Texas Cancer Registry Annual Report 2020

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Texas Health and Safety Code

Section 82.007

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Executive Summary

The Texas Cancer Incidence Reporting Act ([Health and Safety Code, 82.001](#)) requires the Department of State Health Services (DSHS) to maintain the Texas Cancer Registry (TCR) — a statewide population-based registry that serves as the foundation for measuring the cancer burden in Texas. Data from the TCR are used to assess comprehensive cancer control efforts, health disparities, and progress in prevention, diagnosis, treatment, and survivorship. TCR data also support a wide variety of cancer-related research. This important work cannot be adequately addressed by state and local government, academic institutions, or the private sector without the timely, complete, and accurate cancer data provided by the TCR.

[Section 82.007](#) requires DSHS to publish an annual report to the Legislature of the information obtained under the Act. The following are key findings discussed in this report.

- In 2020, an estimated 127,131 new cases of cancer will be diagnosed in Texas, and an estimated 45,858 Texans will die from cancer.
- In 2020, an estimated 1,324 new cases and 161 cancer deaths are expected to occur in Texas children (birth to 14 years), and an additional 556 new cases and 72 cancer deaths are expected in Texas adolescents (15 to 19 years).
- The most common cancers diagnosed are breast cancer for women and prostate cancer for men. Lung cancer is the leading cause of cancer death in Texas, with an estimated 10,792 deaths expected to occur in 2020.
- During the past two decades, lung, colorectal, prostate, female breast, and cervical cancer incidence rates have decreased markedly. Incidence rates are increasing for uterine, thyroid, kidney, and liver cancer.
- Cancer is the second most common cause of death in Texas for adults; however, it is the leading cause of death in 37 counties.
- Cancer is the leading cause of disease-related death in Texas past infancy among children and adolescents ages 1 to 19 years.
- Sixty-five percent of Texans survive five years or more after being diagnosed with cancer.

- The number of cancer survivors continues to increase; as of January 1, 2017, 824,631 Texans who were diagnosed with cancer in the last 22 years are alive today.

1. Introduction

The Texas Cancer Incidence Reporting Act ([Health and Safety Code, Section 82.004](#)) requires the Department of State Health Services to a) maintain a cancer registry for the state that includes a record of cancer cases that are diagnosed and/or treated in Texas and b) collect information that can be used for prevention, early detection, diagnosis, treatment, and survivorship of cancer.

As required by [Section 82.007](#), the purpose of this report is to provide a summary of information collected by the Texas Cancer Registry (TCR). The report is due to the Legislature annually.

This report highlights the role of the TCR in collecting, maintaining, and disseminating accurate, precise, and current information that serves as a tool in the control of cancer. An overview of key cancer statistics is provided using the most current data available (cases diagnosed through 2017), as well as the estimated number of new cases and deaths expected in 2020. The report also includes information on the different ways TCR data are used.

2. Background

Cancer Causes and Prevention

Cancer is not a single disease but rather a group of related diseases characterized by uncontrolled growth and spread of abnormal cells.[1] Cancer can occur in many different sites in the body. If the spread of abnormal cells is not controlled, cancer can invade other organs and tissues. Some cancer cells can spread to distant places in the body through the blood or the lymphatic system and form new tumors. The uncontrolled growth and spread of cancer can result in serious health problems and death.

Cancer is caused by both internal and external factors. Internal factors are conditions and characteristics that exist within the body, such as genetics, hormones, and immune conditions. External factors are behaviors and environmental conditions that affect health, such as tobacco use, excess body weight, infectious organisms, chemicals, and ultraviolet radiation. These causal factors may act together to start the development of cancer. Often 10 or more years pass between exposure to external factors and detectable cancer.

The American Cancer Society (ACS) estimates that at least 42 percent of cancers are preventable. This includes 19 percent that are caused by smoking and 18 percent that are attributable to a combination of excess alcohol consumption, poor nutrition, excess body weight, and physical inactivity.[1] Certain cancers are caused by infectious agents such as viruses and bacteria, which could be prevented through treatment of the infection, behavioral changes, or vaccination.

Cancer screening can reduce the risk of developing and dying from cancer by detecting cancers early at more treatable stages. Screening has been shown to reduce mortality from cancers of the colon and rectum, breast, uterine cervix, prostate, and lung.[2] Additionally, screening for colorectal and cervical cancers can find growths and remove them before they have a chance to turn into cancer.

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[1] American Cancer Society. Cancer Facts & Figures 2020. Atlanta: American Cancer Society; 2020.

[2] American Cancer Society. Cancer Prevention & Early Detection Facts & Figures 2019-2020. Atlanta: American Cancer Society; 2019.

For more information on the types, causes, and prevention of cancer, visit the ACS website cancer.org.

The Texas Cancer Registry

Cancer registries collect information about cancer cases, including the location of the cancer in the body, the specific type(s) of cells effected, the spread of the disease, patient demographics, whether the patent survives, and the ultimate cause of death. This information is used to monitor the cancer burden in the population, identify trends and patterns, and identify high-risk groups and behaviors. Public health officials and policymakers use registry data to guide the planning of cancer control programs and prioritize resources.

The TCR was first established by the 66th Texas Legislature in 1979 and reauthorized by the Texas Cancer Incidence and Reporting Act in 1989. The TCR is one of the largest cancer registries in the United States. Over 240,900 reports of cancer were received in 2019 from more than 550 hospitals, cancer treatment centers, ambulatory surgery centers, and pathology laboratories across Texas. Of these, 11,621 reports were for out-of-state residents. These reports are sent to their residing state cancer registry, providing a significant contribution to the national cancer surveillance system. Similarly, the TCR receives reports of Texans diagnosed with cancer outside of Texas from other state cancer registries.

The TCR first met the Centers for Disease Control and Prevention's (CDC) "high quality" data standards in 2004 and achieved Gold Certification from the North American Association of Central Cancer Registries (NAACCR) in 2006. The data standards and gold certification have been maintained each year since, except in 2013 when the TCR received NAACCR Silver Certification.

More information can be found at dshs.texas.gov/tcr.

3. Cancer in Texas

The Texas Cancer Registry (TCR) examines cancer incidence, mortality, survival, and prevalence to assess the burden of cancer in Texas.

Incidence is the number of new cancers diagnosed, and mortality is the number of new cancer deaths occurring in a specified population during a year. Incidence and mortality rates are most often expressed as the number of new cases or deaths, respectively, per 100,000 individuals in the population at risk. Childhood cancer rates are typically presented as the number of cases or deaths per one million children.

Because cancer incidence and mortality increase with age, incidence and mortality are commonly expressed as age-adjusted rates. Age-adjusted rates allow for fairer comparisons between groups with different age distributions. The age-adjusted incidence rate in 2017 of all cancers in Texas is 400 cases per 100,000 population.

Cancer survival is assessed using the percentage of cancer patients who have survived for a certain period of time after their cancer diagnosis. Five-year relative survival is a commonly used measure of cancer survival as it represents the percentage of cancer patients who have survived for five years after diagnosis compared to the expected survival of people without cancer. Cancer prevalence estimates the number of people alive on a certain date who have ever been diagnosed with cancer.

Cancer Incidence

The TCR used Texas cancer incidence data from 1995 to 2017 to estimate the number of new invasive cancer cases expected to be diagnosed in 2020. 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.[3]

In 2020, an estimated 127,131 new cancer cases are expected to be diagnosed in Texas. Although cancer incidence rates overall continue to decline, the number of

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[3] Zhu L, et al. Predicting US- and state-level cancer counts for the current calendar year. Cancer 2012; 118(4):1100-9.

newly diagnosed cancer cases continues to increase with the aging and growth of the Texas population. The United States (US) has a similar trend - the overall cancer incidence rate decreasing while the number of new cancer cases increases.

For women in both the US and Texas, breast cancer is the most commonly diagnosed cancer. In Texas women, an estimated 18,277 cases are expected to be diagnosed in 2020, followed by lung cancer (7,006 cases) and colorectal cancer (5,170 cases). The fourth and fifth leading cancers in women are cancers of the uterus and thyroid.

Among men in both the US and Texas, prostate cancer is the most commonly diagnosed cancer. In Texas men, an estimated 14,468 cases are expected to be diagnosed in 2020, followed by lung cancer (8,527 cases) and colorectal cancer (6,461 cases). The fourth and fifth most commonly diagnosed cancers in men are urinary bladder cancer and kidney and renal pelvis cancer.

Lung, colorectal, prostate, and cervical cancer incidence rates have markedly decreased due to reduced smoking rates and an increase in screenings. Though incidence rates continue to decline for many cancer types, incidence rates are increasing for uterine, pancreas, kidney, and liver cancer. Similar trends are seen in the US population.

Cancer Mortality

Cancer is the second most common cause of death in both the US and Texas, and is now the leading cause of death in 37 counties in Texas.[4] The age-adjusted cancer mortality rate is 147 cancer deaths per 100,000 population. In 2020, an estimated 45,858 Texans, or over 125 people per day, are expected to die from cancer.

Lung cancer is the leading cause of cancer death in the US and Texas for males and females, accounting for 24 percent of all cancer deaths in Texas in 2020. Cigarette smoking is the leading risk factor for lung cancer. The duration of smoking and number of cigarettes smoked per day significantly impact cancer risk. According to

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[4] Center for Health Statistics, Texas Department of State Health Services. Ten Leading Causes of Death by Race/Ethnicity – Texas, 2014, Vital Statistics Annual Report. 2016. Accessed April 2018. https://www.dshs.texas.gov/chs/vstat/vs14/t16.aspx.

the Centers for Disease Control and Prevention (CDC), 14.4 percent of adult Texans and 7.4 percent of Texas high school students currently smoke cigarettes.[5]

Colorectal cancer is expected to be the second leading cause of cancer death in Texas in 2020, with an estimated 4,276 deaths. Breast, pancreatic, and liver (including intrahepatic bile duct) cancers are expected to be, respectively, the third, fourth, and fifth leading causes of cancer deaths in Texas.

Cancer Survival

Overall, 66 percent of Texans survive 5 years or more after being diagnosed with cancer compared to Texans without cancer. In the US, the equivalent 5-year survival is 67 percent. However, survival rates can significantly vary by cancer type and stage at diagnosis.

The following key statistics highlight survival rate variation in Texas.

- For patients diagnosed with localized cancer, the 5-year relative survival rate is 89 percent.
- If cancer has spread to surrounding tissues or organs and/or regional lymph nodes, the 5-year relative survival rate is 65 percent.
- If cancer has spread to distant organs or tissues, the 5-year relative survival rate is 33 percent.
- Lung and bronchus, liver, and pancreatic cancers have the lowest 5-year relative survival rates among all cancers (20 percent, 20 percent, and 13 percent, respectively).
- In contrast, 5-year survival rates for the most commonly diagnosed cancers, prostate and female breast cancers, are 98 percent and 89 percent, respectively.

Prevalence of Cancer

An estimated 824,631 Texans are cancer survivors (Texans diagnosed with cancer between 1995-2016 who were alive as of January 1, 2017). Some of these individuals were cancer free, while others may have been receiving ongoing

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[5] Centers for Disease Control and Prevention. State Tobacco Activities Tracking and Evaluation (STATE) System. State Highlights. Accessed March 2020. https://www.cdc.gov/statesystem/statehighlights.html.

treatment. The cancer sites with the highest number of survivors in Texas are female breast, prostate, colorectal, thyroid, non-Hodgkin's lymphoma, melanoma, and kidney. Prostate and female breast cancers constitute about 40 percent of the cancer survivor population.

4. Cancer in Children and Adolescents

The types of cancers that develop in children are often different from the types that develop in adults. Unlike many cancers in adults, childhood cancers are not strongly linked to lifestyle or environmental risk factors.[6] The causes of most childhood cancers are unknown as only a small percentage of childhood cancers are attributed to inherited genetic alternations, and, therefore, identifying molecular and genetic targets for treatment options is particularly challenging.[7] Additionally, developing new treatments that are less toxic and have fewer long-term adverse effects is another key challenge area for childhood cancers and a focus of current research.[7]

Although advances in cancer treatment and survival have improved in recent decades, cancer is still the leading cause of disease-related death in Texas past infancy among children and adolescents ages 1 to 19 years. In 2020, an estimated 1,324 new cases and 161 cancer deaths are expected to occur among children (birth to 14 years), and an additional 556 new cases and 72 cancer deaths are expected among adolescents (15 to 19 years).

The annual cancer incidence rate among children is 195 cases per 1 million population. Among this group, leukemias are the most common cancers, followed by brain and central nervous system cancers, lymphomas, soft tissue sarcomas, and neuroblastoma. These five cancer types are also the most common childhood cancers in the United States (US).

The annual incidence rate among Texas adolescents is 261 cases per 1 million population. For this group, the most common cancers are brain and central nervous system cancers, other malignant epithelial neoplasms and melanomas (of which thyroid carcinoma is the predominant cancer in this category), lymphomas, leukemias, and germ cell, trophoblastic tumors, and neoplasms of gonads. The same five cancer types are also the most common in US adolescents.

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[6] American Cancer Society. What Are the Differences between Cancers in Children and Adults? 2019. Accessed April 2020. https://www.cancer.org/cancer/cancer-in-children/differences-adults-children.html.

[7] National Cancer Institute. Childhood Cancer Research. 2019. Accessed April 2020. https://www.cancer.gov/research/areas/childhood.

The relative 5-year survival rate among children and adolescents diagnosed with cancer is approximately 85 percent. An estimated 22,754 Texans are survivors of childhood and adolescent cancer. These are Texans diagnosed with childhood and adolescent cancer between 1995-2016 who were alive as of January 1, 2017.

5. Texas Cancer Registry Data Uses

The following section outlines the many uses of Texas Cancer Registry (TCR) data. More information can be found at dshs.texas.gov/tcr.

Health Care Management

Hospital and cancer treatment center administrators use TCR data to evaluate patient services, identify patterns in cancer care, and plan accordingly. For example, administrators can examine reports that identify changes in care over time and evaluate referral patterns to see when patients are directed or choose to be treated at their own or other health care centers. These data are crucial for planning resource allocation and staff recruitment.

Cancer Surveillance

Cancer surveillance enables health professionals to evaluate and address the cancer burden in a population. Public health professionals, health care providers, researchers, policy makers, and others use TCR data to assess patterns in cancer occurrence, detect important trends, and evaluate the impact of cancer prevention programs. Cancer registry data are used to conduct needs and capacity assessments that allow for evidence-based decision-making when allocating limited resources.

Cancer Research

In 2019, the TCR completed 447 data requests from customers both in state and across the country. TCR data are also available through a web-based query system that provides cancer incidence and mortality rates, counts, and maps.[8] In 2019, there were 13,812 queries for TCR cancer statistics using the web-based query system.

TCR data are requested and queried for the following primary purposes.

- Comprehensive cancer control planning

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[8] Web Query Tool: Selectable Cancer Incidence/Mortality Rates and Mapping. Texas Cancer Registry, Texas Department of State Health Services. http://www.cancer-rates.info/tx/.

- Health event investigations
- Epidemiologic studies
- Collaboration with cancer screening programs
- Study of incidence and mortality by stage, geographic area, or other factors
- Comparative effectiveness of various cancer care interventions
- Needs assessments and program planning and evaluation

Epidemiology Studies

Epidemiologic studies are crucial for identifying risk factors and determining optimal treatment approaches to clinical practice. The TCR provides data that support epidemiologic studies on the causes of cancer, cancer prevention and control, and cancer survivorship. While the TCR does not provide financial support for research, TCR data make a significant amount of cancer epidemiology research possible.

TCR data are used to describe the demographic characteristics of people who develop a specific type of cancer, compare the cancer burden to other public health issues, evaluate trends in cancer incidence and mortality over time, and examine factors affecting cancer survival outcomes.[9,10,11,12] In addition, TCR data on cervical cancer incidence are being used by the National Cancer Institute's Population-based Research to Optimize the Screening Process (PROSPR) I consortium to evaluate and improve the effectiveness of US cervical cancer screening.[13] TCR data are also used to evaluate potential cancer disparities by race/ethnicity, geographic location, and socioeconomic status. For example, a recent study identified that the Black population in Texas, compared to other race/ethnicity groups, experienced higher

[9] Wang DY, et al. Rising Incidence of Colorectal Cancer Among Young Hispanics in Texas. J Clin Gastroenterol 2017; 51(1):34-42.

[10] Zhao H, et al. Adherence to treatment guidelines and survival for older patients with stage II or III colon cancer in Texas from 2001 through 2011. Cancer 2017; 124(4):679-87.

[11] Avila JC, et al. Disparities in adolescent and young adult sarcoma survival: analyses of the Texas Cancer Registry and the National SEER Data. J Adolesc Young Adult Oncol 2018; 7(6): 681-687.

[12] Thomas PS, et al. Demographic, clinical, and geographical factors associated with lack of receipt of physician recommended chemotherapy in women with breast cancer in Texas. Cancer Causes and Control 2019;30:409-415.

[13] Kamineni A, et al. Cervical cancer screening research in the PROSPR I consortium: Rationale, methods and baseline findings from a US cohort. Int J Can 2019; 144(6):1460-1473.

incidence rates of central nervous system tumors.[14] Another study identified that Texans residing in nonmetropolitan areas are 39 percent more likely to develop melanoma than Texans residing in metropolitan areas.[15]

TCR data are used to support some of the largest, longest, and most well-known cohort studies nationally and internationally. For these epidemiologic studies, the TCR conducts regular data linkages to provide accurate and high-quality cancer outcome data. Many of these large cohort studies are examining the effect of lifestyle factors and modifiable behaviors on cancer risk.[16,17,18] For example, the Mexican American Cohort Study led by The University of Texas MD Anderson Cancer Center in Houston, Texas, is investigating behavioral and genetic risk factors for cancer among people of Mexican descent.[19] To achieve their study aims, the TCR conducts a data linkage each year for the researchers. A recent publication from this study showed that serum C-Reactive Protein levels have the potential to serve as a predictive marker of cancer risk in Mexican Americans.[20] Data linkages with TCR are also used to examine other research topics, including the risk of childhood cancer among children conceived via in vitro fertilization, the association

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[14] Ambe SN, et al. Incidence trends, rates, and ethnic variations of primary CNS tumors in Texas from 1995 to 2013. Neurooncol Pract 2018; 5(3):154-160.

[15] Azhar AF, & Faheem S. Comparison of melanoma incidence in metropolitan areas versus nonmetropolitan areas in the state of Texas stratified by poverty classification. Proc (Bayl Univ Med Cent) 2019;32(3):345-347.

[16] Gordon-Dseagu VLZ, et al. A Cohort Study of Adolescent and Midlife Diet and Pancreatic Cancer Risk in the NIH-AARP Diet and Health Study. Am J Epidemiol 2017; 186(3):305-17.

[17] Tantamango-Bartley Y, et al. Independent associations of dairy and calcium intakes with colorectal cancers in the Adventist Health Study-2 cohort. Public Health Nutr 2017; 20(14):2577-86.

[18] Petrick JL, et al. Body weight trajectories and risk of esophageal and gastric cardia adenocarcinomas: a pooled analysis of NIH-AARP and PLCO Studies. Br J Cancer 2017; 116(7):951-9.

[19] Chow WH, et al. Cohort Profile: The Mexican American Mano a Mano Cohort. Int J Epidemiol 2017; 46(2):e3.

[20] Shen, J., et al. Associations of serum CRP levels with demographics, health behaviors, and risk of cancer among the Mexican American Mano A Mano Cohort. Cancer Epidemiology (2019), 60, 1-7. https://doi.org/10.1016/j.canep.2019.03.001

between birth defects and cancer risk, and the risk of cancer among individuals infected with human immunodeficiency virus.[21,22,23]

Additionally, TCR data have been used in tandem with data from 322 other population-based registries in 71 countries to better understand worldwide survival rates for different cancers as a part of the CONCORD-3 study.[24]

Community Efforts

The TCR works locally with a diverse group of partners to provide data in support of community efforts, such as public awareness and education and fundraising. Partner examples include the following organizations.

- Cancer Prevention and Research Institute of Texas
- American Cancer Society
- Susan G. Komen Foundation
- Make a Wish Foundation
- MD Anderson's Center for Community Engagement
- Leukemia and Lymphoma Society

Cancer Cluster Investigations

An important activity performed by cancer registries includes providing data to respond to community concerns about suspected cancer clusters. The Centers for Disease Control and Prevention (CDC) defines a cancer cluster as a greater-than-

[21] Spector LG, et al. Association of in vitro fertilization with childhood cancer in the United States. JAMA Pediatr 2019;173(6): e190392.

[22] Lupo PJ, et al. Association between birth defects and cancer risk among children and adolescents in a population based assessment of 10 million live births. JAMA Oncol. 2019;5(8):1150-1158.

[23] Coghill AE, et al. Risk of breast, prostate, and colorectal cancer diagnoses among HIV-infected individuals in the United States. J Natl Cancer Inst 2018; 110(9): 959-966.

[24] Allemani C et al. Global surveillance of trends in cancer survival: analysis of individual records for 37,513,025 patients diagnosed with one of 18 cancers during 2000–2014 from 322 population-based registries in 71 countries (CONCORD-3). The Lancet 2018;391(10125):1023-1075.

expected number of cancer cases occurring within a group of people, geographic area, or period of time.[25]

The public may suspect a cancer cluster if multiple family members, friends, neighbors, or coworkers in their community are diagnosed with cancer. While most suspected clusters are found to not be true cancer clusters, each inquiry is thoroughly evaluated. Between 2015 and 2019, TCR data were used to complete 21 cancer cluster investigation reports. Investigation reports can be found at dshs.texas.gov/epitox/CancerClusters.shtm.

Accessing Texas Cancer Data

To aid in state, national, and international efforts, the Department of State Health Services (DSHS) has made significant efforts to make TCR data available and accessible. Data tables and summaries with detailed information about cancer incidence, mortality, survival and prevalence in Texas, as well special reports on topics such as obesity- and tobacco-associated cancers, are available at dshs.texas.gov/tcr/data/cancer-statistics.aspx. DSHS will continue developing ways to make TCR more available and accessible to support progress towards addressing the cancer burden in Texas.

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[25] Centers for Disease Control and Prevention, 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(RR08):1-14.

6. Conclusion

The Texas Cancer Incidence Reporting Act (Health and Safety Code, Section 82.001) requires the Department of State Health Services (DSHS) to maintain a cancer registry for the state and publish an annual report to the Legislature of the information obtained under the Act.

From information collected through the Texas Cancer Registry (TCR), DSHS estimates that in 2020, 127,131 new cases of cancer will be diagnosed in Texas and 45,858 Texans will die from cancer. Of these cases, 1,324 new cases and 161 cancer deaths are expected to occur among children (birth to 14 years), and an additional 556 new cases and 72 cancer deaths are expected among adolescents (15 to 19 years). Cancer is the second most common cause of death in Texas for adults and the most common cause of disease-related death past infancy among children and adolescents.

Lung cancer is the leading cause of cancer death in Texas. The most common cancers diagnosed in Texas are breast cancer for women and prostate cancer for men. Incidence rates have markedly decreased for lung, colorectal, prostate, and cervical cancer. However, incidence rates are increasing for uterine, pancreas, kidney, and liver cancers.

The number of cancer survivors continues to increase. An estimated 824,631 Texans are cancer survivors. These are Texans diagnosed with cancer between 1995-2016 who were alive as of January 1, 2017. Cancer continues to have a significant impact on Texans, those seeking care in the state, and institutions providing cancer care. Accurate and complete collection and analysis of high-quality cancer data is central to the fight against cancer. The TCR continues to play a critical role in assessing Texas' cancer burden and contributing to national and international cancer surveillance, research, control, and prevention.

List of Acronyms

Acronym	Full Name
ACS	American Cancer Society
CDC	Centers for Disease Control and Prevention
DSHS	Department of State Health Services
NAACCR	North American Association of Central Cancer Registries
TCR	Texas Cancer Registry