
		Both Sexes	Men	Women
All sites	23,898	106*	104*	108*
Brain	299	108	99	118
Breast, female	3,119	-	-	97
Bronchus & lung	3,621	131*	132*	131*
Colon & rectum	2,132	114*	113*	116*
Esophagus	361	158*	168*	122
Hodgkin's lymphoma	116	122	126	117
Kidney & renal pelvis	854	98	98	99
Larynx	219	151*	149*	159*
Leukemia	663	98	93	104
Liver/intra-hepatic bile duct	458	88*	94	76*
Melanoma of the skin	1,008	97	92*	105
Multiple myeloma	317	83*	81*	87
Non-Hodgkin's Lymphoma	954	100	99	102
Oral cavity & pharynx	742	124*	124*	126*
Ovary	262	-	-	101
Pancreas	818	113*	115*	111*
Prostate	2,644	-	88*	-
Stomach	314	88*	92	81*
Testis	102	-	106	-
Thyroid	690	126*	110	132*
Urinary bladder	1,389	139*	139*	137*
Uterine cervix	179	-	-	119*
Uterine corpus	961	-	-	130*

[¶] Limited to Lackawanna, Luzerne, Pike, Susquehanna, Wayne and Wyoming counties

[†] Standardized incidence ratio = observed / expected cases X 100

* Significantly different from 100, p < 0.05

TABLE 1 SUMMARY

The five most commonly diagnosed cancer sites in northeast Pennsylvania were (starting with the most common): Bronchus and lung, female breast, prostate, colon and rectum, and urinary bladder.

Incidence was significantly elevated in northeast Pennsylvania for all sites combined and for 10 specific cancer sites: Bronchus and lung, colon and rectum, esophagus, larynx, oral cavity and pharynx, pancreas, thyroid (women), urinary bladder, uterine cervix, and uterine corpus.

Reported incidence was significantly lower in northeast Pennsylvania than the US rate for five sites for both sexes combined (unless otherwise noted): Liver and intra-hepatic bile duct, melanoma of the skin (men), multiple myeloma, prostate and stomach. Note, previous analyses suggest that cancers of the breast, prostate, skin, lymph node, and blood (e.g., leukemia) may be under reported. Caution should be used when interpreting incidence rates for these sites.

Table 2. Standardized mortality ratios by primary cancer site and sex, Northeast Pennsylvania[¶], 2016-2020

Primary site	Deaths No.	SMR [†]		
		Both Sexes	Men	Women
All sites	8,823	109*	110*	108*
Brain	225	101	100	103
Breast, female	575	-	-	103
Bronchus & lung	2,229	115*	116*	114*
Colon & rectum	818	116*	118*	114*
Esophagus	312	149*	156*	119
Hodgkin's lymphoma	13	100	113	80
Kidney & renal pelvis	184	97	98	95
Larynx	50	98	93	120
Leukemia	343	108	108	107
Liver/intra-hepatic bile duct	313	85*	91	73*
Melanoma of the skin	146	134*	132*	138*
Multiple myeloma	163	95	98	92
Non-Hodgkin's Lymphoma	276	99	97	101
Oral cavity & pharynx	151	109	102	124
Ovary	181	-	-	98
Pancreas	677	111*	112*	109
Prostate	407	-	95	-
Stomach	150	101	94	110
Testis	5	-	167	-
Thyroid	22	81	58	100
Urinary bladder	271	118*	122*	107
Uterine cervix	59	-		116
Uterine corpus	181	-		120*

[¶] Limited to Lackawanna, Luzerne, Pike, Susquehanna, Wayne and Wyoming counties

[†] Standardized mortality ratio = observed / expected deaths X 100

* Significantly different from 100, p < 0.05

TABLE 2 SUMMARY

The five cancer sites resulting in the highest number of cancer deaths in northeast Pennsylvania were (starting with the most common): Bronchus and lung, colon and rectum, pancreas, female breast and prostate.

Cancer mortality was significantly higher in northeast Pennsylvania than in the US for all sites combined and for seven specific sites: Bronchus & lung, colon & rectum, esophagus, melanoma, pancreas, urinary bladder, and uterine corpus.

Mortality in northeast Pennsylvania was significantly lower than the US rate for cancer of the liver/intra-hepatic bile duct.

Table 3. Standardized incidence and mortality ratios by primary cancer site, both sexes, Northeast Pennsylvania[¶], 2016-2020

Primary site	Cases No.	SIR (95% CI*)	Deaths No.	SMR (95% CI*)
All sites	23,898	106 (104.9, 107.6)	8,823	109 (106.9, 111.4)
Brain	299	108 (95.4, 119.8)	225	101 (88.1, 114.6)
Breast, female	3,119	97 (94.0, 100.9)	575	103 (94.6, 111.5)
Bronchus & lung	3,621	131 (127.2, 135.7)	2,229	115 (110.5, 120.0)
Colon & rectum	2,132	114 (109.5, 119.2)	818	116 (108.1, 124.0)
Esophagus	361	158 (141.4, 173.9)	312	149 (132.1, 165.1)
Hodgkin's lymphoma	116	122 (99.9, 144.3)	13	100 (45.6, 154.4)
Kidney & renal pelvis	854	98 (91.6, 104.7)	184	97 (82.9, 110.8)
Larynx	219	151 (131.0, 171.0)	50	98 (70.9, 125.2)
Leukemia	663	98 (90.1, 104.9)	343	108 (96.1, 118.9)
Liver/intra-hepatic bile duct	458	88 (80.3, 96.5)	313	85 (75.4, 94.2)
Melanoma of the skin	1,008	97 (90.8, 102.7)	146	134 (112.2, 155.7)
Multiple myeloma	317	83 (74.2, 92.6)	163	95 (80.7, 110.0)
Non-Hodgkin's Lymphoma	954	100 (94.1, 106.8)	276	99 (86.9, 110.2)
Oral cavity & pharynx	742	124 (115.5, 133.5)	151	109 (91.3, 126.0)
Ovary	262	101 (88.6, 113.0)	181	98 (84.0, 112.7)
Pancreas	818	113 (105.5, 121.1)	677	111 (102.3, 119.0)
Prostate	2,644	88 (84.4, 91.0)	407	95 (85.5, 103.9)
Stomach	314	88 (78.0, 97.4)	150	101 (84.6, 116.8)
Testis	102	106 (85.6, 126.9)	5	167 (20.6, 312.8)
Thyroid	690	126 (116.5, 135.3)	22	81 (47.4, 115.5)
Urinary bladder	1,389	139 (131.5, 146.1)	271	118 (103.8, 131.9)
Uterine cervix	179	119 (101.9, 136.8)	59	116 (86.2, 145.2)
Uterine corpus	961	130 (121.8, 138.3)	181	120 (102.4, 137.3)

[¶] Limited to Lackawanna, Luzerne, Pike, Susquehanna, Wayne and Wyoming counties

* Confidence interval

Figures in **bold font** are significantly different from 100

TABLE 3 SUMMARY

Cancer incidence and mortality were significantly elevated in northeast Pennsylvania for all sites combined and at six specific sites: Bronchus & lung, colon and rectum, esophagus, pancreas, urinary bladder and uterine corpus.

Some notable disparities between incidence and mortality include: Incidence was significantly depressed but mortality was not significantly different from U.S. rates for multiple myeloma, prostate and stomach. Incidence was significantly elevated but mortality was not for larynx, oral cavity and pharynx, thyroid, and uterine cervix. However, for two of these sites (larynx and uterine cervix) the number of deaths was small and the confidence intervals did not rule out the possibility of a meaningful elevation in mortality for these sites.

Also, incidence and mortality were significantly lower than the US rate for cancer of the liver/intra-hepatic bile duct.

Definition of Terms

CONFIDENCE INTERVAL

The standardized incidence and mortality ratios described in this report are point estimates of cancer incidence and mortality in Northeastern Pennsylvania compared to the United States. Although these are the best estimates of cancer experience in Northeastern Pennsylvania, it is important to recognize the potential for uncertainty in these estimates due to random or sampling error or variability.

The size of the uncertainty in these ratios is reflected in confidence interval. The 95% confidence interval is the range of values that will include the true ratio 95% of the time. Compared to narrow confidence intervals, wider confidence intervals reflect greater uncertainty in value of the true ratio.

PRIMARY SITE

The cancer cases in this report were examined by primary site. The primary site is the tissue or organ where the cancer was shown to originate as evidenced by microscopic examination of tissue, radiologic examination (x-ray, CT scan, or MRI), endoscopy (e.g., colonoscopy), or clinical examination.

STANDARDIZED INCIDENCE AND MORTALITY RATIOS

The incidence ratios in this report (Tables 1 & 3) are the calculated best estimates of the incidence of each cancer in Northeastern Pennsylvania relative to the corresponding incidence in the United States and take the age and racial make-up of the population into account. Similarly, mortality ratios (shown in Tables 2 & 3) compare cancer mortality rates in NEPA to the United States mortality. These ratios are calculated by dividing the number of cancer cases (or deaths) that actually occurred in Northeastern Pennsylvania by the number of cases (or deaths) expected if Northeastern Pennsylvania had exactly the same cancer risk (or mortality) as the United States.

The ratios shown in Tables 1-3 are expressed as a percentage of the corresponding United States rate. For example, the standardized incidence ratio (SIR) for colon and rectal cancer, shown in Table 1, was 114. This means that the incidence of cancers of the colon and rectum in Northeastern Pennsylvania was 14% higher than the same figure for the United States.

This report uses data provided by the Bureau of Health Statistics and Research, Pennsylvania Department of Health. The Department specifically disclaims responsibility for any analyses, interpretations or conclusions.



The Northeast Regional Cancer Institute is a nonprofit community-based agency serving seven counties in northeast Pennsylvania with offices located in Scranton and Wilkes-Barre. Focusing on surveillance, community and patient services, and hospital and practice support services, the Cancer Institute invests 100% of its resources locally.

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