Texas Cancer Registry

Cancer in Texas
2015

TEXAS
Department of
State Health Services

Cancer in Texas 2015

Recognition of Funding Sources

Special thanks to the dedication and hard work of Texas's cancer registrars and others responsible for data collection across this State.

Funding from the Texas Department of State Health Services and the Cancer Prevention Research Institute have enabled the Texas Cancer Registry (TCR) to achieve and maintain data quality standards that meet both the Centers for Disease Control and Prevention (CDC) National Program of Cancer Registries Centers (NPCR) and the North American Association of Central Cancer Registries (NAACCR) requirements.

The TCR also acknowledges the CDC for its financial support under Cooperative Agreement #5U58DP003902-03. The contents of this report are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.

Suggested Citation:

Nogueira LM, Risser DR, Arend JA, Robison-Chadwell AE, Villanacci, JF. Cancer in Texas, 2015. Austin, TX: Texas Cancer Registry, Texas Department of State Health Services; Cancer Prevention Research Institute of Texas, 2015.

Table of Contents

About the Texas Cancer Registry

The Texas Cancer Registry (TCR) is a population-based registry that serves as the foundation for measuring the burden of cancer in Texas. The purpose of the TCR is to collect, maintain, and disseminate complete, accurate, quality cancer data.

The TCR receives approximately 250,000 reports of cancer annually from over 500 hospitals, cancer treatment centers, ambulatory surgery centers, and pathology laboratories located throughout the state. The information received by the TCR also includes more than 20,000 reports of cancer from out-of-state residents, distributed throughout the U.S., who are seeking care in Texas. These reports are sent to their residing state cancer registry, providing a significant contribution to the overall national cancer surveillance system. Similarly, the TCR also receives reports of Texans with cancer from other state registries.

The information collected by the TCR includes the type and site of diagnosed cancers, cancer stage, the kinds of treatment patients receive, survival of patients following cancer diagnosis, and patient characteristics. This information is used to measure comprehensive cancer control efforts, health disparities, and progress in prevention, diagnosis, treatment, survival, and quality of life for cancer patients. The registry also supports a wide variety of cancer-related research.

The TCR currently meets the Center for Disease Control and Preventions National Program of Cancer Registries (CDC NPCR), high quality data standards and is certified by the North American Association of Central Cancer Registries (NAACCR).

Cancer Burden in Texas

What is Cancer?

Cancer is a group of diseases characterized by the uncontrolled growth and spread of abnormal cells. If the spread is not controlled, it can result in death.

How is Cancer Burden in Texas Assessed?

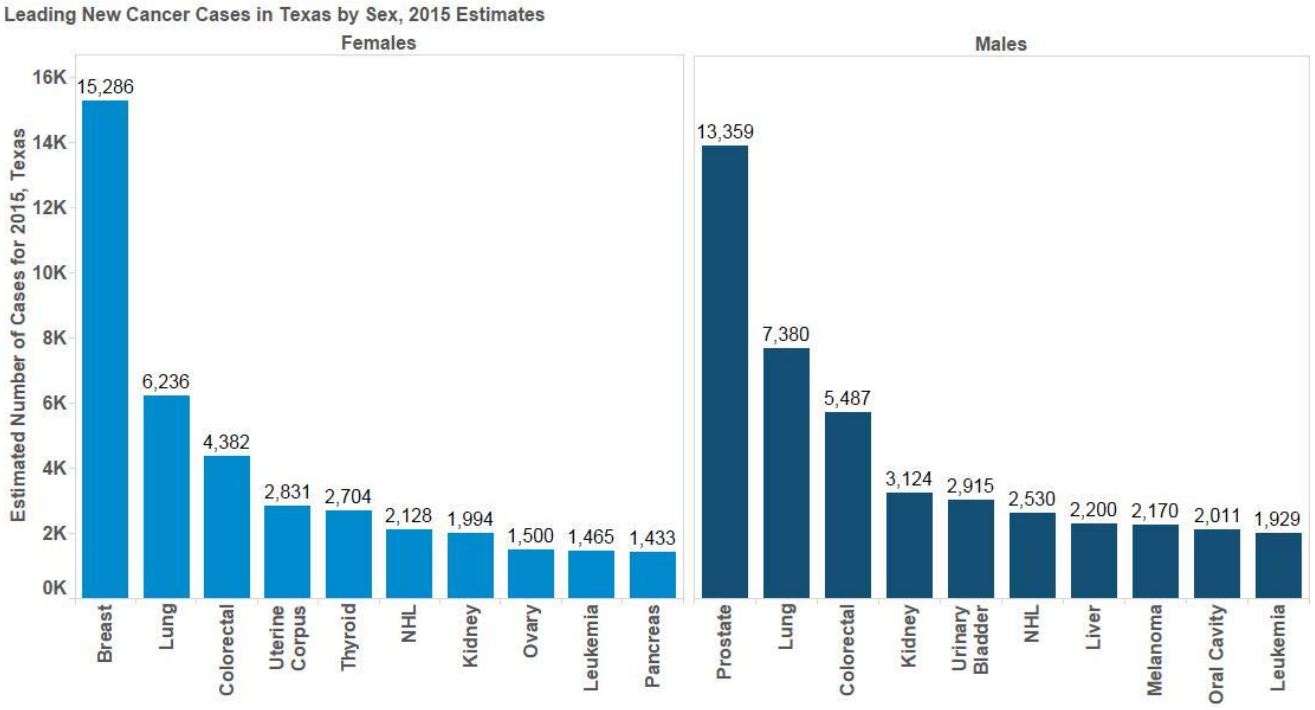
We use cancer incidence (number of new cases) and mortality (number of deaths) to assess the burden of cancer in Texas. To assess cancer incidence in Texas, state law requires health facilities to report all new cancer cases diagnosed among Texas residents to the Texas Cancer Registry (TCR). To assess mortality, we review death certificate information to determine the number of individuals who died from cancer. Because cancer does not affect men and women of all ages, races, and ethnicities equally, cancer burden often is expressed as age, race, and sex specific adjusted incidence and mortality rates. There is a three-year lag in cancer incidence data due to the time required for data collection, compilation, quality control, and dissemination. Thus, the incidence and mortality data presented in this 2015 report are from 2012.

How Many New Cancer Cases Are Expected to Occur in Texas in 2015?

Historical Texas cancer incidence data from 1995 to 2012 and a three-step spatio-temporal model were used to estimate the number of new invasive cancer cases expected to be diagnosed in 2015. This method accounts for expected delays in case reporting and considers geographic variations in sociodemographic and lifestyle factors, medical settings, and cancer screening behaviors as predictors of incidence[1].

Using this methodology we expect about 109,000 new cancer cases to be diagnosed in Texas in 2015, with 52,750 cases among females and 56,250 among males. This estimate does not include carcinoma in situ (noninvasive cancer), or basal cell or squamous cell skin cancers, which are not required to be reported to cancer registries.

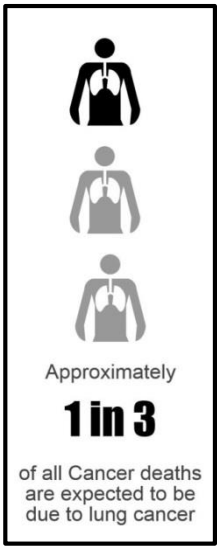
More than 13,000 new cases of prostate cancer, the most frequently diagnosed cancer in men, and more than 15,000 new cases of invasive breast cancer, the most frequently diagnosed cancer in women, are expected to occur in Texas during 2015. The figure below displays the estimated number of the leading new cancer cases in Texas for 2015 for men and women.

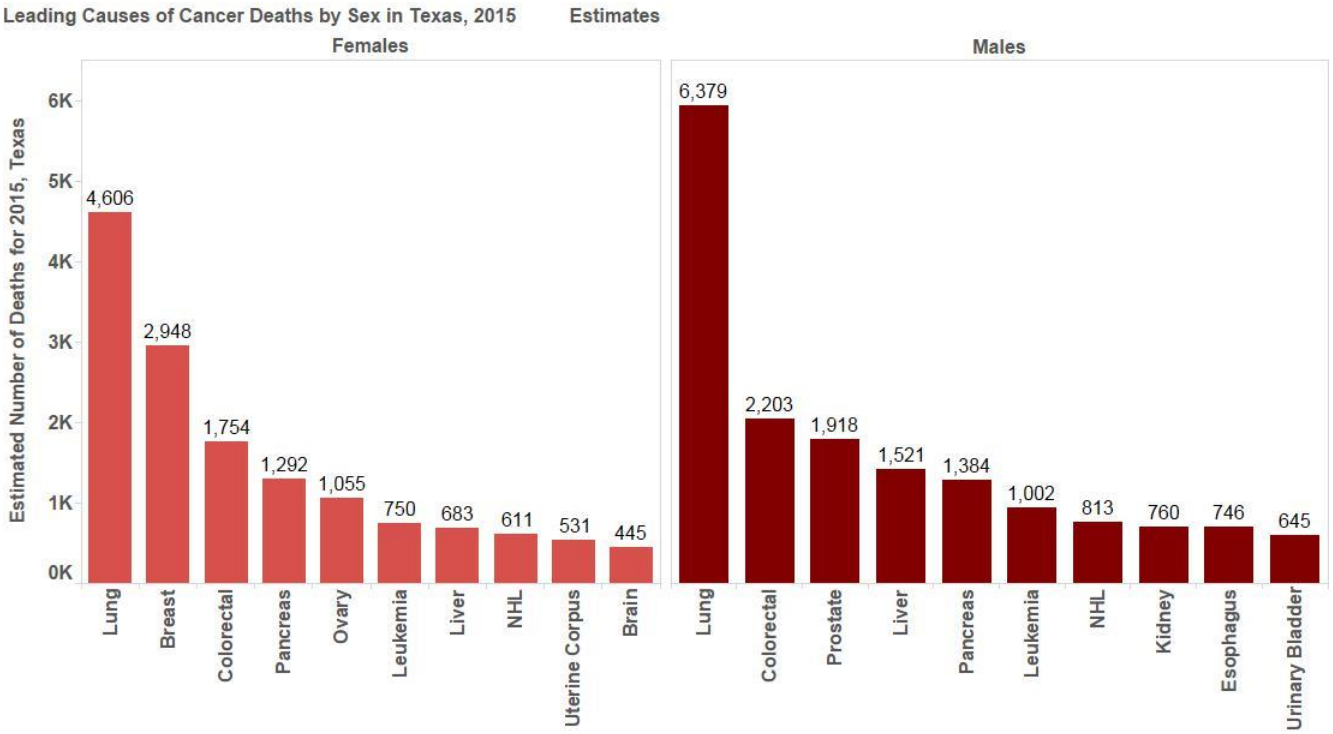


How Many People Are Expected to Die of Cancer in 2015?

Cancer is the second most common cause of death in Texas [2]. In 2015, we expect about 36,000 Texans to die of cancer, nearly 100 people per day.

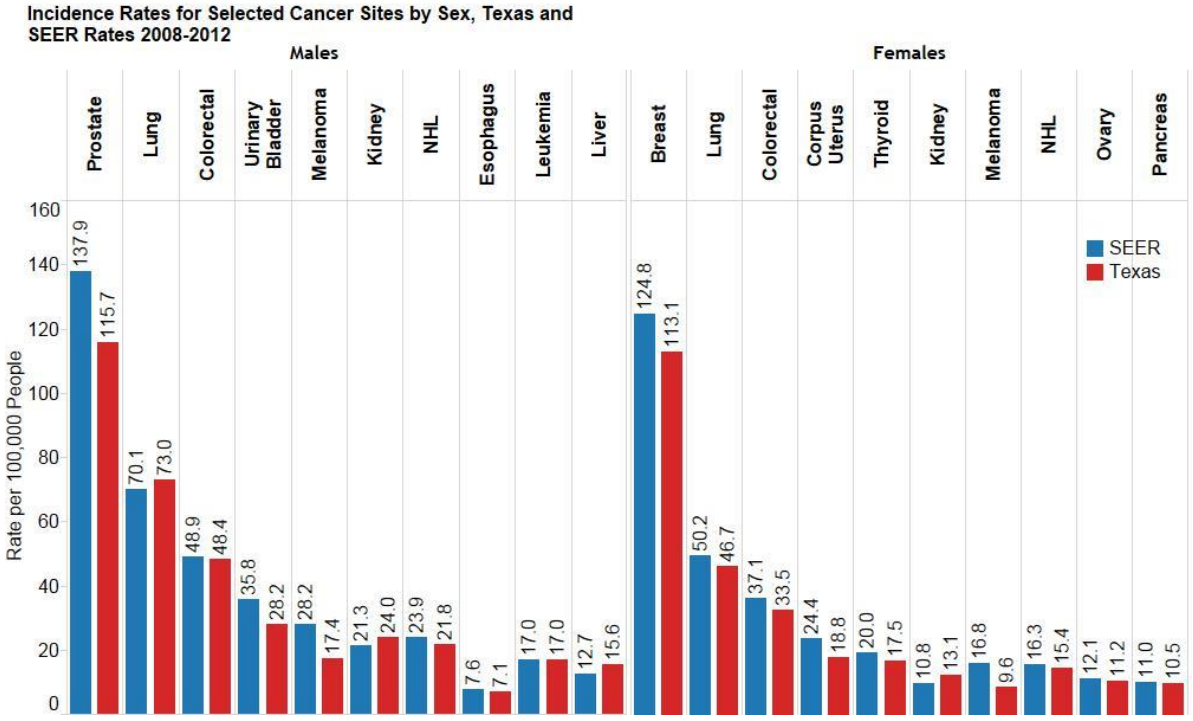
Lung cancer, the leading cause of cancer death in Texas for both males and females, is expected to account for about 30 percent (11,000) of all expected cancer deaths for 2015. Cigarette smoking is the most important risk factor for lung cancer, with both quantity and duration of smoking increasing the risk. According to the last CDC Smoking and Tobacco Use study, Texas ranks 14th among 44 states in the U.S. for cigarette smoking in adults, with 19.2 percent of all adults reportedly smoking cigarettes at the time of the report. Texas also ranked 23rd among 44 states for smoking in youths [3].

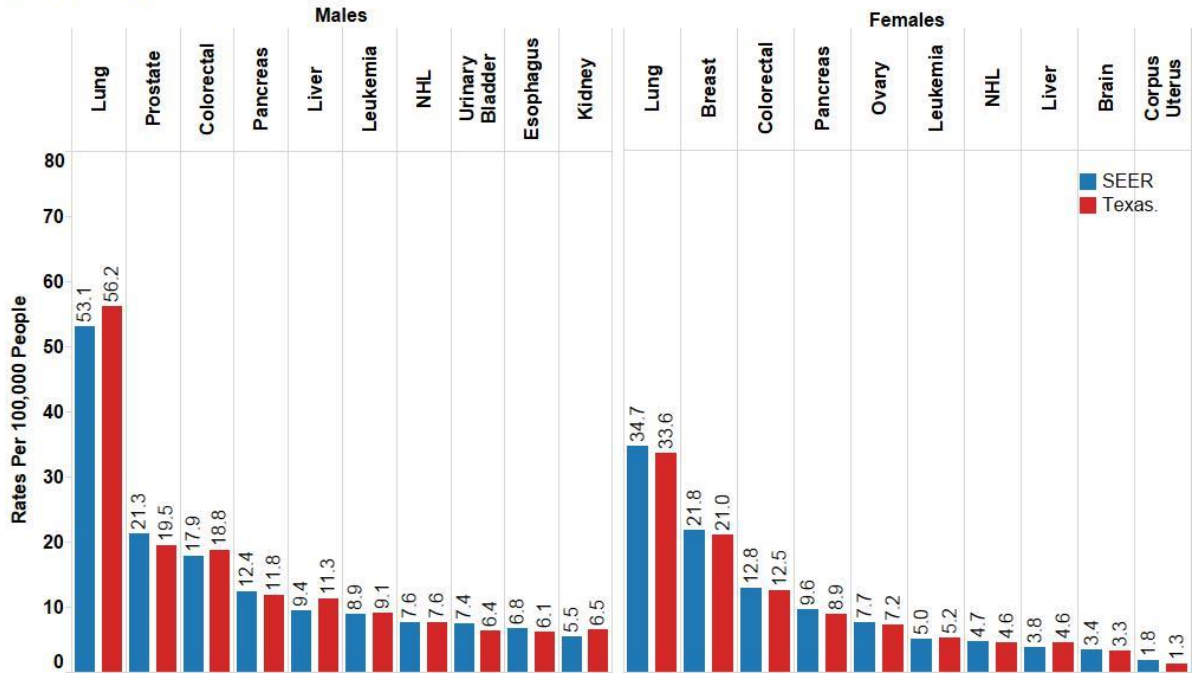




How Does Cancer Burden in Texas Compare to the National Rates?

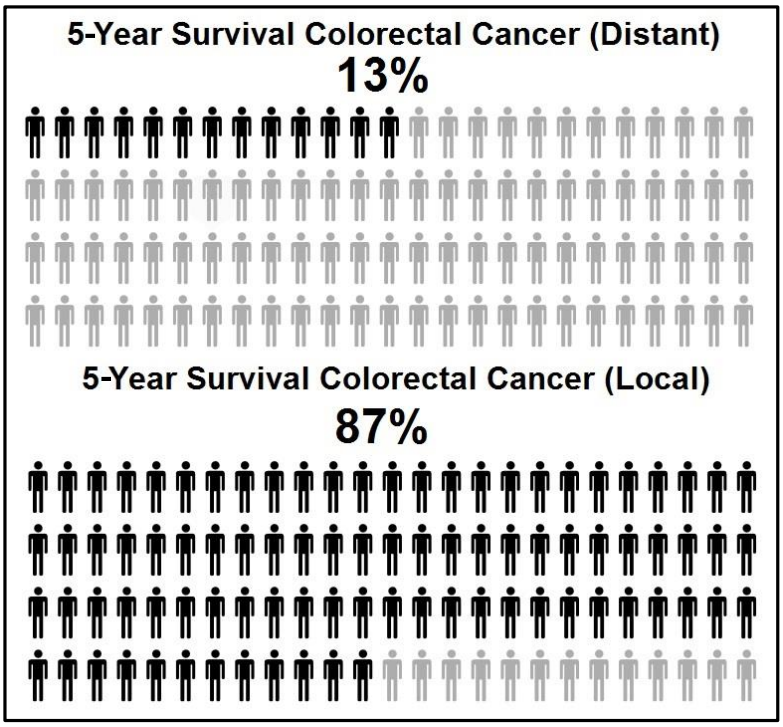
Cancer incidence rates are the number of new cases in a population per 100,000 people at risk, and cancer mortality rates are the number of deaths due to cancer per 100,000 people. Rates provide a useful way to measure cancer burden irrespective of the population size. Because cancer is strongly associated with age, incidence and mortality rates are age-adjusted to remove the impact of different age distributions between populations. Rates in this report are adjusted to the 2000 U.S. Standard Population. We compared the cancer burden in Texas to national rates obtained from the Surveillance, Epidemiology, and End Results (SEER) Registry, which tracks about 28 percent of the U.S. population, but does not include Texas. As can be seen in the figures below, for common cancer types, overall incidence and mortality rates in Texas are comparable with SEER rates.





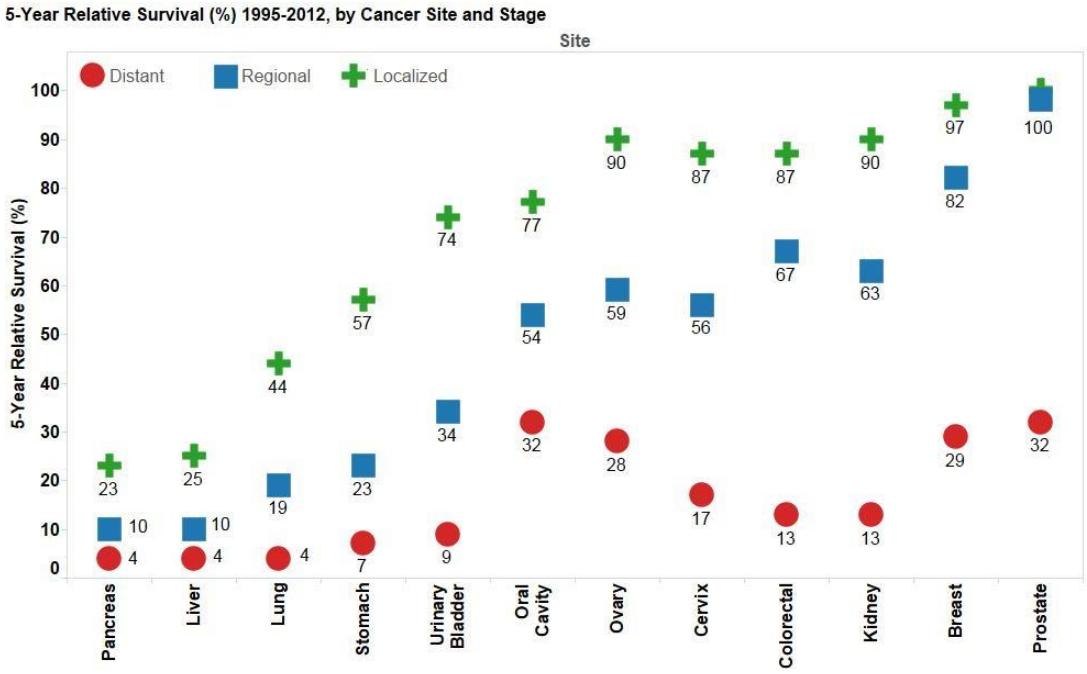
What Percentage of People Survive Cancer?

Survival statistics vary widely by cancer type and stage at diagnosis. Relative survival represents the percentage of cancer patients who are alive after some designated time period (usually 5 years) relative to people without cancer. It does not distinguish between patients who are cancer-free and those who have relapsed or are still in treatment.



While 5-year survival probabilities are useful for monitoring progress in cancer treatment, they are not good predictors of an individual's prognosis in 2015. First, 5-year survival rates for the most recent time period are based on patients who were diagnosed from 1995 to 2008 and thus do not reflect the most recent advances in detection and treatment. Second, survival rates do not account for individual factors that influence survival, such as treatment, other illnesses, and biological or behavioral characteristics.

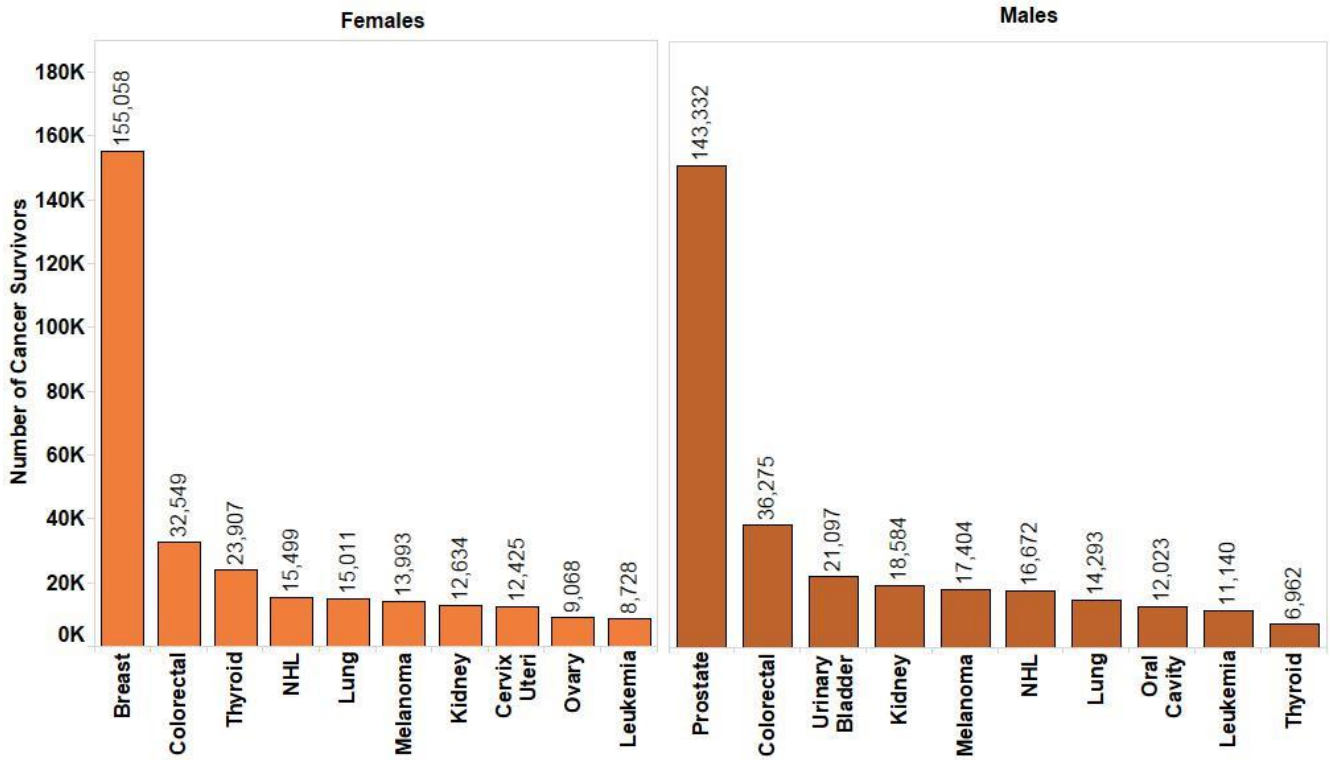
The figure below shows the 5-year relative survival for cancers diagnosed from 1995-2008, and followed through December 2012. The figure illustrates the importance of stage of diagnosis as a main predictor of cancer survival. Staging describes the extent of spread of cancer at time of diagnosis. If cancer cells have spread no farther than the organ in which the cancer started, the stage is "localized." If cancer cells have penetrated beyond the limits of the organ of origin, the stage is "regional." If cancer cells have broken away from the primary tumor, traveled to other parts of the body, and begun to grow at the new location, the stage is "distant." Proper staging is essential to assess prognosis and determine the choice of therapy. The figure shows survival decreasing with distance from the organ where the cancer started.



How Many People in Texas Are Cancer Survivors?

Approximately 494,165 Texans diagnosed between 1995 and 2012 were alive on January 1, 2012. Some of these individuals were cancer free, while others may have ongoing treatment. The cancer sites with the highest number of survivors in Texas are prostate, breast, colorectal, non-Hodgkin Lymphoma, lung, kidney, and melanoma. Breast and prostate cancers constitute over half of this population.

Number of Adult Cancer Survivors by Site and Sex, TX 1995-2012



Cancer Health Disparities in Texas

Definition of Health Disparity

According to the Office of Minority Health a "health disparity is a type of health difference that adversely affects groups of people who have systematically experienced greater social and/or economic obstacles to health" [4] based on characteristics historically linked to discrimination or exclusion. These groups are defined in terms of racial or ethnic group, religion, socioeconomic status, gender, age, mental health, disability (cognitive, sensory, or physical), sexual orientation, and/or geographic location.

Factors Associated with Cancer Health Disparities

Health disparities are associated with social, economic, cultural, environmental, and health system factors. Disparities predominantly arise from inequities in work, wealth, education, housing, and overall standard of living, as well as social barriers to high-quality cancer prevention, early detection, and treatment services.

Disparities in cancer burden largely reflect obstacles to receiving health care services related to cancer prevention, detection, and treatment. Lower socioeconomic status (SES) is associated with financial and structural barriers to health care, including inadequate health insurance coverage, reduced access to preventive services, and lower literacy. Individuals with inadequate health insurance are more likely to be diagnosed with advanced cancer and less likely to survive the disease. People with lower SES are more likely to engage in behaviors that increase cancer risk, such as tobacco use, physical inactivity, and poor diet because of environmental and community factors that provide fewer opportunities for physical activity and less access to fresh fruits and vegetables. According to the U.S. Census Bureau, in 2013, 27 percent of black and 23 percent of Hispanic Americans lived below the poverty line, compared to 12 percent of non-Hispanic white people [5].

Discrimination is another factor that contributes to racial/ethnic disparities in cancer mortality. Historically disadvantaged racial/ethnic groups receive lower-quality health care than white individuals even when insurance coverage, age, severity of disease, and health status are comparable. Communication barriers and provider assumptions affect the interaction between physician and patient and contribute to delivery of substandard care [6, 7].

Survival rates for Asian Pacific Islanders and Hispanics appear to be higher overall. However, survival estimates for Hispanics and Asian Pacific Islanders are inflated [8]. In these populations, linkages with death records are problematic, as the methods are based on Anglo-Saxonic names. Missed matches between cancer patient and death certificate leads to missing deaths and overestimated survival [9].

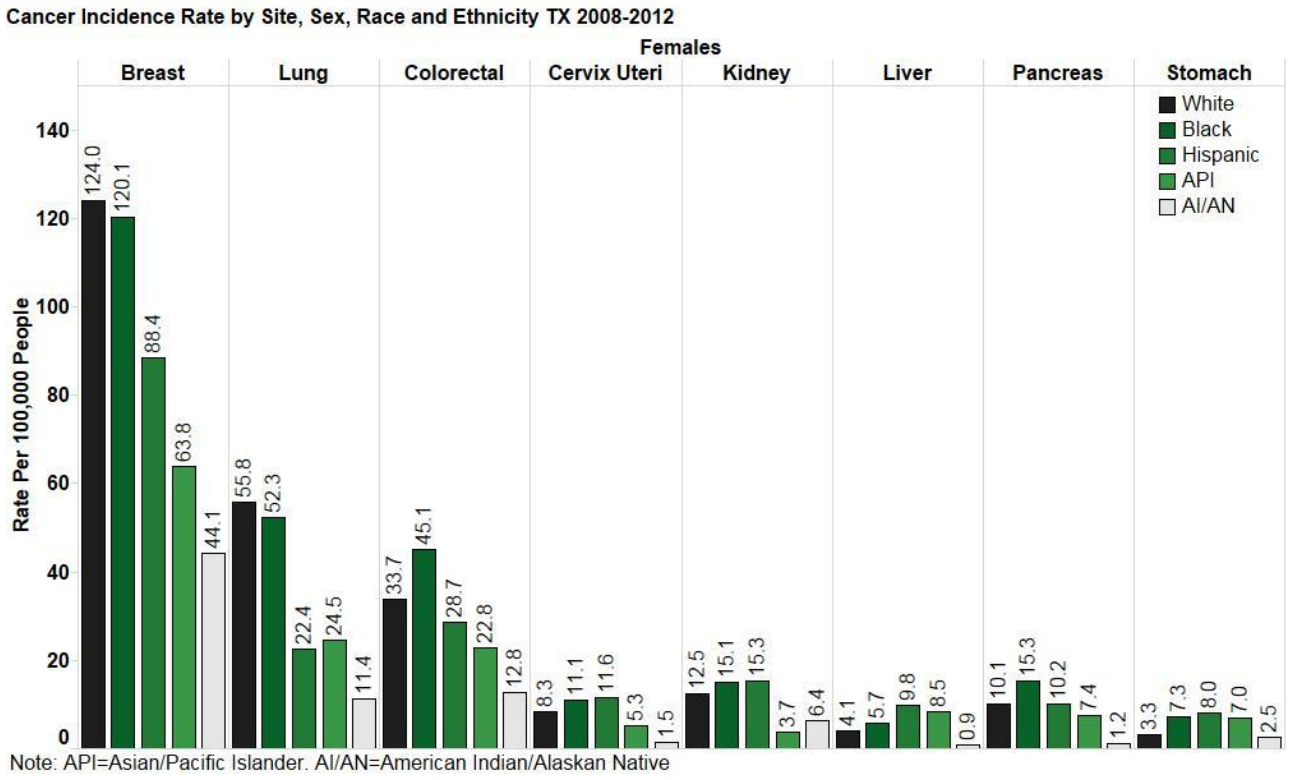
Genetic factors may also explain some differences in cancer incidence between races and ethnicities. For example, women from population groups with a higher frequency of mutations in the breast cancer susceptibility genes *BRCA1* and *BRCA2* have an increased risk of developing breast and ovarian cancer. For example, *BRCA1* 185delAG, a known Jewish founder mutation, is prevalent across the Mexican-American Hispanic population [10]. Although genetic mutations significantly increase cancer risk at the individual level, and increased access to genetic testing among Mexican-Americans is needed, genetic differences associated with race and ethnicity make only a minor contribution to the disparate cancer burden between races and ethnicities [11].

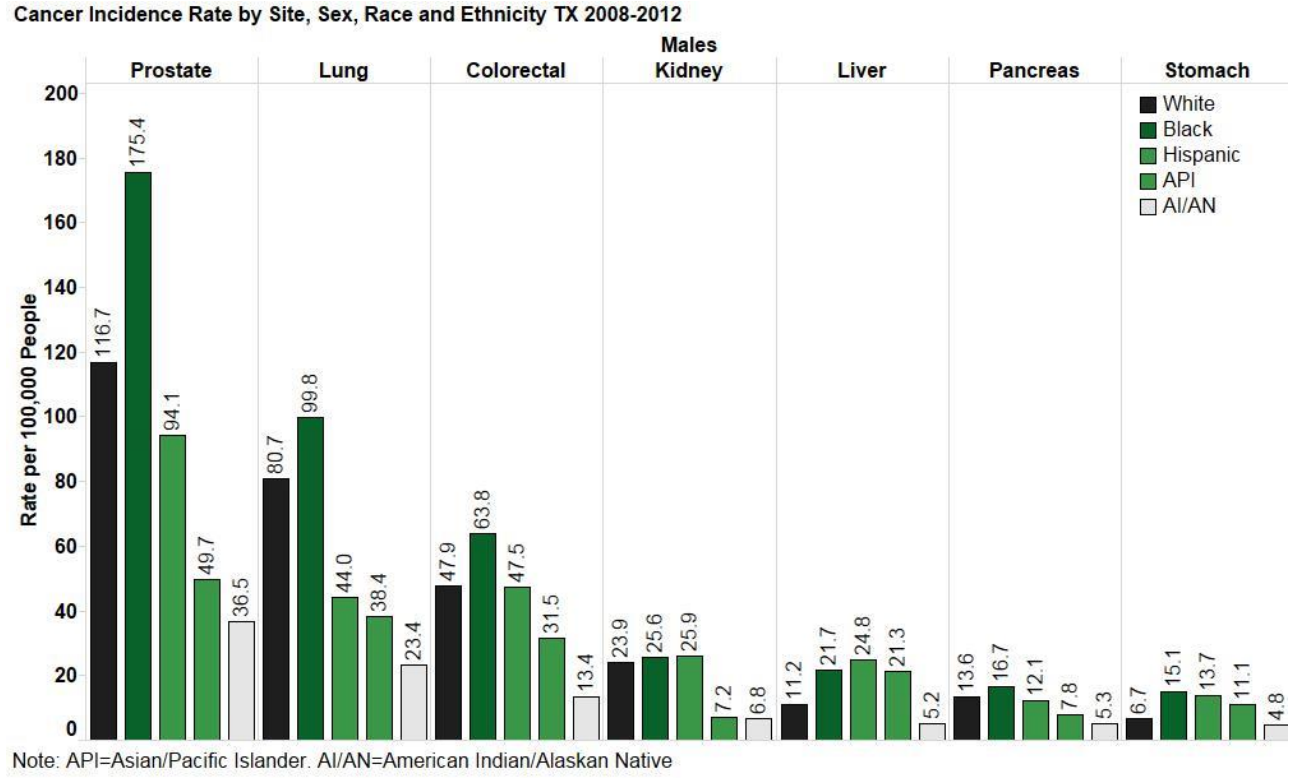
Cancer Incidence and Mortality Disparities in Texas

With the exception of female breast and lung cancer, black individuals have higher incidence and mortality rates than white individuals for many of the cancer sites listed in the following figures. Large disparities exist in incidence rates between blacks and whites, particularly with prostate cancer and lung cancer in males, and colorectal cancer in females.

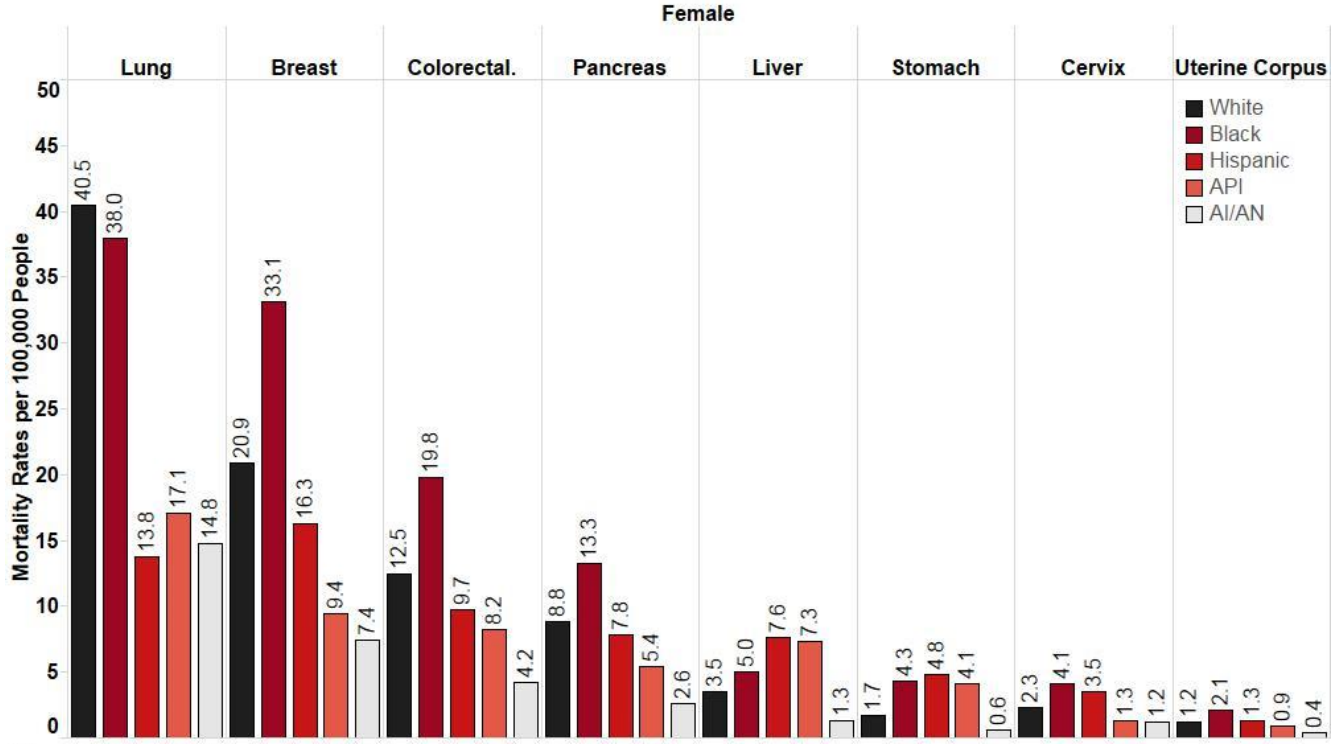
Asians and Pacific Islanders have the lowest overall cancer incidence and mortality rates. However, this population has among the highest rates for cancers of the liver and the stomach. Incidence rates of liver and stomach cancers are more than twice as high in Hispanic than white individuals. Cervical cancer incidence and mortality rates are also higher among Hispanic women compared to white women.

The figures below illustrate how the number of new cancer cases diagnosed per 100,000 people (incidence rate) varies for males and females of different races.



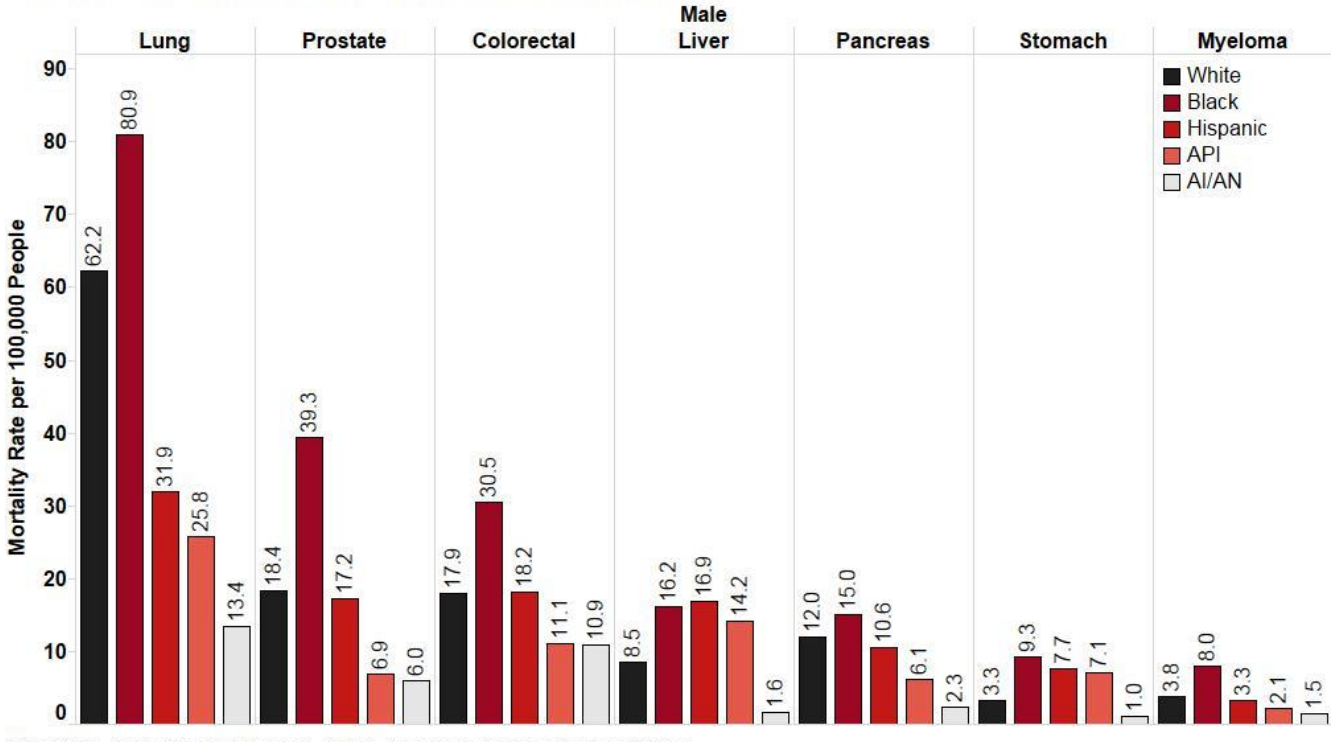


Cancer Mortality Rate by Site, Sex, Race and Ethnicity TX 2008-2012



Note: API=Asian/Pacific Islander. AI/AN=American Indian/Alaskan Native

Cancer Mortality Rate by Site, Sex, Race and Ethnicity TX 2008-2012

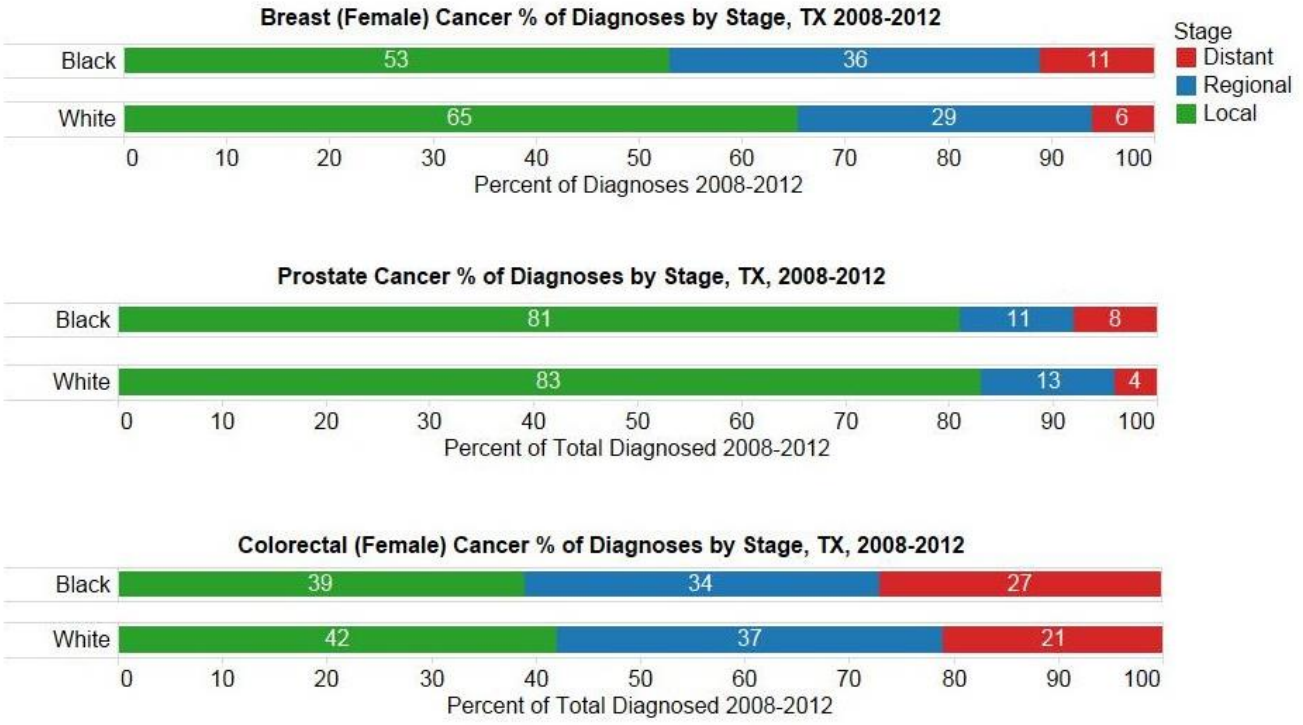


Note: API=Asian/Pacific Islander. AI/AN=American Indian/Alaskan Native

Cancer information for Asians, Pacific Islanders, American Indians, and Native Alaskans is known to be incomplete because the racial/ethnic status of many of these individuals is not correctly identified in medical and death records [12]. Although efforts have been made by the TCR to collect more accurate information through linkage with other data sources, such as the Indian Health Service (IHS), available statistics may not represent the true cancer burden for this population.

The mortality rate for prostate cancer in black males is more than 2 times higher than the rate in white males. Similarly, the mortality rate for colorectal cancer in black women is nearly 2 times higher than the rate in white women.

Although black women have lower breast cancer incidence rates than white women, the mortality rate is significantly higher. As demonstrated in the figure below, the proportion of black individuals who are diagnosed with later stage (distal) cancers, which have lower chance of survival, is higher than the proportion of white individuals.



While the leading cause of death among white Americans is heart disease, cancer is the number one cause of death among Hispanics [13].

Cancer in Children & Adolescents

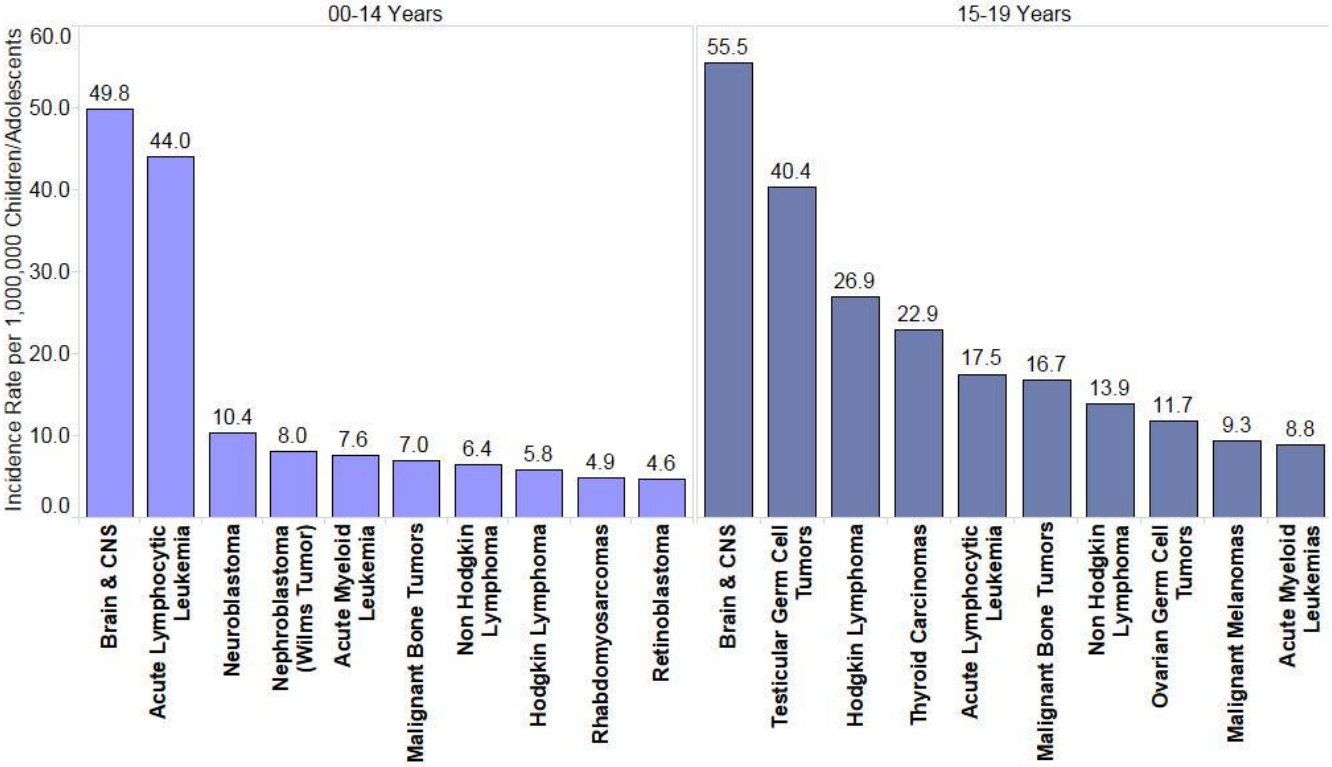
How Many New Cases and Deaths Are Expected to Occur Among Children and Adolescents in 2015?

Although advances in treatment have increased the overall 5-year survival rate for childhood cancers to approximately 80 percent, cancer is still the second leading cause of death (following fatal injuries) in children aged 5 to 14 years old [14]. An estimated 1,288 new cases and 161 cancer deaths are expected to occur among children (birth-14 years), and an additional 612 new cases and 81 cancer deaths are expected among adolescents (15-19 years).

What Are the Most Common Cancers in Children and Adolescents?

The most common cancers among children and adolescents vary by age. Among children ages 0-14 years the most common cancers are brain and CNS (25.5%) and Acute Lymphocytic Leukemia (22.7%). Among adolescents ages 15-19 years the most common cancers were brain and CNS (20.2%) and Hodgkin Lymphoma (9.8%).

Incidence of Childhood and Adolescent Cancers, TX 2008-2012



Note: Brain & CNS includes benign cases. testicular germ cell tumor rates were calculated using male populations only and ovarian germ cell tumor rates were calculated using female populations only.

Cancer Risk Factors

What Causes Cancer?

Cancer is caused by both external factors (tobacco, obesity, infectious organisms, chemicals, and radiation) and internal factors (genetics, hormones, and immune conditions). These causal factors may act together to initiate the development of cancer. Ten or more years often pass between exposure to external factors and detectable cancer.

Can Cancer Be Prevented?

A substantial proportion of cancers could be prevented. For instance, cancers caused by cigarette smoking could be completely prevented. In the U.S. the observed declining lung cancer incidence in men and women is a result of reduced number of smokers [15]. In Texas, since 1995, the incidence of lung cancer decreased by 2.6 percent in men and 0.8 percent in women. The different rates of decline of lung cancer incidence observed between men and women reflect historical differences in tobacco use; cigarette smoking peaked about 20 years later in women than in men [16]. In the U.S. overall there have been approximately 17.7 million deaths between 1964 and 2012 due to smoking with a substantial number of deaths occurring before the age of 65 years [17].

The World Cancer Research Fund estimates that one-third of the cancer cases that occur in economically developed countries, like the U.S., are related to being overweight or obese and could be prevented.

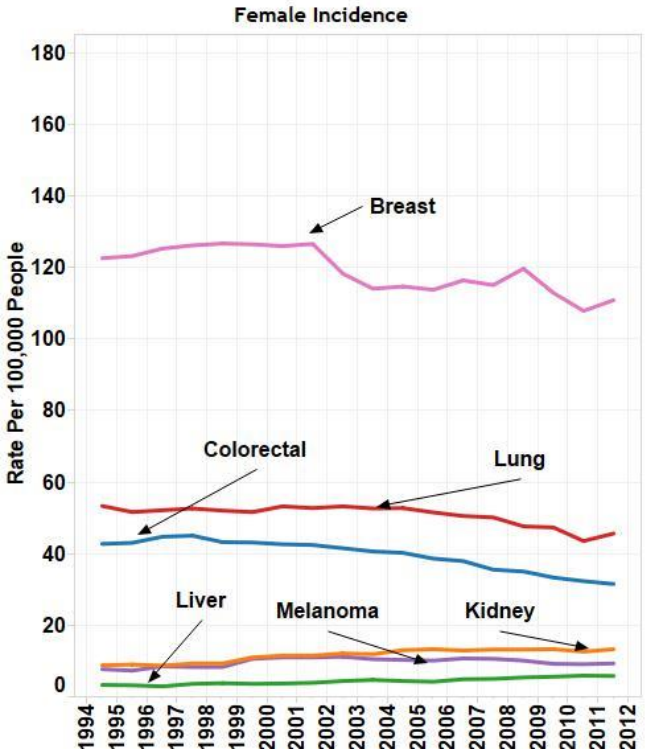
Many of the melanoma cases diagnosed annually also could be prevented by protecting skin from excessive sun exposure and avoiding indoor tanning. Children in particular should be protected from the sun because severe sunburns in childhood greatly increase the risk of developing melanoma later in life.

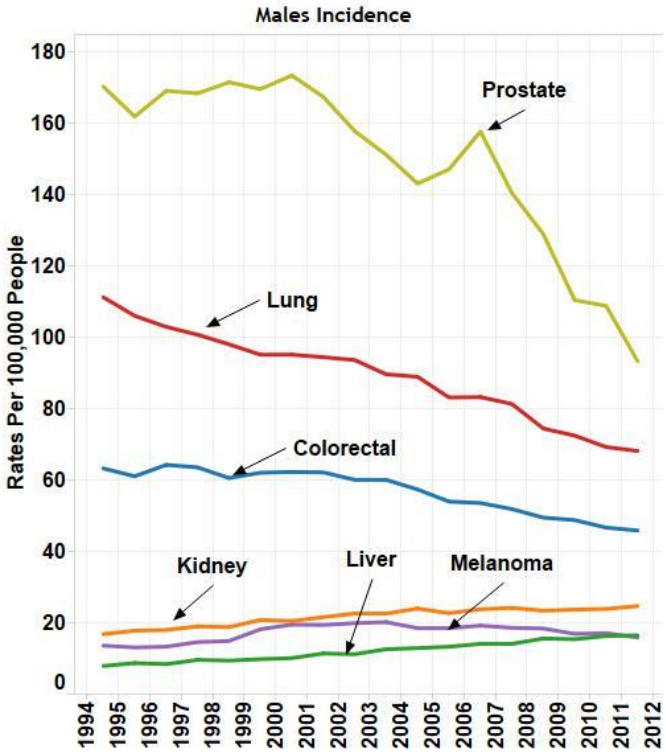
In contrast to the stable decline for most cancer types, incidence rates are increasing for melanoma, thyroid, kidney, and liver cancer. Since 1995, melanoma incidence rates have increased by 17.1% in men and 20.5% in women. Thyroid cancer is the most rapidly increasing cancer in the US and has been increasing worldwide over the past few decades [11]. Since 1995, the incidence rate for thyroid cancer in Texas women has increased 122.4 percent and 99.7 percent in Texas men. The rise is thought to be partly due to increased detection because of more sensitive diagnostic procedures.

Liver cancer incidence rates are about three times higher in men than in women. From 1995 to 2012, the incidence rate of liver cancer in Texas men has nearly doubled from 7.9 per 100,000 to 16.5 per 100,000. Since 1990, Mortality from liver cancer also increased by approximately 65.5 percent in men and 29.2 percent in women. The majority of liver cancer cases are due to alcohol-related cirrhosis and non-alcoholic fatty liver disease associated with obesity. Screening for liver cancer has not been shown to reduce mortality, but many doctors screen high-risk people with ultra-sound and blood tests.

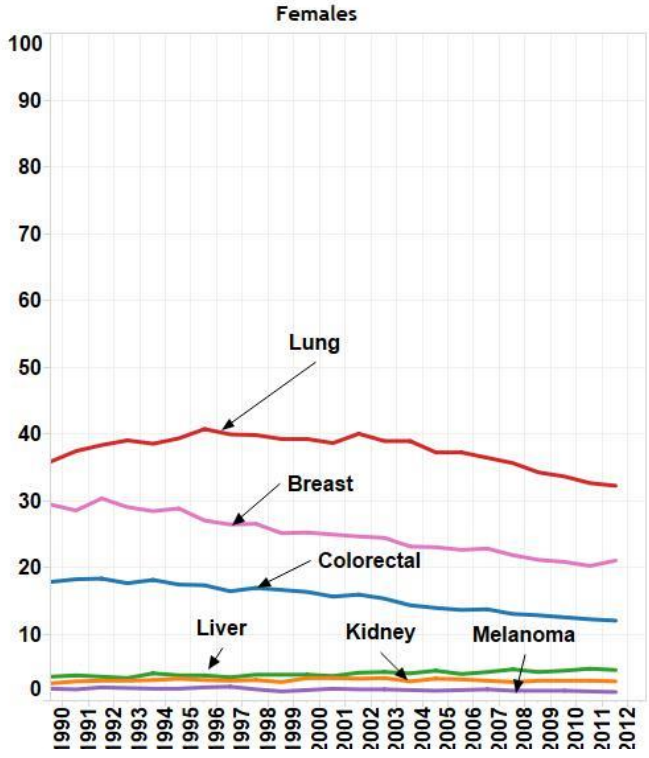
Screening offers the ability for secondary prevention by detecting cancer early, before symptoms appear. Screening for colorectal and cervical cancers can prevent cancer by allowing the removal of precancerous lesions [18]. For example, the recent decline in colorectal cancer incidence and mortality rates has been attributed to the introduction and uptake of colonoscopy [19].

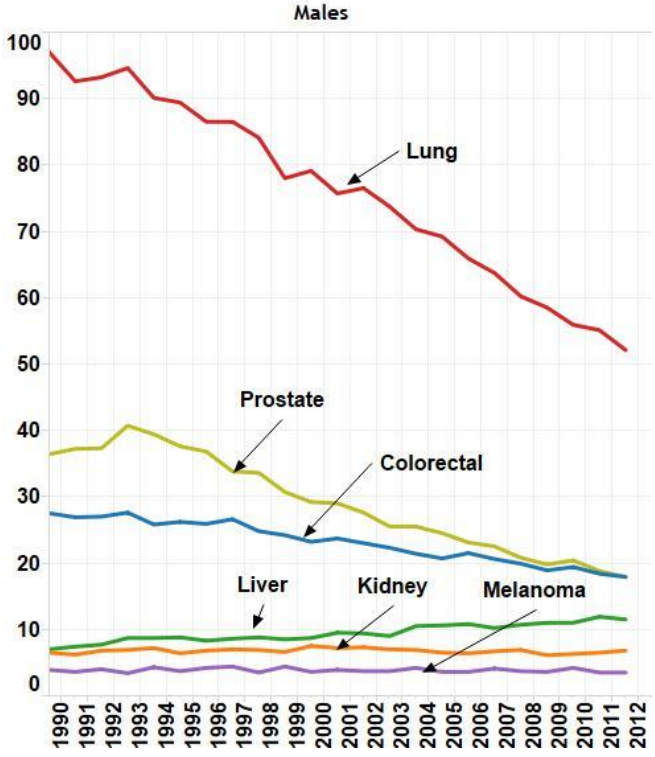
Cancer Incidence Trends in Texas by Sex 1995-2012





Cancer Mortality Trends in Texas by Sex 1990-2012





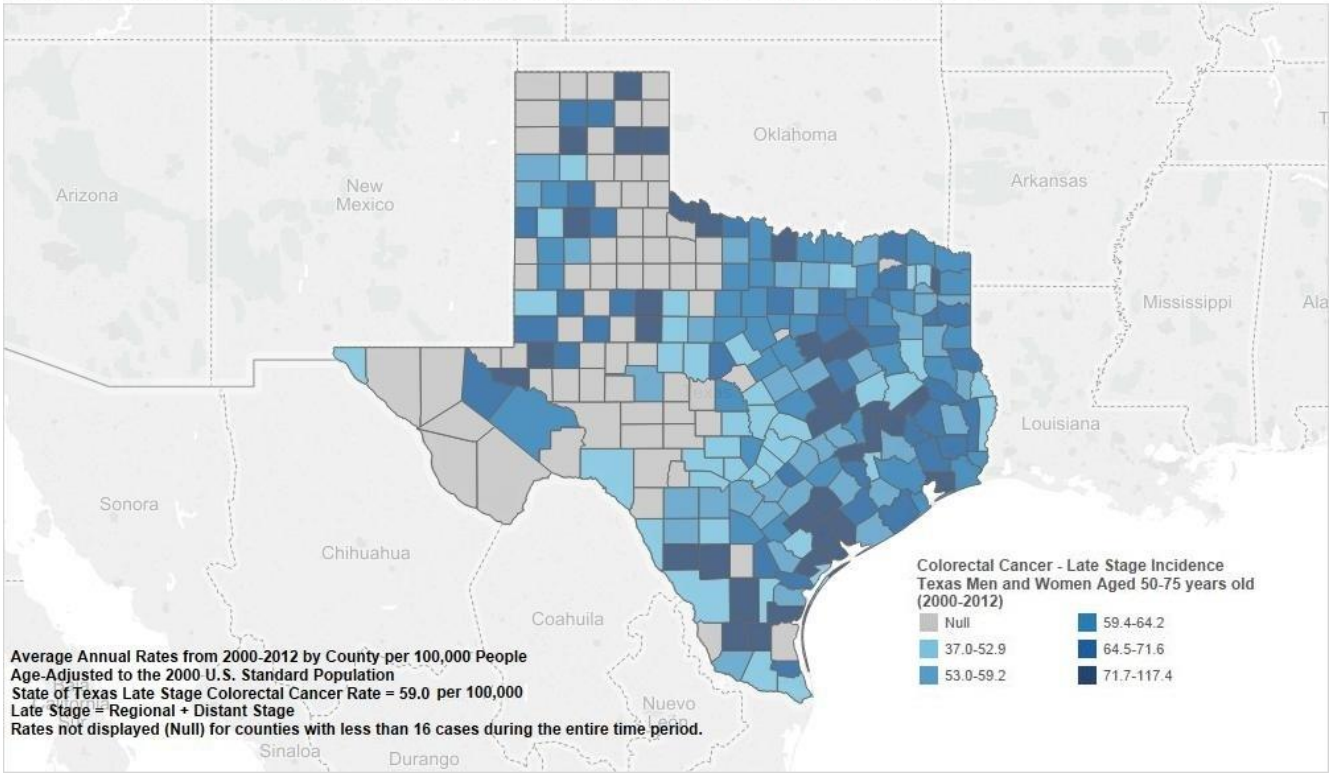
Colorectal Cancer Screening

Recommendations to preventing colorectal cancer include receiving regular screening, maintaining a healthy weight, adopting a physically active lifestyle, consuming a healthy diet with an emphasis on plant sources, limiting alcoholic beverage consumption, and avoiding tobacco and tobacco products.

Screening can prevent colorectal cancer by finding and removing polyps before they progress to cancerous lesions. Screening can also detect colorectal cancer at an early stage, when treatment has a higher probability of success.

The U.S. Preventive Task Force (USPTF) recommends colorectal cancer screening for adults between the ages of 50 and 75 years [20]. In 2014, Texas ranked 41st out of 50 states, with 60.1 percent of adults 50 and older reporting being current for colorectal cancer screening [21]. The map below displays the number of newly diagnosed late-stage colorectal cancer cases per 100,000 people (incidence rate) in different counties in Texas. Areas with higher incidence rates of late-stage colorectal cancer are good candidates for prevention initiatives.

Colorectal Cancer - Late Stage Incidence in Texas Men and Women Aged 50-75 years old, 2000-2012



Cervical Cancer Screening

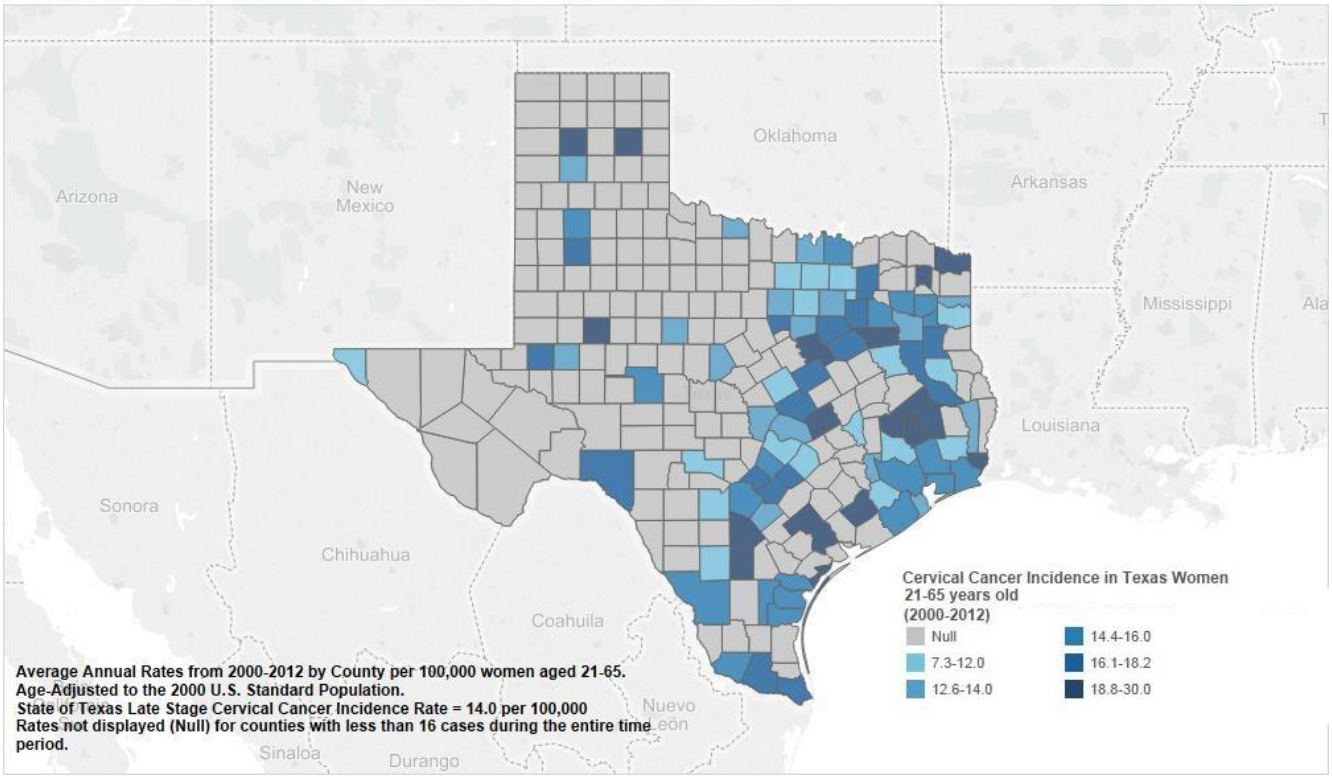
The USPTF recommends screening for cervical cancer in women ages 21 to 65 years via pap smear every 3 years [22]. If most women have access to routine Pap smear screening and timely follow up for detected abnormalities, the onset and progression of cervical cancer can be prevented. Therefore, areas where cervical cancer incidence rates are high are good candidates for prevention initiatives.

Apart from screening, additional measures to prevent cervical cancer include avoiding exposure to the Human Papillomavirus (HPV), vaccination against HPV, and avoiding smoking. The most important risk factor for cervical cancer is infection by HPV. HPV infection can cause cervical, vaginal, and vulvar cancers in women; penile cancer in men; and anal and oropharyngeal cancers in both men and women. The CDC recommends the full HPV vaccine series for preteen boys and girls beginning at age 11 or 12 years, so they are protected before being exposed to the virus. About 14 million people, including teens, become infected with HPV each year.

Additional information about the HPV vaccine can be found on the CDC website:

http://www.cdc.gov/hpv/parents/vaccine.html

Cervical Cancer - Map of Incidence for Women Aged 21-65 years old, 2000-2012



How Texas Cancer Registry Data Are Used

Hospital Management

Data routinely collected by the TCR can help hospital administrators evaluate services being offered and identify patterns in cancer care to plan accordingly. For example, administrators can examine frequency reports to identify changes in care over time. Administrators can also evaluate referral patterns to see when patients are directed or choose to be treated at other facilities. These data are crucial for planning resources allocation and staff recruitment.

Cancer Surveillance

Cancer surveillance enables public health professionals to evaluate and address cancer burden. Public health professionals use cancer registry data to assess patterns in the occurrence of cancer, detect important trends within populations, and assess the impact of cancer prevention programs. Cancer registry data can be used to conduct needs and capacity assessments that allow evidence-based decision-making and rational allocation of limited cancer resources.

Cancer Research

Epidemiology Studies

Epidemiology is the study of patterns and factors that affect the health and illness of populations. Epidemiology is considered a cornerstone methodology of public health research, and is highly regarded in evidence-based medicine for identifying risk factors for disease and determining optimal treatment approaches to clinical practice.

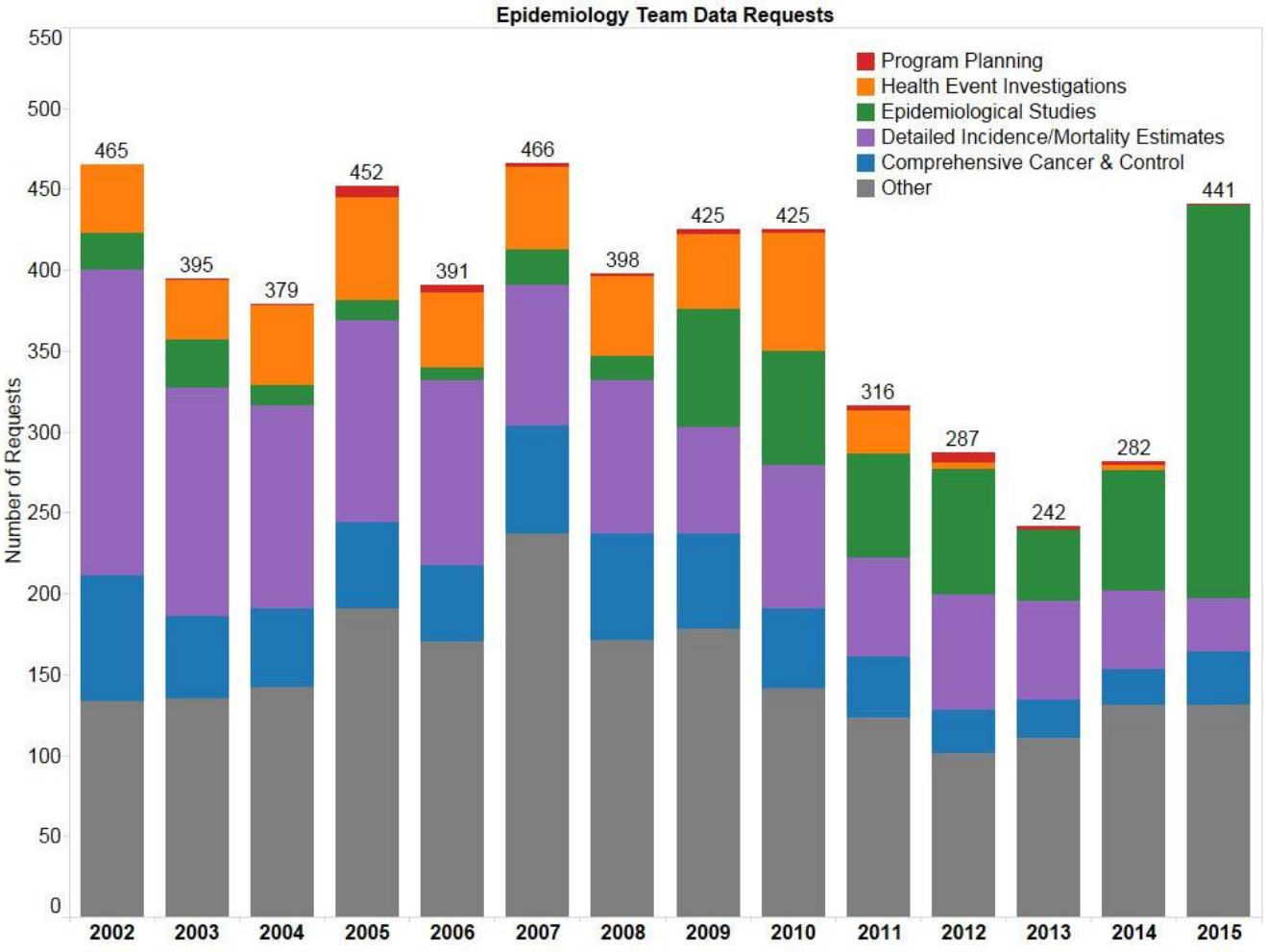
The TCR currently supports approximately $63 million dollars in cancer research. While the TCR does not provide research funds, data from the TCR makes cancer epidemiology research possible. TCR data are used to describe the demographic characteristics of individuals who develop specific type of cancers [23], compare cancer burden to other public health issues [24], and evaluate trends in cancer incidence and mortality over time. A continuous drop in incidence and mortality of cervical cancer after an increase in Pap test screening underscores the importance of preventive strategies [25].

TCR data also are linked to other datasets to evaluate the association of modifiable risk factors with cancer and to identify if specific cancers are amenable to preventive strategies [26-28]. Linked data can also be used to evaluate if cancer patients have appropriate access to care. Researchers have evaluated how regional differences in access to cancer treatment affect patient survival [29], looked at treatment disparities for specific groups of patients [30], and checked whether diagnostic evaluations had been performed according to the guidelines [31].

TCR data was used in tandem with data from 278 other population based registries in the world in order to better understand the worldwide survival rates for difference cancers as a part of the CONCORD-2 study [32]. Researchers have also used TCR and other data in order to examine the difference between robot-assisted laparoscopic radical prostatectomy (RALP) and open radical retropubic prostatectomy (RRP) and the impact on survival and quality of life for prostate cancer patients [33].

Cancer registry data can also be used to investigate health disparities. For example, in 2014, TCR data was used to evaluate disparities in cancer burden by region, such as increased incidence of liver cancer in south Texas [34], residential segregation in breast cancer mortality, as well as disparities [35] by race [12, 36], and by health insurance coverage [37].

The figure below shows the number and type of data requests received by TCR epidemiologists every year since 2002.



Program Planning, Evaluation & Needs Assessment: Requests for the development of, assessment of, or evaluation of programs in cancer prevention and control.

Health Event Investigations: Requests for health event investigation(s) or information about ongoing health event investigations.

Epidemiological Studies: Requests for data to be used for epidemiological studies approved by the Institutional Review Board (IRB).

Detailed Incidence/Mortality Estimates: Requests for detailed estimates and statistics by geographic area and/or stage of diagnosis.

Comprehensive Cancer & Control: General requests for state level incidence and/or mortality and other general cancer data requests.

Other: All requests that to not apply to the above categories (i.e., training inquiries, requests for personal cancer records, requests for copies of published reports, etc.)

The Epidemiology Team Data Requests dashboard is updated monthly. This image reflects data requests as of November 2015. For the most current version of the data dissemination dashboard, visit the following website:

http://public.tableau.com/views/TCRDataDisseminationDashboard_0/EpiDataRequests?%3AshowVizHome=no

Clinical Trials

A clinical trial is a research study designed to test the safety and/or effectiveness of drugs, devices, treatments, or preventive measures in humans. Cancer registry data can be used to calculate the percent of patients diagnosed with a specific type of cancer who have enrolled in a clinical trial.

At this time, there is no centralized source for information on all the government and privately sponsored clinical trials enrolling patients. These are a few resources that contain additional information about ongoing clinical trials:

- The National Cancer Institute (NCI) sponsors the majority of government-funded cancer clinical trials. A list of current trials sponsored by the NCI can be obtained by calling the Cancer Information Service toll free at 1-800-4-CANCER (1-800-422-6237) or visiting the NCI website at www.cancer.gov/clinicaltrials.
- The American Cancer Society website provides a matching service through the Coalition of Cancer Cooperative Groups (CCCG) at www.cancer.org/clinicaltrials. You can also use the website to locate the closest NCI-designed cancer center where clinical trials are conducted, or see a list of cancer studies being conducted at member institutions at www.cancertrialshelp.org.
- The Cancer Trials Support Unit (CTSU) makes clinical trials information available to doctors and patients in the US and Canada. General information about the CTSU is available on the program's website at www.ctsu.org or by calling 1-888-823-5923.
- The Community Clinical Trial Program (CCOP) is a large network that allows patients and physicians to participate in clinical trials sponsored by the NCI. Detailed information about the CCOP can be found at http://ccop.cancer.gov/

Community Efforts

TCR data supports a variety of community efforts including public education to increase cancer awareness, fundraising events, and outreach activities. Some of the institutions that worked together with the TCR in 2014 include:

- Texas Kids Count (http://www.datacenter.aecf.org/data#TX/2/0)
- Relay for Life (ACS) (http://www.relayforlife.org/)
- Susan G. Komen foundation (http://www.komenaustin.org/)
- Make a Wish Foundation (http://cstx.wish.org/)
- Center for Community Engagement at the MD Anderson Cancer Center (http://www.mdanderson.org/)
- Cancer Prevention and Research Institute of Texas (http://www.cprit.state.tx.us/)
- Leukemia and Lymphoma Society (http://www.lls.org/) (14164)

Cancer Cluster Investigations

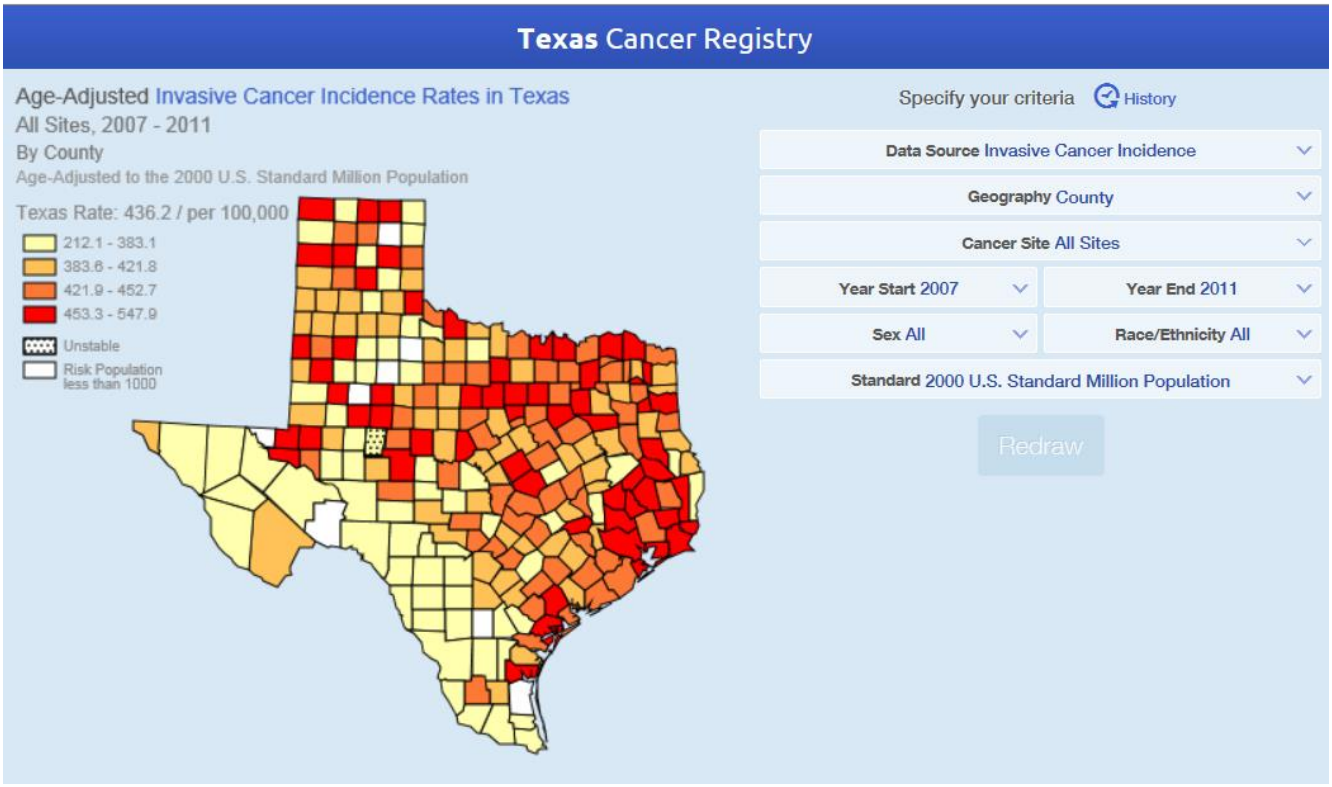
Responding to communities' cancer concerns is one of the most important activities performed by cancer registries. The CDC defines cancer clusters as a greater than expected number of cancer cases that occurs within a group of people, in a geographic area, over a period of time [38].

Cancer clusters may be suspected when people learn about multiple family members, friends, neighbors, or coworkers who have been diagnosed with cancer. The term cancer refers not to a single disease but to a group of related yet different diseases. Unfortunately, about one in three people will develop cancer in their lifetime [11]. Thus, it is not unusual to see multiple cases of cancer in a community or workplace. An apparent cancer cluster is more likely to be genuine if it involves multiple cases of one type of cancer, a rare type of a cancer, and/or an unusual type of cancer in a particular population (breast cancer in men, for example).

Accessing Texas Cancer Data

The TCR has made significant efforts to make its data available and accessible. Information about cancer statistics in Texas is available on the TCR website at http://www.dshs.state.tx.us/tcr/data.shtm. In addition to information about incidence and mortality in adults, the website also has information about childhood and adolescent cancers, cancer estimates, and information about cancer clusters.

A web query tool is also available on the TCR website at http://www.cancer-rates.info/tx/. An example of the interface is shown below:



The query tool can be used to quickly obtain cancer incidence and mortality rates and counts. These statistics can be displayed in a variety ways by selecting different cancer sites, time periods, geographic areas, or demographic characteristics (such as gender and race/ethnicity).

The TCR can also provide more detailed and specific cancer data for researchers. Detailed information on how to request limited use or confidential data from the TCR can be found at http://www.dshs.state.tx.us/tcr/irb.shtm.

References

Uncategorized References

1. Zhu, L., et al., *Predicting US- and state-level cancer counts for the current calendar year.* Cancer, 2012. **118**(4): p. 1100-1109.
2. Texas Department of State Health Sevices. *Leading Causes of Death by Race Ethnicity in Texas*. 2014; Available from: http://www.dshs.state.tx.us/CHS/VSTAT/vs11/t16.shtm.
3. CDC. *Smoking & Tobacco Use: State Highlights.* 2012.
4. Health, U.S.D.o.H.a.H.S.O.o.M. *Health Inequality and Disparities*. 2011.
5. Bureau, U.S.C., *Current Population Survey.* Annual Social and Economic Supplements, 2014.
6. Taylor, T.R.C.D.W., Kepher H. Makambi, Charles Mouton, Jules P. Harrell, Yvette Cozier, Julie R. Palmer, Lynn Rosenberg & Lucile L. Adams-Campbell, *Racial Discrimination and Breast Cancer Incidence in US Black Women The Black Women's Health Study.* American Journal of Epidemiology, 2007. **166**(1): p. 46-54.
7. Ward, E.A.J., Vilma Cokkinides, Gopal K. Singh, Cheryll Cardinez, Asma Ghafoor and Michael Thun *Cancer Disparities by Race/Ethnicity and Socioeconomic Status.* CA: A Cancer Journal for Clinicians, 2008. **54**(2): p. 78-93.
8. Pinheiro, P.S., et al., *The Impact of Follow-up Type and Missed Deaths on Population-Based Cancer Survival Studies for Hispanics and Asians.* JNCI Monographs, 2014. **2014**(49): p. 210-217.
9. Pinheiro, P.S., C.R. Morris, L. Liu, T.J. Bungum, and S.F. Altekruse, *The impact of follow-up type and missed deaths on population-based cancer survival studies for Hispanics and Asians.* JNCI Monographs, 2014. **49**: p. 210-217.
10. Weitzel, J.N., et al., *Prevalence and Type of BRCA Mutations in Hispanics Undergoing Genetic Cancer Risk Assessment in the Southwestern United States: A Report From the Clinical Cancer Genetics Community Research Network.* Journal of Clinical Oncology, 2013. **31**(2): p. 210-216.
11. American Cancer Society, *Cancer Facts and Figures 2014.* 2014.
12. White, M.C., et al., *Disparities in Cancer Mortality and Incidence Among American Indians and Alaska Natives in the United States.* American Journal of Public Health, 2014. **104**(S3): p. S377-S387.
13. Society, A.C., *Cancer facts and Figures for Hispanics/Latinos 2012-2014.* 2014.
14. Murphy, S., J. Xu, and K. Kochanek, *Deaths: Final Data 2010.* National Vital Statistics Reports, 2013. **61**(4).
15. Howlader, N., A. Noone, and M. Krapcho, *SEER Cancer Statistics Review 1975-2010.* 2013.
16. Thun, M.J., et al., *50-Year Trends in Smoking-Related Mortality in the United States.* New England Journal of Medicine, 2013. **368**(4): p. 351-364.
17. Serrvices, U.S.D.H.a.H., *The health consequences of smoking—50 years of progress: a report of the Surgeon General.*, U.S.D.H.a.H. Serrvices, Editor. 2014, US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health: Atlanta, GA.
18. Siegel, R., C. DeSantis, and A. Jemal, *Colorectal cancer statistics, 2014.* CA: A Cancer Journal for Clinicians, 2014. **64**(2): p. 104-117.
19. Edwards, B., E. EWard, and B. Kohler, *Annual report to the nation on the status of cancer, 1975-2006, featuring colorectal cancer trends and impact of interventions (risk factors, screening, and treatment) to reduce future rates.* Cancer, 2010(107): p. 1142-1152.
20. (USPSTF), U.S.P.S.T.F. *Colorectal Cancer: Screening*. 2015.
21. American Cancer Society, *Colorectal Cancer Facts & Figures 2014-2016*. 2014, American Cancer Society: Atlanta: .
22. (USPSTF), U.S.P.S.T.F., *Cervical Cancer: Screening*. 2012: http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening?ds=1&s=CERVICAL_CANCER.
23. Ostrom, Q.T., et al., *CBTRUS Statistical Report: Primary Brain and Central Nervous System Tumors Diagnosed in the United States in 2006-2010.* Neuro-Oncology, 2013. **15**(suppl 2): p. ii1-ii56.
24. Wyatt, S., et al., *All-Cancers Mortality Rates Approaching Diseases of the Heart Mortality Rates as Leading Cause of Death in Texas.* Southern Medical Journal, 2014. **107**(1): p. 19-23.
25. Jemal, A., et al., *Annual Report to the Nation on the Status of Cancer, 1975–2009, Featuring the Burden and Trends in Human Papillomavirus (HPV)–Associated Cancers and HPV Vaccination Coverage Levels.* Journal of the National Cancer Institute, 2013. **105**(3): p. 175-201.

26. Bosire, C., et al., *Coffee consumption and the risk of overall and fatal prostate cancer in the NIH-AARP Diet and Health Study.* Cancer Causes & Control, 2013. **24**(8): p. 1527-1534.

27. Kabat, G.C., et al., *Lifestyle and Dietary Factors in Relation to Risk of Chronic Myeloid Leukemia in the NIH-AARP Diet and Health Study.* Cancer Epidemiology Biomarkers & Prevention, 2013. **22**(5): p. 848-854.

28. Lynch, B.M., et al., *Sedentary Behavior and Prostate Cancer Risk in the NIH–AARP Diet and Health Study.* Cancer Epidemiology Biomarkers & Prevention, 2014. **23**(5): p. 882-889.

29. Kneuertz, P.J., et al., *Regional disparities affect treatment and survival of patients with intrahepatic cholangiocarcinoma—A Texas Cancer Registry analysis.* Journal of Surgical Oncology, 2014. **110**(4): p. 416-421.

30. Suneja, G., et al., *Cancer Treatment Disparities in HIV-Infected Individuals in the United States.* Journal of Clinical Oncology, 2014.

31. Ost, D.E., et al., *QUality gaps and comparative effectiveness in lung cancer staging and diagnosis.* Chest, 2014. **145**(2): p. 331-345.

32. Allemani, C., Weir, H.K., Carreira, H., Harewood, R., Spika, D., Wang, X-S., Bannon, F., Ahn, J.V., Johnson, C.J., Bonaventure, A., Marchos-Gragera, R., Stiller, C., Silva, G.A., Chen, W-Q., Ogunbiyi, O.J., Rachet, B., Soeberg, M.J., You, H., Matsuda, T., Bielska-Lasota, M., Storm, H., & Tucker, T.C. , *Global surveillance of cancer survival 1995–2009: analysis of individual data for 25 676 887 patients from 279 population-based registries in 67 countries (CONCORD-2). .* The Lancet, 2015. **385**(9972): p. 977-1010.

33. Alemozaffar, M., Sanda, M., Yecies, D., Mucci, L., Stampfer, M. & Kenfield S. , *Benchmarks for operative outcomes of robotic and open radical prostatetomy: Results from the Health Professionals Follow-Up Study. .* European Urology 2015. **67**(3): p. 432-438.

34. Ramirez, A., et al., *Incidence of Hepatocellular Carcinoma in Texas Latinos, 1995–2010: An Update.* PLoS One, 2014.

35. Pruitt, S.L., Simon J Craddock Lee, Jasmin A. Tiro, Lei Xuan, John M. Ruiz, *Residential Racial Segregation and Mortality Among Black, White, and Hispanic Urban Breast Cancer Patients in Texas, 1995 to 2009* Cancer, 2015.

36. DeSantis, C., D. Naishadham, and A. Jemal, *Cancer statistics for African Americans, 2013.* CA: A Cancer Journal for Clinicians, 2013. **63**(3): p. 151-166.

37. Highfield, L., *Spatial Patterns of Breast Cancer Incidence and Uninsured Women of Mammography Screening Age.* The Breast Journal, 2013. **19**(3): p. 293-301.

38. Prevention, C.f.D.C.a., *Investigating Suspected Cancer Clusters and Responding to Community Concerns Guidelines from CDC and the Council of State and Territorial Epidemiologists.* Morbidity and Mortality Weekly Report, 2013. **62**.