

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 25 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 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. For the purpose of this report, Northeastern Pennsylvania is made up of six counties including Lackawanna, Luzerne, Pike, Susquehanna, Wayne and Wyoming.

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 that reads "Samuel M. Lesko". The signature is written in a cursive, flowing style.

*Samuel Lesko, MD, MPH
Medical Director*

Table 1. Standardized incidence ratios by primary cancer site and sex, Northeastern Pennsylvania[†], 2013-2017

| Primary site | Cases No. | SIR [†] | | |
|-------------------------------|-----------|------------------|------|-------|
| | | Both Sexes | Men | Women |
| All sites | 23,293 | 105* | 105* | 106* |
| Brain | 313 | 112 | 109 | 115 |
| Breast, female | 3,021 | - | - | 94* |
| Bronchus & lung | 3,444 | 120* | 124* | 116* |
| Colon & rectum | 2,159 | 112* | 113* | 111* |
| Esophagus | 369 | 163* | 171* | 135* |
| Hodgkin's lymphoma | 128 | 132* | 137* | 126 |
| Kidney & renal pelvis | 796 | 98 | 98 | 99 |
| Larynx | 195 | 127* | 123* | 147* |
| Leukemia | 652 | 97 | 93 | 101 |
| Liver/intra-hepatic bile duct | 428 | 89* | 94 | 76* |
| Melanoma of the skin | 962 | 88* | 82* | 96 |
| Multiple myeloma | 340 | 93 | 93 | 93 |
| Non-Hodgkin's Lymphoma | 954 | 99 | 100 | 97 |
| Oral cavity & pharynx | 702 | 123* | 124* | 121* |
| Ovary | 304 | - | - | 106 |
| Pancreas | 725 | 106 | 111* | 101 |
| Prostate | 2,380 | - | 86* | - |
| Stomach | 311 | 84* | 84 | 83* |
| Testis | 111 | - | 116 | - |
| Thyroid | 705 | 114* | 99 | 119* |
| Urinary bladder | 1,352 | 129* | 128* | 129* |
| Uterine cervix | 195 | - | - | 134* |
| Uterine corpus | 929 | - | - | 126* |

[†] 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, breast, prostate, colon and rectum, and urinary bladder.

Incidence was significantly elevated in northeast Pennsylvania for all sites combined and for 11 specific cancer sites: bronchus and lung, colon and rectum, esophagus, Hodgkin lymphoma, larynx, oral cavity and pharynx, pancreas (men), 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): breast (women), liver and intra-hepatic bile duct, melanoma of the skin, 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, Northeastern Pennsylvania[†], 2013-2017

| Primary site | Deaths No. | SMR [†] | | |
|-------------------------------|------------|------------------|------|-------|
| | | Both Sexes | Men | Women |
| All sites | 9,082 | 109* | 111* | 107* |
| Brain | 215 | 99 | 90 | 110 |
| Breast, female | 611 | - | - | 106 |
| Bronchus & lung | 2,311 | 108* | 113* | 101 |
| Colon & rectum | 838 | 114* | 111* | 117* |
| Esophagus | 319 | 152* | 158* | 130 |
| Hodgkin's lymphoma | 8 | 57* | 56 | 60 |
| Kidney & renal pelvis | 173 | 87 | 86 | 90 |
| Larynx | 57 | 106 | 102 | 118 |
| Leukemia | 384 | 116* | 112 | 122* |
| Liver/intra-hepatic bile duct | 297 | 84* | 89 | 75* |
| Melanoma of the skin | 141 | 116 | 125* | 98 |
| Multiple myeloma | 177 | 101 | 105 | 95 |
| Non-Hodgkin's Lymphoma | 314 | 109 | 114 | 102 |
| Oral cavity & pharynx | 158 | 120* | 120 | 118 |
| Ovary | 230 | - | - | 117* |
| Pancreas | 638 | 108 | 109 | 108 |
| Prostate | 399 | - | 96 | - |
| Stomach | 145 | 92 | 91 | 92 |
| Testis | 9 | - | 300* | - |
| Thyroid | 19 | 68* | 50* | 81 |
| Urinary bladder | 283 | 120* | 122* | 114 |
| Uterine cervix | 54 | - | - | 102 |
| Uterine corpus | 177 | - | - | 125* |

[†] 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, breast (women) and prostate. Cancer mortality was significantly higher in northeast Pennsylvania than in the US for all sites combined and for ten specific sites: Bronchus & lung (men), colon & rectum, esophagus, leukemia, melanoma (men), oral cavity & pharynx, ovary, testis, 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 and thyroid cancer.

Table 3. Standardized incidence and mortality ratios by primary cancer site, both sexes, Northeastern Pennsylvania[†], 2013-2017

| Primary site | Cases No. | SIR (95% CI*) | Deaths No. | SMR (95% CI*) |
|-------------------------------|-----------|---------------------------|------------|---------------------------|
| All sites | 23,293 | 105 (104.0, 106.7) | 9,083 | 109 (106.7, 111.2) |
| Brain | 313 | 112 (99.4, 124.2) | 215 | 99 (85.8, 112.3) |
| Breast, female | 3,021 | 94 (90.4, 97.1) | 611 | 106 (98.0, 114.9) |
| Bronchus & lung | 3,444 | 120 (116.1, 124.1) | 2,311 | 108 (103.4, 112.2) |
| Colon & rectum | 2,159 | 112 (107.4, 116.8) | 838 | 114 (106.2, 121.6) |
| Esophagus | 369 | 163 (146.0, 179.1) | 319 | 152 (135.2, 168.6) |
| Hodgkin's lymphoma | 128 | 132 (109.1, 154.8) | 8 | 57 (17.5, 96.7) |
| Kidney & renal pelvis | 796 | 98 (91.4, 105.1) | 173 | 87 (74.4, 100.4) |
| Larynx | 195 | 127 (109.6, 145.3) | 57 | 106 (78.2, 133.0) |
| Leukemia | 652 | 97 (89.2, 104.0) | 384 | 116 (104.7, 128.0) |
| Liver/intra-hepatic bile duct | 428 | 89 (80.6, 97.4) | 297 | 84 (74.4, 93.4) |
| Melanoma of the skin | 962 | 88 (82.3, 93.4) | 141 | 116 (96.5, 134.7) |
| Multiple myeloma | 340 | 93 (82.8, 102.5) | 177 | 101 (85.8, 115.4) |
| Non-Hodgkin's lymphoma | 954 | 99 (92.3, 104.8) | 314 | 109 (96.6, 120.7) |
| Oral cavity & pharynx | 702 | 123 (113.7, 131.8) | 158 | 120 (101.0, 138.4) |
| Ovary | 304 | 106 (94.3, 118.2) | 230 | 117 (101.7, 131.8) |
| Pancreas | 725 | 106 (98.4, 113.9) | 638 | 108 (99.9, 116.7) |
| Prostate | 2,380 | 86 (82.1, 89.0) | 399 | 96 (86.3, 105.1) |
| Stomach | 311 | 84 (74.5, 93.1) | 145 | 92 (76.8, 106.7) |
| Testis | 111 | 116 (94.1, 137.1) | 9 | 300 (104.0, 496.0) |
| Thyroid | 705 | 114 (105.5, 122.3) | 19 | 68 (37.3, 98.4) |
| Urinary bladder | 1,352 | 129 (121.7, 135.4) | 283 | 120 (105.9, 133.9) |
| Uterine cervix | 195 | 134 (114.8, 152.3) | 54 | 102 (74.7, 129.1) |
| Uterine corpus | 929 | 126 (117.6, 133.8) | 177 | 125 (106.3, 143.0) |

[†] 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, oral cavity & pharynx, 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 breast (women), melanoma, prostate, and stomach and incidence was significantly elevated but mortality was not for Hodgkin's lymphoma, larynx, 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.

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 112. This means that the incidence of cancers of the colon and rectum in Northeastern Pennsylvania was 12% 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.

Participating Health Organizations

Allied Services

Geisinger Community Medical Center
Geisinger Wyoming Valley Medical Center
Moses Taylor Hospital
Regional Hospital of Scranton
Tyler Memorial Hospital
Wayne Memorial Health System
Wilkes-Barre General Hospital

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