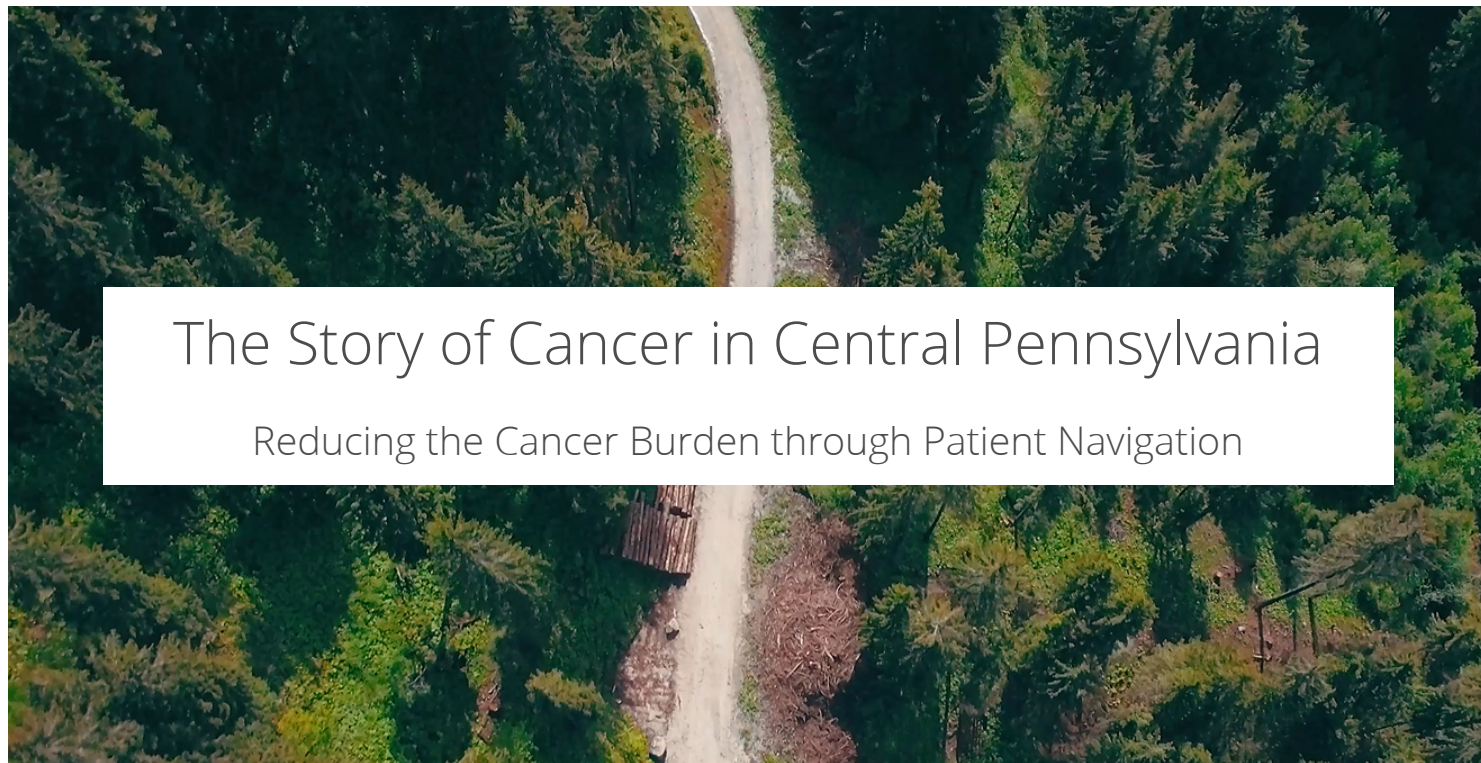


This story was made with [Esri's Story Map Cascade](#).

Read it on the web at <http://arcg.is/eSjSW>.



A diagnosis of cancer is life-changing and will likely bring important questions and concerns to mind. What if my insurance will not cover the full expense of treatment? How will I get to my treatments that are a 60-minute drive from home in the winter? What will life be like after treatment? Is there anyone who can help me better prepare?

The diagnosis may also stir questions about cancer in your neighborhood or in central Pennsylvania. Is there more cancer in my community than elsewhere? Are my friends and family members more likely than others to get cancer? What can they do to reduce their risk of cancer? They do not like to go to the doctor until there is a problem, but should they go anyway? Is there a vaccine to prevent cancer?

Come with us on an interactive journey of cancer in Central Pennsylvania and learn how to overcome these cancer challenges.

In this Story Map, we will:

- discuss the extent of the [cancer problem](#) in central Pennsylvania;
- hear from [patient navigators](#) as they help people overcome barriers to cancer care;
- highlight three key populations - those who live in [Rural Areas](#), [Hispanic/Latinos](#), and [African Americans/Black](#);
- provide [action steps](#) to help you address cancer in your community.

We encourage you to explore the maps. You can do this by clicking on individual geographic areas and scrolling through the data popup. There are often multiple pages within each popup.



The Cancer Problem

While a cancer diagnosis is an experience of an individual, it is also important to see cancer from population and community perspective.

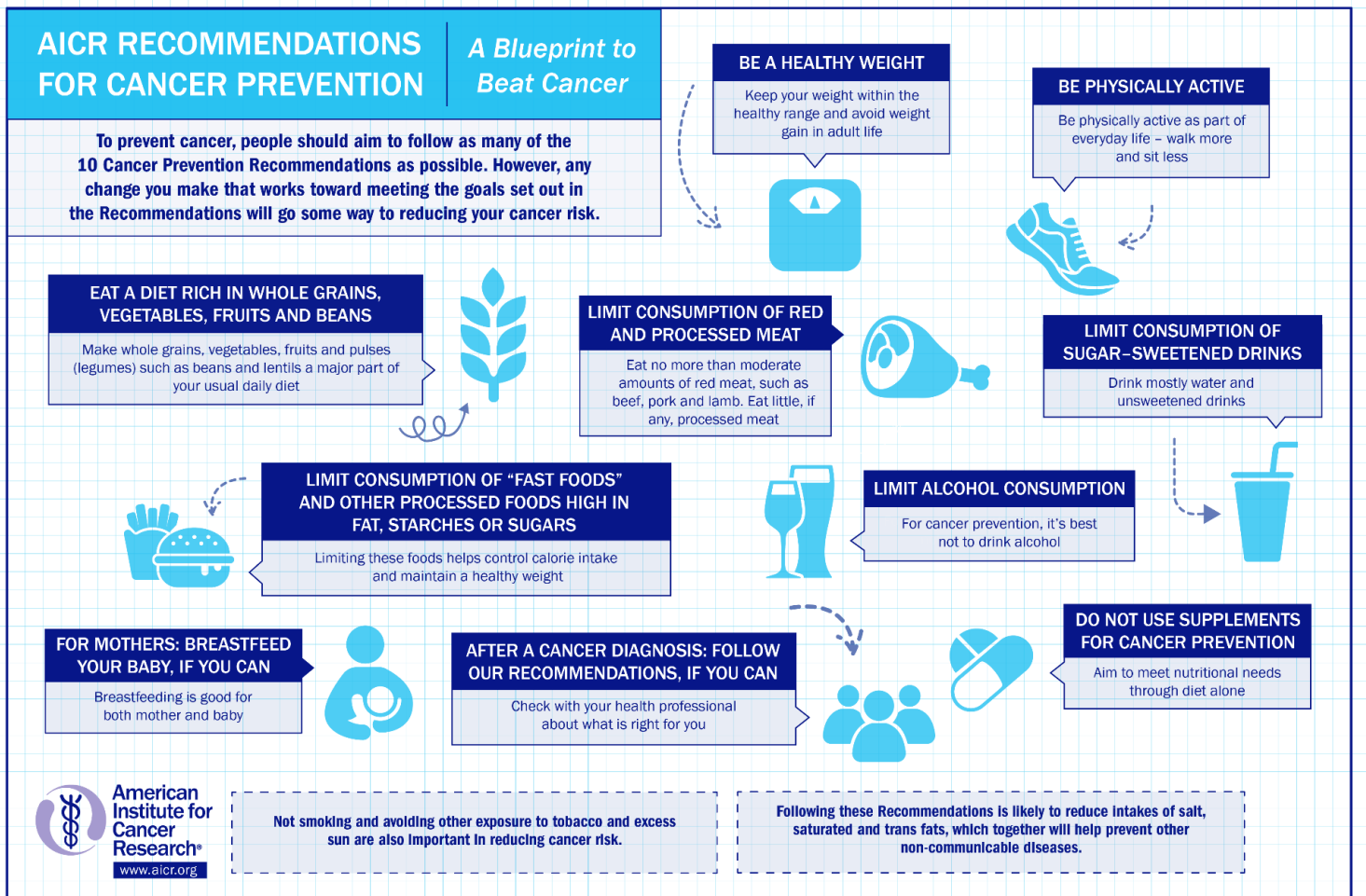


Cancer is serious. It is the 2nd leading cause of death for Pennsylvanians and claims more than 28,000 lives in Pennsylvania each year. There are close to 80,000 new cases of cancer in Pennsylvania each year.

Cancer Incidence

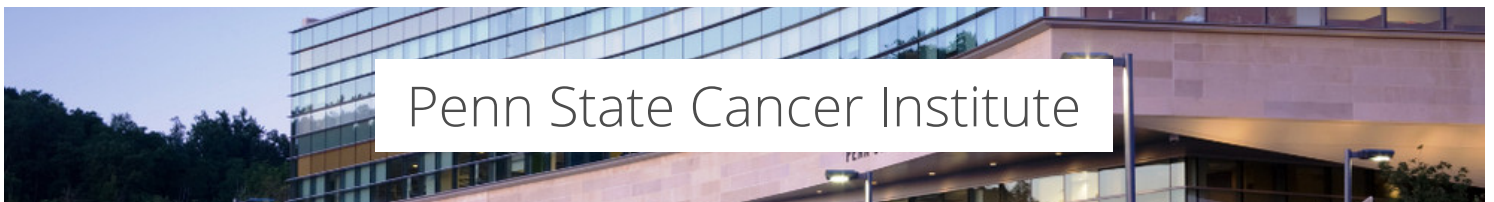
is the number of **new** cancer cases per 100,000 population per year.

Some experts say that at least 30% of new cases of cancer are associated with modifiable lifestyles, such as tobacco use or physical inactivity. We also know that many people may not have regular preventive exams, which allow for an earlier stage diagnosis when treatment is more likely to be successful.



10 Cancer Prevention Recommendations

But we also know that not everyone has the same access to cancer health care. For example, there are few cancer hospitals in rural communities. This means that cancer care for these rural patients requires a longer commute to the nearest treatment center, which reduces the chances of a good outcome for the cancer patient. In addition, we know that cancer incidence among African Americans or Hispanic/Latinos may occur at a different rate than it does for other populations.



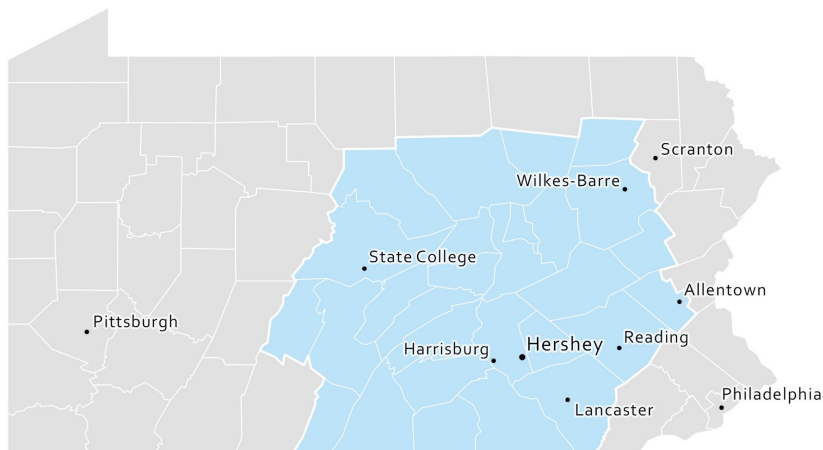
The Penn State Cancer Institute (Cancer Institute) is committed to reducing the burden of cancer in central Pennsylvania. Clinically, the Cancer Institute is based at the Penn State Health Milton S. Hershey Medical Center, located in Hershey, PA. In terms of research, the Cancer Institute is composed of faculty and investigators located at several Penn State campuses, including University Park and Hershey. The Cancer Institute offers a variety of cancer-related services like infusion therapy, state-of-the-art radiation oncology, and a chemotherapy and infusion pharmacy. There are 53 providers with 16 specialties represented.



In addition to offering cancer-related treatment at the Milton S. Hershey Medical Center, Cancer Institute physicians also provide care through a partnership with Mount Nittany Health in State College and Penn State Health St. Joseph in Reading.

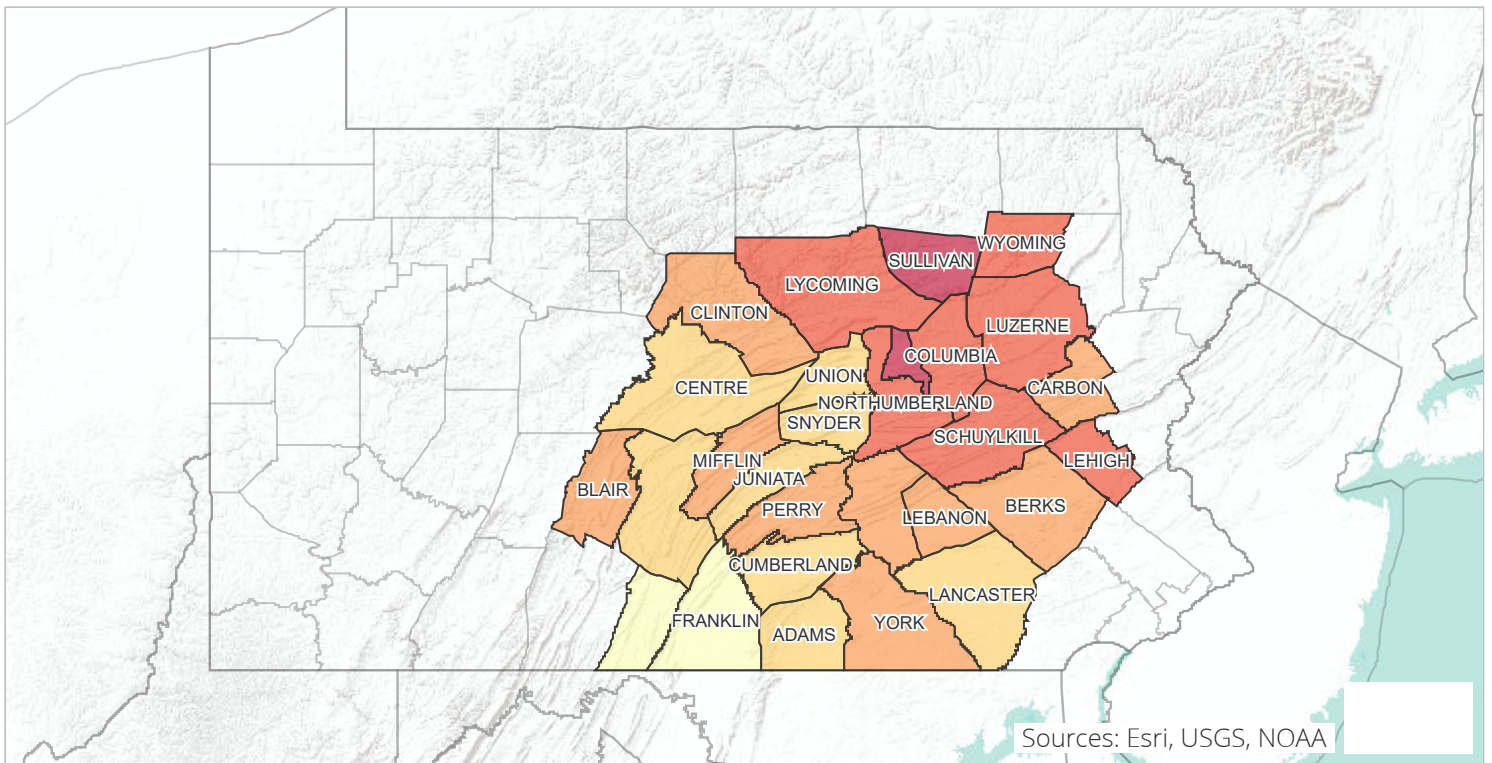
Did you know that the Cancer Institute also serves a broad catchment area in Central Pennsylvania? This area includes 28 Pennsylvania counties:

Adams, Berks, Blair, Carbon, Centre, Clinton, Columbia, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, Mifflin, Montour, Northumberland, Perry, Schuylkill, Snyder, Sullivan, Union, Wyoming, and York.



According to the 2010 US Census, just over 4 million live within the 17,000 total square miles of the catchment area. The population density is 241 people per square mile and there are over 3000 primary care providers in the catchment area.

On average, there are approximately 21,385 new cancer cases in the catchment area each year. Excluding skin cancer, cancers of the lung and colon/rectum are common for both men and women. For women, breast cancer is the most common and for men, prostate cancer is the most common. From 2011 to 2015, Lancaster County had the highest number of new cases and Sullivan County had the lowest number of new cases. The highest age-adjusted cancer incidence rates were in rural Montour, Sullivan, Wyoming, and Lycoming Counties and non-rural Lehigh County.



Age-Adjusted Cancer Rate

This map shows the 2011-2015 age-adjusted rate (per 100,000 population) of the incidence (newly diagnosed cancer) of cancer, by county. The process of age-adjusting a rate removes any effect that might be present because the population in a county might be older, on average, and thus more likely to get cancer.

Counties in the darkest red color have the highest rate of new cancer cases, ranging from 451 to 494 (per 100,000 population).

Counties in the lightest yellow color have the lowest rate of new cancer cases, ranging from 343 to 344.

Click on any county to show popup of additional data. Use the + and – buttons in the bottom right corner to zoom in and out on the map.

CANCER INCIDENCE

IN THE PENN STATE CANCER INSTITUTE'S CATCHMENT AREA

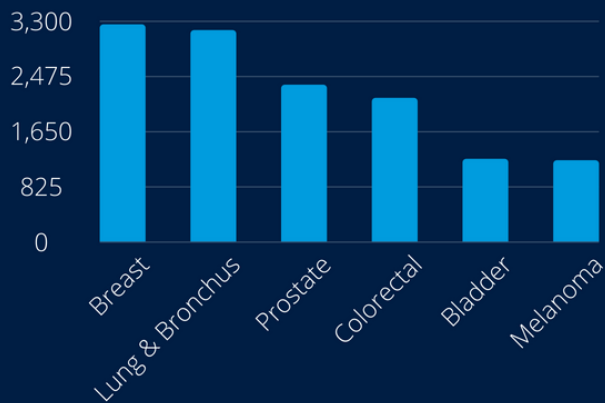


28

COUNTIES OUT OF 67 IN PENNSYLVANIA

21,385

AVERAGE NUMBER OF NEW CANCER CASES PER YEAR



TOP CANCERS SITES

COUNTIES WITH THE HIGHEST NUMBER OF NEW CANCER CASES (FROM 2011 - 2015)

LANCASTER	12,685
YORK	11,145
BERKS	10,705
LUZERNE	9,741
LEHIGH	9,573

COUNTIES WITH THE LOWEST NUMBER OF NEW CANCER CASES (FROM 2011 - 2015)

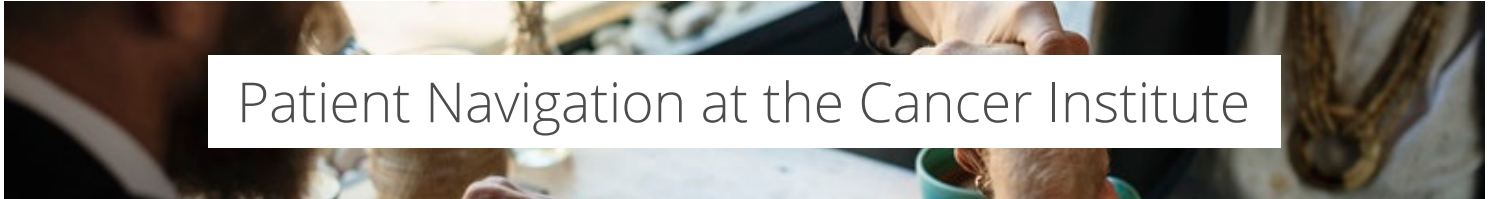
WYOMING	846
JUNIATA	650
MONTOUR	633
FULTON	348
SULLIVAN	262

AGE-ADJUSTED CANCER INCIDENCE RATES WITH 95% CONFIDENCE INTERVALS (TOP 5 COUNTIES FROM 2011-2015)

MONTOUR 494.7 (455.2 - 537.6)

SULLIVAN	467.9	(407.7 - 540.8)
LYCOMING	451.3	(435.7 - 467.4)
COLUMBIA	450.7	(430.0 - 472.5)
LUZERNE	448.4	(439.3 - 457.8)

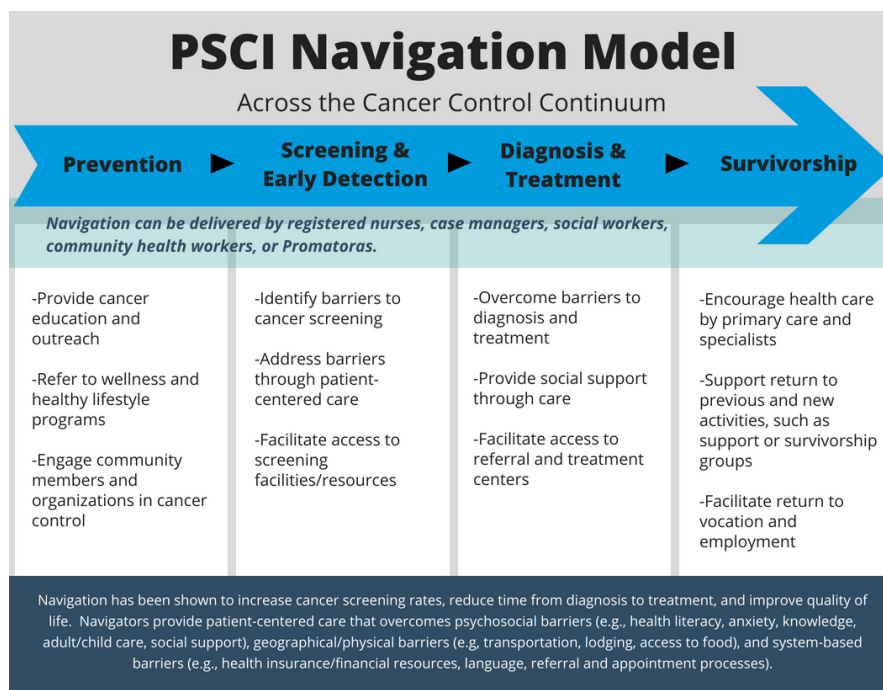
Within the catchment area there are urban areas, such as Harrisburg and Reading. However there are also very sparsely populated areas, such as Sullivan County. About 42% of the population of the catchment area lives in a rural area, with 19 of the 28 counties located in the Appalachia Region. Approximately 5% of the population in the catchment area are African American and over 7% are Hispanic/Latino.



The Cancer Institute is using patient navigation to address the cancer burden in central Pennsylvania. Patient navigation is a barrier-focused, individual-centered approach that has been shown in research studies to improve cancer-related outcomes. The term “patient navigation” was coined by Dr. Harold Freeman, who, in partnership with the American Cancer Society, developed the first patient navigation program. His program was associated with a reduction in late-stage breast cancer among women in Harlem, New York. Since then, many similar programs were developed across the country to address population-wide disparities in cancer-related care.

Navigators are trained in cancer control, patient care, communication skills, systems-based practice, and interprofessional collaboration. They act as a liaison between patients, healthcare teams, and community resources, facilitating better communication and understanding among all groups. Navigators are key in addressing the cancer burden in the catchment area.

Patient navigators help at every step of the cancer-care continuum – from prevention and screening, to diagnosis and treatment, and into survivorship.



The Penn State Cancer Institute Navigation Model

**"Navigators are social workers.
Not necessarily by training all
of the time, but by their intent
and willingness to dive into
hard situations with patients
during a challenging time of
their lives."**

**Chrissy Valania
Geisinger Community Cancer Center**

Chrissy Valania, MSW, LCSW

Pottsville and Hazleton Community Cancer Centers

Chrissy Valania works in both Pottsville (Schuylkill County) and Hazleton (Luzerne County) Community Cancer Centers.



**"Navigators are social workers.
Not necessarily by training all
of the time, but by their intent
and willingness to dive into
hard situations with patients
during a challenging time of
their lives."**

**Chrissy Valania
Geisinger Community Cancer Center**

We asked Chrissy what inspires her to be a cancer patient navigator – her response is typical of patient navigators:

"I am regularly impressed and inspired by my patients. They have strength in the face of total despair. My job of making their lives easier (by advocating for assistance in the community, managing communication, being sure that they have support and medical equipment for their home, coordinating resources, assisting with their mental health, offering medical crisis counseling, etc.) is the simple part. Their job of fighting cancer is FAR harder."

Come with us as we explore cancer in the communities of central Pennsylvania and hear from navigators who are making a positive impact.

Cancer Health Disparity

The National Cancer Institute defines a cancer health disparity as a significant difference in the cancer-related health of one population group, compared to another group. These population groups may be characterized by race, ethnicity, disability, gender, geographic location, income, education, or other characteristics.

Let's explore cancer in three populations of the catchment area – those who reside in rural communities, Hispanics/Latinos, and African Americans.

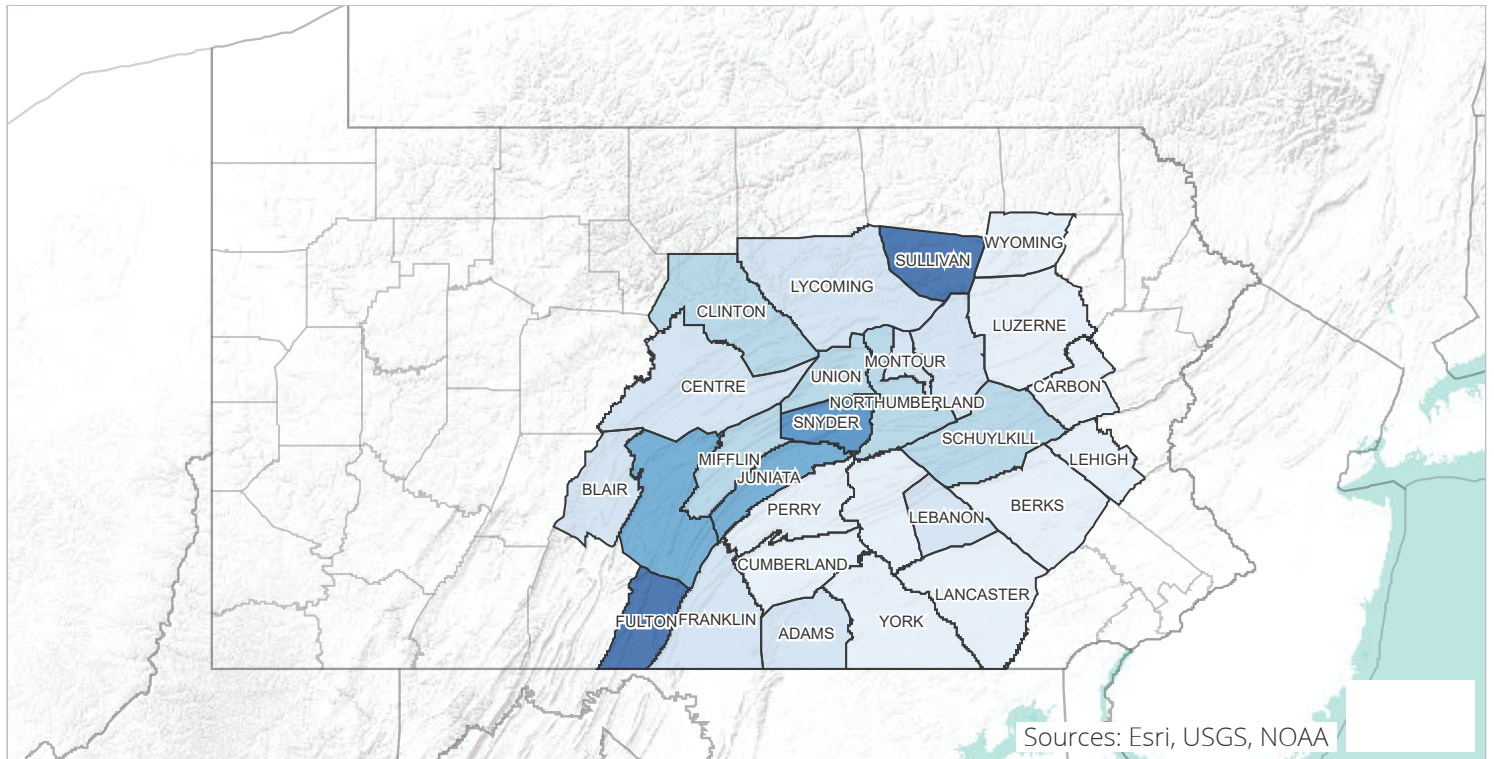


Cancer in the Rural Population

While the catchment area has several metropolitan counties, 42% of the catchment area population live in a rural county. Importantly, 19 out of the 28 counties in the catchment area are in Appalachia, a 205,000-square-mile region from Mississippi to New York along the Appalachian Mountains. Access to health care is a significant problem in rural areas, with some individuals having to travel long distances to a hospital. These areas lack public transportation which forces individuals to provide their own transportation.

Let's look at rural communities and the people who live in them.

Rural Areas in the Catchment Area

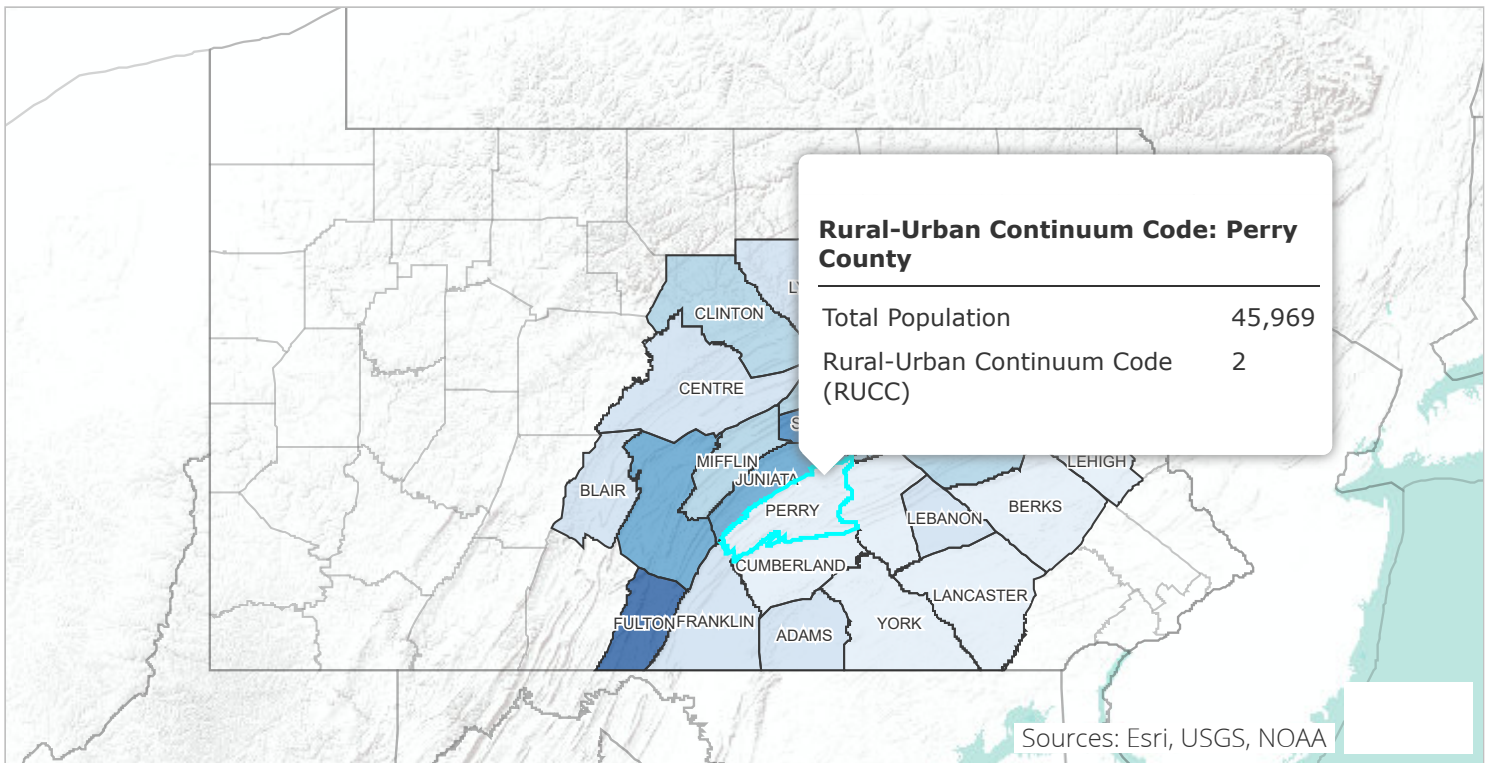


Rural Pennsylvania

Over 42% of the catchment area population live in a rural county. Counties are classified using the Rural-Urban Continuum Code (RUCC), which is based upon population size and adjacency to a metropolitan area. RUCC classification ranges from 1 (most metropolitan) to 9 (most rural). A RUCC of 4 or higher is considered rural.

Counties in the darkest blue color are the most rural, with a RUCC of 8.

Counties in the lightest blue color are the most urban with a RUCC of 2.



Rural-Urban Continuum Code

Although the RUCC is a standard for classifying counties, there are limitations. One limitation is that RUCC uses adjacency to a metropolitan area in its classification. Consequently, a very "rural" county (e.g., low population density) that is adjacent to a metropolitan county may be classified as metropolitan.

This is the case for Perry County. Even though Perry County has a population density of 63 people per square mile, it is classified as having a RUCC of 2 because it is adjacent to Dauphin County, which has a population density of 512 persons per square mile.



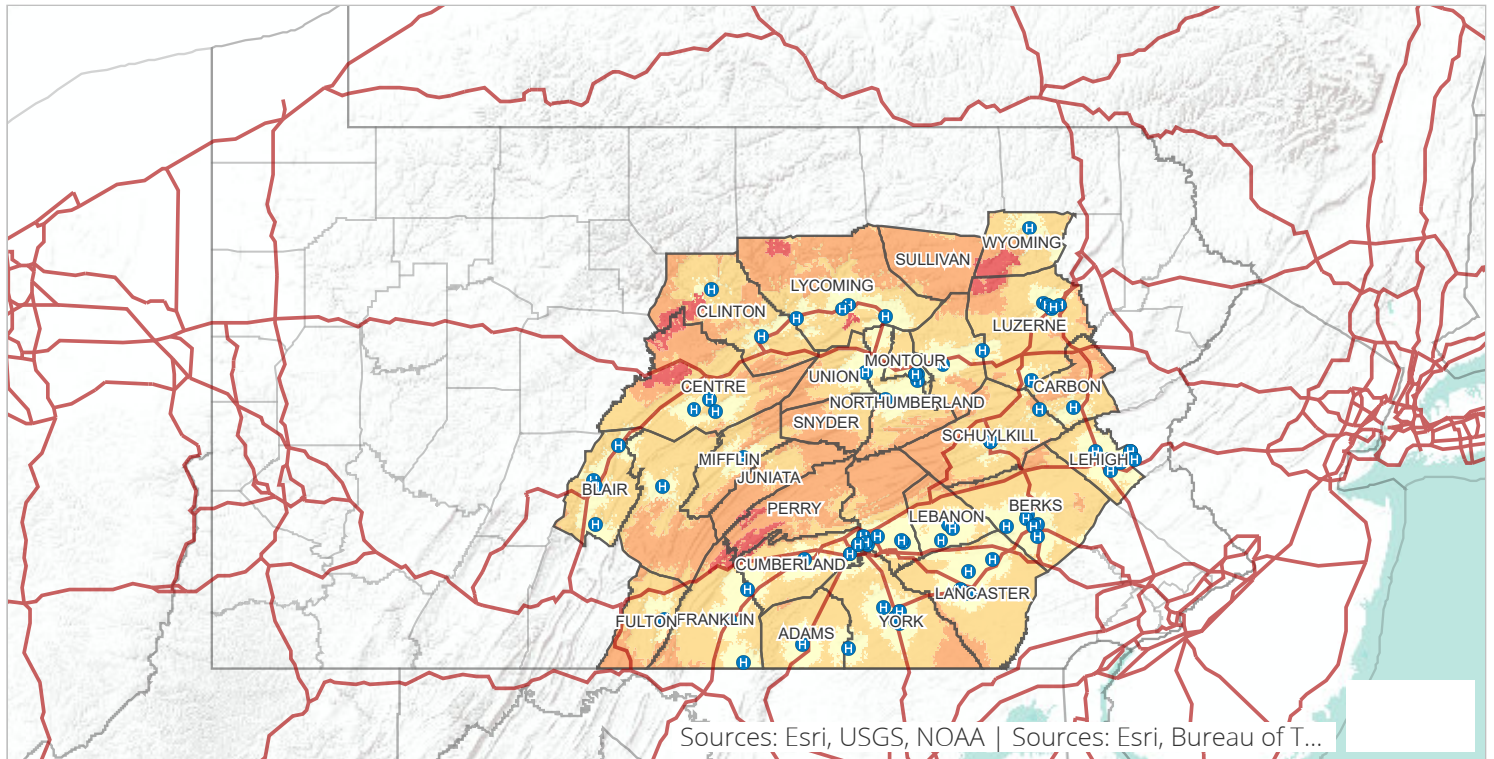
USDA FSA | Source: USGS, NGA, NASA, CGIAR, GEBCO, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen and t... Powered by Esri

Transportation in Rural Pennsylvania

The primary barriers for rural populations are the distance and travel time to nearby healthcare centers.

The Ridge-and-Valley topography of central Pennsylvania is a travel obstacle. Even with the interstate system, the terrain of the Appalachian Mountains poses a challenge forcing patients to go through mountain gaps or tunnels, or even over mountain ridges.

This scene shows Interstate 81 curving between the Appalachian Mountains near Ravine, Pennsylvania in Schuylkill County.



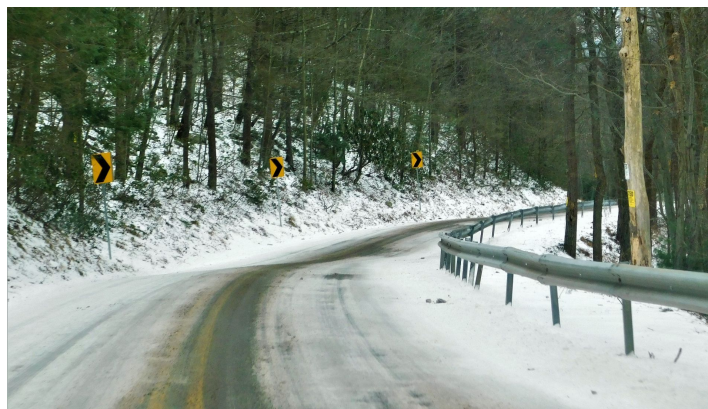
Traveling to Hospitals

With limited direct routes in the PSCI catchment area, travel time to the nearest hospital can exceed 60 minutes.

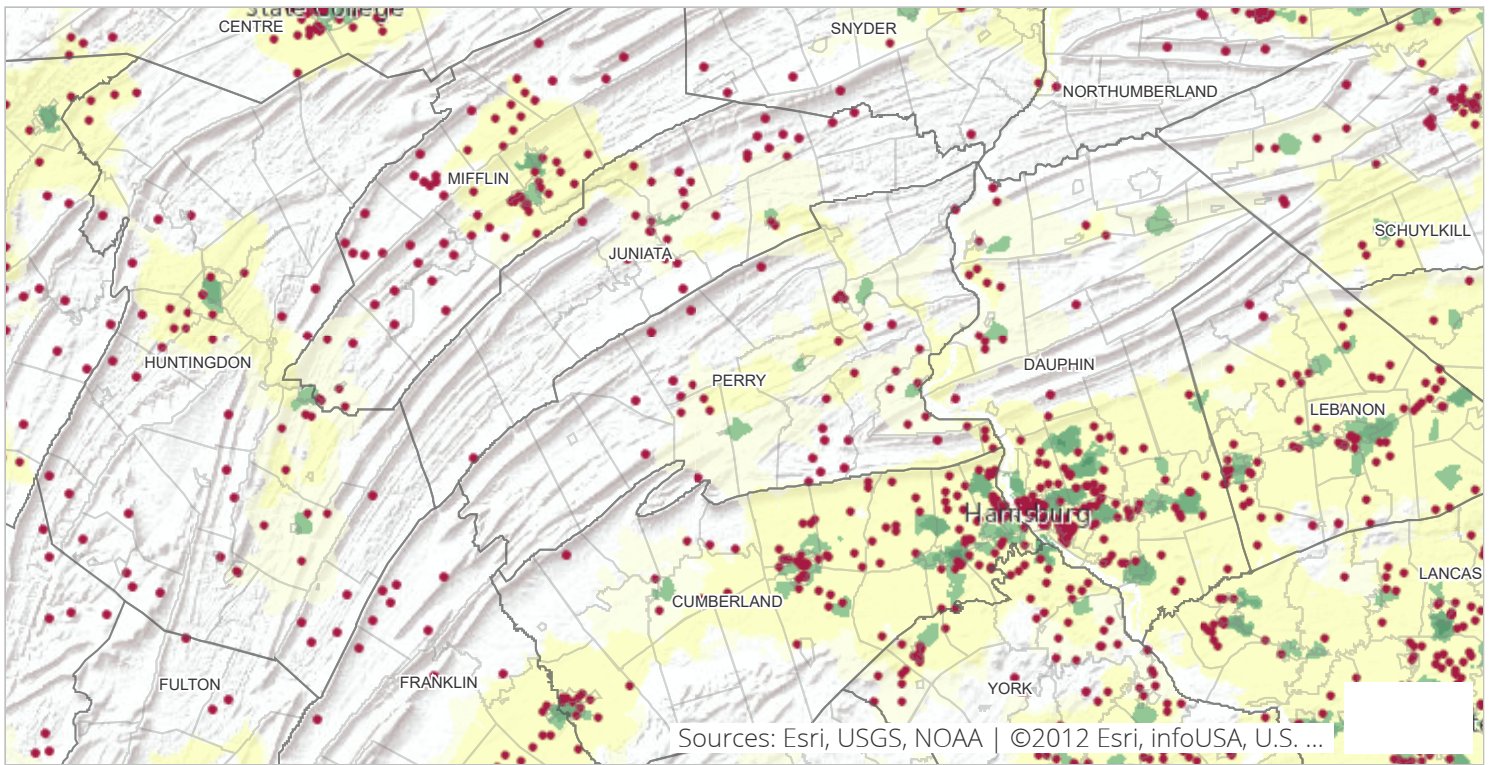
This map shows the driving time to the nearest hospital where **red is over 60 minutes** and **light yellow is less than 15 minutes**.

For residents in the middle of the catchment area, including Perry County, **travel time is between 30 and 60 minutes**.

Of course, travel can be hazardous in the winter, further lengthening time to the nearest hospital.



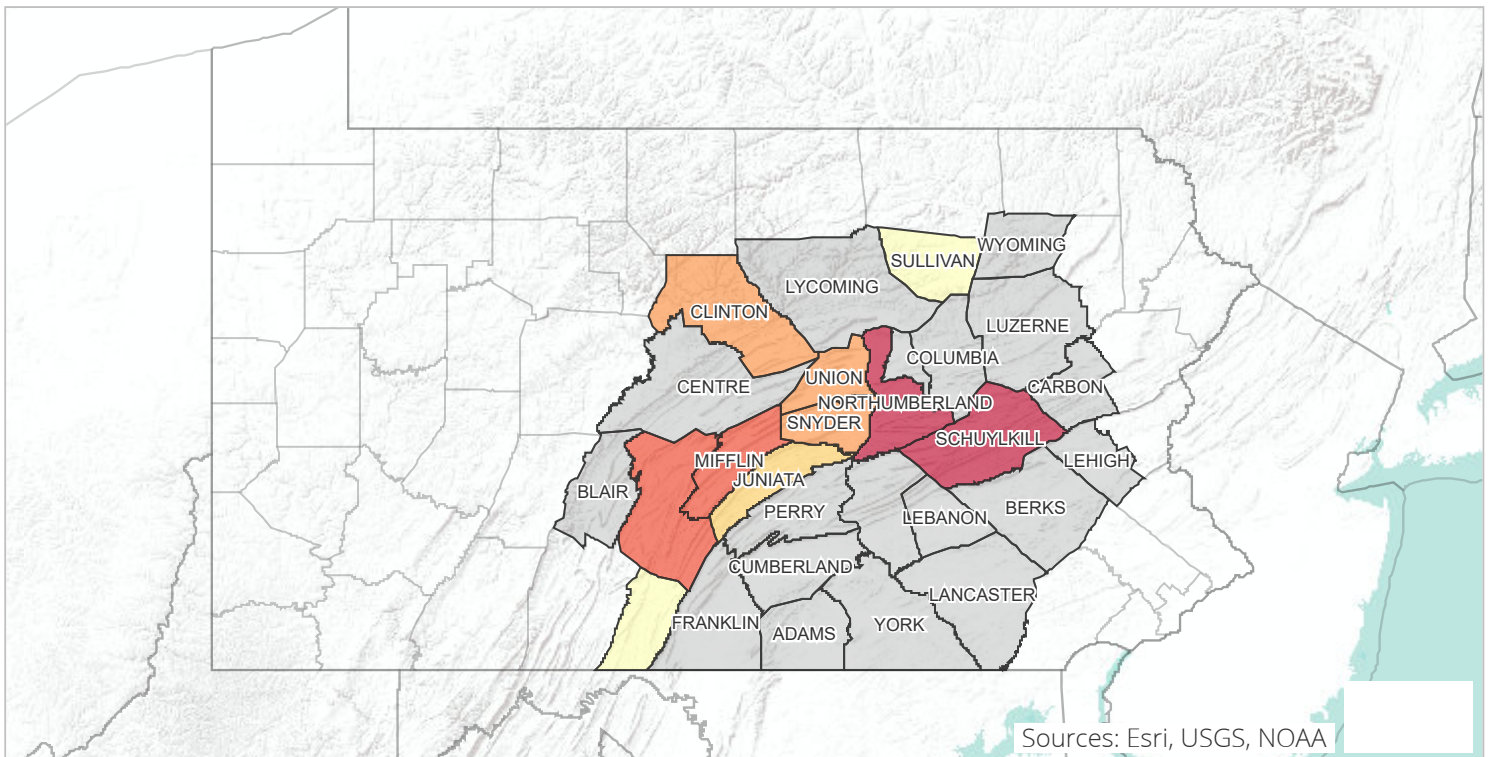
"Pennsylvania State Route 339", Adam Moss



Access to Supermarkets for Food Options

Travel time can also affect access to supermarkets with broad ranges of food options. To reduce the risk of developing cancer, the American Cancer Society recommends a diet with adequate fruit and vegetable consumption.

This map shows access to supermarkets. **Each yellow dot is a full supermarket.** Green areas represent walking access and yellow areas represent driving access. **Each red dot represents 30 people in poverty with limited access.**



Cancer in Rural Areas

This map shows the 2011-2015 average annual number of cancer cases per year in rural counties.

Counties in the darkest red color have the highest average annual number of cancer cases ranging between 274 and 896.

Counties in the lightest yellow color have the lowest average number of cancer cases between 52 and 70.

Counties in gray have a RUCC of less than 4, which is considered metropolitan.

Patient Navigators in Rural Communities in the Catchment Area

The Cancer Institute has developed specific initiatives to address cancer burden in rural communities. For example, the Northern Appalachia Cancer Network (NACN) is a community/academic partnership that seeks to measurably reduce the cancer burden among rural residents of Pennsylvania through community-based participatory education, training, and engaged cancer research.

[Read more about NACN](#)

"Additional support is needed for this population to make sure they have equal access to healthcare and necessary resources."

**Natalie Patterson
Geisinger Hospital**

Natalie Patterson, LSW

Geisinger Hospital

Natalie works in Radiation Oncology at Geisinger Hospital in Danville. She is a Licensed Social Worker (LSW) and a patient navigator.

We asked Natalie what she finds to be the most common barrier for patients.

"Transportation is such a HUGE issue in this area," she said. "Some patients are not eligible for public transportation and some simply cannot afford it. Some people can't afford to pay for gas five days a week for several weeks to receive treatment. Many patients have no support network and need extra assistance with applications and referrals."

Natalie also sees that her patients require financial support.

"Financial assistance is also a great need. People often have difficulty affording their medical bills, copays, and prescriptions. Likewise, they have difficulty paying for utilities when they are unable to work due to their cancer. Additional support is needed for this population to make sure they have equal access to healthcare and necessary resources."

It seems as though cancer navigators like Natalie have demanding jobs, but Natalie sees it differently.

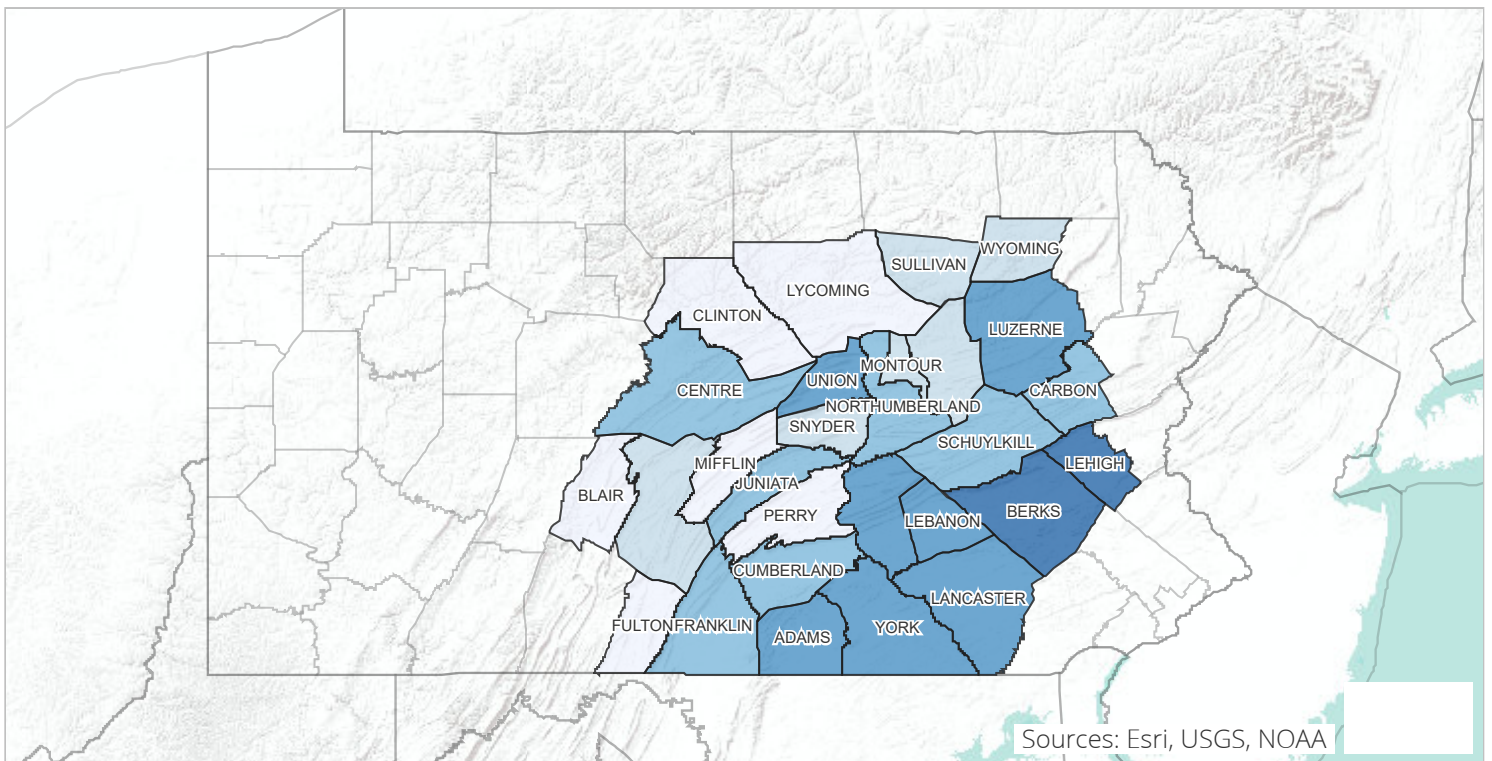
"I continue to be a navigator because it is very rewarding. Seeing people smile because you helped them problem solve or just gave some words of encouragement is the best part of my job."

Take Action

Hispanics/Latinos and Cancer in the Catchment Area

Let's look at the Hispanic/Latino population and where they live.

Hispanic/Latinos in the Catchment Area



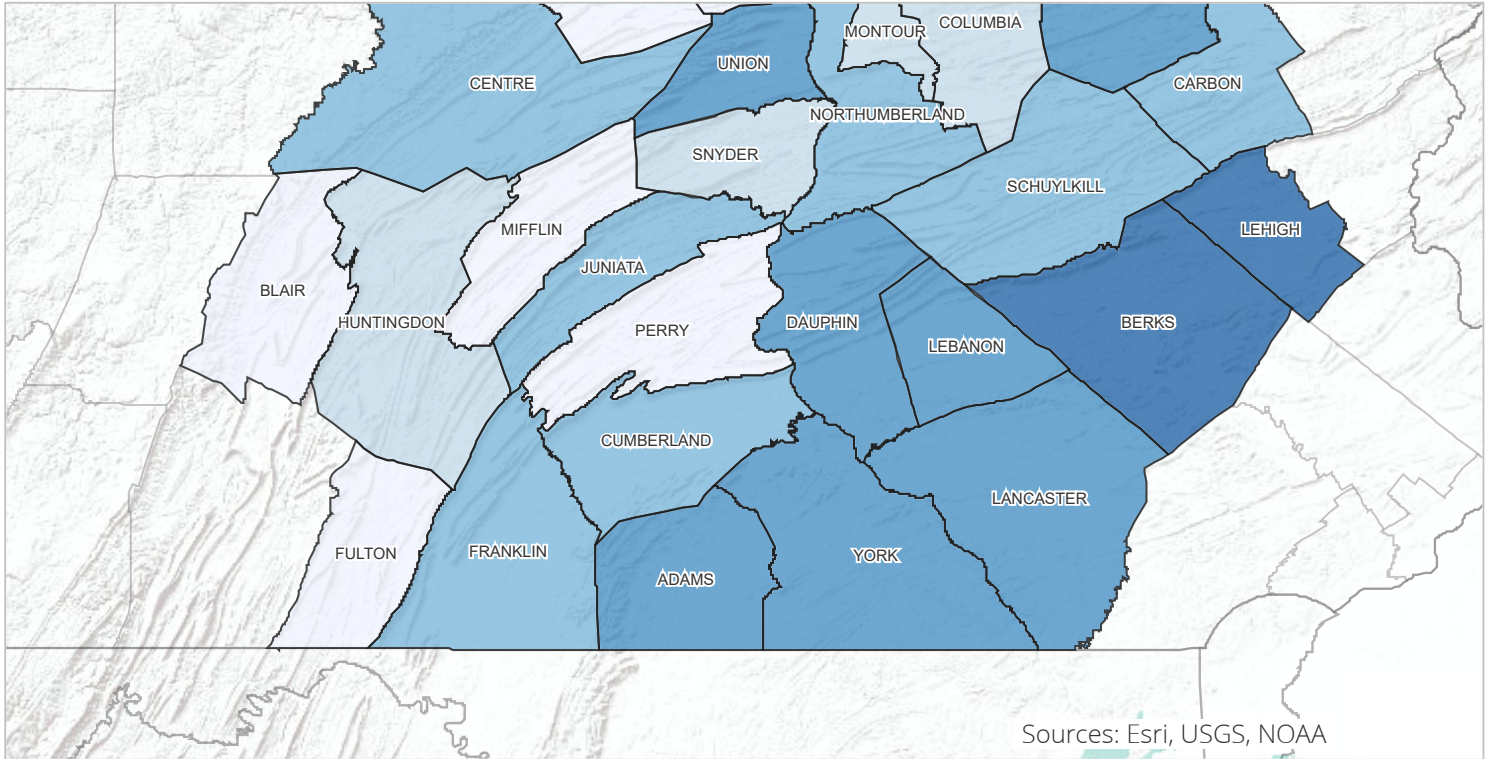
The Hispanic/Latino Population

More than 7% of the population in the PSCI catchment area is Hispanic/Latino. This map shows the percentage of each county's population that is Hispanic/Latino.

Counties in the darkest blue color have the highest percentage of Hispanic/Latino population, ranging from 9 to 19%.

Counties in the lightest blue color have the lowest percentage of Hispanic/Latino population, with less than 1.3%.

The population of Hispanic/Latinos is higher in the eastern and southern areas of the PSCI catchment area, such as in Berks, Lehigh, Lebanon, and Lancaster counties.

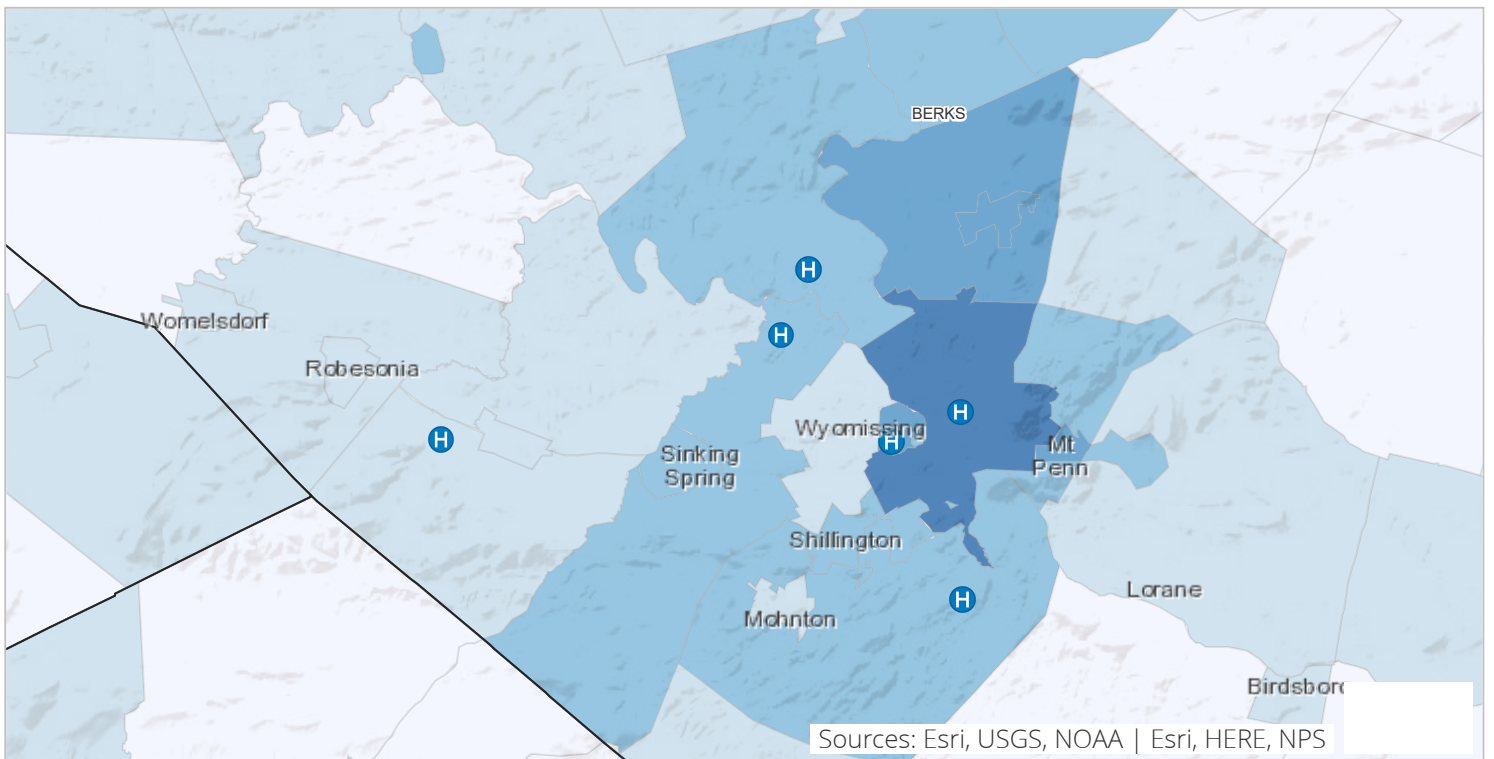


Hispanic/Latinos in the Eastern Catchment Area

This map shows the percentage of the population that is Hispanic/Latino at the sub-county level. Sub-county areas include townships, cities, boroughs, and other incorporated places.

Sub-counties in the darkest blue have the highest percentage of Hispanic/Latinos ranging from 32 to 61%.

Let's look further at Reading, Pennsylvania.

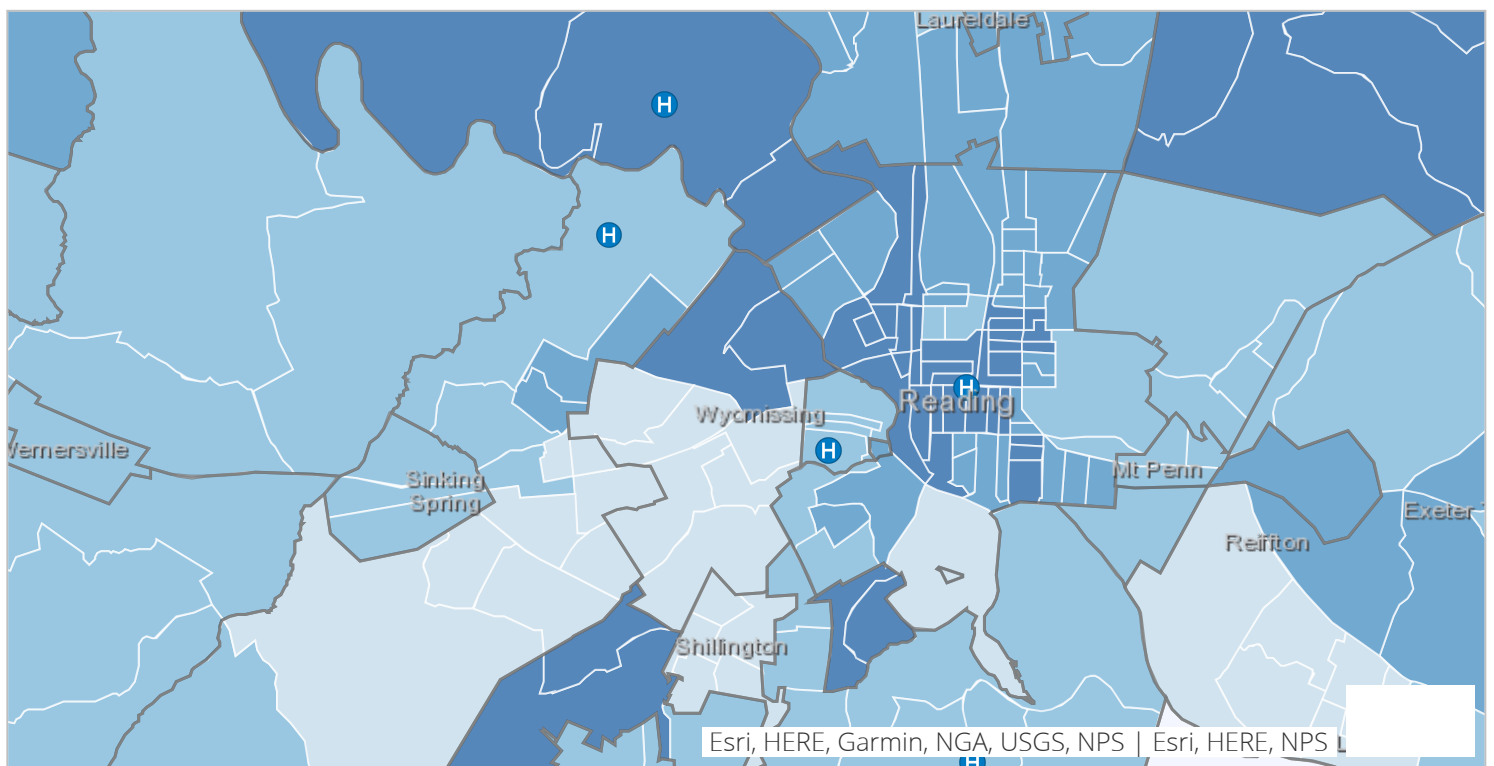


Reading, Pennsylvania

More than 60% of the population in the city of Reading are Hispanic/Latino, with 32% claiming a Puerto Rican heritage.



Jack Thomas, "Reading Pa from Skyline Drive"



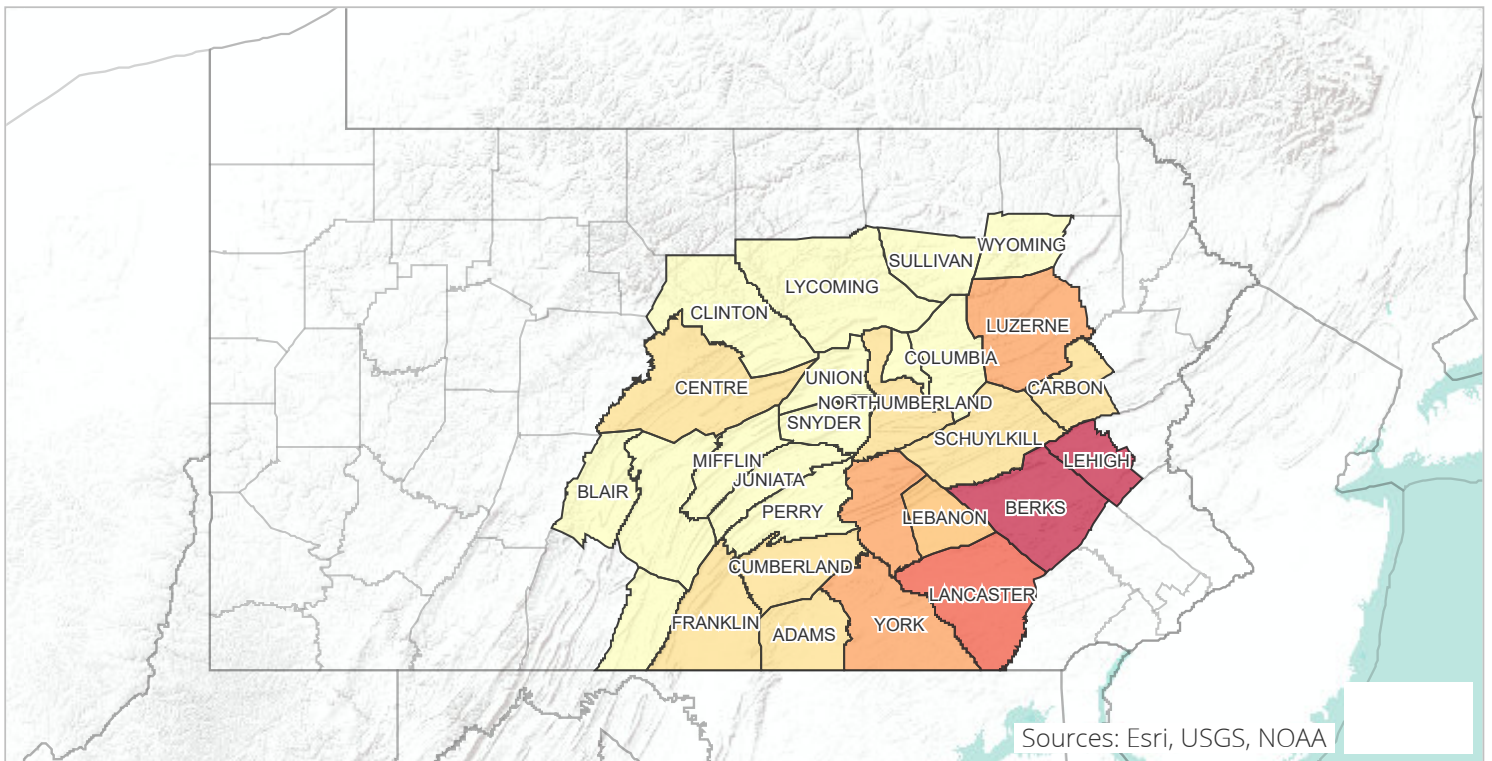
Reading, Pennsylvania

Also, 51% of the population of Reading speak a language other than English at home. This map shows people who speak a language other than English at home as a percentage of the total population, by census tract.

Tracts in the darkest blue color have the highest percentage, ranging from 80 to 100%.

Tracts in the lightest blue color have the lowest percentage, less than 20%.

Of course, language is an important consideration when navigating cancer patients.



Cancer Among the Hispanic/Latino Population

This map shows the average annual number of cancer cases between 2011 and 2015 among Hispanic/Latinos.

Counties in the darkest red color have the highest average annual number of new cancer cases, between 78 and 124.

Counties in the lightest yellow color have the lowest average number cancer new cases with fewer than 2.

Patient Navigators and Cancer Among Hispanics/Latinos in the Catchment Area

In 2016, the Cancer Institute released a report on cancer among Hispanics/Latinos in Pennsylvania, with a special analysis focused upon the catchment area. The report found that 40% of cancers were diagnosed at late-stage. These findings demonstrate the need to increase cancer screening and early detection.

**"I know,
I am here for you."**

**Maria Jimenez
St. Joseph Cancer Center**

Maria Jimenez, BS

St. Joseph Cancer Center

Maria is a promotora, which is often the name given to a Hispanic/Latino navigator, at the St. Joseph Cancer Center in Reading, Berks County. She is also a cancer survivor.



We asked Maria to describe her typical day as a navigator.

"I work mostly with the Hispanic population," she said, "and I find that the most common obstacles for the patients are language, financial, and literacy barriers. Fear and their customs also play an important role in their treatment decisions. I am also here to provide trust, comfort, and to let them know that I understand what they are going through because I am a breast cancer survivor."

Maria provides support for making breast cancer screening appointments, Pap smear referrals, and breast cancer exam training. She also participates in different events in the community such as The Breast Cancer Support System, The Susan G. Komen Organization, El Poder del Rosado, One Run Together, and the Community Health Workers Program throughout the year.

Maria also provides support to the medical team.

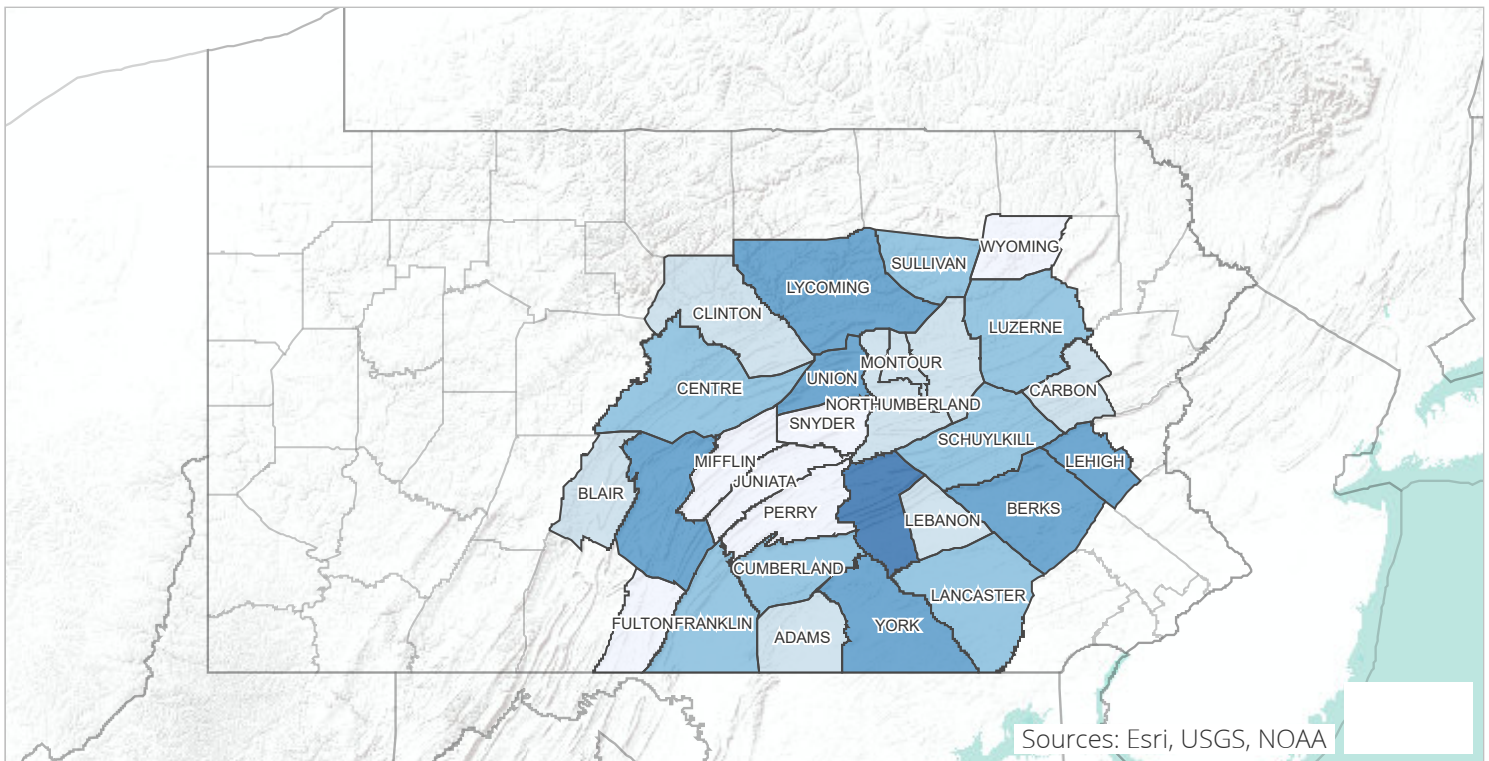
"I also provide interpretation and translation services anywhere the patient might need me, such as the doctor's office, at radiology during biopsy and follow-up, during infusion, in the pharmacy to pick-up their medicine when they cannot do it by themselves, and chemotherapy education in Spanish."

Take Action

African Americans/Blacks and Cancer in the Catchment Area

Let's look at the African American/Black Population and where they live.

African Americans/Blacks in the Catchment Area



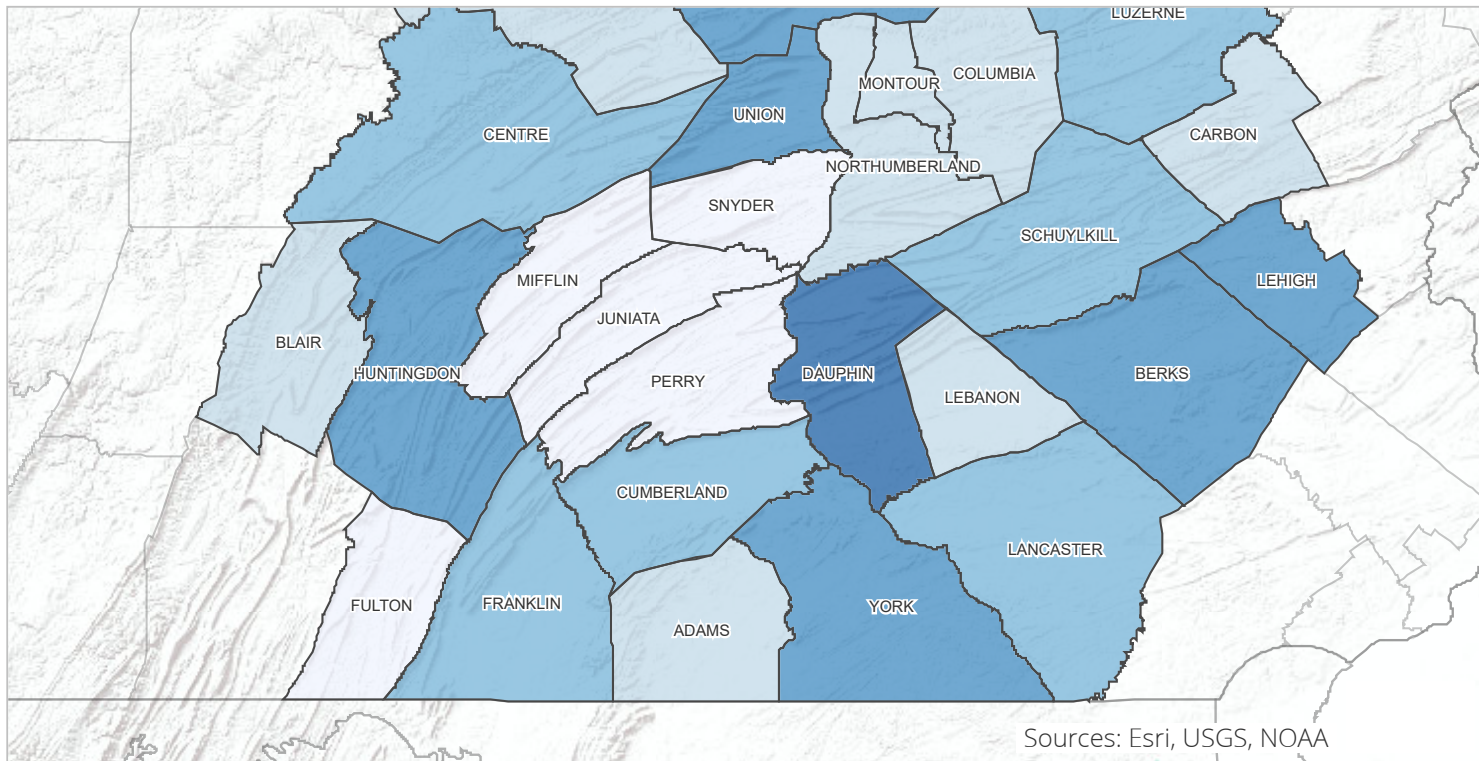
The African-American/Black Population

In 2010, approximately 5% of the population in the PSCI catchment area was African American/Black. This map shows the African-American/Black population as a percentage of the total population in each county.

Counties in the darkest blue color have the highest percentage of African Americans/Blacks, ranging from 7 to 18%.

Counties in the lightest blue color have the lowest percentage of African Americans/Blacks (less than 1%).

However, county data can mask important variation in the population within a county. Let's zoom in on Dauphin County, which is **18% African American/Black**.

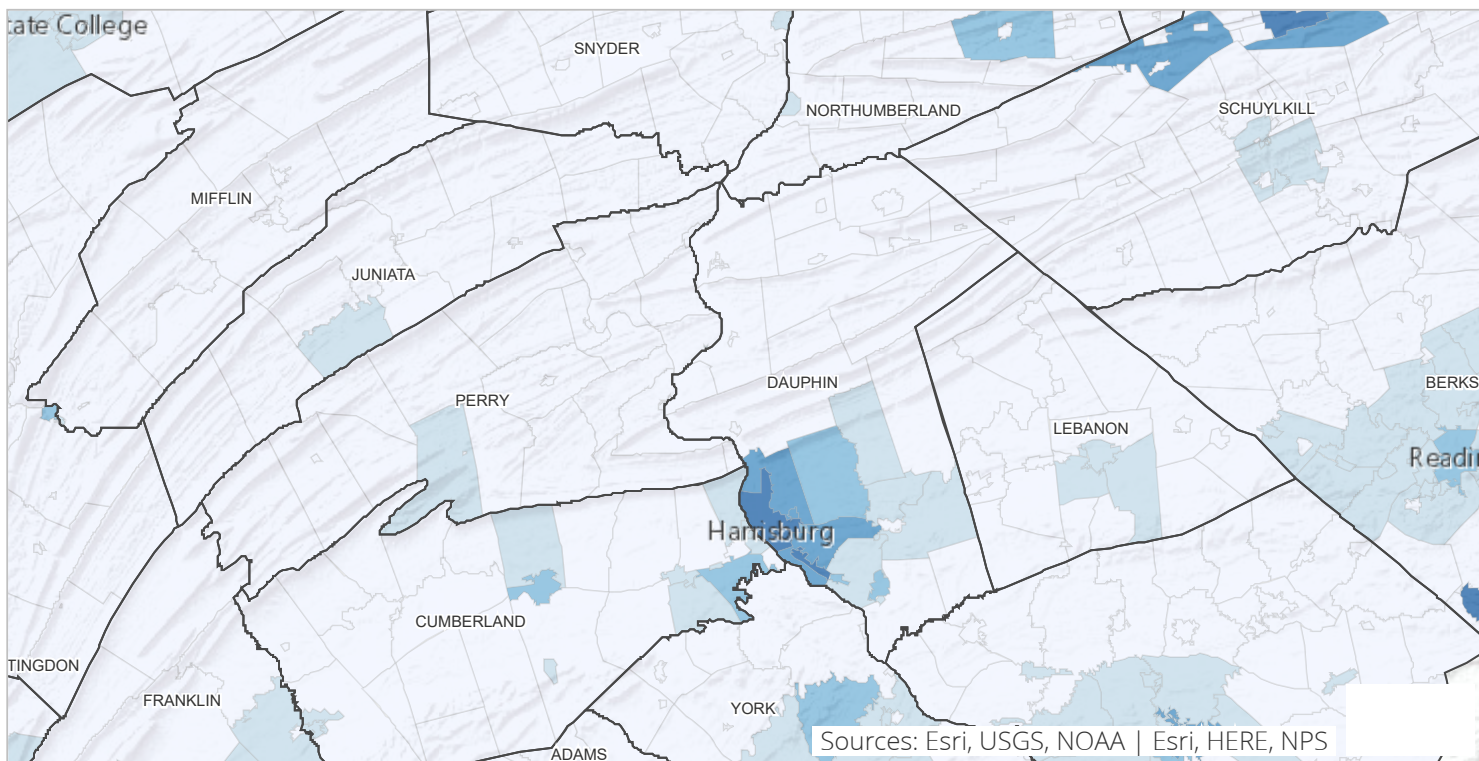


The African-American/Black Population in Dauphin County

This map shows the African-American/Black population as a percentage of the total population by sub-county areas.

Sub-counties in the darkest blue color have the highest percentage of African American/Black, ranging from 29 to 52%.

Let's look at the City of Harrisburg in Dauphin County.

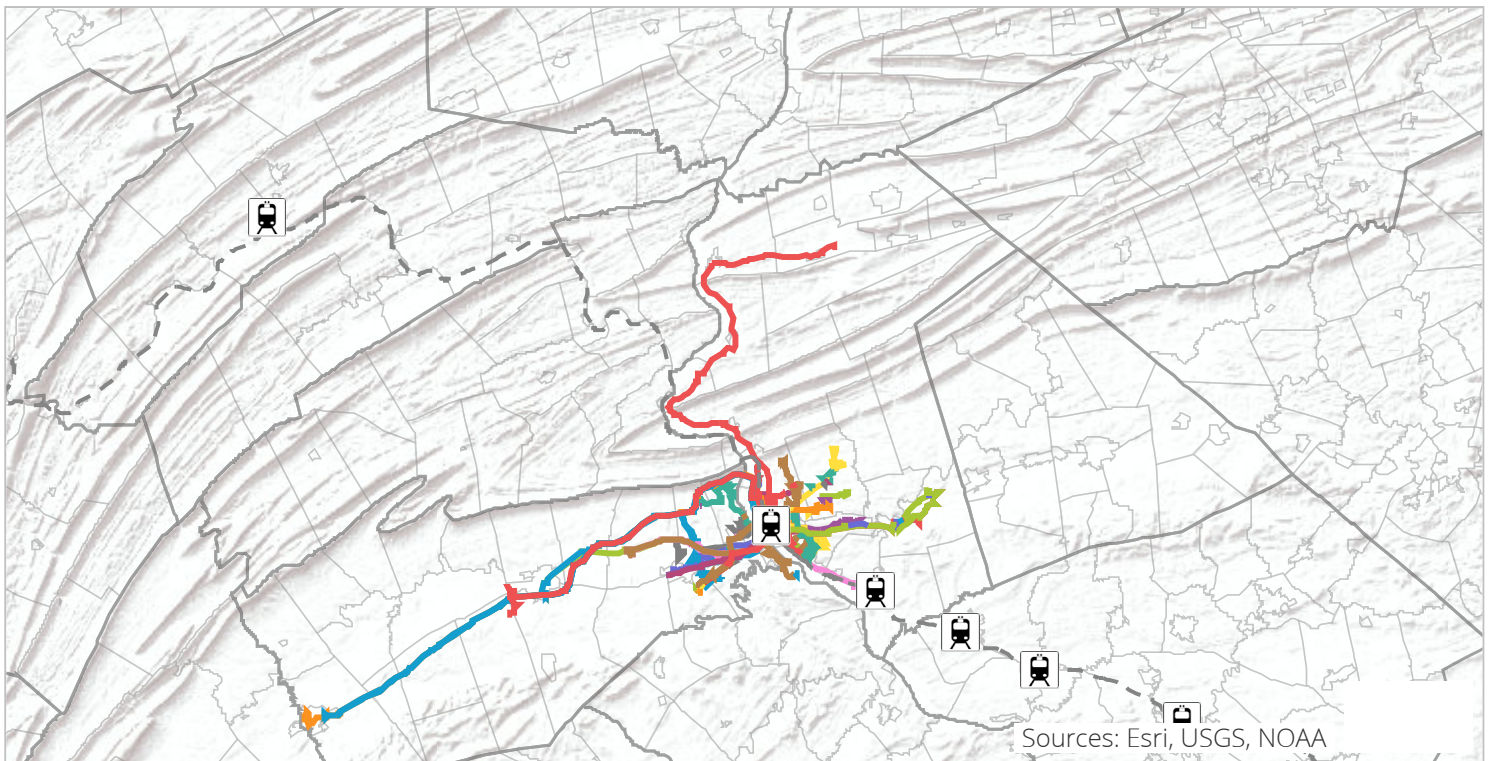


Harrisburg, Pennsylvania

Over 50% of the population in the city of Harrisburg is African American/Black.



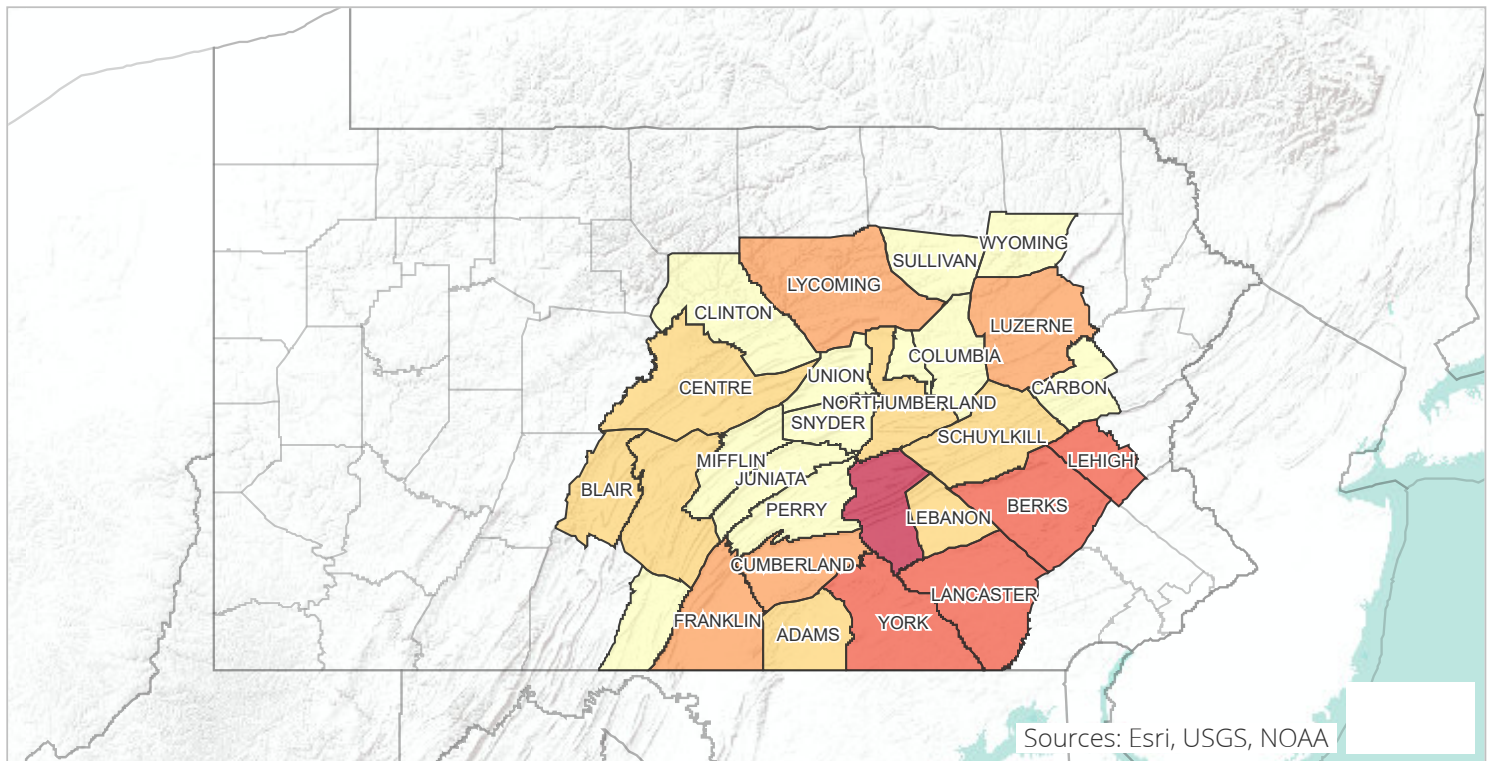
The Harrisburg Skyline



Harrisburg, Pennsylvania

As the capital of the Commonwealth, Harrisburg offers economic, educational, and cultural opportunities to many people from surrounding areas. Harrisburg's transit system includes the Capital Area Transit (CAT) bus system and Amtrak Keystone Service.

Transportation resources are important for cancer care of residents of Harrisburg.



Cancer Among the African-American Population

This map shows the average number of new cancer cases per year for African Americans/Blacks between 2011 and 2015.

Counties in the darkest red color have the highest average number of new cancer cases, ranging between 82 and 191.

Counties in the lightest yellow color have the lowest average number of new cancer cases, fewer than 3.

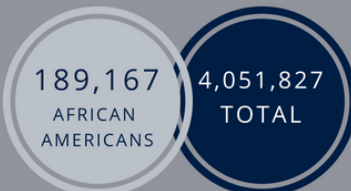
Now let's look at cancer incidence among the African American/Black population in the catchment area.

CANCER INCIDENCE: FOR AFRICAN AMERICANS

IN THE PENN STATE CANCER INSTITUTE'S
CATCHMENT AREA

4.7%

PERCENTAGE OF
AFRICAN AMERICANS
WITHIN THE
CATCHMENT AREA
(2010 CENSUS)



BETWEEN 2011-2015:

3,163

TOTAL NUMBER OF
NEW CANCER CASES
PER YEAR



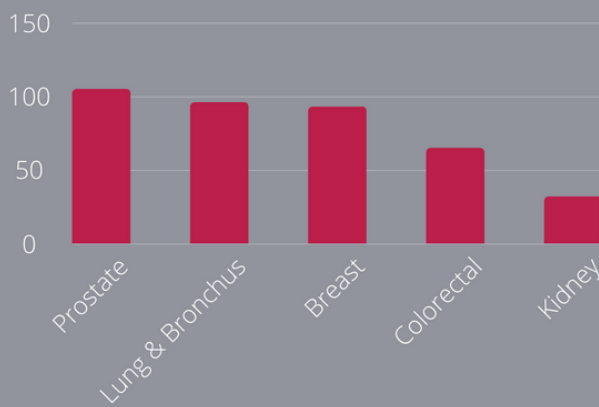
1,655

MALE NEW CASES



1,507

FEMALE NEW CASES



TOP 5 CANCERS SITES

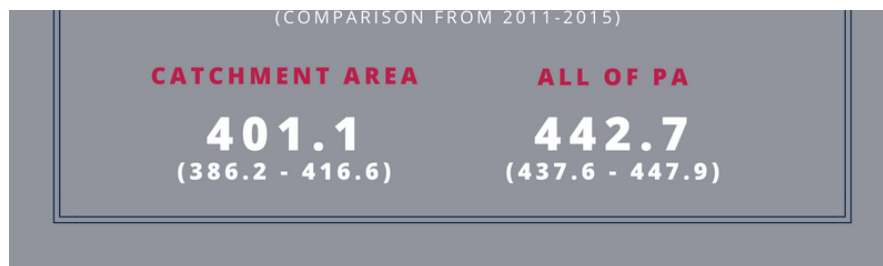
COUNTIES WITH THE HIGHEST NUMBER
OF NEW AFRICAN AMERICAN CANCER CASES
(FROM 2011 - 2015)



DAUPHIN	192
LEHIGH	83
YORK	79
BERKS	69
LANCASTER	60



AGE-ADJUSTED AFRICAN AMERICANS CANCER
INCIDENCE RATES
WITH 95% CONFIDENCE INTERVALS



Patient Navigators and Cancer in Harrisburg

In 2011, the Cancer Institute initiated a Community Health Worker Program in Harrisburg. Community health workers are persons with limited formal training in health care with a passion to reduce the cancer burden in their community. Community health workers provide cancer education and outreach focused upon cancer screening and early detection. This assistance may help individuals understand the benefit of risk reduction through lifestyle modifications and screening, obtain insurance or financial assistance, and find transportation to medical appointments.

Find out more about the Community Health Worker Program

**"I wanted to share the
community health resources
available and improve the
quality of life for families."**

**Lorna LeMelle
Penn State University**

Lorna LeMelle

Penn State Cancer Institute

Lorna LeMelle is a navigator who works at the Cancer Institute in communities such as Harrisburg. Lorna has experience with several community-based projects.



The Pennsylvania State Capital in Harrisburg viewed from City Island.

When we asked her why she became a navigator, she said, *“As I gained access to information, I wanted to share the community health resources available and improve the quality of life for families in the Harrisburg community.”*

She told us about her experience with a colorectal cancer screening project:

“The participants were given test kits that they took to their homes for private sampling. These test kits helped ease the minds of our participants and provided them with a diagnosis from the lab without having to immediately face a gastroenterologist.”

“As the issues of health and welfare are concerns that we all have, they are not easily discussed. How to speak with individuals about this exam is a very sensitive subject. My interactions in the Harrisburg community allowed me to gain access to populations where health disparities were an issue.”

Take Action



Know your ABC'S

By now, you realize that cancer in central Pennsylvania is serious. You also realize the uniqueness of our communities. Despite these complexities, patient navigation is one process that can reduce the cancer burden in central Pennsylvania. It does not matter whether you are a patient, community member, health care provider, an experienced navigator, or an aspiring navigator, you can take action.

A – Advocate for navigation and related efforts in central Pennsylvania

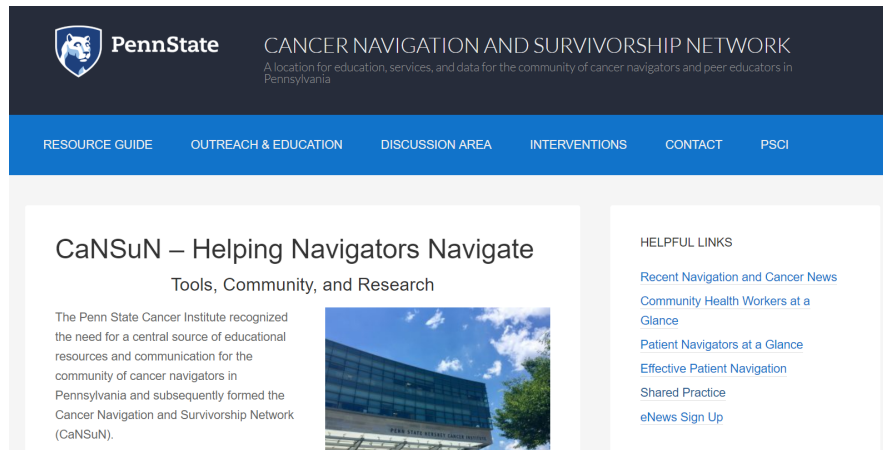
If you are a patient, ask your physician or hospital about the services of a navigator. If you are a health program manager or administrator, consider whether your navigation program is adequate for the community. If you are a health care provider, refer your patients to a navigation program.

B - Become a navigator

If you are new to navigation and feel a passion for the health of your community, you can become a navigator. Contact the Penn State Cancer Institute about training and certification programs.

C - Connect with the other navigators through Cancer Navigation and Survivorship Network (CaNSuN)

If you are a navigator, join the Cancer Navigation and Survivorship Network. CaNSuN provides navigators throughout Pennsylvania with tools, resources and guidance related to navigation. CaNSuN (cansun.psu.edu) offers an interactive forum of navigators, training opportunities, and a monthly newsletter.



[CaNSuN Homepage](#)

S - Share the story of cancer in central Pennsylvania

There's a lot of information about cancer in central Pennsylvania. So, please share this Story Map of Cancer in Central Pennsylvania.



To learn more about the cancer prevention and control across the cancer care continuum, click on of the buttons below.

Prevention & Risk Reduction

Screening & Early Detection

Diagnosis & Treatment

Post-Treatment & Survivorship

Brought to you by the [Community Sciences and Health Outcomes Shared Resource of the Penn State Cancer Institute](#). For more information, contact CSHO@psu.edu.

These data were provided by the Division of Health Informatics, Pennsylvania Department of Health. The Department specifically disclaims responsibility for any analysis, interpretations or conclusions.

Appalachian Regional Commission	The Appalachian Region
American Cancer Society	Cancer Facts & Figures for African Americans 2016-2018
American Cancer Society	Cancer Facts & Figures for Hispanics/Latinos 2015-2017
Centers for Disease Prevention and Control	Stats of the State of Pennsylvania
Pennsylvania Department of Health	Cancer Prevention and Control
Demographic Data and Population Estimates	United States Census Bureau, 2010 Decennial Census, retrieved through American Fact Finder