

# Cancer in Northeastern Pennsylvania: Incidence, Mortality and Survival for Common Cancers

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*“Easing the burden of cancer in  
Northeastern Pennsylvania”*



*Dear Community Members,*

*The Northeast Regional Cancer Institute, a community-based nonprofit organization, is pleased to present this report on cancer incidence, mortality and survival in Northeastern Pennsylvania. For the past 20 years, the Cancer Institute has worked to ease the burden of cancer by focusing on the areas of community & patient services, survivorship, and epidemiology research. The Cancer Institute invests 100% of its resources in this region.*

*The Epidemiology Research Department at the Cancer Institute compiled this report using data from the organization's Regional Cancer Registry, the National Cancer Database, and the Bureau of Health Statistics and Research of the Pennsylvania Department of Health. Characterized in this report are cancer incidence and mortality in Northeastern Pennsylvania relative to the United States for the 23 most common cancer sites. Additionally, the last section of the report consists of plots comparing United States relative cancer survival rates with those of our region for the five most common cancer sites in Northeastern Pennsylvania.*

*The Northeast Regional Cancer Institute uses the local cancer surveillance data it generates to focus the organization's community and patient services so that they may have the greatest possible impact. Similarly, we hope that the information contained in this report is helpful to you in your efforts against cancer.*

*Sincerely,*

A handwritten signature in black ink, reading "Samuel M. Lesko". The signature is fluid and cursive, with the first name "Samuel" and middle initial "M." clearly visible, followed by the last name "Lesko".

*Samuel Lesko, MD, MPH  
Medical Director/Director of Research*

Table 1. Standardized Incidence Ratios by primary cancer site and sex, Northeastern Pennsylvania<sup>†</sup>, 2003-2007

Primary site	Cases No.	SIR <sup>†</sup>		
		Both Sexes	Men	Women
All sites	22,433	106*	105*	107*
Brain	300	112	117	107
Breast, female	2,754	-	-	91*
Bronchus & lung	3,236	111*	128*	92*
Colon & rectum	2,866	128*	136*	122*
Esophagus	279	127*	137*	100
Hodgkin's lymphoma	130	123*	125	120
Kidney & renal pelvis	705	112*	116*	107
Larynx	207	137*	134*	147*
Leukemia	569	101	95	109
Liver/intra-hepatic bile duct	226	76*	81*	63*
Melanoma of the skin	645	73*	73*	74*
Multiple myeloma	242	90	89	92
Non-Hodgkin's Lymphoma	851	93*	86*	100
Oral cavity & pharynx	510	109	117*	93*
Ovary	372	-	-	115*
Pancreas	572	100	112	90
Prostate <sup>§</sup>	2,624	-	78*	-
Stomach	372	108	114	99
Testis	91	-	99	-
Thyroid	613	150*	100	166*
Urinary bladder	1,235	125*	123*	129*
Uterine cervix	175	-	-	131*
Uterine corpus	896	-	-	147*

<sup>†</sup> Limited to Lackawanna, Luzerne, Pike, Susquehanna, Wayne and Wyoming counties.

<sup>†</sup> Standardized incidence ratio = observed / expected cases X 100.

\* Significantly different from 100, p < 0.05.

<sup>§</sup> SIR computed taking race (white, black) into account.

### Table 1 Summary

The five most commonly diagnosed cancer sites in Northeastern Pennsylvania were (starting with the most common): bronchus and lung; colon and rectum; breast; prostate; and urinary bladder.

Cancer Incidence was significantly elevated in Northeastern Pennsylvania at 11 cancer sites for both sexes (unless otherwise noted): bronchus and lung; larynx; urinary bladder; kidney; esophagus; Hodgkin's lymphoma; colon and rectum; ovary (female); uterus (female); cervix (female); and thyroid.

Cancer Incidence was significantly decreased in Northeastern Pennsylvania at five sites for both sexes (unless otherwise noted): breast (female); prostate (male); melanoma; liver; and Non-Hodgkins lymphoma.

Table 2. Standardized Mortality Ratios by primary cancer site and sex, Northeastern Pennsylvania<sup>†</sup>, 2003-2007

Primary site	Deaths No.	SMR <sup>†</sup>		
		Both Sexes	Men	Women
All sites	9,340	107*	111*	103
Brain	181	96	95	97
Breast, female	663	-	-	104
Bronchus & lung	2,393	96*	104	86*
Colon & rectum	1,038	122*	131*	114*
Esophagus	245	120*	132*	83
Hodgkin's lymphoma	31	167*	245*	80
Kidney & renal pelvis	214	111	108	115
Larynx	74	130*	138*	103
Leukemia	358	106	93	122*
Liver/intra-hepatic bile duct	214	88*	91	83
Melanoma of the skin	129	106	110	99
Multiple myeloma	143	83*	77*	89
Non-Hodgkin's Lymphoma	352	107	101	112
Oral cavity & pharynx	119	100	117	69*
Ovary	272	-	-	115*
Pancreas	528	102	107	97
Prostate	471	-	107	-
Stomach	197	109	111	107
Testis	8	-	200	-
Thyroid	22	95	99	93
Urinary bladder	226	109	115	96
Uterine cervix	52	-	-	94
Uterine corpus	167	-	-	142*

<sup>†</sup> Limited to Lackawanna, Luzerne, Pike, Susquehanna, Wayne and Wyoming counties.

<sup>†</sup> Standardized mortality ratio = observed / expected deaths X 100.

\* Significantly different from 100, p < 0.05.

### Table 2 Summary

The five cancer sites that resulted in the highest number of deaths in Northeastern Pennsylvania were (starting with the highest): bronchus and lung; colon and rectum; breast; pancreas; and prostate.

Cancer mortality in Northeastern Pennsylvania was significantly elevated at six sites for both sexes (unless otherwise noted): colon and rectum; esophagus; larynx; Hodgkin's lymphoma; ovary (female); uterus (female).

Cancer mortality in Northeastern Pennsylvania was significantly decreased at three sites for both sexes: bronchus and lung; multiple myeloma; and liver.

Table 3. Standardized Incidence and Mortality Ratios by primary cancer site, both sexes, Northeastern Pennsylvania<sup>†</sup>, 2003-2007

Primary site	Cases No.	SIR (95% CI*)	Deaths No.	SMR (95% CI*)
Brain	300	112 (99.6, 125.1)	181	96 (81.6, 109.4)
Breast, female	2,754	<b>91 (87.7, 94.5)</b>	663	104 (95.8, 111.5)
Bronchus & lung	3,236	<b>111 (106.8, 114.4)</b>	2,393	<b>96 (91.8, 99.4)</b>
Colon & rectum	2,866	<b>128 (123.7, 133.1)</b>	1,038	<b>122 (114.7, 129.6)</b>
Esophagus	279	<b>127 (112.5, 142.4)</b>	245	<b>120 (105.2, 135.3)</b>
Hodgkin's lymphoma	130	<b>123 (101.6, 143.7)</b>	31	<b>167 (108.0, 225.3)</b>
Kidney & renal pelvis	705	<b>112 (104.0, 120.6)</b>	214	111 (96.1, 125.9)
Larynx	207	<b>137 (118.4, 155.8)</b>	74	<b>130 (100.6, 160.0)</b>
Leukemia	569	101 (93.1, 109.8)	358	106 (95.4, 117.4)
Liver/intra-hepatic bile duct	226	<b>76 (65.7, 85.4)</b>	214	<b>88 (76.0, 99.5)</b>
Melanoma of the skin	645	<b>73 (67.7, 79.0)</b>	129	106 (87.5, 124.0)
Multiple myeloma	242	90 (78.9, 101.7)	143	<b>83 (69.6, 96.8)</b>
Non-Hodgkin's lymphoma	851	<b>93 (86.4, 98.8)</b>	352	107 (95.5, 117.8)
Oral cavity & pharynx	510	109 (99.5, 118.4)	119	100 (82.2, 118.3)
Ovary	370	<b>115 (103.2, 126.6)</b>	272	<b>115 (101.0, 128.2)</b>
Pancreas	572	100 (91.8, 108.2)	528	102 (93.3, 110.7)
Prostate	2,624	<b>78 (75.2, 81.2)</b>	471	107 (97.4, 116.7)
Stomach	372	108 (96.6, 118.4)	197	109 (94.0, 124.5)
Testis	91	99 (78.6, 119.2)	8	200 (61.4, 338.6)
Thyroid	613	<b>150 (138.0, 161.7)</b>	22	95 (55.4, 135.0)
Urinary bladder	1,235	<b>125 (117.9, 131.8)</b>	226	109 (94.4, 122.8)
Uterine cervix	175	<b>131 (111.3, 150.0)</b>	52	94 (68.5, 119.6)
Uterine corpus	896	<b>147 (137.3, 156.5)</b>	167	<b>142 (120.9, 164.1)</b>

<sup>†</sup> Limited to Lackawanna, Luzerne, Pike, Susquehanna, Wayne and Wyoming counties.

\* Confidence interval.

Figures in Bold font are significantly different from 100.

### Table 3 Summary

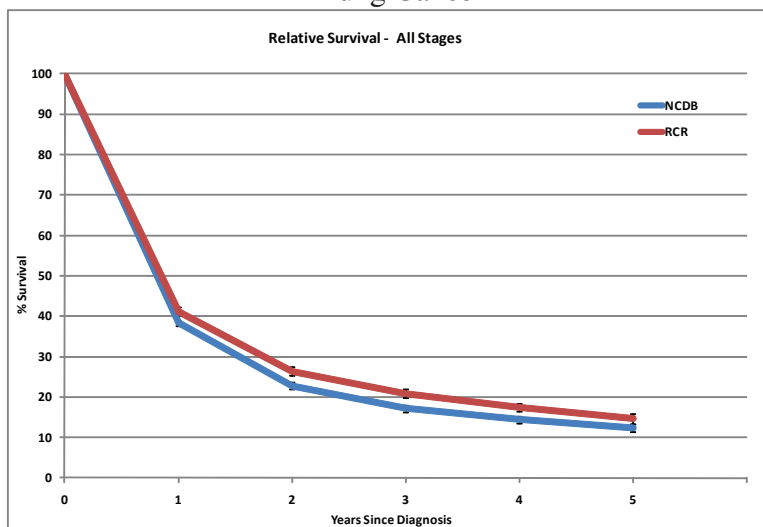
Cancer incidence and mortality were significantly elevated in Northeastern Pennsylvania at six cancer sites for both sexes (unless otherwise noted): colon and rectum; esophagus; Hodgkin's lymphoma; larynx; ovary (female); and uterus (female).

Incidence and mortality for liver cancer was significantly low in Northeastern Pennsylvania for both sexes.

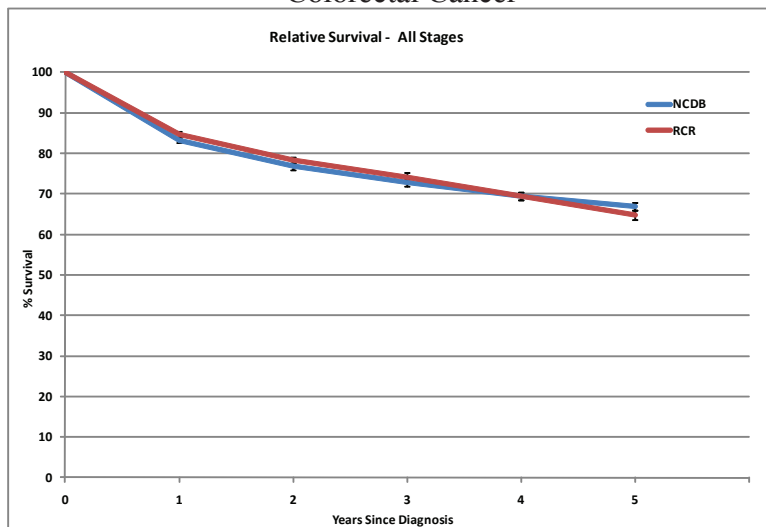
Incidence of lung cancer for both sexes in Northeastern Pennsylvania was significantly elevated, while lung cancer mortality for the same population was significantly lower than the United States average.

# Relative survival plots for selected cancers

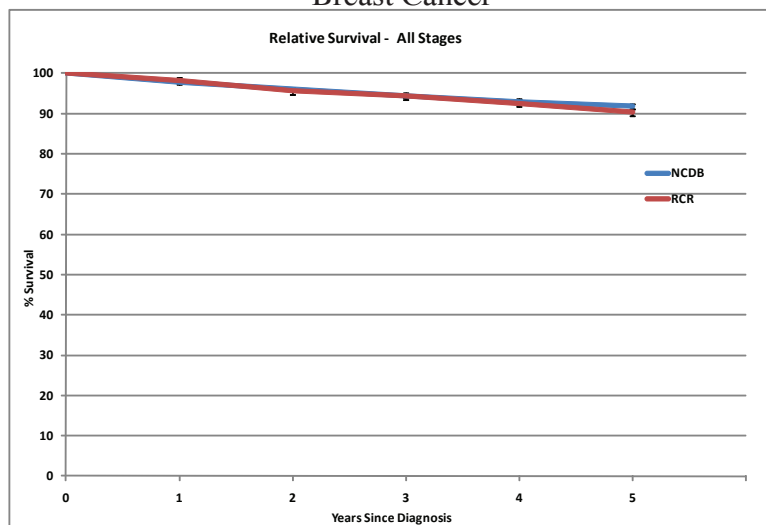
## Lung Cancer



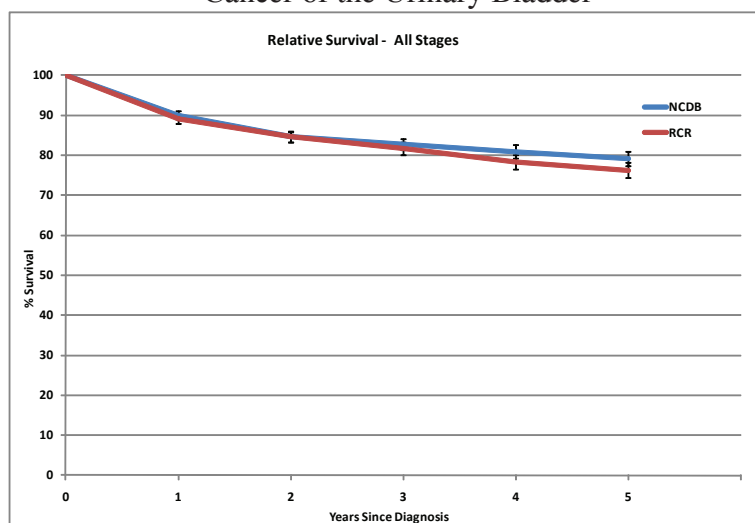
## Colorectal Cancer



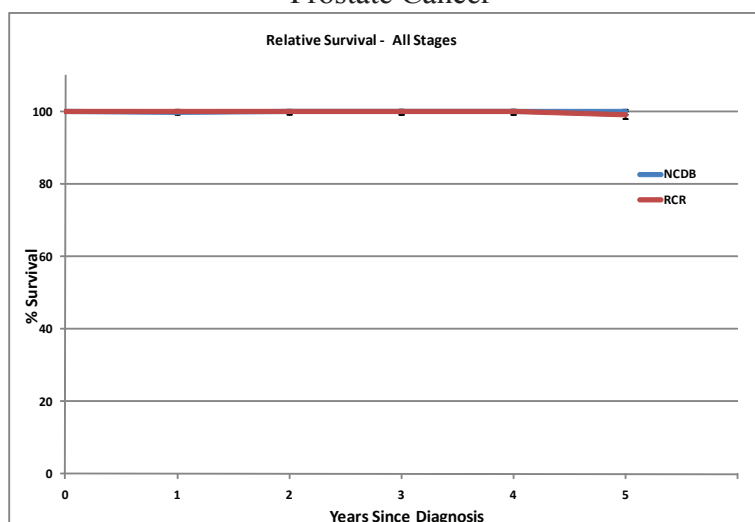
## Breast Cancer



## Cancer of the Urinary Bladder



## Prostate Cancer



## Relative Survival Plots Summary

Above are shown relative survival plots for the five most commonly diagnosed cancer sites in Northeastern Pennsylvania. For an in-depth description of how relative survival was calculated, please see page 8 of this report.

Overall, the survival plots indicate no significant difference between the average relative five-year survival for each cancer site for Northeastern Pennsylvania, compared to the United States average.

## 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.

## Relative Survival

The survival plots shown on pages 6 and 7 of this report show the percent of patients diagnosed with a specific cancer who are alive one, two, three, four or five years after diagnosis. The survival figures in this report are “relative survival” plots, which take into account deaths from all other causes. Relative survival is calculated by dividing observed survival ( $S_o$ ) by expected survival ( $S_e$ ) for a group of subjects with the same age, sex and race make-up as the cancer cases. ( $S_r = S_o/S_e$ ) Relative survival is the best measure of cancer survival in a population.

## 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 128. This means that the incidence of cancers of the colon and rectum in Northeastern Pennsylvania was 28% higher than the same figure for the United States.

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*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.*

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*The Northeast Regional Cancer Institute is a non-profit, community-based agency working to ease the burden of cancer in Northeastern Pennsylvania. Focusing on research, education & survivorship the Cancer Institute invests all of its resources in this region.*

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