

2018 Texas Cancer Plan

About CPRIT: In 2007, Texas voters overwhelmingly approved a constitutional amendment establishing the Cancer Prevention and Research Institute of Texas (CPRIT) and dedicating up to \$3 billion to invest in groundbreaking cancer research and prevention programs and services in Texas. Committed to the war on cancer, CPRIT focuses on expediting the innovation and translation of cancer research – in turn increasing the potential for a medical or scientific breakthrough – and enhancing access to evidence-based prevention programs and services.

Texas is one of 65 states, tribes and territories developing, implementing and evaluating a Cancer Plan that addresses cancer-related priorities for Texas and aligns with the Centers for Disease Control and Prevention’s National Comprehensive Cancer Control Program.¹ By state statute, CPRIT is charged with the responsibility of facilitating the development of the Texas Cancer Plan. The first plan developed under CPRIT’s leadership was the 2012 Texas Cancer Plan and involved a working group of public health experts, the Cancer Alliance of Texas and numerous stakeholders throughout the process. This 2018 Texas Cancer Plan will reflect changes, progress and advances in cancer prevention and control efforts since 2012. CPRIT’s strategic direction and funding opportunities will align with the Plan but will, by necessity, be a subset of the Plan. The overall outcome and success of the Plan will continue to depend on the cooperation, collaboration and resources of the many stakeholders in Texas.

CPRIT would like to thank the Texas Department of State Health Services for providing data, the Cancer Alliance of Texas for their continued assistance in drafting this revision, The University of Texas MD Anderson Cancer Center for sharing their population health strategic plan and the many stakeholders who provided feedback on the revision of the Plan. Thank you for your support of comprehensive cancer control. Together, we will reduce the burden of cancer in Texas.

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Printed in the United States.

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Executive Summary

Empowered by hope, partnership, and determination, Texas is continuing to take on cancer. Almost 50% of new cancers and deaths from cancers can be prevented.^{2,3} Living a healthy lifestyle and reducing exposure to secondhand smoke, ultraviolet radiation and cancer-associated infections can help prevent 26 different types of cancer among Texans.²

Through the delivery of proven prevention interventions, early detection, and better treatments, Texas has seen a drop in the death rates from cancer by 9% between 2010 and 2015; this translates to nearly 10,707 averted deaths. Improvements in treatment and earlier detection also means that the number of people diagnosed and living with cancer in the state will continue to increase as Texas' population grows and ages.

Although we are making progress addressing the overall burden of cancer in Texas, cancer is the second leading cause of death in Texas overall and lung cancer is the leading cause of death from cancer.⁴ Cancer has become the leading cause of death in almost a quarter (24%) of Texas counties.⁵ In 2018, it is estimated that over 121,463 Texans will be told, "You have cancer."⁶ These individuals, along with their friends and families, will join thousands of other Texans who are fighting for hope and a cure for this dreaded disease. It is also estimated that in 2018, over 44,713 Texans will lose their lives to cancer – this equates to more than 122 Texans lost each day to the disease. Almost every Texan, whether connected personally or through friends or family members, has been affected by cancer.

Some segments of the Texas population are affected by cancer to a greater degree than others. For example, some racial and ethnic groups are more likely than others to have cancer discovered at a later stage, leading to higher mortality rates. Eliminating cancer disparities due to factors such as socio-economic status (income, education level, insurance coverage, etc.), race, ethnicity, geographic location, and gender is a cross cutting aim of the Plan. These unique issues present challenges as well as opportunities and should be considered when reviewing and implementing any section of this Plan.

Cancer also places a huge economic burden on individuals and the state. According to a 2017 economic assessment report on the cost of cancer in Texas by The Perryman Group, direct medical costs and morbidity and mortality losses in the state totaled \$38.7 billion in 2017, up from \$34.9 billion in 2016 and \$31.3 billion two years ago.⁸ The report finds that cancer costs the Texas economy:

\$204.5 billion in reduced annual spending;

- \$100.8 billion in output losses annually; and
- 1,045,800 lost jobs from cancer treatment, morbidity and mortality and the associated spillover effects.

The *2018 Texas Cancer Plan (Plan)* is a statewide blueprint for cancer research, prevention and control in areas including risk reduction, early detection and screening, diagnosis, treatment, palliation, quality of life, survivorship, research, and product development. Identifying the challenges and issues that affect our state, the *Plan* presents a set of goals, objectives, and strategic actions to help inform and guide communities and partners in the fight against cancer. Continued support is needed for timely and reliable data collection, analysis and surveillance that informs the research and public health community of cancer rates and trends to help assess the cancer burden and monitor the progress in meeting the goals and objectives in the *Plan*.

Progress and Challenges

The 2012 Texas Cancer Plan identified baseline data points for many of the cancer plan goals and objectives. The latest available data (2014 to 2017) was compared to the baselines in the 2012 Texas Cancer Plan to evaluate progress. We have highlighted some of these differences below:

IMPROVING
<ul style="list-style-type: none"> ↓ Youth and adult smoking use ↑ Texans covered by comprehensive smoke-free ordinance ↑ HPV vaccination completion rate ↑ Breast cancer screening ↑ Cancer survivor pain and symptom management grade ↓ Breast cancer incidence and mortality rates ↓ Colorectal cancer incidence and mortality rates ↓ Lung cancer incidence and mortality rates ↓ Uninsured population
LITTLE OR NO CHANGE
<ul style="list-style-type: none"> Cervical cancer incidence and mortality rates Colorectal cancer screening Prevalence of hospital-based palliative care programs Melanoma incidence and mortality rates
WORSENING
<ul style="list-style-type: none"> ↓ Cervical cancer screening ↑ Youth and adult electronic vapor product use ↓ Youth and adults at a healthy weight ↓ Youth engaging in physical activity ↓ Youth and adults eating at least 5 fruits and vegetables daily ↓ Number of Commission on Cancer accredited facilities
<p><i>See Appendix for more detailed information on progress since 2012.</i></p>

Priority areas for 2018 Cancer Plan

These priorities were selected based upon review of progress and challenges since 2012 as well as cancer trends and health disparities. They also align with evidence-based strategies, that if implemented in systematic and comprehensive ways, will have a significant impact on the human and economic cancer burden in Texas. The priority areas are a subset of the goals and objectives included within this plan and provide an opportunity for Texas organizations to collaborate and leverage resources for maximum impact.

Priority areas for 2018 Cancer Plan include:

- Decrease tobacco and electronic vapor product use and exposure to secondhand smoke
 - Increase vaccination rates for HPV and Hepatitis B
 - Reduce cancer risk by increasing healthy lifestyles
 - Reduce cancer health disparities
 - Increase cancer survivor supportive care
-

AT A GLANCE: The 16 Goals of the Texas Cancer Plan

Primary Prevention and Risk Reduction: *Promoting change in behavior, policy, environment, or other systems to prevent or reduce the risk of developing cancer*

- Goal 1:** Eliminate tobacco use to reduce new cases and deaths from tobacco-related cancers
- Goal 2:** Increase adoption of healthy behaviors to reduce new cases and deaths from cancers related to nutrition, physical activity and obesity
- Goal 3:** Increase skin protection behaviors to reduce new cases and deaths from melanoma
- Goal 4:** Reduce the risk of cancers related to environmental carcinogens
- Goal 5:** Increase vaccination rates for vaccines shown to reduce the risk of cancer

Screening and Early Detection: *Increasing risk-appropriate, evidence-based and timely screening services to detect pre-cancerous changes or cancers as early as possible, when treatment is more likely to be successful*

- Goal 6:** Increase screening and early detection to increase the number of cancers diagnosed at an early stage and reduce deaths from breast cancer
- Goal 7:** Increase screening and early detection to reduce the number of new cases and deaths from cervical cancer
- Goal 8:** Increase screening and early detection to reduce the number of new cases and deaths from colorectal cancer
- Goal 9:** Increase screening and early detection among Texans at high risk for lung cancer to increase the number of cancers diagnosed at an early stage and reduce deaths from lung cancer
- Goal 10:** Increase screening and treatment for Texans at high risk for Hepatitis B and C infections to reduce new cases and deaths from liver cancer
- Goal 11:** Develop and implement screening and early detection methods for other cancers

Diagnosis, Treatment, and Palliation – *Ensuring that all patients receive timely and effective diagnostics, treatment, and supportive care*

- Goal 12:** Increase timely access to quality cancer diagnostic, treatment, and palliation services for all Texans

Quality of Life and Survivorship – *Improving the health and well-being of cancer survivors, from the point of diagnosis throughout treatment, and beyond*

- Goal 13:** Promote overall health and well-being of people affected by cancer

Infrastructure – *Developing and strengthening a sustainable framework to support delivery of the most appropriate prevention and care services and policy, systems and environmental changes*

- Goal 14:** Strengthen the public health and clinical health care system infrastructure by supporting the delivery of the most appropriate evidence-based cancer prevention interventions and clinical care services.

Academic Research and Product Development Research – *Accelerating the discovery, development, and dissemination of innovation in cancer prevention and treatment that holds the potential to reduce the burden of cancer*

- Goal 15:** Support the highest quality and most innovative research, including clinical trials, that will enhance the potential for medical or scientific breakthroughs in cancer
- Goal 16:** Improve patient care by accelerating the movement of prevention interventions, therapeutics, diagnostics and technologies into practice

Introduction

Purpose

The *Texas Cancer Plan (Plan)* aims to reduce the cancer burden across the state and improve the lives of all Texans. As the statewide action plan for cancer initiatives, the Plan identifies the challenges and issues that affect our state and presents a set of goals, objectives, and strategic actions to help inform and guide communities and partners in the fight against cancer. The Plan is not an all-inclusive list of goals, objectives, and strategic actions. Rather, the intent of the Plan is to provide a coordinated, prioritized, and actionable framework that will help guide efforts to reduce the human and economic burden of cancer in Texas.

By state statute, Texas Health and Safety Code Chapter 102 Section 102.002(3),⁷ the Cancer Prevention and Research Institute (CPRIT) is charged with facilitating the development of the *Plan* and supporting its implementation. However, the overall outcome and success of the *Plan* depends on the cooperation, collaboration and resources of many stakeholders across the state.

The Cancer Burden in Texas

There is no single cause or cure for cancer. Cancer represents more than 100 distinct diseases, all characterized by uncontrolled reproduction of abnormal cells in the body. Some cancers are preventable, while others are successfully treated, even cured, if detected early enough. Survival rates vary greatly, depending on cancer site, stage at diagnosis, access to care, and a host of other factors.

Cancer is second only to heart disease as the most costly chronic disease in the United States.⁹ A cancer diagnosis often means lengthy, expensive treatments. The financial costs in medical care and lost productivity are staggering, bankrupting families and burdening health care systems. Texas must continue to invest in prevention and research efforts to help Texans reduce their risk of developing cancer, or detect it early, when treatments are more successful and less costly.

Principles

The goals, objectives, strategic actions, and targets included in this plan were developed with consideration of the following principles:

- Focusing on the CONTINUUM of cancer research, prevention and control – primary prevention and risk reduction, early detection, diagnosis, treatment, survivorship and quality of life, infrastructure, research, and product development
- Defining MEASURABLE and REALISTIC targets based on review of available baseline and trend data for cancer prevention and control key measures in Texas (e.g., cancer mortality and incidence rates, screening rates, etc), with consideration of factors such as available resources, barriers, and capacity for implementation of strategic actions
- Aligning with national and Texas PRIORITIES related to cancer
- Including EVIDENCE-BASED guidelines and best practices for cancer research, prevention and control, such as those recommended by the Guide to Community Preventive Services, Cancer Control P.L.A.N.E.T., and the U.S. Preventive Services Task Force
- Addressing cancer health DISPARITIES and priority populations

CALL to ACTION

What can **YOU** do?

The overall success of the *Plan* depends on the cooperation, collaboration and resources of many stakeholders across the state.

Below are a few examples of what you can do to work toward the goals presented in the *Plan*. Use these examples and think of other actions you can take to reduce the burden of cancer in your community and throughout Texas.

If you are a health system

- Ensure that your cancer cases are reported in a timely way
- Provide meeting space to host community cancer support groups
- Collaborate to sponsor evidence-based community screening programs
- Acquire or maintain American College of Surgeons (ACoS) Commission on Cancer (CoC) accreditation
- Educate health care professionals and the public about genetics and cancer risk

If you are a local health department

- Promote effective cancer prevention policy, systems and environmental changes
- Implement and enforce a tobacco-free campus
- Provide cancer prevention and healthy lifestyle education
- Collaborate with communities to support changes in the built environment, including walkability
- Support evidence-based cancer screening and early detection efforts
- Encourage HPV vaccination among adolescents and young adults
- Educate health care professionals and the public about genetics and cancer risk
- Provide meeting space to host community survivor support groups

If you are a community-based organization

- Provide cancer prevention and healthy lifestyle information to constituents
- Promote evidence-based smoking cessation programs
- Partner with advocacy groups to support tobacco control policies
- Promote evidence-based cancer screening among clients
- Encourage participation in clinical trials
- Collaborate to provide community cancer prevention and screening programs

If you are an employer

- Become CEO Cancer Gold Standard Certified™
- Provide healthy foods in vending machines and cafeterias
- Encourage employees to increase physical activity
- Collaborate with hospitals to host screening events

If you are a school/university

- Include cancer prevention and healthy lifestyle messages in classes
- Provide healthy foods in vending machines and cafeterias
- Increase physical education requirements
- Make your entire campus a tobacco-free environment
- Provide smoking cessation resources for faculty, staff and students

If you are a faith-based organization

- Provide cancer prevention information to members
- Learn how to provide healthy potlucks and meeting meals
- Open your building to support healthy lifestyle activities
- Encourage members to get cancer screening tests on time

If you are a health care professional

- Make sure patients get appropriate evidence-based cancer screening tests
- Refer patients to smoking cessation classes, tobacco quitline and nutrition programs
- Be sure your cancer cases are reported in a timely way
- Collect cancer family history from patients and provide referrals to genetic counseling
- Find out how to enroll patients in clinical trials
- Make earlier referrals to hospice for end-of-life care

If you are a Community Health Worker, Navigator or a Promotora

- Provide cancer prevention and healthy lifestyle information to constituents
- Promote evidence-based cancer screening among clients
- Encourage participation in clinical trials
- Collaborate to provide community cancer prevention and screening programs

If you are an elected official

- Appropriate funding for comprehensive cancer prevention and control and research
- Support tobacco prevention policies
- Sponsor or support legislation that promotes cancer prevention and control
- Raise constituents' awareness about cancer prevention and control programs in your district or help establish new programs where needed
- Ensure that all Texans have access to health care and to cancer early detection and screening services

If you are a Texan

- Stop tobacco use or never start
- Support tobacco-free policies and legislation
- Eat more fruits and vegetables and maintain a healthy weight
- Increase your daily physical activity
- Know when to be screened and do it on schedule
- Know your family health history, including any family history of cancer
- If diagnosed with cancer, consider enrolling in a clinical trial
- Show your support and care for those who are diagnosed
- Volunteer with your hospital, health department, faith community, or local American Cancer Society (ACS)

Primary Prevention and Risk Reduction

Although it is not entirely clear why some individuals develop cancer and others do not, research has identified certain risk factors that increase the chance that a person will develop cancer in his or her lifetime.¹⁰ Cancer risk factors include but are not limited to:



- Growing older
- Tobacco
- Alcohol
- Cancer-causing substances in the environment
- Poor diet, lack of physical activity and obesity
- Chronic inflammation
- Certain hormones
- Weakened immune system
- Some viruses, bacteria and parasites
- Obesity
- Sunlight
- Ionizing radiation
- Radon
- Inherited (genetic) predisposition
- Family history

Some risk factors are related to behaviors that can be avoided, while other risk factors, such as growing older or family history, cannot be changed or modified. Approximately 50% of the cancer deaths in the U.S. are related to preventable causes, including tobacco use, obesity, exposure to sunlight and vaccine-preventable infections with cancer-linked viruses.^{2,3}

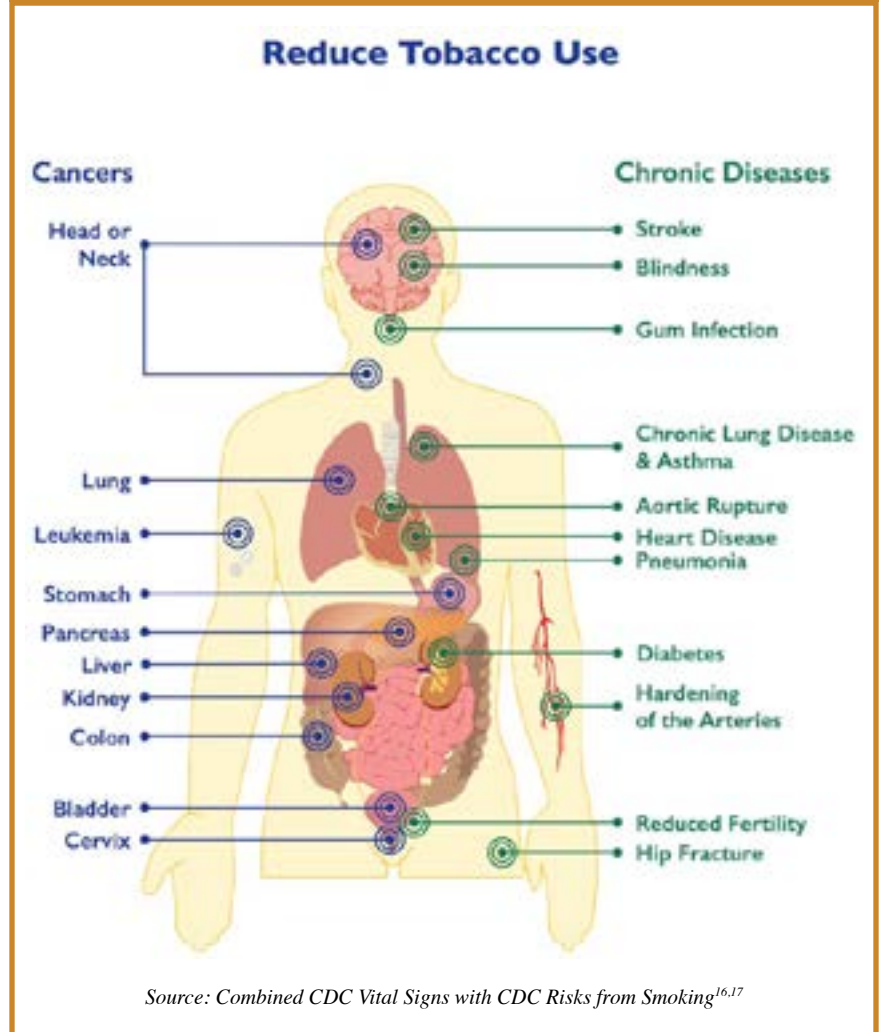
Source: American Association for Cancer Research (AACR), 2017.¹¹

Support and implementation of comprehensive, evidence-based, culturally relevant, and state-of-the-art strategies that give communities the knowledge, skills, and resources they need to improve their health and the health of those around them are key elements in preventing and reducing the risk of developing cancer.

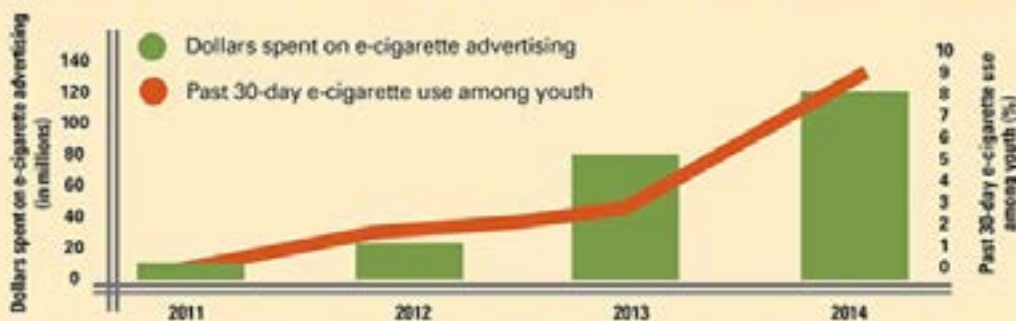
Tobacco use continues to be the leading cause of preventable premature cancer death in the United States.¹² People who use tobacco products or who are often around secondhand smoke have a higher risk of cancer because the chemicals found in tobacco products and secondhand smoke damage DNA.¹³ Approximately 7.4% of high school students in Texas smoke and 47.3% have ever used electronic vapor products, while 14.3% of adults in Texas smoke and 23.7% have ever used e-cigarettes, one type of electronic vapor product.¹⁴ Tobacco use is linked to 17 different types of cancer including: lung, larynx, mouth, esophagus, throat, bladder, kidney, liver, stomach, pancreas, colon and rectum, cervix and acute myeloid leukemia. Almost 27% of cancer deaths in Texas are linked to smoking.¹⁵ More people die from smoking than alcohol, AIDS, car crashes, illegal drugs, murders and suicides combined.¹⁵ Approximately \$8.85 billion dollars are spent in Texas each year in health care costs caused by smoking.¹⁵

Smokeless tobacco and electronic vapor products, including e-cigarettes, e-cigars, e-pipes, vapor pipes, vaping pens, e-hookahs and hookah pens, are not safe alternatives to cigarettes. Smokeless tobacco increases the risks of cancer to the mouth, esophagus and pancreas.¹³

Risks from Smoking: Smoking Can Damage Every Part of the Body



E-cigarette use among youth is rising as e-cigarette advertising grows



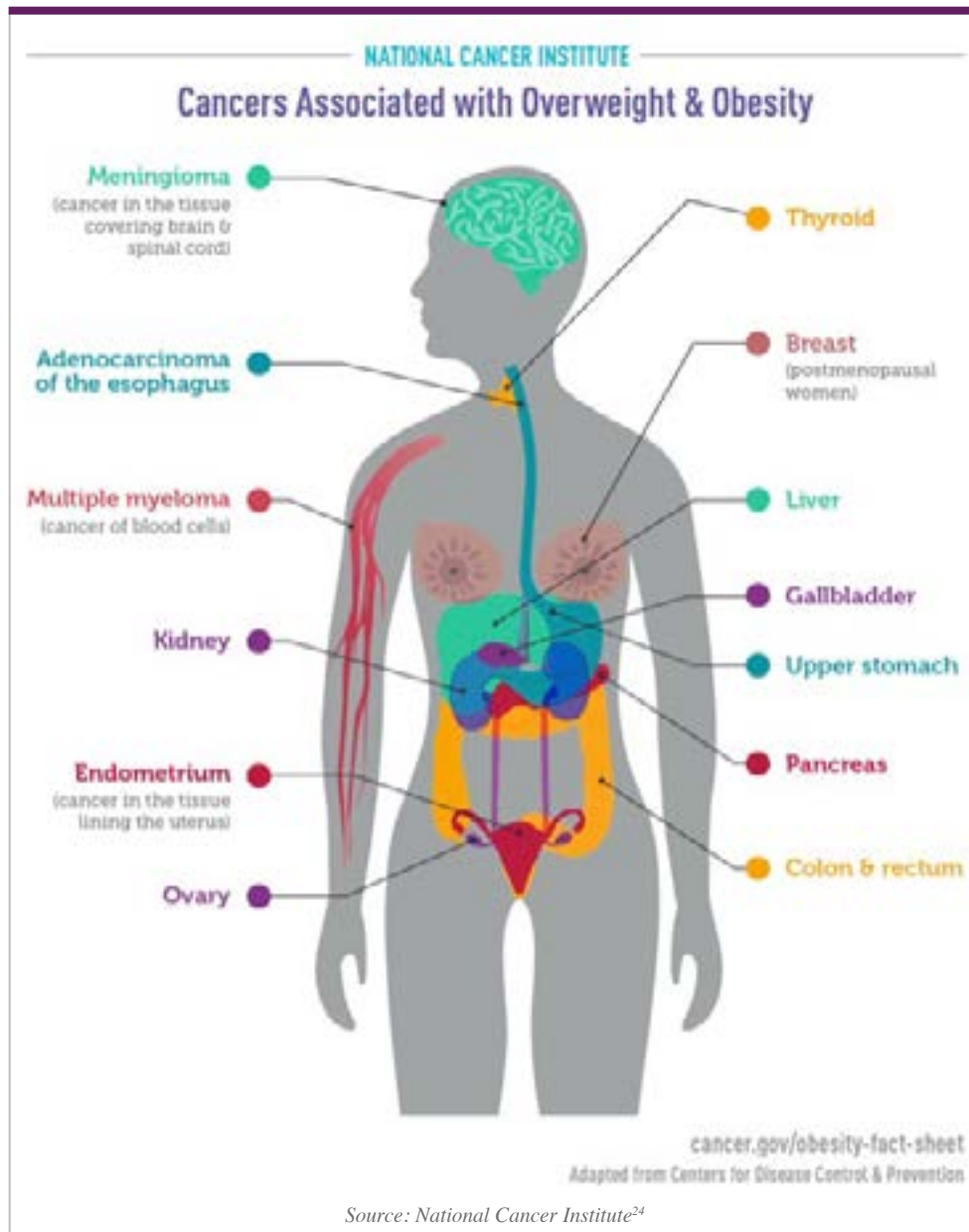
SOURCE: National Youth Tobacco Survey, 2011-2014; Kim et al (2014), Truth Initiative (2015).

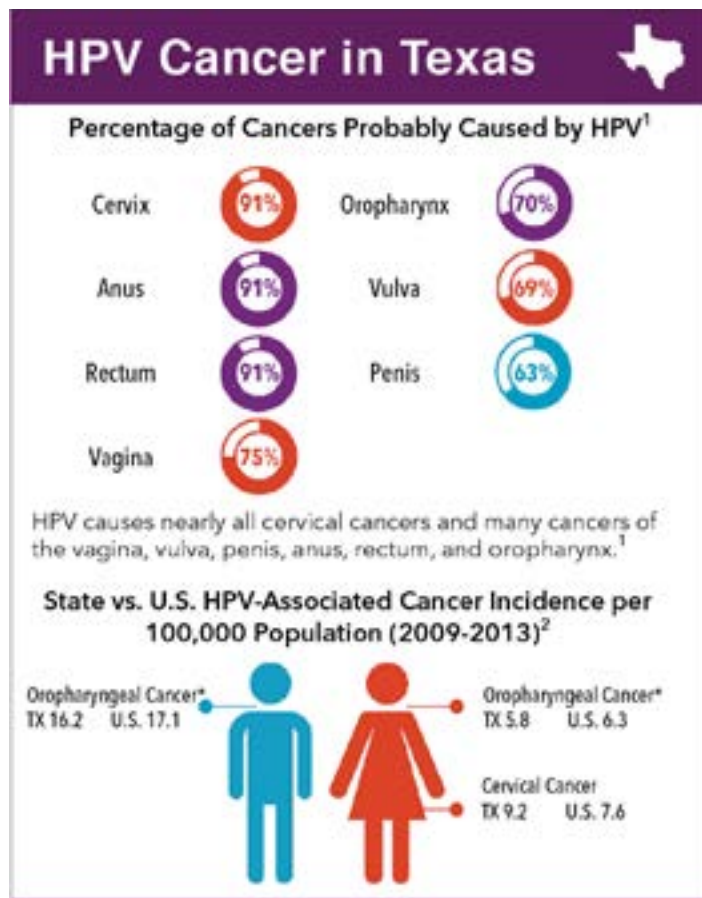
Source: Centers for Disease Control and Prevention²⁰

Electronic vapor products contain several chemicals known to cause cancer, including formaldehyde, are not a proven tobacco cessation aid, and are often marketed as “healthy” which may encourage youth to experiment, lack regulation and have been shown to have immediate negative impact on the lungs.^{18,19} Reducing deaths from tobacco-related cancers requires evidence-based, comprehensive, and coordinated efforts to prevent initiation of tobacco and electronic vapor product use, increase tobacco cessation treatment, and reduce secondhand smoke exposure.

Overweight and obesity can increase certain hormones and inflammation that causes changes in the body that can lead to cancer.²¹ Approximately 20% of all new cancer diagnoses in the United States are related to being overweight or obese, lack of physical activity, and/or a poor diet.²² In 2016, 68.4% of adults were overweight or obese in Texas.¹⁴ In 2017, 18% of high school students in Texas were overweight and an additional

18.6% were obese.²³ Researchers have identified a strong link between obesity and 13 types of cancer, including breast, colorectal, esophageal, gallbladder, kidney, liver, meningioma (cancer in the tissue that covers the brain and spinal cord), multiple myeloma (cancer of blood cells), pancreas, ovarian, thyroid, upper stomach and uterine cancers. Women, adults age 50-74, and blacks and whites have the highest rates of new cancers related to overweight and obesity. Approximately 55% of all cancers diagnosed in women and 24% of all cancers diagnosed in men are related to overweight and obesity. From 2005-2014, the rate of new cancers that are not related to overweight and obesity have declined by 13%, those related to overweight and obesity (except colorectal cancer) have increased by 7% and colorectal cancer rates have declined by 23%.²¹ Since colorectal cancer screening through colonoscopy involves removing polyps before they become cancer, this screening method can prevent new cases of cancer.²¹





Source: GW Cancer Center Cancer Control Tap: HPV Cancer and Prevention Profiles 2017.²⁷

Texas communities can address the overweight and obesity impact on cancer by making it easier for people to choose healthy food options and building communities that make it safer and easier to be physically active where they live, work, learn and play.²¹ Some specific strategies that have been identified to address these risk factors include: comprehensive telehealth and multi-component technology interventions, multi-component interventions to increase healthy options for food and beverages in schools, reducing screen time among children, interventions that include activity monitors, built environment that combines transportation system and land use/environmental design, family-based physical activity interventions and worksite programs.²⁵





Some infectious diseases have been associated with certain types of cancer. For example, high-risk types of human papillomavirus (HPV) cause almost all cervical cancers and most anal cancers. Many other cancers, including oropharyngeal, vaginal, vulvar and penile cancers, are linked to high-risk HPV infections.²⁶ Vaccines may help reduce cancer risk associated with infectious disease. The HPV vaccine has been proven to prevent most cervical cancers and many cases of oral and anal cancer.²²

The Advisory Committee on Immunization Practices has issued new recommendations for the HPV vaccine. A two-dose series is now recommended for girls and boys who begin the vaccination series between ages 9 and 14 years. The three doses continue to be recommended for individuals who begin the vaccination series at ages 15 through 26 years.²⁸

In 2016, 39.7% of females and 26.5% of males in Texas are up-to-date with HPV vaccination series. In the U.S., 49.5% of females and 37.5% of males are up-to-date with the HPV vaccination series.²⁹

Texas has the highest rates of liver cancer in the U.S.³⁰ From 1995 to 2015, the incidence rate of liver cancer in Texas men doubled from 7.8 to 17.2 per 100,000.⁶ Chronic Hepatitis B (HBV) and Hepatitis C (HCV) infections are the most common risk factor for liver cancer.³¹ Approximately 15% of liver cancers are associated with Hepatitis B and 50% are associated with Hepatitis C.³² Since the 1980s, infants in the U.S. are routinely vaccinated against HBV. Adults who have not been vaccinated against HBV and are at high risk for HBV infection (particularly health care workers and other professionals who have contact with blood) are recommended to get the HBV vaccine.²⁶

Preventing or Eliminating Infection with the Four Main Cancer-causing Pathogens

PATHOGEN	WAYS TO PREVENT INFECTION	WAYS TO ELIMINATE OR TREAT INFECTION	U.S. RECOMMENDATIONS
<p><i>Helicobacter pylori</i></p> 	None available	Treatment with a combination of antibiotics and a proton-pump inhibitor can eliminate infection	CDC recommends testing and treatment for people with active or a documented history of gastric or duodenal ulcers, low-grade gastric MALT lymphoma, or early gastric cancer that has been surgically treated
<p>HBV</p> 	<ul style="list-style-type: none"> • HBV vaccination • Avoid behaviors that can transmit infection (e.g., injection drug use and unsafe sex) 	Treatment of those chronically infected with antiviral drugs rarely eliminates infection but does slow virus multiplication; this slows the pace at which liver damage occurs and thereby reduces risk for liver cancer	<ul style="list-style-type: none"> • Vaccination part of childhood immunization schedule since 1991 • USPSTF recommends screening high-risk individuals—those from countries with high rates of HBV infection, HIV-positive persons, injection drug users, household contacts of HBV-infected individuals, and men who have sex with men—for HBV infection
<p>HCV</p> 	Avoid behaviors that can transmit infection (e.g., injection drug use and unsafe sex)	Treatment with any of several antiviral drugs can eliminate infection	CDC and USPSTF recommend screening those born from 1945 to 1965 for HCV infection
<p>HPV</p> 	<ul style="list-style-type: none"> • Three FDA-approved vaccines • Practice safe sex, although this may not fully protect against infection 	None available	<p>CDC recommends HPV vaccination for:</p> <ul style="list-style-type: none"> • boys and girls age 11 or 12 • women up to age 26 and men up to age 21 who did not receive the vaccine or complete the course as preteens <p>See sidebar on updated HPV vaccination recommendations, p. 36</p>

CDC, Centers for Disease Control and Prevention; HBV, hepatitis B virus; HCV, hepatitis C virus; HPV, human papillomavirus; MALT, mucosa-associated lymphoid tissue; USPSTF, U.S. Preventive Services Task Force. Adapted from (36).

Source: American Association for Cancer Research (AACR), 2017³³

Many cases of skin cancer could be prevented by protection and avoidance of ultraviolet radiation that is found in the sun's rays, sun lamps, and indoor tanning.²² The following types of interventions are recommended to reduce skin cancer risk: interventions in outdoor, recreational and occupational settings; child-care center based interventions, primary and middle school based interventions; and multi-component community-wide interventions.³⁴

Although the full extent of environmental influences has yet to be determined or fully understood, there is a growing body of evidence that links environmental exposures to cancer. The following are examples of environmental cancer risk factors: radon, asbestos, lead, radiation and benzene.²² Issues that impede further linkage determinations include limited research related to the study of types and magnitude of environmental contaminants and the effects of lifetime human exposure to combinations of chemicals or other agents, inadequate exposure measurement tools, and lack of policy related to regulation of hazardous exposures.³⁵

Radon is a radioactive colorless, odorless, and tasteless soil gas that comes from the breakdown of uranium in soil, rock and water.^{22,36} The risk of radon occurs because it becomes trapped in indoor spaces.³⁷ Radon is the second leading cause of lung cancer. ^{22,36,37} Homes, workplaces and schools should be tested and mitigated if the radon level is at or above 4 pCi/L of air.³⁷ To learn more about national radon testing, mitigation and policy, go to the [National Radon Action Plan](#).

Many cancer risk factors are also risk factors for other chronic diseases, such as heart disease, respiratory diseases, and diabetes. Addressing the risk factors discussed in this *Plan* such as tobacco use, alcohol, poor diet, lack of physical activity, obesity, chronic inflammation, and exposure to viruses, bacteria and parasites can potentially reduce the disease burden beyond cancer.

It is important to work with other initiatives addressing shared risk factors to maximize resources, coordinate messaging for the public, and avoid duplication of effort across programs. In addition, further research to determine the causes and risks of developing cancer, as well as strategies to help prevent it, remains a critical need.



Screening and Early Detection

Risk-appropriate screening for certain types of cancers can have a significant impact on the cancer burden in Texas, reducing overall new cases and deaths from the disease. Screening and early detection is used to detect cancer at its earliest stages when it can be treated more effectively, with less toxicity and often less cost. The frequency at which a person should be screened for cancer varies by many factors, including but not limited to the type of cancer screening, age, family history, genetics, exposure to certain types of viruses, and lifestyle factors. Shared decision making with a health care clinician is important for all cancer screenings, but is particularly important for lung and prostate cancer screenings.³⁸

Routine screenings for the following cancer types are currently recommended by the ACS, CDC and the U.S. Preventive Services Task Force (USPSTF) for populations that meet specific screening criteria:

- Lung cancer
- Breast cancer
- Cervical cancer
- Colorectal cancer

The public health community understands the importance of screening for certain types of cancer; however, adherence to screening recommendations continues to be a challenge. Complex and often intertwined barriers that deter individuals from getting screened must be addressed to increase shared decision making with clinicians, increase screening rates and reduce cancer incidence and mortality in the state.

Issues that affect screening adherence may vary by region and population and can include:

- Awareness of screening recommendations in the target population
- Navigation/referral procedures within the healthcare system
- Availability of screening facilities in a given service area
- Distance and time to screening services
- Screening facility hours of operation
- Availability of screening services in non-clinical settings (e.g., mobile mammography)
- Availability of transportation to and from screening
- Insurance status (insured, uninsured, underinsured) and screening costs
- Cultural, social and linguistic differences
- Stigma (particularly for lung cancer)

Lung Cancer Screening

In 2013 lung cancer screening through low-dose CT scans became the newest evidence-based screening for high-risk populations. According to the USPSTF guidelines, those who are ages 55-80, who have smoked at least 30 pack-years (a pack/day for 30 years or 2 packs/day for 15 years), are currently smoking, or who have quit smoking less than 15 years ago should consider annual lung cancer screening.³⁹ Those eligible for screening should talk with their doctor and engage in shared decision making, which includes a discussion of potential benefits, harms and unknowns related to lung cancer screening.⁴⁰ The CDC provides a [chart](#) comparing screening guidelines from several national organizations.⁴¹ ACS also emphasizes the importance of informed and shared decision making and that screening should be done at high-quality lung cancer screening and treatment centers.⁴² In addition, the national guidelines also emphasize the importance of tobacco treatment for current smokers and encouraging former smokers to continue to be non-smokers. If a lung cancer screening is recommended, tobacco treatment counseling should also be provided.^{39,41,42}

Breast Cancer Screening

Breast cancer screening guidelines, particularly the age to begin screening, vary among national organizations. The following chart compares screening guidelines between the ACS, CDC and the USPSTF.

For purposes of the *Texas Cancer Plan*, the measurable objectives will focus on women ages 50-74. While not all guidelines agree on how often to be screened before age 50, they all consistently recommend screening after age 50 and the Behavioral Risk Factor Surveillance System (BRFSS) measures align with this approach.¹⁴ Women with a family history of breast cancer or those who have an inherited increased risk of breast cancer may be recommended to begin screening at earlier ages.⁴⁶

Cervical Cancer Screening

The USPSTF cervical cancer screening guidelines are being reviewed in 2018. The USPSTF, CDC and ACS most recent guidelines are that women ages 21-65 get a Pap smear every 3 years or for women ages 30-65, every 5 years with both a Pap smear and HPV testing.⁴⁷ All encourage shared decision making with a doctor to discuss screening frequency and HPV-cotesting.^{48,49}

Colorectal Cancer Screening

The USPSTF and CDC recommend colorectal cancer screening for those ages 50-75 and the ACS recommends screening for those ages 45-75. These organizations highlight the differences in risks and benefits for various screening methods, and encourage shared decision making with a doctor.⁵⁰⁻⁵² The Centers for Disease Control and Prevention (CDC) provides information on potential risk factors for those who may need to begin screening earlier than age 50 because of increased risk, including family history, inflammatory bowel disease (Chron's or ulcerative colitis) or a genetic syndrome such as familial adenomatous polyposis (FAP) or hereditary non-polyposis colorectal cancer (Lynch syndrome).⁵¹ The ACS provides a [table](#) of recommendations for those who are at increased risk.^{52,53}

Prostate Cancer Screening

The USPSTF recommends that men ages 55-69 talk with their clinician about the potential benefits and harms in order to make an individual decision about prostate cancer screening.⁵⁴ The USPSTF recommends against routine screening for men who are age 70 and older.⁵⁴

Breast Cancer Screening Guidelines

National Organization	Risk Status	Age Recommendation	Frequency of Screening	Additional Notes
ACS ⁴³	Average	45	Every year age 45-54 Every 2 years 55 and older	Women age 40-44 should have an opportunity to be screened annually; screening should continue if future life expectancy is 10 years or longer
CDC ⁴⁴ and USPSTF ⁴⁵	Average	50	Every 2 years	Women age 40-49 should talk to their doctor and consider potential benefits and harms, patient-level risk factors and decide individually whether to start screening before age 50

Liver Cancer Screening

While there is not yet an evidence-based screening for liver cancer, the most common risk factor for liver cancer is chronic infection with Hepatitis B (HBV) or Hepatitis C (HCV).³¹ In the United States, HCV is more common, while in Asia and developing countries, HBV is more common.³¹ The liver cancer risk is even higher for people who have chronic hepatitis and are heavy drinkers (6 or more standard drinks per day).³¹ In the United States, approximately 50% of liver cancers are caused by Hepatitis C and 15% are caused by Hepatitis B.³² HCV is transmitted through contact with infectious blood and there is no vaccine available. HBV is transmitted through infectious blood, semen and other body fluids and there is a vaccine available that is routinely given to infants at birth.⁵⁵ Texas has the highest rates of liver cancer and the highest rates of HCV in the U.S. Approximately 400,000 Texans have the HCV infection.³⁰ The USPSTF and the CDC recommend screening for those at high-risk for HCV infection and a one-time screening for adults who were born between 1945 and 1965.⁵⁶ Those born between 1945 and 1965 are more likely to be diagnosed with HCV infection, possibly because of blood transfusions prior to screening for HCV beginning in 1992 or have a past history of other risk factors.⁵⁶ Texans should talk with their doctor to find out if they should be tested for Hepatitis C.³²

Genetic Testing

The use of genetic information for the diagnosis, treatment and prevention of cancer has grown over time as our knowledge and technology improves. Genetics refers to the heredity of how traits and characteristics are passed from generation to generation. An estimated 5-10% of all cancers are hereditary.⁵⁷ One of the greatest barriers to genetic testing has been cost. As genomic technology improves and the cost of genetic testing continues to decline, health care professionals can order these tests more easily.⁵⁸ The Cancer MoonshotSM Blue Ribbon Panel report emphasizes the need to conduct hereditary cancer testing in high-risk populations to identify hereditary cancer syndromes and the need for evidence-based cancer screenings at different intervals than the average-risk population.⁵⁸ Currently there are more than 50 known hereditary cancer syndromes that may cause genetic mutations that may increase cancer risk in populations with these syndromes.⁵⁸ Implementation research is needed to better define optimal intervals and frequency for screening among populations with hereditary cancer syndromes.⁵⁸ For more information on genetic counseling resources in Texas, visit the [Texas Society of Genetic Counselors](#).⁵⁹

Screening for Other Cancers

Other cancer screening methodologies are being researched to determine whether they should be recommended for the general population or higher risk groups and whether they will ultimately have an impact on incidence and mortality. Support for more research for new and improved screening technologies continues to be a critical need in Texas and around the globe.

Diagnosis, Treatment and Palliation

Timely and appropriate care following screening services is an essential component of the cancer prevention and control continuum and ensures that patients are adequately counseled about screening test results and, if needed, referred for further diagnostic testing and appropriate treatment. Quality cancer diagnostic results help inform all areas of patient care planning, including staging, treatment, palliation, rehabilitation, and surveillance for late effects and recurrent disease. An accurate diagnosis can also inform risk assessments to determine if a patient or family members may benefit from genetic testing or genetic testing counseling, screening, or follow-up services.

Traditionally, cancer treatment efforts focused only on surgery, radiation and/or chemotherapy. While these are still options for cancer treatment, additional options include immunotherapy, targeted therapy, hormone therapy, stem cell transplant and precision medicine.⁶⁰

Current research recognizes that the same type of cancer may change or grow differently in different people and that the same types of changes may be identified in various cancer types.⁶¹ Precision medicine is focused on better understanding the genetic changes in cancer tumors and finding targeted therapies that can be more effective at treating cancers rather than providing the same therapies to all patients with the same type and stage of cancer.⁶¹ Also, some cancer therapies work initially but then stop working; cancer cells become drug resistant allowing the cancer to grow again. Precision medicine will help identify which cancers will be resistant to which drugs and can develop targeted therapies that will be less likely to be drug-resistant and more effective at destroying cancer cells.⁵⁸ Some targeted therapies use genetic testing results to guide treatment recommendations.

Immunotherapy is a form of cancer treatment that supports a person's immune system in fighting cancer.⁶² Some immunotherapies are able to help a person's immune system better identify which cells are cancer cells so that the immune system can find and destroy them, while other immunotherapies support a person's immune system overall to work more effectively at eliminating cancer.⁶²

Changes in detection and treatment methodologies, clinical recommendations, and health care industry practices often present challenges in getting the best care to patients. One way to improve the quality of cancer care for patients in Texas is to increase the number of facilities approved by the American College of Surgeons (ACoS) Commission on Cancer (CoC) Approvals Program. Approved cancer programs offer a full range of medical services along with a multidisciplinary team approach to patient care. As of 2018, there are 77 CoC accredited programs in Texas.⁶³ Some essential elements of these programs include:

- Access to state-of-the-art clinical services and equipment for all phases of the cancer prevention and control continuum, (e.g., primary prevention, screening/early detection, diagnostics, treatment, rehabilitation and support services)
- A multidisciplinary team approach to coordinate patient care
- Up-to-date clinical trials and treatment information for patients
- A cancer registry and database that follows patients throughout life
- Ongoing monitoring and evaluation of patient outcomes

What is palliative care?

Palliative care, or supportive care, is given with the intent to improve a cancer patient's quality of life. Supportive care should begin at diagnosis and continue through treatment, follow-up care, and the end of life, regardless of the patient's cancer prognosis. It addresses the emotional, physical, practical, and spiritual aspects of the cancer patient. Family members may also receive palliative care. The goal of palliative care is not to cure disease, but to provide comfort care. It can help with issues such as pain, nausea, fatigue, insomnia, anxiety, depression, constipation, appetite loss and weight changes.

Quality of Life and Survivorship

Due to advances in early detection and treatment, today there are more cancer survivors, living longer after diagnosis, than ever before. It is estimated that more than 750,683 Texans who were diagnosed with cancer in the last twenty years are alive today.⁶ As this population continues to grow, so does the need for access to evidence-based or recommended survivorship programs and services such as patient navigation, treatment and care plans, culturally and linguistically appropriate outreach and education, and effective symptom management. This requires application of comprehensive cancer prevention and control strategies, from professional education and training, to public awareness and education, health systems and policy change, research, and surveillance.

A survivor care plan is a critical component in arming survivors with the information needed to confront the physical, psychological, and socioeconomic issues that may arise during and after treatment. The Institute of Medicine (IOM) recommends that all cancer survivors receive an individualized survivorship care plan from their provider that is clearly explained to them.⁶⁴ The American College of Surgeons Commission on Cancer includes a standard regarding the use of survivor care plan and treatment summaries.⁶⁵ Several types of care plans exist, but common elements among them include information about a patient's treatment or healthcare team, medical history, diagnosis, treatment, follow-up care and resources. Having this information in one place helps inform and prepare survivors and their care teams for issues that may arise during and after treatment.

The [American Society of Clinical Oncology](#) has developed key components for high-quality survivorship care, which include:⁶⁶

- Surveillance to assess recurrence
- Monitoring and managing both psychosocial and short and long-term effects
- Screening recommendations for other types of cancer
- Educating survivors on their diagnosis, exposures during treatment and potential short and long-term effects
- Referring survivors to specialists and appropriate resources
- Conducting genetic risk assessments for survivors and their family members (as appropriate)
- Providing support related to diet, exercise and other health promotion activities
- Connecting survivors to financial and insurance-related resources
- Empowering survivors to be their own advocates in addressing their healthcare needs

Cancer survivors and their families often experience financial difficulties because of a cancer diagnosis. The following organizations provide support and assistance in navigating resources for cancer survivors: The [Patient Advocate Foundation](#) and the [American Cancer Society](#).^{67,68}

Research shows that lung cancer survivors experience stigma more than patients with other types of cancers, particularly among smokers compared to nonsmokers. Lung cancer survivors may feel judged or discriminated against based on their diagnosis.⁶⁹ Although lung cancer has the highest rates of death among men and women in both Texas and the United States (more than colorectal, breast and prostate cancer combined), awareness and resources for lung cancer are lower than other types of cancer. While the tobacco control movement has helped to reduce the social acceptability of smoking, it has increased the stigma for smokers.⁶⁹ Some of the consequences of lung cancer stigma include:⁶⁹

- Avoiding or delaying treatment or seeking a second opinion
- Increased lung-cancer related distress
- Relationship conflict
- Unwillingness to disclose that the survivor has lung cancer
- Less social support
- Lower healthcare quality

Organizations such as the [American Lung Association](#) and the [Lung Cancer Alliance](#) have resources to help address stigma. These and other organizations are encouraging the interventions to reduce lung cancer stigma and increase knowledge, empathy and hope. One example of a media campaign from the Lung Cancer Alliance is known as: "[No one deserves to die](#)".

As the number of cancer survivors in Texas continues to grow, members of the public health community, including advocates, practitioners, health plan administrators, researchers, service organizations, and elected officials must be prepared to meet the unique and often complex challenges that survivors face during and after treatment. From providing access to a comprehensive survivorship care plan that can help monitor and plan care, to enacting policies that will support survivors in the workplace and provide appropriate health insurance coverage, as well as finding ways to support those with metastatic cancer and reduce stigma related to lung cancer, Texas has many opportunities to improve the health and well-being of cancer survivors.



Infrastructure

Implementing a comprehensive cancer control plan requires focus on research and all areas of cancer prevention including preventing cancer from occurring to detecting it early and preventing future cancers in cancer survivors. Due to advances in technology, treatment, data collection and analysis, quality care standards and prevention research, there are proven strategies and interventions that can reduce the burden of cancer. However, implementing such strategies in a systematic and culturally relevant way – in a state with 254 counties and a diverse population that exceeds 28 million people – presents a unique set of challenges that must be addressed to make a significant impact on the cancer burden in Texas.

Most Texas counties are designated as medically underserved areas and health professional shortage areas.⁷⁰ This highlights two critical and inseparable needs for cancer control: increased numbers and distribution of public health services, and increased numbers and distribution of well-trained health professionals.

A survey by the North Texas Regional Extension Center lists some factors regarding the physician workforce in Texas that may affect cancer prevention and control.⁷¹

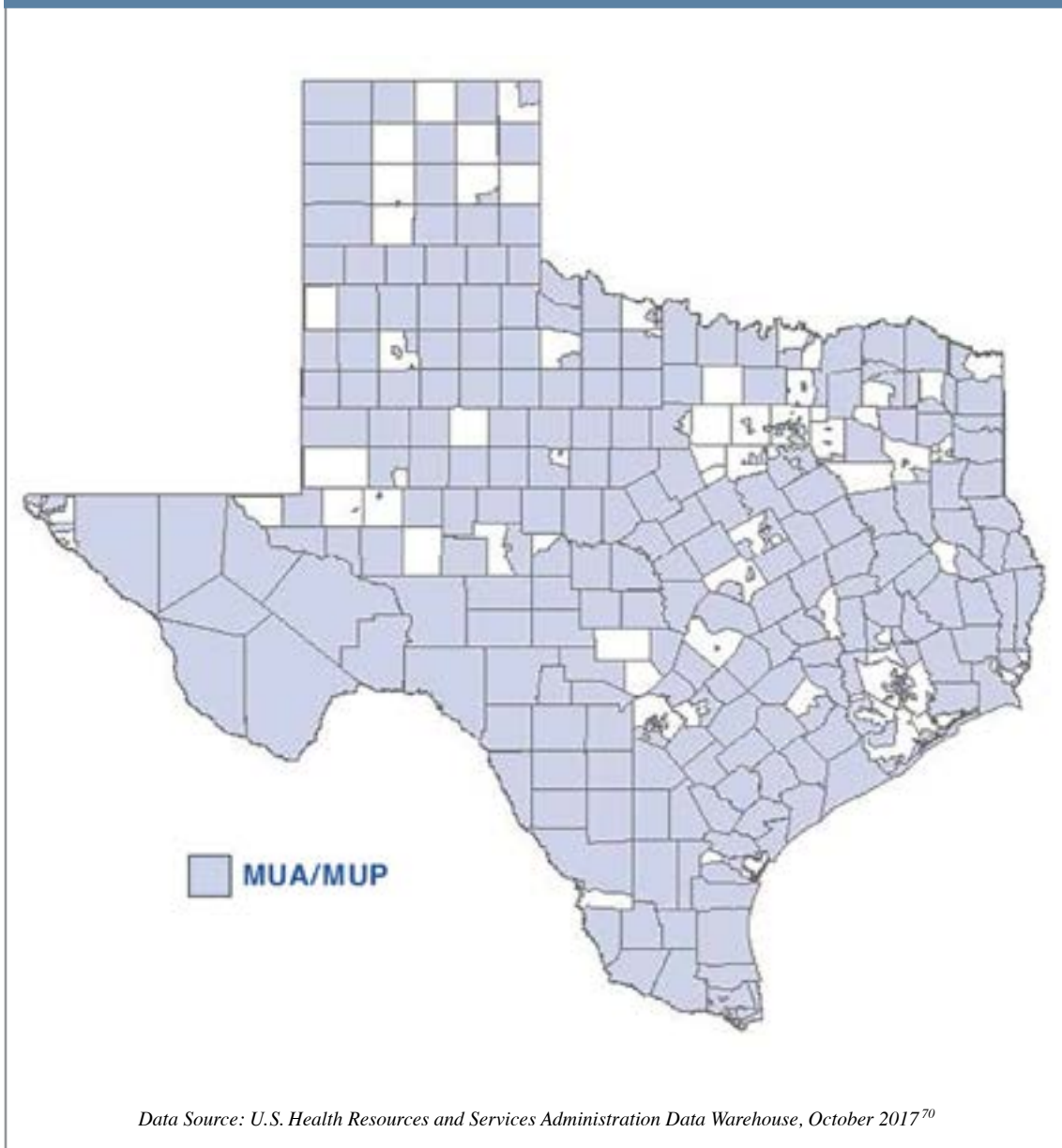
- Texas ranks 47th in the nation in active primary care physicians per 100,000 population
- 35 Texas counties have no physicians of any specialty (total population of 115,826)
- 80 Texas counties have five physicians or less (total population of 782,790)
- 147 Texas counties have no obstetrician/gynecologist (total population of 1,940,722)
- 158 Texas counties have no general surgeon (total population of 2,066,766)
- 57% of the workforce is in the five most populated counties in Texas while 44% of the population lives in these counties.
- Medicare and Medicaid acceptance rates are relatively low among Texas physicians. 35% do not accept Medicaid and 20% do not accept Medicare. In the U.S. 18% do not accept Medicaid and 13% do not accept Medicare.

Although the registered nurse (RN) and licensed physician assistant (PA) workforces have increased dramatically since 2005, there is still a need for more racial and ethnic diversity in these professions. Hispanics comprise almost 40% of the Texas population but only 14.1% of the RN workforce and 16.3% of the PA workforce.⁷²

Health Professional Shortage Areas in Texas (HPSA)⁷³

HPSA Shortage Category	Total HPSA designations	Percent of need met	Practitioners needed to remove designation
Primary Care	432	66.40%	587
Mental Health	412	45.25%	271
Dental	306	61.08%	402

Texas Medically Underserved Areas (MUA) and Populations (MUP)



Disparities and Priority Populations

Defining the exact causes of cancer disparities is complex. The factors that contribute to disparities are often interrelated issues such as socioeconomic status, culture, and health system factors. According to the ACS, disparities predominantly occur from inequities in work, wealth, income, education, housing, and overall standard of living, as well as social barriers to accessing high-quality cancer prevention, control, and treatment services.⁷⁴ Therefore, it is imperative that planners, policy makers, providers, advocates, and others consider these factors in their efforts to lessen the burden of cancer in Texas.

During 2010-2014, Texas had a lower cancer incidence rate for eight of the top 10 cancers compared to the U.S. rate.⁷⁵ The only exceptions are leukemias and kidney and renal pelvis cancers. For leukemias, the Texas and U.S. rates were the same (13.8 per 100,000 population). However, for kidney and renal cancers, the Texas incidence rate was higher than the U.S. (18.3 vs 16.1 per 100,000 population)⁷⁵ Texas had a lower mortality rate for six of the 10 top cancers compared to the U.S. rate. The exceptions were colorectal, leukemias, liver and kidney and renal cancers. Colorectal cancers and leukemias had the same mortality rate as the U.S. (14.7 and 6.8 per 100,000 population, respectively). Liver and kidney and renal pelvis cancer mortality rates were higher than the U.S. rate (8.0 vs 6.3 per 100,000 population for liver cancers and 4.5 vs 3.9 per 100,000 population for kidney and renal pelvis cancers).⁷⁵

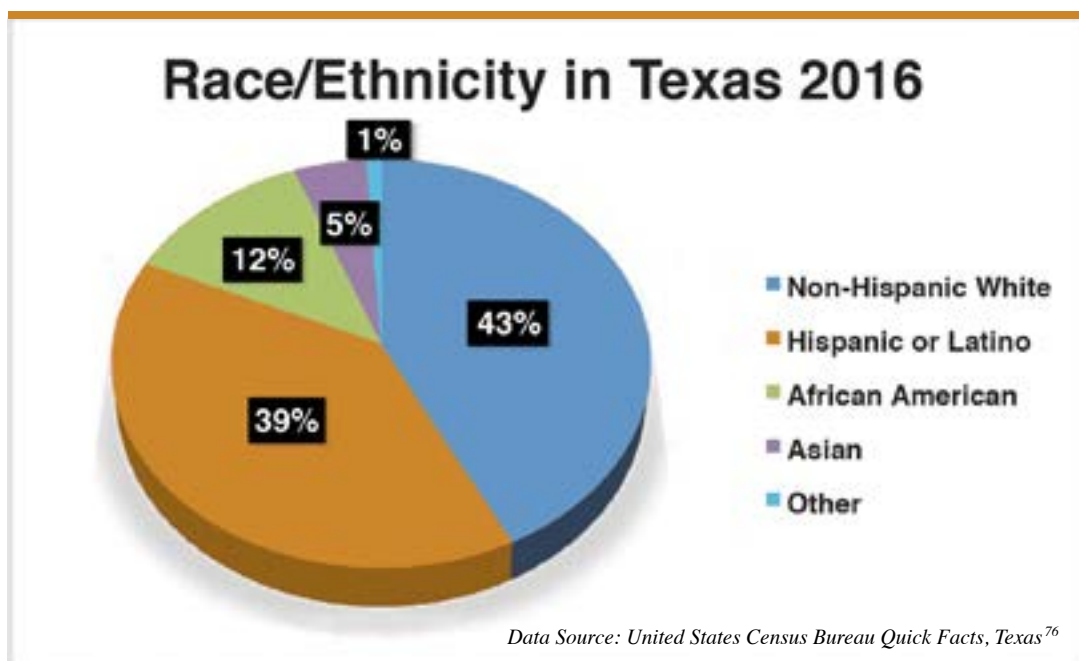
Race/Ethnicity

Texas is a diverse state, with a racial/ethnic demographic breakdown in 2016 of 42.6% non-Hispanic White, 39.1% Hispanic or Latino, 12.6% African American, and 4.8% Asian.⁷⁶ Texas has led the U.S. in population growth since 2006 and is one of only four states in the U.S. that is a “majority-minority” where the non-Hispanic white population is less than 50%.⁷⁷ The Hispanic population in Texas is the second largest in the nation, with about 39% of Texas residents reporting Hispanic ethnicity. The Hispanic or Latino population of Texas also includes immigrants from Mexico, Central America, and South America, as well as Tejanos.⁷⁶

Cancer incidence and mortality rates vary by race and ethnicity. Overall, blacks in Texas have cancer incidence and mortality rates that exceed those of whites and other racial/ethnic groups.⁶ Although white women have historically had higher breast cancer incidence rates than black women, the two rates converged recently and have become virtually the same.⁷⁸ Even though incidence rates are now similar, blacks still have a 42% higher mortality rate from breast cancer and the median age of both diagnosis and death is younger than non-Hispanic white women.⁷⁸

Liver cancer incidence rates are about three times higher in men than in women. From 1995 to 2015 the incidence rate of liver cancer in Texas men doubled from 7.8 to 17.2 per 100,000 population.⁶ Hispanics have the highest liver cancer incidence and mortality compared to any other ethnic group.³¹

Some of the challenges related to access to care facing the Hispanic population



in Texas are influenced by socioeconomic factors such as education, income and insurance status. Other barriers to care arise from geographic location (particularly for those who live in border, rural or frontier counties) as well as immigrant status, whether one is employed in seasonal work and one's level of English language fluency.

More information on cancer incidence and mortality by county, race, and type of cancer can be found at the Texas Cancer Registry (TCR) website.⁶

Income/Uninsured populations

Low-income populations face financial barriers to accessing cancer prevention and treatment resources. During 2016, 16.7% of the people in Texas were below poverty level, compared to the national rate of 15.1%.⁷⁹ The median household income in Texas in 2016 was \$54,727.⁷⁹ Approximately 21% of blacks, 20% of Hispanics and 8% of non-Hispanic whites live in poverty in Texas.⁸⁰

The uninsured rate has declined from 27% in 2007 to 16.6% in 2016; however, Texas continues to have the highest uninsured rate in the nation. The uninsured rate in Texas is almost twice as high as the national average of 8.8%.⁸¹ There are also racial differences in uninsured status. According to the Texas BRFSS survey for 2016, Hispanics ages 18 and older are more likely to report being without health insurance (34.7%) when compared to either non-Hispanic whites (7.5%) or blacks (11.8%).¹⁴

Education

Populations with lower education bear a greater share of the cancer burden. As of 2016, 17.7% of the population in Texas has less than a high school education compared to 13% of the U.S.⁷⁹

For example, a disparity in obesity prevalence remains between non-Hispanic whites and minority populations, as well as among populations with lower SES and lower levels of educational attainment. For instance, nearly 39% of Texans with less than a high school education were obese in 2013, compared with 23% of college graduates.⁸²

Health Literacy

Lack of proficiency in the English language can be a significant barrier to health care utilization and adherence. In addition, overall health literacy also plays a pivotal role in the effort to improve the quality of life. Health literacy includes the ability to read, understand, and take action on health-related information.⁷⁴ People with low health literacy are more likely to report poorer health and are less likely to use preventive services, thus putting them at an increased risk of late-stage cancer diagnosis, hospitalization, and higher healthcare costs. Approximately 14% of U.S. adults over the age of 16 had a below basic level of health literacy, the majority of whom did not graduate high school.⁷⁴ Those with less than a high school education, racial and ethnic minorities, older populations and populations with disabilities have a higher rate of "below basic literacy level" than other populations.⁷⁴

Age

The risk of developing cancer increases with age. Over 95% of cancer deaths occur among Texans who are age 45 years or older.⁶ In Texas, as in the nation, the growing number of older adults will increase the number of people affected by cancer, making prevention and early detection efforts all the more necessary.

Geographic Area

Cancer incidence and mortality rates also vary by geographic area. The reason for these differences are likely due to variation in cancer risk factors (e.g., tobacco use) and population demographics of an area, including age, racial/ethnic makeup, income, and insurance coverage.⁶

Rural Texans are an especially underserved population. These Texans tend to be older, have low income, and are less likely to have insurance than their urban counterparts. Rural/non-metropolitan counties in Texas have a higher cancer mortality burden than their urban/metropolitan counterparts.⁶ Linkage to care and preventative medicine are essential to

reduce the cancer burden but are currently lacking in many rural settings. Residents of rural areas often have less contact and fewer visits with physicians and, in general, lower levels of available preventative care. One reason is often the distance residents of rural areas must travel to receive cutting edge care delivered by sites such as NCI-designated cancer centers. With the rapid increase in population, significant health challenges and widening disparities must be addressed in a strategic manner. Additional information on cancer disparities, including statistics, can be found through the Texas Cancer Registry⁶ and ACS.

Children and Adolescents

Cancer is a disease that affects people of all age groups – including children and adolescents. Approximately 1,600 young Texans ages 0-19 are diagnosed with cancer each year and over 200 young Texans die of cancer each year.⁶ Cancer is manifested differently in children - the most common cancer sites are blood and bone marrow, brain, lymph nodes, nervous system, kidneys, and soft tissues.⁶

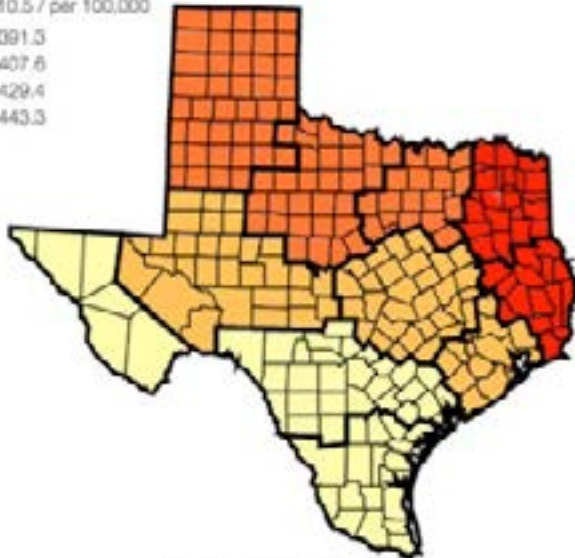
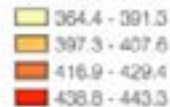
Age-Adjusted Invasive Cancer Incidence Rates in Texas

All Sites, 2011 - 2015

By Public Health Region

Age-Adjusted to the 2000 U.S. Standard Population

Texas Rate: 410.5 / per 100,000



All rates per 100,000.
Data accessed February 15, 2018. Cancer Incidence File, Feb 2018.
© 2018 Texas Cancer Registry.

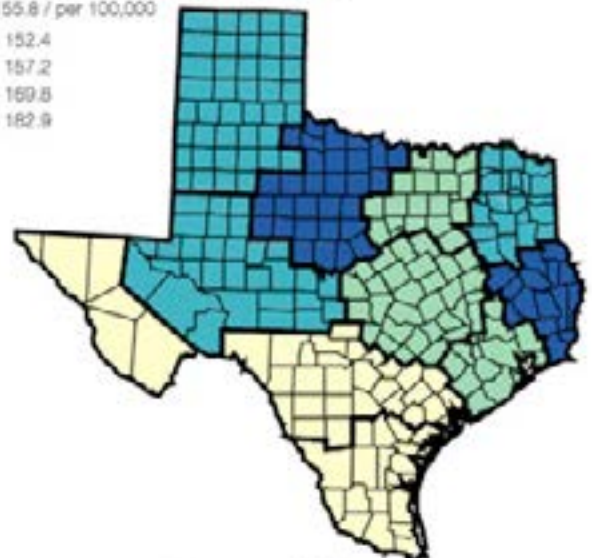
Age-Adjusted Cancer Mortality Rates in Texas

All Sites, 2011 - 2015

By Public Health Region

Age-Adjusted to the 2000 U.S. Standard Population

Texas Rate: 155.8 / per 100,000



All rates per 100,000.
Data accessed February 15, 2018. Cancer Mortality File, Feb 2018.
© 2018 Texas Cancer Registry.

Advancements in diagnosis and treatment for childhood and adolescent cancers have led to improved survival and have also revealed a new host of questions and issues related to the unique needs of this population. Cancer during childhood and adolescence can cause financial, physical, and psychosocial challenges for many Texas families, both during treatment as well as the years of adjustment that follow.

Issues that must be examined and addressed include but are not limited to: physical and psychological effects of treatment, integration back into social and educational systems, insurance coverage needs, long-term care, and risks of treatment late effects and development of other cancers later in life.

The universally accepted standard of care for childhood cancer is participation in clinical trials. To ensure that children with cancer in Texas have access to state-of-the-art care, it is critically important to provide the infrastructure and resources to overcome current barriers to participation in standard-of-care clinical trials.

Cancer prevention also plays an important role in children and youth. Interventions for prevention of cancers related to ultraviolet radiation, tobacco, obesity, and certain viruses should begin at an early stage to minimize risk for developing cancer later in life.



Academic Research

The opportunity to expedite research that explores the causes of cancer and discoveries with potential to improve risk reduction, early detection, treatment, and quality of life has never been greater than it is today. Virtually all the most effective methods currently in use were once part of a research study or clinical trial.

Across Texas, cancer academic research occurs at institutions of higher education, research institutions, and medical facilities with federal, state, and private funding. Texas is home to four National Cancer Institute (NCI) designated cancer centers: Baylor College of Medicine (BCM), The University of Texas M.D. Anderson Cancer Center (MD Anderson), The University of Texas Southwestern Medical Center (UT Southwestern), and The University of Texas Health Science Center at San Antonio (UTHSC - San Antonio). BCM, MD Anderson, and UT Southwestern are also NCI designated comprehensive cancer centers. Over 80% of the NCI supported cancer research in Texas takes place at these institutions. In addition to conducting research, the NCI Cancer Centers disseminate new knowledge through clinical trials and outreach programs on cancer prevention and screening, with special attention to the needs of underserved populations.

Texas academic cancer research has been accelerated by a unique funding program authorized by the citizens of Texas and created by the Legislature in 2007—the Cancer Prevention and Research Institute of Texas (CPRIT). CPRIT began awarding grants in 2010 to Texas-based entities for cancer-related academic research and product development research, and for the delivery of cancer prevention programs and services. Through May 2018, CPRIT has funded 1,024 academic research projects totaling \$1.44 billion at 35 institutions and organizations across the state. These awards support the most creative ideas and meritorious projects brought forward by the cancer research community in Texas and as of May 2018 have brought 154 premier cancer researchers to Texas, making this program the envy of research institutions across the nation. CPRIT’s current authority to support cancer research continues until 2023.



Product Development Research

Academic researchers seek to understand scientific principles and mechanisms of action (e.g., the specific biochemical interaction that effect biological functions). This is typically conducted at institutions of higher education supported by government grants. Those in product development then create safe and reliable products that physicians can use to treat patients. Clinical research then confirms product safety and efficacy to attain regulatory approval. Product development, clinical research and regulatory approval are historically conducted by startup companies funded by private investors.

Texas has a large and growing cancer research and development industry that has grown significantly over the last decade. Texas startup life sciences companies received an average of \$500 million annually since 2015 in venture capital investment to develop new products and services. Startup companies are funded by angel investors, venture capital groups, National Institutes of Health grants and CPRIT awards for cancer related product development.

The growth in the Texas life sciences industry has been accelerated by CPRIT through its Product Development Research Program. This program funds companies developing novel products addressing large or challenging unmet medical needs. Investment decisions are based on scientific or medical merit, company management and business viability. As of May 2018, CPRIT has invested \$330 million in 29 companies of which 20 are developing cancer therapies and 9 are developing medical devices or diagnostics. These firms have raised \$1.68 billion in follow-on investment funding after receiving a CPRIT award - 5 times the CPRIT awarded amount to date and growing.

The Texas cancer research and development industry is supported by an extensive life sciences ecosystem. Many research institutions have programs and facilities to support new company formation including incubator facilities at Austin Technology Incubator, The University of Texas at Austin, UT Southwestern, MD Anderson, Johnson and Johnson Jlabs incubator at Texas Medical Center and many others.

Major research institutions have programs and facilities supporting new company formation including MD Anderson, BCM, UT Southwestern and Texas Medical Center. Statewide and regional advocacy groups, including Texas Healthcare and Bioscience Institute, BioHouston, BioAustin, and bioNorthTX, support ecosystem development by providing training, networking, and advocacy.

Action Plan for Cancer Research, Prevention and Control

Goals are broad and lofty statements of general purpose to guide planning. These should be few in number and focus on aspects of highest importance to the Plan.

Objectives offer specific and measurable milestones when possible. Baselines will be established if available; however, data may not always be available to set a starting baseline.

Strategic Actions are the activities that could and should be undertaken to accomplish the goals and objectives of the Plan. This is not intended to be a comprehensive list of all possible strategic actions. Rather it is a list of focused, specific, evidence-based (where possible), and action-oriented strategies that could have a significant impact on accomplishing goals of the Plan if implemented.

If there is an asterisk (*) beside a strategic action, it is a recommended strategy from the [Guide to Community Preventive Services](#).

The Healthy People 2020 objectives informed the targets for this plan. For more information on Healthy People 2020 and cancer, visit www.healthypeople.gov/2020/topics-objectives/topic/cancer⁸³

Goal 1

Eliminate tobacco use to reduce new cases and deaths from tobacco-related cancers

Objectives

1. Decrease the percentage of youth who use tobacco products

- Decrease the percentage of high-school students who currently smoke cigarettes
- Decrease the percentage of high-school students who use electronic vapor products

2. Decrease the percentage of adults who use tobacco products

- Decrease the percentage of adults who are current smokers
- Decrease the percentage of adults who use electronic vapor products

3. Reduce exposure to secondhand smoke

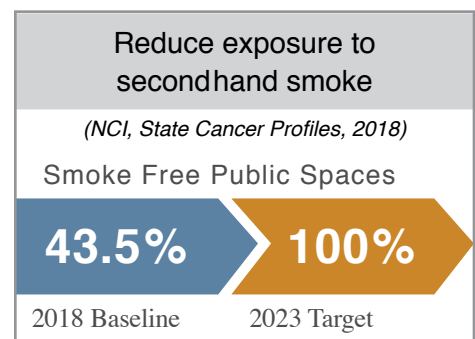
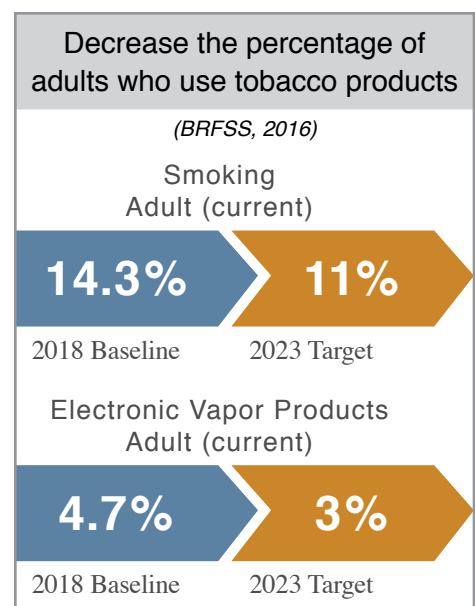
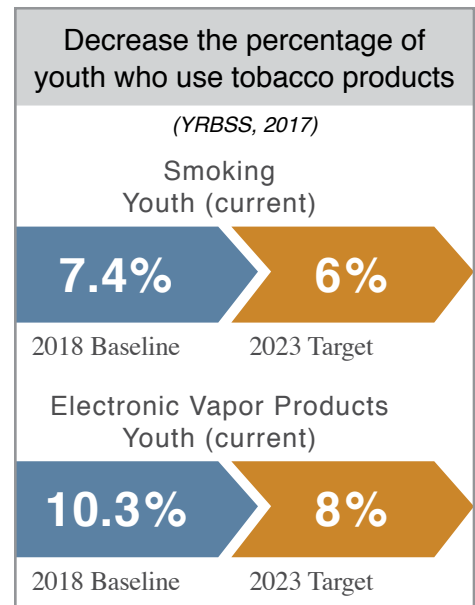
- Increase the percentage of Texans covered by 100% comprehensive smoke-free workplace, restaurant and bar laws

Strategic Actions

Policy

- Promote and implement comprehensive tobacco-free environment policies statewide*
- Increase prices of cigarettes and other tobacco products*
- Reduce tobacco users' out-of-pocket costs for tobacco treatment through policy or program changes*
- Improve comprehensive cessation coverage for Medicaid recipients
- Advocate for and dedicate consistent and reliable funding for tobacco control at the level recommended by the CDC
- Promote laws that raise the minimum legal sale age of tobacco products, including all future tobacco-related products, to 21 years old, including all electronic smoking devices

DATA TARGETS



Continued on the next page →

Communication/Education

- Implement mass-reach health communication campaigns that target large audiences through television and radio broadcasts, print media (e.g., newspaper), out-of-home placements (e.g., billboards, movie theaters, point-of-sale), and digital media to change knowledge, beliefs, attitudes, and behaviors affecting tobacco use*
- Conduct statewide youth and adult focused counter-marketing campaigns
- Improve health professional knowledge, practice behaviors and system support related to increasing provision of or referral to tobacco cessation services
- Educate health professionals and consumers on the dangers of secondhand and third-hand smoke [the tobacco residue that contains toxins found in cigarettes, cigars and other tobacco products and remains in buildings through walls, carpet and furnishings]

Programs

- Promote worksite-based incentives in combination with additional interventions to support individual cessation efforts*
- Expand access to and promote use of comprehensive tobacco cessation programs and services*
- Conduct health communication campaigns using multiple channels, which includes mass media, combined with the distribution of free or reduced-price health-related products*
- Support Quitline interventions – particularly proactive interventions*
- Implement mobile phone-based cessation interventions that use interactive features to deliver evidence-based information, strategies, and behavioral support directly to tobacco users interested in quitting*
- Promote the adoption of CEO Gold Standard™ for worksites

Systems Improvement/Infrastructure

- Encourage community mobilization combined with additional interventions such as stronger local laws directed at retailers, active enforcement of retailer sales laws, and retailer education with reinforcement*



Goal 2

Increase adoption of healthy behaviors to reduce new cases and deaths from cancers related to nutrition, physical activity and obesity

Objectives

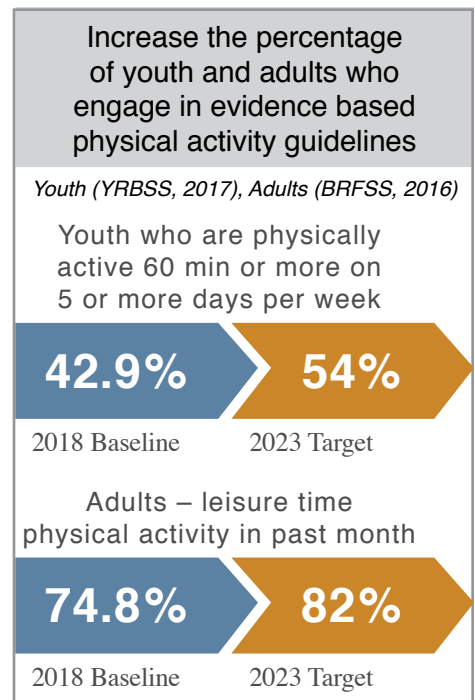
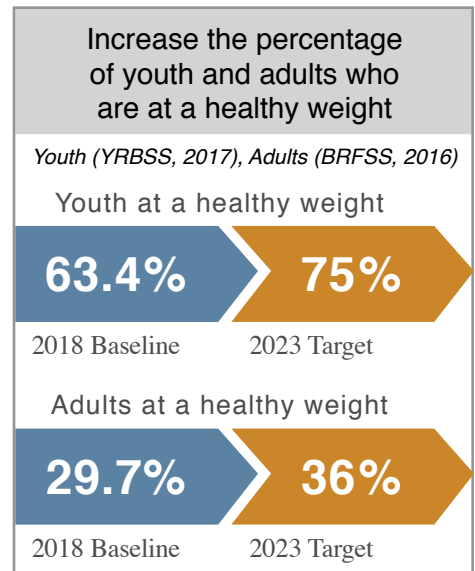
- 1. Increase the percentage of youth and adults who are at a healthy weight**
 - Percentage of high school students who are at a healthy weight
 - Percentage of adults who are at a healthy weight (BMI 18.5 to <25)
- 2. Increase the percentage of youth and adults who engage in evidence-based physical activity guidelines**
 - Percentage of high school students who were physically active for at least 60 minutes on 5 or more days per week
 - Percentage of adults who engaged in leisure time physical activity in the past month
- 3. Increase the percentage of youth and adults who follow evidence-based nutrition guidelines**
 - Percentage of youth who eat at least 5 fruits and/or vegetables per day
 - Percentage of adults who eat at least 5 fruits and/or vegetables per day

Strategic Actions

Policy

- Advocate for and dedicate consistent and reliable funding for implementation of evidence-based nutrition and physical activity recommendations and obesity prevention and control programs and policies
- Support policies and environments that promote the adoption of healthy behaviors and reduce barriers to accessing healthy food*
- Support evidence-based policies to address excessive consumption of alcohol, including limits on days of sale, hours of sale, increasing alcohol taxes and regulating alcohol outlet density*
- Support enhanced school-based physical education (PE) [changing the curriculum and course work for K-12 students to increase the amount of time they spend engaged in moderate- or vigorous-intensity physical activity during PE classes]*

DATA TARGETS



Continued on the next page →

Communication/Education

- Conduct adult-awareness campaigns statewide on the links between nutrition, alcohol, physical activity and obesity, diabetes and risk of cancer
- Improve health professional knowledge, practice behaviors, and system support related to increasing provision of or referral to counseling and services that promote good nutrition, physical activity and obesity reduction and control

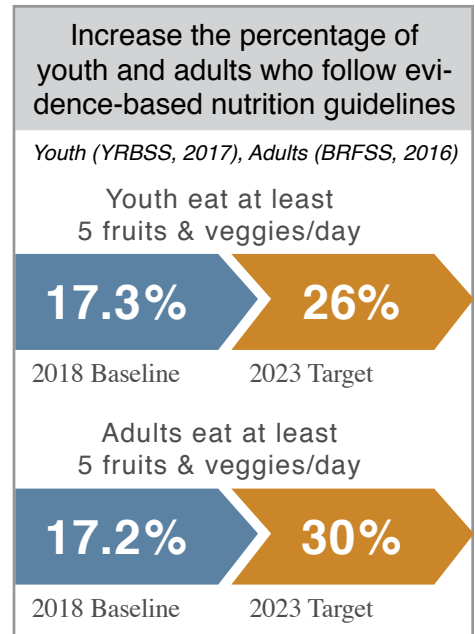
Programs

- Encourage worksites to implement worksite programs to improve diet or physical activity and reduce weight among employees, including the adoption of the CEO Gold Standard™ for worksites*
- Utilize health information technology to conduct comprehensive telehealth interventions to improve healthy eating among adults with chronic diseases, including cancer*
- Implement interventions to reduce recreational sedentary screen time among children*
- Promote family-based interventions that combine activities to build family support with health education to increase physical activity among children*
- Implement evidence-based school, youth and adult programs that promote healthy weight, good nutrition and physical activity
- Support electronic screening and brief intervention related to alcohol use: screening individuals for excessive drinking and delivering personalized feedback through a brief intervention about risks and consequences*

Systems improvement/infrastructure

- Encourage built environment and land use/environmental design interventions to provide opportunities for people to be more physically active (improving pedestrian or bicycle transportation systems)*

DATA TARGETS



Goal 3

Increase skin protection behaviors to reduce new cases and deaths from melanoma

Objectives

1. Promote skin cancer prevention behavior

- Age-adjusted incidence rate of melanoma (per 100,000 population)

2. Reduce the mortality from melanoma

- Age-adjusted mortality rate of melanoma (per 100,000 population)

Strategic Actions

Policy

- Advocate for eliminating the use of tanning beds
- Support policies that promote behaviors that reduce exposure to UV radiation and support an environment that promotes sun safety
- Provide expertise and tools on the implementation of skin cancer policies in various settings (college campuses, recreational venues, etc.)

Communication/Education

- Conduct statewide awareness campaigns on the link between UV radiation and risk of skin cancer (settings such as parks, schools, daycare centers, worksites, and beaches)
- Conduct statewide awareness campaigns on recognizing the early signs and symptoms of skin cancer

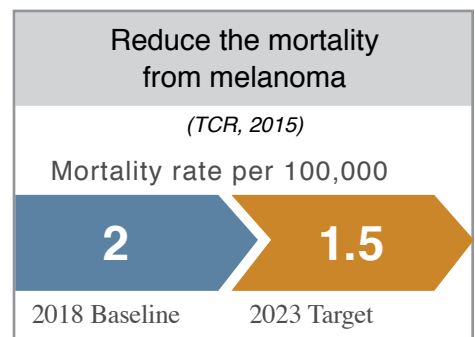
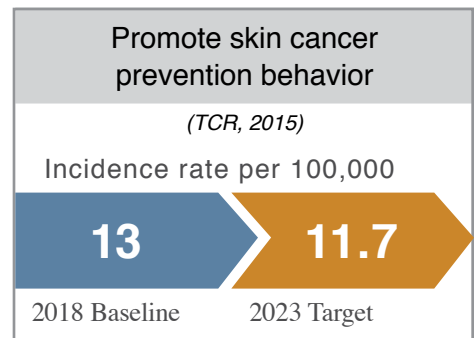
Programs/Interventions

- Implement evidence-based school, worksite, and community programs that promote sun safety
- Promote multi-component community-based interventions focused on skin cancer prevention through individual-focused strategies, mass media, and environmental and policy changes in multiple settings in a geographic area as a collaborative effort to influence sun protective behaviors*

Systems Improvement/Infrastructure

- Establish additional partnerships with recreational venues and corporate entities, as these may be potential settings for educational sessions

DATA TARGETS



Goal 4

Reduce the risk of cancers related to environmental carcinogens

Objectives

1. Increase the use of evidence-based policies, systems, and environmental changes that reduce exposure for workers and communities to known environmental carcinogens
2. Increase radon testing in homes and work with certified radon mitigators to fix homes with high levels of radon
3. Increase research related to environmental carcinogens

Strategic Actions

Policy

- Advocate for and dedicate consistent and reliable funding for evidence-based epidemiologic and environmental monitoring and research across the life course (in utero and childhood, workplace, and multi-generational exposures)
- Advocate for system changes and training programs to prevent community and workplace exposure to carcinogens

Communication/Education

- Educate the public, health care providers, public health officials, schools, property owners and managers and policy makers about known and emerging environmental carcinogens including radon and other environmental substances linked to cancer

Programs/Interventions

- Support workplace and community-based initiatives that reduce environmental exposures to substances or chemicals linked to cancer

Systems Improvement/Infrastructure

- Implement evidence-based policies, programs, and system changes to increase transparency and information sharing among the public, researchers, regulatory agencies, and industry about environmental carcinogens
- Support increased research and funding on environmental cancer risks

DATA TARGETS

Data not available to determine a baseline and a target

Although environmental pollution has been a source of great public concern for decades, more research is needed about environmental exposures at the community level. Evidence is building to support a link between cancer and lower levels of exposures to environmental pollutants.

[Health Effects Cancer and the Environment – CDC Tracking Network](#)

Goal 5

Increase vaccination rates for vaccines shown to reduce the risk of cancer

Objectives

1. Increase the percentage of youth and young adults who have completed the recommended HPV vaccine series according to national guidelines*

- Percentage of females, age 13-17 years, who are up-to-date with the HPV vaccine
- Percentage of males, age 13-17 years, who are up-to-date with the HPV vaccine

2. Increase the percentage of youth and adults who have completed the recommended Hepatitis B vaccine series according to national guidelines

- Percentage of adolescents age 13-17 years who completed ≥ 3 doses of Hep B vaccine
- Percentage of adults who ever had a Hep B shot and completed ≥ 3 doses of Hep B vaccine

Strategic Actions

Policy

- Support policies that promote HPV and Hepatitis B vaccinations.
- Reduce out-of-pocket costs for vaccinations*

Communication/Education

- Improve health professional knowledge, practice behaviors, and system support related to increasing provision of or referral to immunizations against HPV and Hepatitis B
- Conduct a statewide awareness campaign on the link between infectious disease and cancer risk

Programs/Interventions

- Implement evidence-based programs that promote immunization of high-risk adults against Hepatitis B and teens and pre-teens of both sexes against HPV

Systems Improvement/Infrastructure

- Implement interventions that remind clients that vaccinations are due or late*
- Promote provider assessment and feedback interventions that evaluate provider performance in delivering vaccinations*
- Promote population-based immunization information systems to increase vaccination rates*

DATA TARGETS

Increase the percentage of youth and young adults who have completed the recommended HPV vaccine series according to national guidelines

(NIS-Teen, 2016)

Females age 13-17 up-to-date

39.7%

60%

2018 Baseline

2023 Target

Males age 13-17 up-to-date

26.5%

45%

2018 Baseline

2023 Target

Increase the percentage of youth and adults who have completed the recommended Hepatitis B vaccine series according to national guidelines

Adolescents (NIS-Teen 2016),
Adults (BRFSS, 2016)

Adolescents age 13-17
completing ≥ 3 doses Hep B

84.5%

93%

2018 Baseline

2023 Target

Adults who have ever
had a Hep B shot and
completed ≥ 3 doses Hep B

49.5%

55%

2018 Baseline

2023 Target

Goal 6

Increase screening and early detection to increase the number of cancers diagnosed at an early stage and reduce deaths from breast cancer

Objectives

1. Increase the percentage of women who receive breast cancer screening according to national guidelines*

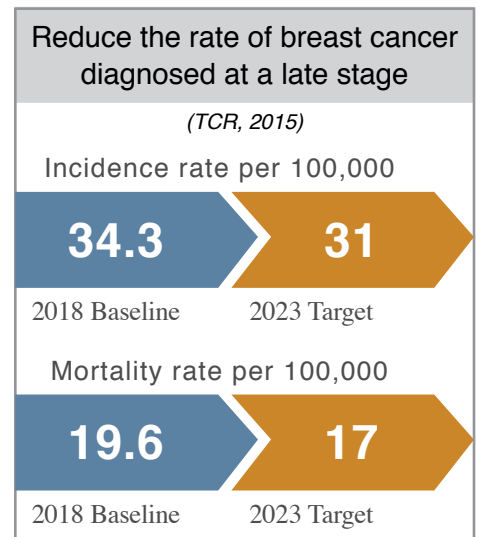
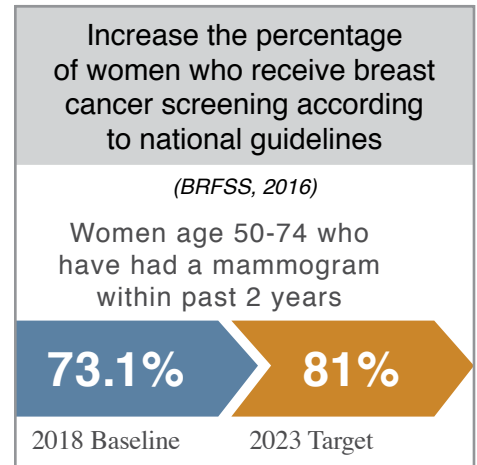
- Percentage of women age 50-74 who have had a mammogram within the past two years

2. Reduce the rate of breast cancer at late stage

- Age-adjusted incidence rate of female breast cancer at late stage (regional and distant) (per 100,000 population)
- Age-adjusted mortality rate, female breast cancer (per 100,000 population)

**While there is still controversy over what age to begin screening, all guidelines recommend screening at age 50 so this measure serves as a proxy for population-based breast cancer screening. Also, BRFSS has changed the question to be age 50-74 rather than 50+. The only two years available are 2014 and 2016. Individual women should talk with their doctors about when they should begin screening.*

DATA TARGETS



Goal 7

Increase screening and early detection to reduce the number of new cases and deaths from cervical cancer

Objectives

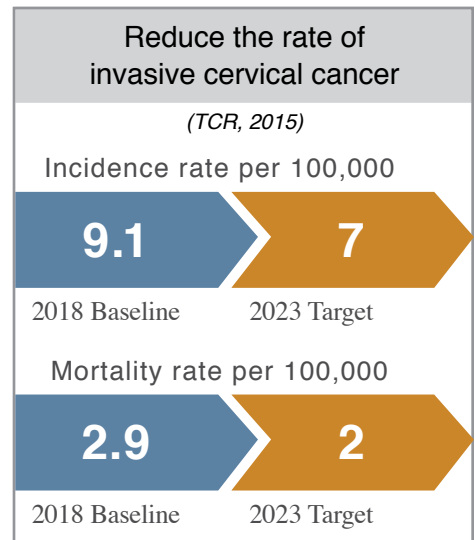
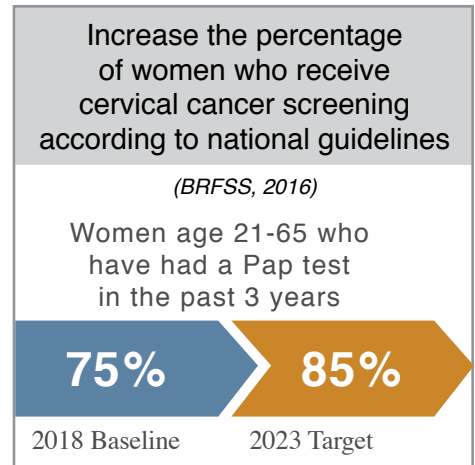
1. Increase the percentage of women who receive cervical cancer screening according to national guidelines

- Percentage of women age 21-65 who have had a Pap test in the past three years

2. Reduce the rate of invasive cervical cancer

- Age-adjusted incidence rate of cervical cancer at invasive stage (local, regional and distant) (per 100,000 population)
- Age-adjusted mortality rate, cervical cancer (per 100,000 population)

DATA TARGETS



Goal 8

Increase screening and early detection to reduce the number of new cases and deaths from colorectal cancer

Objectives

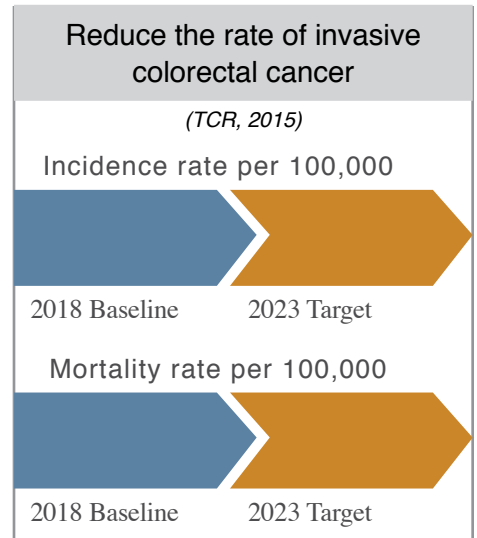
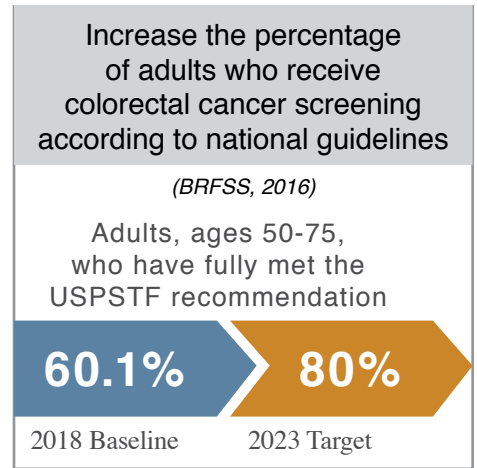
1. Increase the percentage of adults who receive colorectal cancer screening according to national guidelines

- Percentage of adults, ages 50-75, who have fully met the USPSTF recommendation

2. Reduce the rate of invasive colorectal cancer

- Age-adjusted incidence rate of colorectal cancer at invasive stage (local, regional and distant) (per 100,000 population)
- Age-adjusted mortality rate, colorectal cancer (per 100,000 population)

DATA TARGETS



Continued on the next page →

Strategic Actions for Goals 6, 7, 8

Policy

- Reduce out-of-pocket cost for screening services*
- Identify gaps and barriers related to breast, cervical and colorectal cancer screening policies and advocate for addressing them

Communication/Education

- Provide individual and/or group education on breast, cervical and colorectal cancer screenings that discusses eligibility, benefits, risks, unknowns and ways to overcome barriers*
- Implement small media such as videos, printed materials (letters, brochures, newsletters) that are used to inform and motivate Texans to be screened for breast, cervical or colorectal cancers*
- Improve health professional knowledge, practice behaviors, and system support related to improving service delivery
- Encourage shared decision making between health professionals and patients for screening
- Increase health professionals' awareness of USPSTF guidelines for family history collection and assessment, genetic counseling and genetic testing for cancers that are linked to hereditary predispositions

Programs/Interventions

- Implement multi-component interventions that will increase community demand, community access and health care professional delivery of services*
- Promote the provision of screening services through medical homes, accountable-care organizations, and other emerging models of healthcare delivery
- Implement programs that increase access to genomic screening and counseling services
- Implement programs that increase access to hereditary cancer risk assessment, genetic counseling and genetic testing services

Systems Improvement/Infrastructure

- Promote interventions to reduce structural barriers to screening that include*:
 - Reducing administrative barriers by eliminating or simplifying procedures and paperwork and incorporating patient navigators
 - Providing appointment scheduling assistance
 - Offering services in clinical and non-clinical settings which may include worksite locations or mobile units
 - Modifying hours of service to meet client needs
 - Providing transportation, child care and translation services
- Promote interventions that remind clients that their screening is due or late*
- Promote provider assessment and feedback interventions that evaluate provider performance in delivering screening*
- Promote investments in and increase availability of patient navigation services
- Ensure appropriate follow-up for those who receive abnormal cancer screening results
- Increase availability and utilization of electronic medical records and implementation of clinical system changes to increase utilization of evidence-based cancer screening
- Increase collaboration with clinicians to promote screening, case reporting and referral systems and programs
- Engage clinician residency training programs to promote evidence-based screening guidelines

Goal 9

Increase screening and early detection among Texans at high risk for lung cancer to increase the number of cancers diagnosed at an early stage and reduce deaths from lung cancer

Objectives

1. Increase lung cancer screening of adults according to national guidelines

2. Reduce the rate of lung cancer at late stage

- Age-adjusted incidence rate of lung cancer at late stage (per 100,000 population)
- Age-adjusted mortality rate, lung cancer (per 100,000 population)

Strategic Actions

Policy

- Reduce out-of-pocket cost for screening services and tobacco cessation treatment
- Identify gaps and barriers related to lung cancer screening policies and advocate for addressing them

Programs/Interventions

- Promote and train health care professionals on lung cancer screening utilizing a patient/healthcare professional shared decision-making model and the [USPSTF recommendations](#)
- Promote shared decision making discussions between patients and health-care professionals on the risks and benefits of being screened as well as patient preferences and values among those who meet the USPSTF lung cancer screening criteria
- Educate the public on the eligibility, risks, benefits and unknowns of lung cancer screening and that screening is not a substitute for tobacco treatment

Programs/Interventions

- Encourage clinics and hospitals to deliver high-quality lung cancer screening and patient centered care by following the USPSTF evidence-based recommendations, which include evidence-based tobacco treatment and access to multi-disciplinary follow up and care
- Implement community-based programs that increase access to high-quality lung cancer screening for eligible populations

DATA TARGETS

Increase lung cancer screening of adults according to national guidelines

Data not available to determine a baseline and a target

Reduce the percentage of lung cancers diagnosed at a late stage

Incidence (TCR, 2014), Mortality (TCR, 2015)

Incidence rate per 100,000

34.9

28

2018 Baseline

2023 Target

Mortality rate per 100,000

35.1

32

2018 Baseline

2023 Target

Continued on the next page →

Systems Improvement/Infrastructure

- Ensure appropriate follow-up and care for men and women who receive abnormal lung cancer screening results
- Increase and promote the continued study of the optimization of the pairing of tobacco treatment with lung cancer screening to improve the outcomes of the screening
- Increase research to reduce the false positive rate of lung cancer screening
- Increase collaboration with clinicians to promote shared decision making for screening, case reporting and referral systems and programs
- Engage clinician residency training programs to promote shared decision-making and evidence-based screening guidelines



Goal 10

Increase screening and treatment for Texans at high risk for Hepatitis B and C infections to reduce new cases and deaths from liver cancer

Objectives

- 1. Increase screening for HCV infection in populations at high risk of infection and 1-time screening to adults born between 1945 and 1965 according to national guidelines**
- 2. Increase screening for HBV infection in populations at high risk of infection according to national guidelines**
- 3. Develop and implement novel methods for liver cancer screening and early detection, including imaging technologies, genomics, and proteomics**

Strategic Actions

Policy

- Promote policies that increase access to Hepatitis B and C prevention, testing, treatment, and care services

Communication/Education

- Improve health professional knowledge, practice behaviors, and system support related to increasing screening for Hepatitis B and C
- Educate the public that all individuals born between 1945 and 1965 should have a one-time screening test for Hepatitis C and encourage them to talk with their doctor
- Educate the public on the link between Hepatitis B and C and liver cancer and the burden of liver cancer in Texas

Programs/Interventions

- Implement evidence-based programs for Hepatitis B and C screening, treatment and cancer surveillance
- Promote demonstration projects and research on screening for Hepatitis B and Hepatitis C to prevent liver cancer

Systems Improvement/Infrastructure

- Ensure appropriate follow-up and care for men and women who receive abnormal Hepatitis B or C screening results
- Increase availability and utilization of electronic medical records and implementation of clinical system changes to increase utilization of evidence-based Hepatitis B and C screening

DATA TARGETS

Data not available to determine a baseline and a target

Goal 11

Develop and implement screening and early detection methods for other cancers

Objectives

- 1. Promote shared decision making for prostate cancer screening**
- 2. Develop and implement novel methods for screening and early detection, including imaging technologies, genomics, and proteomics**
- 3. Develop and implement more effective screening and early detection methods that can differentiate between aggressive and indolent cancers for which there is no benefit from treatment**

Strategic Actions

Policy

- Promote increased research funding to develop and implement novel methods for screening and early detection of prostate and other cancers

Communication/Education

- Provide education and promote shared decision making for prostate cancer and prostate cancer screening, including the known risks and possible benefits
- Increase awareness of new evidence-based screening and early detection methods among health care professionals and the public
- Increase health professionals' awareness of evidence-based guidelines for family history collection and assessment, genetic counseling and genetic testing for cancers that are linked to hereditary predispositions

Programs/Interventions

- Promote demonstration projects and continued study of emerging screening technologies

Systems Improvement/Infrastructure

- Increase implementation of new evidence-based screening and early detection methods into routine practice

DATA TARGETS

Data not available to determine a baseline and a target

Goal 12

Increase timely access to quality cancer diagnostic, treatment, and palliation services for all Texans

Objectives

- Promote efforts aimed at increasing the optimal care of cancer patients**
 - Number of Commission on Cancer accredited facilities in Texas
- Promote timely and appropriate referral to palliative care programs in Texas hospitals**
 - Grade for prevalence and distribution of palliative care programs in Texas hospitals
- Promote appropriate pain and symptom management among cancer survivors**
 - Grade for pain and symptom management among cancer survivors
- Promote timely access to and utilization of care for individuals who are under-insured or uninsured, or do not qualify for financial assistance programs**

Strategic Actions

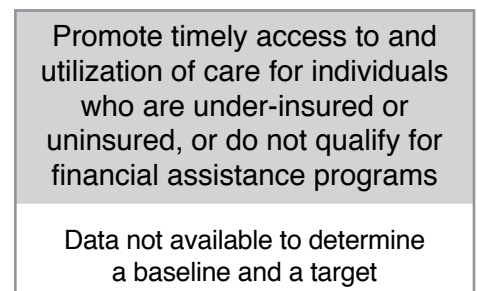
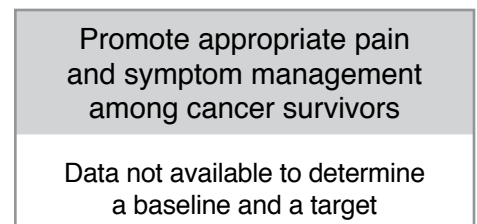
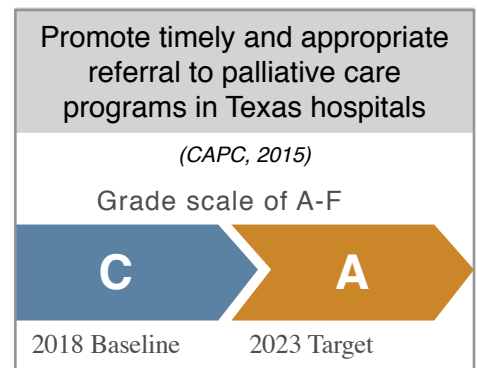
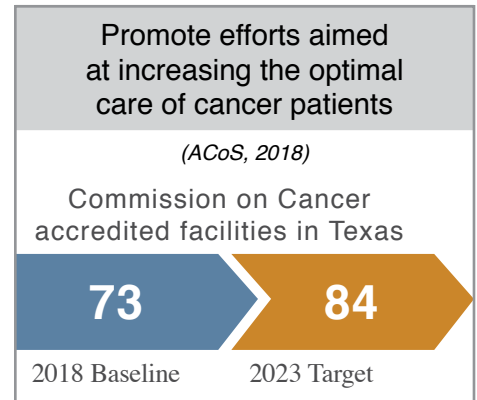
Policy

- Increase access to insurance coverage
- Promote policies that increase timely access to high-quality cancer care for all Texans
- Support policies that increase opportunities for evidence-based palliative care among cancer patients in Texas
- Identify and promote policy changes that increase and improve delivery of care and reduce structural and financial barriers

Communication/Education

- Promote awareness, education, and advocacy efforts aimed at increasing the number of patients who receive high quality care
- Develop, implement, and evaluate public and health professional education and advocacy plans to support adoption and practice of existing standards of quality care for all patients
- Increase standardized training for and utilization of patient navigators and community health workers in both clinic and community settings across the continuum of cancer care

DATA TARGETS



Continued on the next page →

- Develop, implement, and evaluate education and advocacy plans to support an increase in the number of hospitals and treatment facilities with the Commission on Cancer accreditation in underserved areas of Texas
- Promote opportunities to retain/increase the number of healthcare professionals in underserved areas
- Increase shared decision making between healthcare professionals and patients related to professional treatment guidelines

Programs/Interventions

- Gather data and report on patient/survivor experiences with diagnosis, treatment, and post-treatment care plans

Systems Improvement/Infrastructure

- Encourage hospitals/facilities to pursue advanced certification for palliative care.
- Implement evidence-based systems changes to increase and improve delivery of care and reduce structural and financial barriers



Goal 13

Promote overall health and well-being of people affected by cancer

Objectives

1. Promote quality follow-up care and post-treatment support programs for cancer survivors

- Percentage of persons living 5 years or longer after diagnosis

2. Increase percentage of cancer survivors with a written summary of treatment and care plan

- Percentage of cancer survivors, ages 18+ years, who received a written summary of their cancer treatments
- Percentage of cancer survivors, ages 18+ years, who received a care plan

Strategic Actions

Policy

- Advocate for policies and funding for implementation of evidence-based survivorship programs shown to improve quality of life
- Partner with cancer advocacy organizations to support policies aimed at improving Texas cancer patients' quality of life from diagnosis onward
- Promote policy changes that will support reimbursement for advanced care planning conversations and concurrent use of hospice care during active treatment

Communication/Education

- Increase knowledge of survivorship issues for the general public, cancer survivors, health care professionals and policy makers
- Develop and evaluate curricula based on the IOM recommendations that target health-profession students, community health workers, and health professionals
- Train health-profession students, community health workers, and health professionals using established curricula
- Encourage healthcare professionals to provide and discuss survivorship care plans with all cancer patients
- Support and promote awareness for programs that provide psychosocial, physical, logistical, and emotional support for cancer patients and their caregivers

DATA TARGETS

Promote quality follow-up care and post-treatment support programs for cancer survivors

(TCR, 2018)

Percentage of cancer survivors who have been diagnosed 5 or more years ago

67%

75%

2018 Baseline

2023 Target

Increase percentage of cancer survivors with a written summary of treatment and care plan

Data not available to determine a baseline and a target

Continued on the next page →

- Train healthcare professionals in recommendations/ standards for follow-up care [e.g., Children’s Oncology Group Passport for Care; Psychosocial Standards of Care Project for Childhood Cancer (PSCPCC)], including baselines for neuro-cognitive status and follow-up screening
- Encourage health care providers, institutions, voluntary organizations, government agencies and others to provide education and information on palliative care and hospice care, including scope of services, locations, access to care and reimbursement

Programs/Interventions

- Promote appropriate follow-up care (e.g., guidelines for concordant cancer screening) and other appropriate post-treatment support (e.g., tobacco cessation treatment counseling, physical activity recommendations) to cancer survivors
- Increase patient access to copay and financial counseling assistance
- Promote availability of caregiver support services
- Partner with school intervention specialists to raise awareness among Texas patients, families, educators and administrators as to support that should be available through the school system (individualized education programs, educational consultants, etc.)

Systems Improvement/Infrastructure

- Develop and enhance patient-centered navigation systems and pathways based on best practices to ensure optimum care across the continuum of cancer survivorship.
- Assess compliance with survivorship policies, programs, and activities relative to the recommendations from the IOM
- Promote use of standards for delivery of survivor services developed by national organizations (e.g., National Hospice and Palliative Care Organization, Center to Advance Palliative Care, American College of Surgeons)
- Increase availability of telemedicine/telehealth services and infrastructure.
- Offer tobacco treatment at all points of care, but especially during teachable moments such as immediately after diagnosis
- Build existing treatment summary and survivorship care plan templates into systems of care and electronic medical records
- Promote hospice and palliative care certification and credentialing

Goal 14

Strengthen the public health and clinical health care system infrastructure by supporting the delivery of the most appropriate evidence-based cancer prevention interventions and clinical care services

Objectives

- 1. Increase the number of quality, accessible facilities and well-trained professionals in medically underserved areas**
 - Number of counties in the state that are full /partial Medically Underserved Area (MUA)
- 2. Maintain and enhance high-quality cancer data provided by the Texas Cancer Registry**
 - North American Association of Central Cancer Registries (NAACCR) Certification
 - NCI Surveillance, Epidemiology, and End Results (SEER) Program
- 3. Enhance and protect existing cancer data systems, including the Texas Cancer Registry, BRFSS, and YRBSS, to monitor and support outcome-driven cancer research, prevention, and control**

Strategic Actions

Policy

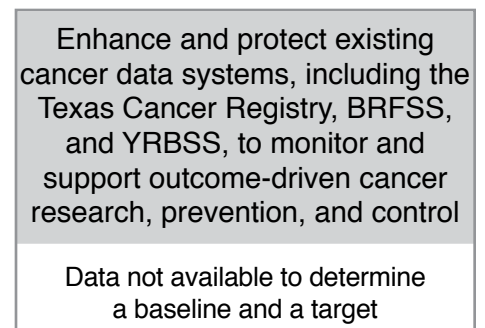
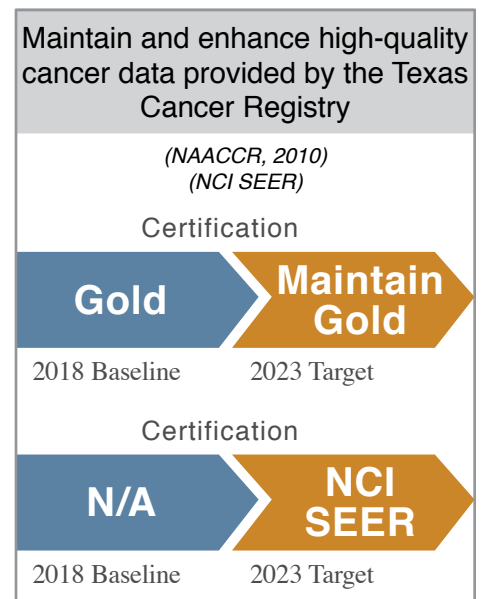
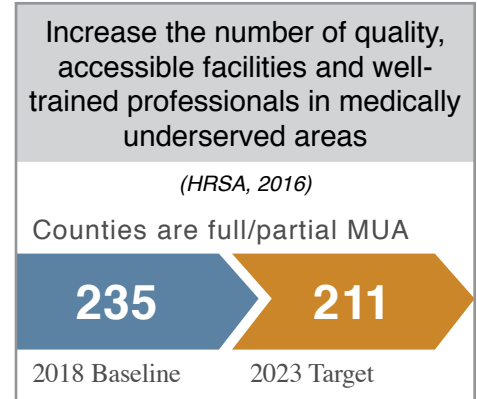
- Promote policies that increase insurance coverage for Texans
- Advocate for and dedicate consistent and reliable funding to strengthen the infrastructure supporting collection of quality cancer data
- Advocate for and dedicate consistent and reliable funding to strengthen the infrastructure supporting the delivery of quality cancer prevention and care
- Advocate for adoption of state and federal policies to maintain an adequate supply of standard cancer prevention vaccines and treatment drugs
- Advocate for appropriate payment for prevention services and the continuum of cancer care services
- Advocate for payment for community health workers and patient navigators in delivering cancer prevention and care services

Communication/Education

- Enhance awareness and promote use of cancer data for research, prevention, and control
- Increase standardized training for and utilization of patient navigators and community health workers in both clinic and community settings across the continuum of cancer care

Continued on the next page →

DATA TARGETS



Programs/Interventions

- Identify and promote awareness of existing facilities and resources and fully implement evidence-based strategies and interventions to build and sustain healthy communities
- Promote collaborations that facilitate transition of young adult and childhood cancer survivors to adult health care systems

Systems Improvement/Infrastructure

- Increase the number and distribution of quality, accessible, and affordable facilities, equipment, technology, and cancer prevention and care services
- Increase the number of well-trained health professionals serving rural, frontier and other health professional shortage areas

- Increase the number of accredited facilities (e.g., ACoS, the Joint Commission, Accreditation Association for Ambulatory Health Care) in areas of need
- Increase the number of NCI-designated cancer centers in the state
- Increase data collection and enhanced data elements for electronic health records
- Promote careers in health care with specialized focus on cancer from high school through graduate education
- Address projected shortages in cancer workforce geographically and by specialty
- Maintain NAACCR Gold Standard Certification for the TCR
- Develop and implement a plan to become an NCI SEER registry
- Increase availability of telemedicine/telehealth services

Goal 15

Support the highest quality and most innovative research, including clinical trials, that will enhance the potential for medical or scientific breakthroughs in cancer

Objectives

- 1. Enhance and expand research capabilities and collaboration of public or private institutions of higher education with other public or private entities that will promote a substantial increase in both the quality and quantity of cancer research**
- 2. Emphasize rapid and open dissemination and translation of research to practice and to the community**

Strategic Actions

Policy

- Advocate for funding to support research across the spectrum of cancer research
- Support policies that promote community-based participatory research
- Support policies that promote health equity in research

Communication/Education

- Include the voice of the advocate/survivor in the clinical and community health research process
- Promote research training and diversity of trainees at all levels
- Develop, implement, and evaluate education and advocacy plans to increase public education and professional awareness, knowledge, and adoption of clinical trials
- Increase participation, and retention of eligible patients, including those from diverse and underrepresented populations, in cancer clinical trials

Programs/Interventions

- Support funding opportunities across the spectrum of cancer research
- Conduct implementation science research to advance the development, testing, tailoring and adoption of evidence-based strategies across the cancer continuum
- Promote biospecimen research and tumor profiling that will increase understanding of treatment effectiveness, resistance and other clinical outcomes

DATA TARGETS

Data not available to determine a baseline and a target

Continued on the next page →

- Promote research to improve the quality of life for survivors that address the physical, cognitive and psychosocial consequences of treatment from diagnosis through late effects
- Support research leading to new therapies and clinical trials targeted specifically for children with cancer that are effective and less toxic
- Promote basic/molecular research leading to understanding the causes of childhood cancers
- Continue to focus on kidney and liver cancer research in Texas in order to improve early detection, diagnosis and treatment

Systems Improvement/Infrastructure

- Recruit highly qualified researchers at different career stages with goals of increasing the quality, diversity, geographic distribution, and size of the workforce
- Promote development of infrastructure that supports high quality research
- Support and collaborate with public and private stakeholders to expand research capabilities and accelerate translation of research into community-based practice
- Support biotech infrastructure and data ecosystem that will provide opportunities to collect, share and coordinate efforts with large datasets so that researchers, clinicians and patients can work together to contribute, analyze and disseminate data and findings
- Expand geographic (community) reach of clinical trials to provide patients and physicians with local access to novel therapeutics and cancer treatments
- Develop, implement, and evaluate education and advocacy plans to increase infrastructure resources for clinical trials



Goal 16

Improve patient care by accelerating the movement of prevention interventions, therapeutics, diagnostics and technologies into practice

Objectives

- 1. Increase the life sciences ecosystem and infrastructure as a result of public and private investments**
- 2. Increase statewide economic development as a result of public and private investments**

Strategic Actions

Policy

- Promote policies that support the development and implementation of new products that will impact cancer across the continuum

Communication/Education

- Educate health professionals and researchers on promising new advances, technologies and products

Programs/Interventions

- Promote funding opportunities that support company formation, relocation, and commercialization activities
- Increase opportunities for research into and commercialization of new and more effective screening and early detection methods
- Support companies developing novel products addressing large, challenging unmet medical needs based on sound scientific research
- Support the development of promising new technologies that accelerate tumor characterization and testing new therapies

Systems Improvement/Infrastructure

- Support infrastructure, including core facilities and shared instrumentation grants, to promote efficiencies in cancer research and new product development

DATA TARGETS

Data not available to determine a baseline and a target

PROGRESS AND CHALLENGES 2012 – 2017

The 2012 Texas Cancer Plan identified baseline data points for many of the cancer plan goals and objectives. The latest available data (2014 to 2017) was compared to the objectives in the 2012 Texas Cancer Plan to evaluate progress.

Improving	2012 Baseline Metric	Most Recent Metric	Measurement Period
Youth Smoking	17.4%	7.4%	2011-2017
Adult Smoking	16%	14.3%	2010-2016
HPV Vaccination - Females	41.2%	44.2%	2012-2014
HPV Vaccination - Males	14.2%	26.0%	2012-2014
Breast Cancer Screening	73.1%	76.7%	2014-2016
Breast Cancer Late Stage	41.8 / 100,000	34.3 / 100,000	2008-2015
Breast Cancer Mortality Rate	21.8 / 100,000	19.6 / 100,000	2008-2015
Colorectal Cancer Incidence Rate	42.8 / 100,000	37.5 / 100,000	2008-2015
Colorectal Cancer Late Stage	22.4 / 100,000	19.6 / 100,000	2008-2015
Colorectal Cancer Mortality Rate	16 / 100,000	13.9 / 100,000	2008-2015
Lung Cancer Late Stage	36.9 / 100,000	29.9 / 100,000	2011-2015
Lung Cancer Mortality Rate	46.1 / 100,000	35.1 / 100,000	2008-2015
Pain & Symptom Management	C	C+	2008-2013
Uninsured Population	27%	16.6%	2010-2016

APPENDIX 1, Progress and Challenges 2012 – 2017 cont.

New Threats	2012 Baseline Metric	Most Recent Metric	Measurement Period
Electronic Vapor Products - Youth User	—	10.3%	2017
Electronic Vapor Products – Adult User	—	4.7%	2016

Worsening	2012 Baseline Metric	Most Recent Metric	Measurement Period
Healthy Weight - Youth	68.5%	63.4%	2011-2017
Healthy Weight - Adult	30.9%	29.7%	2010-2016
Physical Activity - Youth	44.5%	42.9%	2011-2017
Youth Nutrition-based Guidelines	18.5%	17.3%	2011-2017
Adult Nutrition (5 fruit, veg / day)	23.8%	17.2%	2009-2016
Pap Test	77.7%	75%	2014-2016
CoC Accredited Facilities in TX	86	76	2011-2017

Little or No Change	2012 Baseline Metric	Most Recent Metric	Measurement Period
Cervical Cancer Incidence Rate	9.3 / 100,000	9.1 / 100,000	2008-2015
Cervical Cancer Late Stage	4.1 / 100,000	3.9 / 100,000	2008-2015
Cervical Cancer Mortality Rate	2.9 / 100,000	2.9 / 100,000	2008-2015
Colorectal Cancer Screening	60.8%	60.1%	2014-2016
Melanoma Incidence Rate	14 / 100,000	13 / 100,000	2008-2015
Melanoma Mortality Rate	2.5 / 100,000	2.0 / 100,000	2008-2015
Palliative Care	C	C	2011-2015

RESOURCES

- ❖ Accreditation Association for Ambulatory Health Care: www.aaahc.org
- ❖ Advisory Committee on Immunization Practices: www.cdc.gov/vaccines/acip/index.html
- ❖ American Academy of Pediatrics: www.aap.org
- ❖ American Association of Cancer Research: www.aacr.org/Pages/Home.aspx
- ❖ American Cancer Society: www.cancer.org
- ❖ American College of Surgeons Commission on Cancer: www.facs.org/quality-programs/cancer/coc/
- ❖ American Lung Association: www.lung.org
- ❖ Behavioral Risk Factor Surveillance System: www.cdc.gov/brfss/
- ❖ American Society of Clinical Oncology: www.asco.org
- ❖ Cancer Alliance of Texas: www.dshs.texas.gov/tcccp/CancerAllianceofTexas.shtm
- ❖ Cancer Control P.L.A.N.E.T.: <https://cancercontrolplanet.cancer.gov>
- ❖ Cancer MoonshotSM Blue Ribbon Panel: www.cancer.gov/research/key-initiatives/moonshot-cancer-initiative/blue-ribbon-panel
- ❖ Cancer Prevention and Research Institute of Texas: www.cprit.texas.gov
- ❖ Center to Advance Palliative Care: www.capc.org
- ❖ Centers for Disease Control and Prevention: www.cdc.gov
- ❖ CEO Cancer Gold Standard™: www.cancergoldstandard.org
- ❖ Children’s Oncology Group: www.childrensoncologygroup.org
- ❖ Guide to Community Preventive Services: www.thecommunityguide.org
- ❖ Health Resources and Services Administration Medically Underserved Areas: <https://datawarehouse.hrsa.gov>
- ❖ Healthy People 2020: www.cdc.gov/nchs/healthy_people/hp2020.htm
- ❖ ImmTrac2 – Texas Immunization Registry: <https://immtrac.dshs.texas.gov>
- ❖ Institute of Medicine Survivorship Care: www.nationalacademies.org/hmd/Reports/2005/From-Cancer-Patient-to-Cancer-Survivor-Lost-in-Transition.aspx
- ❖ The Joint Commission: www.jointcommission.org
- ❖ Lung Cancer Alliance: <https://lungcanceralliance.org>
- ❖ National Cancer Institute: www.cancer.gov
- ❖ National Cancer Institute Research Tested Intervention Programs: <https://rtips.cancer.gov/rtips/>
- ❖ National Comprehensive Cancer Control Program: www.cdc.gov/cancer/ncccp/
- ❖ National Comprehensive Cancer Network: www.nccn.org
- ❖ National Hospice and Palliative Care Organization: www.nhpco.org
- ❖ National Immunization Survey – Teen: www.cdc.gov/nchs/nis/data_files_teen.htm
- ❖ National Radon Action Plan: www.epa.gov/radon/national-radon-action-plan-strategy-saving-lives
- ❖ NCI-Designated Cancer Centers: www.cancer.gov/research/nci-role/cancer-centers
- ❖ North American Association of Central Cancer Registries: www.naacr.org
- ❖ Patient Advocate Foundation: www.patientadvocate.org
- ❖ The Perryman Group: www.cprit.state.tx.us/images/uploads/perryman_cprit_impact_2017.pdf
- ❖ Psychosocial Standards of Care Project for Childhood Cancer: www.mattiemiracle.com/standards

APPENDIX 2, Resources cont.

- ❖ Smoke-free Texas: www.smokefreetexas.org
- ❖ State Office of Rural Health: www.texasagriculture.gov/GrantsServices/RuralEconomicDevelopment/StateOfficeofRuralHealth.aspx
- ❖ Texas Behavioral Risk Factor Surveillance System: www.dshs.texas.gov/chs/brfss/
- ❖ Texas Cancer Registry: www.dshs.texas.gov/tcr/
- ❖ Texas Department of State Health Services: www.dshs.texas.gov
- ❖ Texas Regional Extension Center Resource Center: www.texmed.org/hitrec/
- ❖ Texas Primary Care Office: www.dshs.texas.gov/chpr/default.shtm
- ❖ Texas Society of Genetic Counselors: www.tsgc.org
- ❖ Texas Youth Risk Behavior Surveillance System: www.dshs.texas.gov/chs/yrbs/
- ❖ U.S. National Institutes of Health – Clinical Trials: <https://clinicaltrials.gov>
- ❖ U.S. Preventive Services Task Force: www.uspreventiveservicestaskforce.org
- ❖ University of Texas MD Anderson Cancer Center: www.mdanderson.org

REFERENCES

1. Centers for Disease Control and Prevention. CDC - National Comprehensive Cancer Control Program (NCCCP). www.cdc.gov/cancer/ncccp/index.htm. Accessed February 18, 2016.
2. American Cancer Society. More than 4 in 10 Cancers and Cancer Deaths Linked to Modifiable Risk Factors. www.cancer.org/latest-news/more-than-4-in-10-cancers-and-cancer-deaths-linked-to-modifiable-risk-factors.html. Accessed April 27, 2018.
3. American Association for Cancer Research (AACR). Cancer Prevention. www.aacrfoundation.org/Pages/prevention.aspx. Accessed October 3, 2017.
4. Texas Department of State Health Services. Center for Health Statistics. Texas Health Data. <http://healthdata.dshs.texas.gov/HealthFactsProfiles>. Accessed October 3, 2017.
5. Texas Department of State Health Services, Center for Health Statistics. Leading Causes of Death by Texas County of Residence, 2015, Source: Texas Death Certificates. April 2018. Accessed April 2018.
6. Cancer Epidemiology and Surveillance Branch, Texas Department of State Health Services. Texas Cancer Registry. www.dshs.texas.gov/tcr/. Accessed February 15, 2018.
7. Cancer Prevention and Research Institute of Texas. www.cprit.state.tx.us/about-cprit/laws-rules-and-guidelines/
8. The Perryman Group. *An Economic Assessment of the Cost of Cancer in Texas and the Benefits of the Cancer Prevention and Research Institute of Texas (CPRIT) and Its Programs: 2017 Update.*; 2017. http://www.cprit.state.tx.us/images/uploads/perryman_cprit_impact_2017.pdf
9. Centers for Disease Control and Prevention. Chronic Disease Overview | Publications | Chronic Disease Prevention and Health Promotion | CDC. www.cdc.gov/chronicdisease/. Published June 28, 2017. Accessed October 3, 2017.
10. National Cancer Institute. Risk Factors. National Cancer Institute. www.cancer.gov/about-cancer/causes-prevention/risk. Accessed October 3, 2017.
11. Cancer Progress Report Graphics. <http://www.cancerprogressreport.org/Pages/graphics.aspx>. Published 2017. Accessed December 8, 2017.
12. National Cancer Institute. Monograph 22: A Socioecological Approach to Addressing Tobacco-Related Health Disparities - National Cancer Institute - Cancer Control and Population Sciences. <https://cancercontrol.cancer.gov/brp/tcrb/monographs/22/>. Accessed October 3, 2017.
13. National Cancer Institute. Tobacco. National Cancer Institute. <https://www.cancer.gov/about-cancer/causes-prevention/risk/tobacco/cessation-fact-sheet>. Accessed October 3, 2017.
14. Texas Department of State Health Services. 2016 Texas BRFSS Summary Tables. 2016. <http://healthdata.dshs.texas.gov/HealthRisks/BRFSS>. Accessed October 4, 2017.
15. Campaign for Tobacco-Free Kids. The Toll of Tobacco in Texas. Campaign for Tobacco-Free Kids. www.tobaccofreekids.org/problem/toll-us/texas. Published May 10, 2017. Accessed October 3, 2017.
16. Centers for Disease Control and Prevention. CDC VitalSigns - Tobacco Use, Secondhand Smoke - Infographics. Centers for Disease Control and Prevention. www.cdc.gov/vitalsigns/tobaccouse/smoking/infographic.html. Published September 7, 2010. Accessed June 29, 2018.
17. Centers for Disease Control and Prevention. Smoking and Tobacco Use; Annual Deaths Attributable to Cigarette Smoking: Risks from Smoking. Centers for Disease Control and Prevention. www.cdc.gov/tobacco/infographics/health-effects/index.htm. Published May 17, 2018. Accessed June 29, 2018.

APPENDIX 3, References cont.

18. Bridging Research Efforts and Advoacy Toward Healthy Environments (BREATHE), University of Kentucky College of Nursing. E-cigarette Fact Sheet. www.uky.edu/breathe/tobacco-policy/quick-facts-topic/e-cigarettes-and-hookah. Accessed October 3, 2017.
19. Vardavas CI, Anagnostopoulos N, Kougias M, Evangelopoulou V, Connolly GN, Behrakis PK. Short-term pulmonary effects of using an electronic cigarette: impact on respiratory flow resistance, impedance, and exhaled nitric oxide. *Chest*. 2012;141(6):1400-1406. doi:10.1378/chest.11-2443
20. Centers for Disease Control and Prevention. E-cigarette Ads and Youth. Centers for Disease Control and Prevention. www.cdc.gov/vitalsigns/ecigarette-ads/index.html. Published March 23, 2017. Accessed June 29, 2018.
21. Centers for Disease Control and Prevention. Cancer and obesity. Centers for Disease Control and Prevention. www.cdc.gov/vitalsigns/obesity-cancer/index.html. Published October 3, 2017. Accessed December 8, 2017.
22. American Association for Cancer Research (AACR). Preventing Cancer: Understanding Risk Factors. www.cancerprogressreport.org/Pages/cpr17-preventing-cancer.aspx. Accessed October 4, 2017.
23. Texas Department of State Health Services. 2017 YRBS Summary Tables. 2017. <http://healthdata.dshs.texas.gov/HealthRisks/YRBS>. Accessed October 4, 2017.
24. National Cancer Institute. Obesity and Cancer Risk - National Cancer Institute. www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet. Accessed April 6, 2016.
25. Community Preventive Services Task Force (Task Force). The Guide to Community Preventive Services (The Community Guide): Nutrition, Physical Activity and Obesity. www.thecommunityguide.org. Accessed October 4, 2017.
26. National Cancer Institute. Infectious Agents. National Cancer Institute. www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents. Accessed October 4, 2017.
27. GW Cancer Center. HPV Cancer and Prevention Profiles 2017 | Cancer Control Tap. <https://smhs.gwu.edu/cancercontroltap/resources/hpv-cancer-and-prevention-profiles-2017>. Published 2017. Accessed July 6, 2018.
28. Centers for Disease Control and Prevention (CDC). CDC recommends only two HPV shots for younger adolescents. CDC. www.cdc.gov/media/releases/2016/p1020-hpv-shots.html. Published January 1, 2016. Accessed October 4, 2017.
29. Walker TY. National, Regional, State, and Selected Local Area Vaccination Coverage Among Adolescents Aged 13–17 Years — United States, 2016. *MMWR Morb Mortal Wkly Rep*. 2017;66. doi:10.15585/mmwr.mm6633a2
30. UT Health San Antonio. About Liver Cancer | Stop HCC/HCV. <http://stop-hcv-hcc.com/about-liver-cancer/>. Accessed October 4, 2017.
31. American Cancer Society. Liver Cancer Risk Factors. www.cancer.org/cancer/liver-cancer/causes-risks-prevention/risk-factors.html. Accessed October 4, 2017.
32. Centers for Disease Control and Prevention. Viral Hepatitis and Liver Cancer. www.cdc.gov/nchhstp/newsroom/docs/factsheets/viral-hep-liver-cancer.pdf. Published 2016.
33. American Association for Cancer Research (AACR). Preventing or Eliminating Infection with the Four Main Cancer-causing Pathogens. www.cancerprogressreport.org/PublishingImages/CPR17/1701053G_CPR17_SidebarJPGs_16.jpg. Published 2017.
34. Community Preventive Services Task Force (Task Force). The Guide to Community Preventive Services: Cancer. The Guide to Community Preventive Services (The Community Guide). www.thecommunityguide.org/topic/cancer. Accessed October 4, 2017.
35. U.S. Department of Health and Human Services. National Institutes of Health. National Cancer Institute. 2008-2009 Annual Report, President's Cancer Panel. Reducing Environmental Cancer Risk: What We Can Do Now. https://deainfo.nci.nih.gov/Advisory/pcp/annualReports/pcp08-09rpt/PCP_Report_08-09_508.pdf. Published 2009. Accessed October 4, 2017.
36. Texas Department of State Health Services. Indoor Radon - Radiation Control Program. www.dshs.texas.gov/radiation/radon.aspx. Accessed October 4, 2017.
37. University of Kentucky, College of Nursing, Clean Indoor Air Partnership. Radon: What the Public and Policymakers Need to Know. www.uky.edu/breathe/sites/breathe.uky.edu/files/radonbooklet.pdf. Published December 2009. Accessed October 4, 2017.

APPENDIX 3, References cont.

38. Centers for Medicare and Medicaid Services. Decision Memo for Screening for Lung Cancer with Low Dose Computed Tomography (LDCT) (CAG-00439N). www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=274. Accessed October 6, 2017.
39. U.S. Preventive Services Task Force. Final Update Summary: Lung Cancer: Screening - US Preventive Services Task Force. www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/lung-cancer-screening. Accessed October 7, 2017.
40. Agency for Healthcare Research and Quality (AHRQ). Is Lung Cancer Screening Right for Me? | Effective Health Care. <https://effectivehealthcare.ahrq.gov/decision-aids/lung-cancer-screening/home.html>. Accessed October 7, 2017.
41. Centers for Disease Control and Prevention. CDC - What Screening Tests Are There for Lung Cancer? www.cdc.gov/cancer/lung/basic_info/screening.htm. Published July 26, 2017. Accessed October 7, 2017.
42. Wender R, Fontham ETH, Barrera E, et al. American Cancer Society lung cancer screening guidelines. *CA Cancer J Clin*. 2013;63(2):106-117. doi:10.3322/caac.21172
43. Oeffinger KC, Fontham ETH, Etzioni R, et al. Breast Cancer Screening for Women at Average Risk: 2015 Guideline Update From the American Cancer Society. *JAMA*. 2015;314(15):1599-1614. doi:10.1001/jama.2015.12783
44. Centers for Disease Control and Prevention. CDC - What Is Breast Cancer Screening? www.cdc.gov/cancer/breast/basic_info/screening.htm. Published September 27, 2017. Accessed October 7, 2017.
45. U.S. Preventive Services Task Force. Final Update Summary: Breast Cancer: Screening - US Preventive Services Task Force. www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/breast-cancer-screening1. Accessed October 7, 2017.
46. American Cancer Society. American Cancer Society Recommendations for the Early Detection of Breast Cancer. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/american-cancer-society-recommendations-for-the-early-detection-of-breast-cancer.html. Accessed May 3, 2018.
47. U.S. Preventive Services Task Force. Final Update Summary: Cervical Cancer: Screening - US Preventive Services Task Force. www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/cervical-cancer-screening2. Accessed August 27, 2018.
48. Centers for Disease Control and Prevention. CDC - What Should I Know About Cervical Cancer Screening? www.cdc.gov/cancer/cervical/basic_info/screening.htm. Accessed October 7, 2017.
49. Saslow D, Solomon D, Lawson HW, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. *CA Cancer J Clin*. 2012;62(3):147-172. doi:10.3322/caac.21139
50. U.S. Preventive Services Task Force. Final Update Summary: Colorectal Cancer: Screening - US Preventive Services Task Force. www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/colorectal-cancer-screening2. Accessed October 7, 2017.
51. Centers for Disease Control and Prevention. CDC - What Should I Know About Screening for Colorectal Cancer? www.cdc.gov/cancer/colorectal/basic_info/screening/index.htm. Published October 4, 2017. Accessed October 7, 2017.
52. American Cancer Society. American Cancer Society Recommendations for Colorectal Cancer Early Detection. www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/acs-recommendations.html. Accessed October 7, 2017.
53. Levin B, Lieberman DA, McFarland B, et al. Screening and Surveillance for the Early Detection of Colorectal Cancer and Adenomatous Polyps, 2008: A Joint Guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology*†. *CA Cancer J Clin*. 2008;58(3):130-160. doi:10.3322/CA.2007.0018
54. U.S. Preventive Services Task Force. USPSTF Final Prostate Cancer Screening Recommendations. USPSTF Final Prostate Screening Recommendations. <https://screeningforprostatecancer.org/>. Accessed May 23, 2018.
55. Centers for Disease Control and Prevention. The ABC's of Hepatitis. www.cdc.gov/hepatitis/resources/professionals/pdfs/abctable.pdf. Published 2016.

APPENDIX 3, References cont.

56. U.S. Preventive Services Task Force. Final Update Summary: Hepatitis C: Screening - US Preventive Services Task Force. www.uspreventiveservicestaskforce.org/page/Document/UpdateSummaryDraft/hepatitis-c-screening1. Accessed October 7, 2017.
57. American Cancer Society. Family Cancer Syndromes. www.cancer.org/cancer/cancer-causes/genetics/family-cancer-syndromes.html. Accessed May 4, 2018.
58. National Cancer Advisory Board. Cancer Moonshot Blue Ribbon Panel Report. National Cancer Institute. www.cancer.gov/research/key-initiatives/moonshot-cancer-initiative/blue-ribbon-panel/blue-ribbon-panel-report-2016.pdf. Accessed October 7, 2017.
59. Texas Society of Genetic Counselors. TSGC - Texas Society of Genetic Counselors. www.tsgc.org/default.aspx. Accessed May 4, 2018.
60. National Cancer Institute. Types of Cancer Treatment. National Cancer Institute. www.cancer.gov/about-cancer/treatment/types. Accessed October 10, 2017.
61. National Cancer Institute. Precision Medicine in Cancer Treatment. National Cancer Institute. www.cancer.gov/about-cancer/treatment/types/precision-medicine. Accessed October 10, 2017.
62. National Cancer Institute. Immunotherapy. National Cancer Institute. www.cancer.gov/about-cancer/treatment/types/immunotherapy. Accessed October 10, 2017.
63. American College of Surgeons. Commission on Cancer (CoC) Accredited Programs in Texas. American College of Surgeons. www.facs.org/search/cancer-programs?state=TX. Accessed August 27, 2018.
64. American Cancer Society. Survivorship Care Plans. www.cancer.org/treatment/survivorship-during-and-after-treatment/survivorship-care-plans.html. Accessed December 8, 2017.
65. American College of Surgeons. Cancer Program Standards (2016 Edition). American College of Surgeons. www.facs.org/quality-programs/cancer/coc/standards. Accessed May 4, 2018.
66. American Society of Clinical Oncology. Key Components of Survivorship Care. ASCO. www.asco.org/practice-guidelines/cancer-care-initiatives/prevention-survivorship/survivorship/survivorship. Published February 2, 2016. Accessed December 8, 2017.
67. Patient Advocate Foundation. Patient Advocate Foundation National Financial Resource Directory. www.patientadvocate.org/NURD/index2.php?application=financial. Accessed May 4, 2018.
68. American Cancer Society. Programs and Resources to Help With Cancer-related Expenses. www.cancer.org/treatment/finding-and-paying-for-treatment/understanding-health-insurance/if-you-have-trouble-paying-a-bill/programs-and-resources-to-help-with-cancer-related-expenses.html. Accessed May 4, 2018.
69. American Lung Association. Addressing the Stigma of Lung Cancer. www.lung.org/assets/documents/research/addressing-the-stigma-of-lung-cancer.pdf. Published 2014.
70. Health Resources & Services Administration. HRSA Data Warehouse – Shortage Areas. <https://datawarehouse.hrsa.gov/topics/shortageAreas.aspx>. Accessed December 15, 2017.
71. North Texas Regional Extension Center. The Physician Workforce in Texas. www.merritthawkins.com/UploadedFiles/MerrittHawkins/Surveys/Merritt_Hawkins_NTREC_Physician_Workforce_Survey.pdf. Accessed December 15, 2017.
72. Texas Department of State Health Services. 2015 Trends, Distribution and Demographics Fact Sheets. www.dshs.texas.gov/chs/hprc/. Accessed December 15, 2017.
73. Kaiser Family Foundation. State Category | Health Professional Shortage Areas | The Henry J. Kaiser Family Foundation. December 2016. www.kff.org/state-category/providers-service-use/health-professional-shortage-areas/. Accessed December 15, 2017.
74. American Cancer Society. *Cancer Facts and Figures Special Section: Cancer Disparities and Premature Deaths.*; 2011. www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2011/special-section-cancer-disparities-and-premature-deaths-cancer-facts-and-figures-2011.pdf.
75. Centers for Disease Control and Prevention. United States Cancer Statistics. <https://gis.cdc.gov/Cancer/USCS/DataViz.html>. Accessed September 19, 2016.
76. United States Census Bureau. U.S. Census Bureau QuickFacts: Texas. www.census.gov/quickfacts/TX. Accessed December 22, 2017.

APPENDIX 3, References cont.

77. Texas Demographic Center. Aging in Texas: Introduction. www.demographics.texas.gov/Resources/publications/2016/2016_06_07_Aging.pdf. Published June 2016.
78. DeSantis CE, Fedewa SA, Goding Sauer A, Kramer JL, Smith RA, Jemal A. Breast cancer statistics, 2015: Convergence of incidence rates between black and white women. *CA Cancer J Clin*. 2016;66(1):31-42. doi:10.3322/caac.21320
79. United States Census Bureau. American FactFinder - Community Facts. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml. Accessed December 22, 2017.
80. Kaiser Family Foundation. Poverty Rate by Race/Ethnicity. The Henry J. Kaiser Family Foundation. www.kff.org/other/state-indicator/poverty-rate-by-raceethnicity/. Published September 22, 2017. Accessed December 22, 2017.
81. United States Census Bureau. Health Insurance Coverage in the United States: 2016. www.census.gov/library/publications/2017/demo/p60-260.html. Accessed December 22, 2017.
82. Texas Department of State Health Services. The Hefty Price Tag of Obesity in Texas 2014. www.dshs.texas.gov/Obesity/Reports/. Accessed October 4, 2017.

Note: Goals 4, 10, 11, 15, and 16 are not represented in the Measures table because no data is available to determine a baseline and target.

MEASURES				
Goal	Objective	Metric	Baseline & Data Source	Recommended Target (2023) and % Change from Baseline
1.0 Eliminate tobacco use to reduce new cases and deaths from tobacco-related cancers	1.1 Decrease the percentage of youth who use tobacco products	% of students who are current smokers	7.4% (YRBSS, 2017)	6% Δ 19%
		% of students who are current electronic vapor product users	10.3% (YRBSS, 2017)	8% Δ 22%
	1.2 Decrease the percentage of adults who use tobacco products	% of adults who are current smokers	14.3% (BRFSS, 2016)	11% Δ 23%
		% of adults who are current e-cigarette users	4.7% (BRFSS, 2016)	3% Δ 36%
	1.3 Reduce exposure to secondhand smoke	% of Texans covered by comprehensive smoke-free workplace, restaurant and bar laws	43.5% of state population with 100% smoke-free workplace, restaurant and bar laws (NCI, State Cancer Profiles, 2018)	100% of Texans covered by comprehensive workplace, restaurant and bar smoke-free laws
	2.0 Increase adoption of healthy behaviors to reduce new cases and deaths from cancers related to nutrition, physical activity and obesity	2.1 Increase the percentage of youth and adults who are at a healthy weight	% of high school students who are at a healthy weight	63.4% (YRBSS, 2017)
% of adults who are at a healthy weight (BMI 18.5 to <25)			29.7% (BRFSS, 2016)	36% Δ 21%
2.2 Increase the percentage of youth and adults who engage in evidence-based physical activity guidelines		% of high school students who are physically active 60 minutes or more on 5 or more days per week	42.9% (YRBSS, 2017)	54% Δ 26%
		% of adults who have engaged in leisure time physical activity in the past month	74.8% (BRFSS, 2016)	82% Δ 10%
2.3 Increase the percentage of youth and adults who follow evidence-based nutrition guidelines		% of youth who eat at least 5 fruits and/or vegetables per day	17.3% (YRBSS, 2017)	26% Δ 50%
		% of adults who eat at least 5 fruits and/or vegetables per day	17.2% (BRFSS, 2016)	30% Δ 74%
3.0 Increase skin protection behaviors to reduce new cases and deaths from melanoma		3.1 Promote skin cancer prevention behavior	Age-adjusted incidence rate of melanoma (per 100,000)	13.0 per 100,000 (TCR, 2015)
	3.2 Reduce the mortality from melanoma	Age-adjusted mortality rate of melanoma (per 100,000)	2.0 per 100,000 (TCR, 2015)	1.5 per 100,000 Δ 25%

MEASURES cont.

Goal	Objective	Metric	Baseline & Data Source	Recommended Target (2023) and % Change from Baseline
5.0 Increase vaccination rates for vaccines shown to reduce the risk of cancer	5.1 Increase the percentage of youth and young adults who have completed the recommended HPV vaccine series according to national guidelines	% of females age 13-17 who are up-to-date with HPV vaccination series	39.7% (NIS-Teen, 2016)	60% Δ 51%
		% of males age 13-17 who are up-to-date with HPV vaccination series	26.5% (NIS-Teen, 2016)	45% Δ 70%
	5.2 Increase the percentage of youth and adults who have completed the recommended Hepatitis B vaccine series according to national guidelines	% of adolescents age 13-17 years who completed ≥ 3 doses of Hepatitis B vaccine	84.5% (NIS Teen, 2016)	93% Δ 10%
		% of adults who completed ≥ 3 doses of Hepatitis B vaccine	49.5% (BRFSS, 2016)	55% Δ 11%
6.0 Increase screening and early detection to increase the number of cancers diagnosed at an early stage and reduce deaths from breast cancer	6.1 Increase the rate of women who receive breast cancer screening according to national guidelines	% of women age 50-74 years who have had a mammogram within the past two years	73.1% (BRFSS, 2016)	81% Δ 10%
	6.2 Reduce the rate of breast cancer at late stage	Age-adjusted incidence rate of female breast cancer at late stage (regional and distant) (per 100,000)	34.3 per 100,000 (BRFSS, 2016)	31 per 100,000 Δ 10%
		Age-adjusted mortality rate, female breast cancer (per 100,000)	19.6 per 100,000 (TCR, 2015)	17 per 100,000 Δ 13%
7.0 Increase screening and early detection to reduce the number of new cases and deaths from cervical cancer	7.1 Increase the percentage of women who receive cervical cancer screening according to national guidelines	% of women age 21-65 years who had a Pap test within the last three years	75.0% (BRFSS, 2016)	85% Δ 13%
	7.2 Reduce the rate of invasive cervical cancer	Age-adjusted incidence rate of cervical cancer at invasive stage (local, regional and distant) (per 100,000)	9.1 per 100,000 (TCR, 2015)	7.0 per 100,000 Δ 23%
		Age-adjusted mortality rate, cervical cancer (per 100,000)	2.9 per 100,000 (TCR, 2015)	2.0 per 100,000 Δ 31%
8.0 Increase screening and early detection to reduce the number of new cases and deaths from colorectal cancer	8.1 Increase the percentage of adults who receive colorectal cancer screening according to national guidelines	% of adults, ages 50-75, who have fully met the USPSTF recommendation	60.1% (BRFSS, 2016)	80% Δ 33%
	8.2 Reduce rate of invasive colorectal cancer	Age-adjusted incidence rate of colorectal cancer at invasive stage (local, regional and distant) (per 100,000)	37.4 per 100,000 (TCR, 2008)	27 per 100,000 Δ 28%
		Age-adjusted mortality rate, colorectal cancer (per 100,000)	15.8 per 100,000 (TCR, 2008)	12 per 100,000 Δ 24%

MEASURES cont.

Goal	Objective	Metric	Baseline & Data Source	Recommended Target (2023) and % Change from Baseline
9.0 Increase screening and early detection among Texans at high risk for lung cancer to increase the number of cancers diagnosed at an early stage and reduce deaths from lung cancer	9.1 Increase lung cancer screening of adults according to national guidelines			Data not available to determine a baseline and target
	9.2 Reduce the rate of lung cancer at late stage (regional and distant)	Age-adjusted incidence rate of lung cancer at late stage (regional and distant) (per 100,000)	34.9 per 100,000 (TCR, 2014)	28 per 100,000 Δ 20%
		Age-adjusted mortality rate, lung cancer (per 100,000)	35.1 per 100,000 (TCR, 2015)	32 per 100,000 Δ 9%
12.0 Increase timely access to quality cancer diagnostic, treatment, and palliation services for all Texans	12.1 Promote efforts aimed at increasing the optimal care of cancer patients	Number of CoC accredited facilities	73 (American College of Surgeons, 2018)	84
	12.2 Promote timely and appropriate referral to palliative care programs in Texas hospitals	Palliative Care Scorecard	Grade of C on a scale of A – F (Center to Advance Palliative Care, 2015)	Grade of A
	12.3 Promote appropriate pain and symptom management among cancer survivors			Data not available to determine a baseline and target
	12.4 Promote timely access to and utilization of care for individuals who are under-insured or uninsured, or do not qualify for financial assistance programs			Data not available to determine a baseline and target
13.0 Promote overall health and well-being of people affected by cancer	13.1 Promote quality follow-up care and post-treatment support programs for cancer survivors	Percentage of cancer survivors were diagnosed 5 or more years ago	67% (TCR, 2018)	75% Δ 12%
	13.2 Increase percentage of cancer survivors with a written summary of treatment and care plan			Data not available to determine a baseline and target

Goal	Objective	Metric	Baseline & Data Source	Recommended Target (2023) and % Change from Baseline
14.0 Strengthen the public health and clinical health care system infrastructure by supporting the delivery of the most appropriate evidence-based cancer prevention interventions and clinical care services	14.1 Increase the number of quality, accessible facilities and well-trained professionals in medically underserved areas	Number of Medically Underserved Area counties (full and partial)	235 counties are full/partial MUA (HRSA, 2016)	211 counties Δ 10%
	14.2 Maintain and enhance high-quality cancer data provided by the Texas Cancer Registry	Type and level of cancer registry certification	NAACCR Gold Certification	NCI SEER Registry
	14.3 Enhance and protect existing cancer data systems, including the Texas Cancer Registry, BRFSS and YRBSS, to monitor and support outcome-driven cancer research, prevention and control		Data not available to determine a baseline and target	

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CANCER PREVENTION & RESEARCH
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