



Cancer is Not Our Destiny

The People's Cancer Incidence Screening Tool (PCIST)

A Citizens' Project in Support of Dignity-Based Epidemiology in Pennsylvania

Community Cancer Incidence Report for Twilight Borough, Washington County, PA

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People's Cancer Incidence Screening Tool (PCIST)

1

We calculate the average annual crude incidence of 23 different types of cancer over a 20-year (2002-2021) period in a PA town, borough or municipality

2

We compare the local cancer incidence numbers to the national, state and county numbers to identify significant "cancer signals" with elevated rates

3

We take the median age of onset of each type of cancer and compare it with the median age of the town, county, PA and US populations to assess the effect of differences in population age on the cancer rates

4

We investigate and address probable causes of elevated "cancer signals", including heavily polluting industries; infections associated with cancer development; and predatory marketing of addictive toxins to vulnerable EJ communities

Cancer	U.S. Median Age of Onset
Brain and Nervous	61
Breast (F only)	62
Cervical	50
Colon and rectal	66
Esophageal	68
Hodgkin's Lymphoma	39 (bimodal, 20 and 55+)
Kidney and renal	65
Laryngeal	66
Leukemia	65-74, varies by type
Liver and bile	62 (liver) and 70 (bile)
Lung and bronchial	71
Melanoma (skin)	(skin, 66)
Myeloma	60
Non-Hodgkin's lymphoma	67
Oral and pharyngeal	64
Ovarian	63
Pancreatic	70
Prostate	66
Stomach	68
Testicular	33
Thyroid	51
Uterine	60
Urinary and bladder	73

Cancer Rates Vary By Age

The U.S. national, PA state, PA county, and municipal/township/borough cancer incidence rates used in PCIST are crude rates. We derive these by taking the total number of invasive cancer cases that occurred in a specific population (<20 yrs, <30 yrs, adults 20+, and All ages — total, females & males) in relation to the total number of people in that specific segment of the population. This produces a value that represents the amount of cancer in a community relative to its relevant population size. These values are then compared to generate incidence ratios. In our community reports, we flag municipal “cancer signals” with a percentage rate equal to or more than 10% higher than the US, PA and County numbers.

It is important to note that most cancer rates increase with age. To help interpret the effect of a population's age distribution on its crude incidence rates, the following is provided:

- 1) A reference table (at left) with the median age of onset of each type of cancer in the U.S. as per the American Cancer Society
- 2) The relevant median population age for each municipality/ township/borough, the county, PA state, and the US nation
- 3) A chart that shows the precise population age distribution in 5-year increments, derived from the 2010 US Census figures that are used in PCIST's 20-year calculations

When analyzing cancer signals, it is important to note that (with the exception of Hodgkin's lymphoma and testicular cancer) a younger population's crude cancer incidence rates will be under-represented when compared with an older population.

PCIST uses publicly available data sources from the American Cancer Society; the PA Cancer Registry via the PA Department of Health; the CDC SEER and WONDER databases; and the U.S. Census' American Community Survey. None of these providing institutions are responsible for PCIST calculations, interpretations and reports.

Please visit www.pcist.net or contact PCIST@pm.me for a detailed explanation of the PCIST project and more information about the People's Cancer Incidence Screening Tool.

MORE Air & Water Pollution: OUR CONTEXT for RISING CANCER

In the community of Twilight Borough, residents have faced **elevated cancer rates for at least the past 20 years.**

WHY? CUMULATIVE IMPACTS

Twilight Borough is located in the most heavily fracked county in Pennsylvania, which is itself part of a large and growing **environmental justice zone** above the Marcellus Shale. Since 2004, thousands of oil and gas wells have been **hydraulically fractured**. Many residents now live within a few miles of dozens of active wells and multiple compressor stations. Energy companies often abandon unplugged oil and gas wells and contaminate drinking water sources with **fracking wastewater** – a toxic slurry of “industry secret” chemicals, radioactive particulate matter such as radium, and PFAS “forever chemicals”.

Residents also face significant legacy and contemporary pollution due to the long history of bituminous **coal mining** in southwestern Pennsylvania. A neighbor of Fallowfield Township, Twilight Borough is located near mines including the High Quality Mine, which closed in 2005 after it violated DEP regulations and polluted a nearby stream. Intensive agriculture with **chemical pesticides and herbicides** widely contaminates residents’ soil and water supplies. A network of state and inter-state highways, including the I-70 and I-79, brings a steady flow of trucks and **diesel emissions** into Washington County. The heavy pollution from all of these activities compounds and travels, producing **significant cumulative impacts** on residents’ health.

Additionally, Twilight Borough residents require adequate medical screenings and treatments for **infections that can contribute to cancer**, such as HPV (cervical cancer), EBV (Hodgkin’s lymphoma), Hepatitis B and C (liver cancer), H. pylori (stomach cancer), and HIV (many cancers). In pursuit of profit, companies also sell already vulnerable residents **addictive products** that contain carcinogenic substances, such as tobacco and alcohol.

TOTAL CANCER IN TWILIGHT

During **2002-2021 (20 years)**, the average annual crude cancer incidence rate among all ages of the population of **Twilight Borough** is greater than the corresponding rate for the **US; PA; & Washington County** by:

All Age Cancer in Twilight	> US	> PA	> WashCo
Laryngeal	392%	310%	240%
Esophageal	265%	185%	148%
Brain and Nervous System	177%	140%	126%
Myeloma	162%	137%	133%
Liver and Bile	121%	103%	93%
Colon and Rectal	111%	73%	45%
Leukemia	28%	11%	0%

2010 Median Population Age:

Twilight Borough’s population (39.4) is **comparable to** the US (36.9), PA (39.8) & WashCO (43.0).

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FEMALE CANCER IN TWILIGHT

During **2002-2021 (20 years)**, the average annual crude cancer incidence rate among females of all ages in **Twilight Borough** is greater than the corresponding rate for the **US; PA; & Washington Co** by:

All Age Female Cancer in Twilight	> US	> PA	> WashCo
Laryngeal	2148%	1699%	1293%
Liver and Bile	605%	579%	459%
Cervical	344%	350%	299%
Leukemia	181%	143%	117%
Kidney and Renal	168%	138%	96%
Colon and Rectal	63%	31%	12%

2010 Median Female Age: The total female Twilight Borough population (37.8) is **slightly younger than** the US (38.1), PA (41.2) & WashCo (44.4)

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MALE CANCER IN TWILIGHT

During **2002-2021 (20 years)**, the average annual crude cancer incidence rate among males of all ages in **Twilight Borough** is greater than the corresponding rate for the **US; PA; & Washington Co** by:

All Age Male Cancer in Twilight	> US	> PA	> WashCo
Brain and Nervous System	443%	373%	355%
Myeloma	418%	368%	367%
Esophageal	406%	295%	236%
Colon and Rectal	166%	121%	81%
Non-Hodgkin's Lymphoma	84%	55%	43%
Prostate	55%	37%	38%
Urinary Bladder	24%	-9%	-24%

2010 Median Male Age: The total male Twilight Borough population (39.9) is **comparable** to the US (35.6); PA (38.3) & WashCo (41.7)

CANCER IN TWILIGHT

PEDIATRIC CANCER

During **2002-2021 (20 years)**, the average annual crude cancer incidence rate among **children aged 0-19 years** in **Twilight Borough** is greater than the corresponding rate for the **US; PA; & Washington County** by:

Pediatric Cancer in Twilight 0-19 years of age	> US	> PA	> WashCo
None	0	0	0

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YOUTH CANCER

During **2002-2021 (20 years)**, the average annual crude cancer incidence rate among **youth aged 0-29 years** in **Twilight Borough** is greater than the corresponding rate for the **US; PA; & Washington County** by:

Youth Cancer in Twilight 0-29 years of age	> US	> PA	> WashCo
None	0	0	0

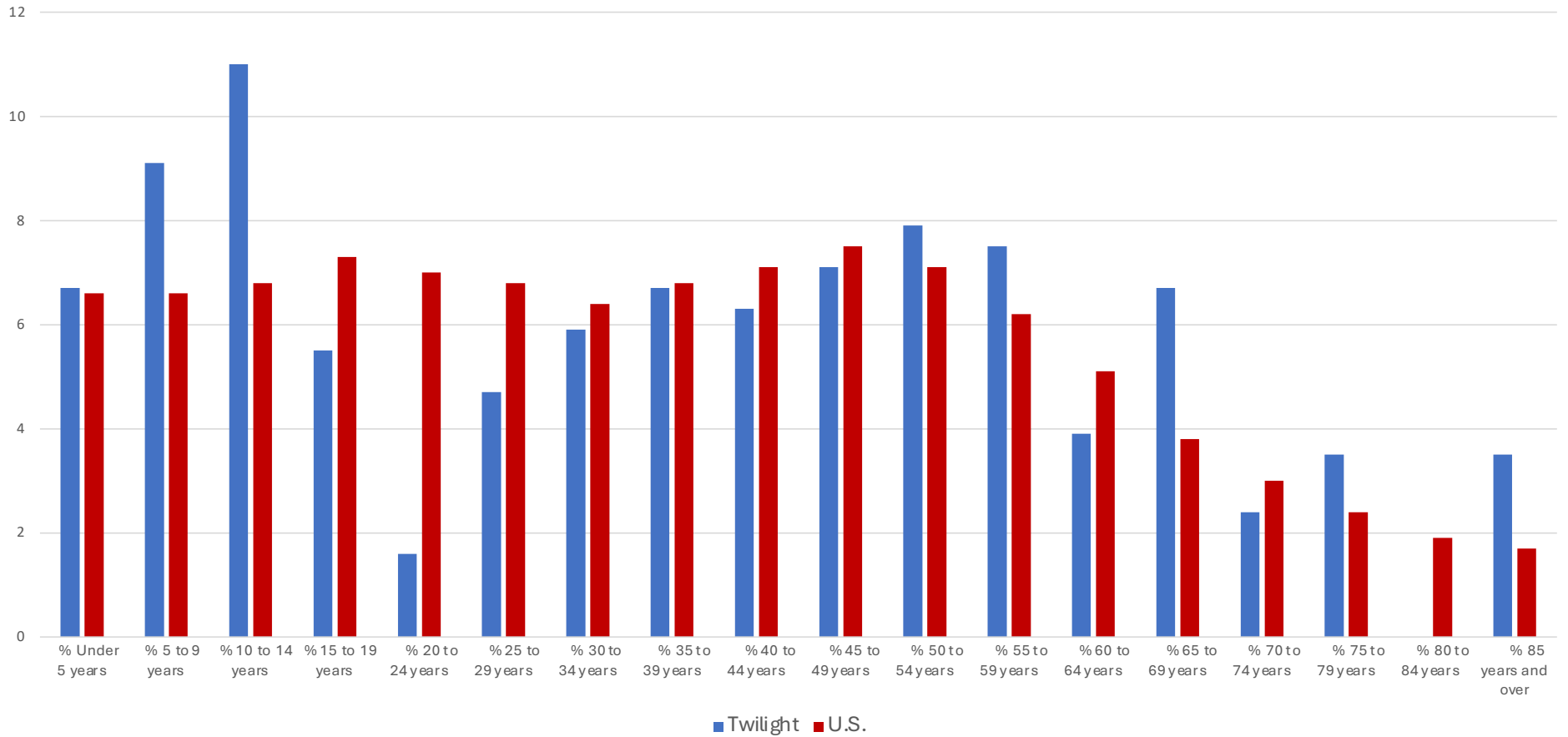
◆ Twilight Borough is located in the most heavily fracked county in Pennsylvania, which is itself part of a large and growing **environmental justice zone** above the Marcellus Shale.

ADULT CANCER

During **2002-2021 (20 years)**, the average annual crude cancer incidence rate among **adults aged 20+** in **Twilight Borough** is greater than the corresponding rate for the **US; PA; & Washington County** by:

Adult Cancer in Twilight 20+ years of age	> US	> PA	> WashCO
Laryngeal	439%	354%	283%
Cervical	382%	393%	353%
Esophageal	298%	216%	179%
Brain and nervous	242%	207%	183%
Myeloma	185%	174%	162%
Liver and bile	142%	130%	119%
Colon and rectal	130%	91%	64%
Prostate	68%	58%	54%
Leukemia	50%	43%	20%
Kidney and renal	18%	8%	-5%

2010 Twilight Total Population Age Distribution



PCIST's TIPS to Help Protect Our Families

1. RUN AIR PURIFIERS IN OUR HOMES. These machines **remove toxic particles** so that we don't inhale them into our lungs. This helps to prevent both cancer and asthma. The best ones have an **activated carbon filter** that also removes VOCs (volatile organic compounds). An air purifier handles a set amount of space, so we may need more than one (or to move the one we have when we go to bed). Found on Amazon and Walmart, Lowes, and Home Depot.

DID YOU KNOW? We can inexpensively build our own air purifier with a box fan and furnace filters. Google "How to make a Corsi-Rosenthal box" for directions. Try to use MERV activated carbon filters, which are available on Amazon and at Lowes and Home Depot.

2. REPLACE GAS STOVES WITH ELECTRIC ONES. Natural gas and propane stoves release invisible, odorless and toxic gases (including radon, benzene, nitrogen dioxide and methane) into our homes. These gases affect air quality throughout our homes, including in the bedrooms, and are known to cause asthma and cancer. It is much safer to cook with an electric stove.

3. USE A WATER FILTER, ESPECIALLY IN THE KITCHEN. These filters **remove harmful particles and toxic chemicals from our drinking and cooking water**. Some come as a pitcher that we fill with water from the tap, while others attach directly to the faucet. The **best filters also remove PFAS/PFOS – forever chemicals – which are known to be in the fracking waste that often contaminates drinking water sources**. Found on Amazon and in a wide range of department and home supply stores.

4. AVOID ADDITIONAL FACTORS that put addictive toxins in our bodies and increase cancer risk, such as **smoking**; breathing **second-hand smoke**; and **drinking alcohol**. Some **infections also contribute to causing cancer** such as **HPV** (cervical cancer), **EBV** (Hodgkin's lymphoma), **Hepatitis B and C** (liver cancer), **H. pylori** (stomach cancer), and **HIV** (many cancers). If you were exposed or have symptoms, ask a doctor for **testing and proper treatment**. All girls and women can also **get vaccinated against HPV** between the ages of 9 and 45.

5. FIND AND JOIN ENVIRONMENTAL JUSTICE GROUPS IN YOUR COMMUNITY TO LEARN HOW TO FIGHT BACK against the pollution that is causing asthma and cancer, among other diseases. Take a few minutes to **call local political leaders** and tell them that we **need clean air and clean water**. Use your voice to speak up – together we are very strong and loud!

See links on www.pcist.net for suggested environmental health organizations that you can join **to get connected and learn more**.