This update is based on the latest available health data (up to 2017 for blood lead data and cancer incidence, and 2018 for overall mortality rates and for asthma endpoints). Also presented are environmental data from 2018 to match the health data.

ABOUT THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) TOXICOLOGY, RISK ASSESSMENT, AND RESEARCH DIVISION (TD)

- The TD helps the TCEQ make scientifically sound decisions by applying toxicological principles when evaluating environmental data, issuing authorizations, developing environmental regulations, and making policy decisions. The TD also conducts research to address environmental toxicology questions that are important to the state of Texas.
- TCEQ toxicologists identify chemical hazards, evaluate potential exposures, assess human health risks, and communicate risk to the general public and stakeholders.
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Common Terms

Air monitoring comparison values (AMCVs) are chemical-specific short- and long-term air concentrations used to evaluate air monitoring data. These values are developed to protect human health and welfare, and are set well below levels where health effects are known to occur. Slight exceedances of AMCVs will not necessarily lead to health effects, but the TCEQ works to keep ambient air concentrations below AMCVs.

Air toxics, also known as hazardous air pollutants (HAPs), are pollutants that are known or suspected to cause cancer or other serious health effects. Benzene, arsenic, and mercury are examples of air toxics.

Automated gas chromatograph (autoGC) is a sampler that measures volatile organic compounds every hour, continuously, 22 hours per day, and 7 days per week.

A canister sampler collects volatile organic compounds during a 24-hour sampling duration once every-sixth-day.

Volatile organic compounds (VOCs) are potentially toxic chemicals that readily evaporate into the air and are often used as solvents, degreasers, paint thinners, and fuels (e.g. benzene).
Data from monitoring air toxics can be used for finding pollution sources, evaluating air permit applications, and identifying potential health concerns.

The TCEQ toxicology staff uses ambient air monitoring data to assess the potential for measured concentrations of air toxics to impair health and/or cause odors. Benzene is of particular focus because it is the chemical that is measured closest to its AMCV.

In 2018, all monitors in Texas had annual average benzene concentrations below the state's long-term AMCV. Figure 1 represents the majority of monitoring sites in some major Texas cities.

In addition to benzene, all 85 VOCs monitored in Texas in 2018 were below their AMCVs.

The TCEQ uses air permitting, ambient air monitoring, and the Air Pollution Watch List (APWL) to ensure that ambient air toxic concentrations are at levels that are protective of public health and welfare (Figure 2).

**FIGURE 1**
Average Benzene Concentrations at Monitoring Sites in Texas in 2018

**FIGURE 2**
Three State Programs to Decrease Ambient Air Toxic Levels

*The TCEQ Long-Term Air Monitoring Comparison Value - 1.4 ppb*

---

### Air Monitoring Data Collection and Evaluation
- Fixed site network monitors
- Mobile monitors
- Survey equipment
- Health Effects Review of measured concentrations using AMCVs

### Air Permitting Control Technology and Protectiveness Review
- Evaluation of impacts considering surrounding land use and predicted concentrations from air dispersion modeling using ESLs

### Air Monitoring Data Collection and Evaluation
- Increased monitoring & inspections
- Stricter air permit reviews
- Negotiate with companies to make additional emission reductions

**APWL Strategic Action Plan**
- Form Work Group
- Increase monitoring & inspections
- Stricter air permit reviews
- Negotiate with companies to make additional emission reductions

---
Air Pollutant Watch List (APWL)

- The APWL is a TCEQ program designed to address areas in Texas where data show persistent, elevated concentrations of air toxics.
- More information regarding the TCEQ APWL program can be accessed at www.tceq.texas.gov/toxicology/apwl

Active Air Pollutant Watch List Areas

Currently there are four active APWL areas (Table 1).


Air Pollutant Watch List Successes

The TCEQ has used the APWL process to address areas of concern and delist pollutants and/or areas from the APWL. The following table shows the pollutants and/or areas where ambient chemical concentrations have been successfully reduced to levels that are no longer of potential concern (Table 2).

TABLE 1
Active Air Pollutant Watch List Areas

<table>
<thead>
<tr>
<th>APWL</th>
<th>City</th>
<th>County</th>
<th>Pollutant(s)</th>
<th>Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>0501</td>
<td>N/A</td>
<td>Bowie and Cass</td>
<td>Hydrogen sulfide</td>
<td>1999</td>
</tr>
<tr>
<td>0601</td>
<td>El Paso</td>
<td>El Paso</td>
<td>Hydrogen sulfide</td>
<td>2004</td>
</tr>
<tr>
<td>1001</td>
<td>Evadale</td>
<td>Jasper</td>
<td>Hydrogen sulfide</td>
<td>2003</td>
</tr>
<tr>
<td>1201</td>
<td>Freeport</td>
<td>Brazoria</td>
<td>Arsenic, cobalt, nickel, vanadium</td>
<td>2005</td>
</tr>
</tbody>
</table>

TABLE 2
Air Pollutant Watch List Successes

<table>
<thead>
<tr>
<th>APWL</th>
<th>City</th>
<th>County</th>
<th>Pollutant(s)</th>
<th>Added</th>
<th>Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0401</td>
<td>Dallas</td>
<td>Dallas</td>
<td>Nickel</td>
<td>2004</td>
<td>2016</td>
</tr>
<tr>
<td>0701</td>
<td>Odessa</td>
<td>Ector</td>
<td>Ethylene</td>
<td>2001</td>
<td>2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Benzene</td>
<td>2004</td>
<td>2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sulfur Dioxide</td>
<td>2003</td>
<td>2016</td>
</tr>
<tr>
<td>1003</td>
<td>Port Arthur</td>
<td>Jefferson</td>
<td>Benzene</td>
<td>2001</td>
<td>2014</td>
</tr>
<tr>
<td>1004</td>
<td>Port Neches</td>
<td>Jefferson</td>
<td>1,3-Butadiene</td>
<td>1996</td>
<td>2009</td>
</tr>
<tr>
<td>1101</td>
<td>Bastrop</td>
<td>Bastrop</td>
<td>Hydrogen sulfide</td>
<td>2007</td>
<td>2012</td>
</tr>
<tr>
<td>1202</td>
<td>Texas City</td>
<td>Galveston</td>
<td>Acrolein, butyraldehyde, valeraldehyde</td>
<td>2001</td>
<td>2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Benzene</td>
<td>2003</td>
<td>2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hydrogen sulfide</td>
<td>2004</td>
<td>2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Propionaldehyde</td>
<td>2001</td>
<td>2016</td>
</tr>
<tr>
<td>1203</td>
<td>Texas City</td>
<td>Galveston</td>
<td>Benzene</td>
<td>2004</td>
<td>2007</td>
</tr>
<tr>
<td>1204</td>
<td>Lynchburg Ferry area</td>
<td>Harris</td>
<td>Benzene</td>
<td>2002</td>
<td>2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Styrene</td>
<td>2003</td>
<td>2014</td>
</tr>
<tr>
<td>1206</td>
<td>Galena Park</td>
<td>Harris</td>
<td>Benzene</td>
<td>2000</td>
<td>2017</td>
</tr>
<tr>
<td>1207</td>
<td>Milby Park area</td>
<td>Harris</td>
<td>1,3-Butadiene</td>
<td>1999</td>
<td>2009</td>
</tr>
<tr>
<td>1401</td>
<td>Point Comfort</td>
<td>Calhoun</td>
<td>Ethylene dichloride</td>
<td>2004</td>
<td>2007</td>
</tr>
<tr>
<td>1402</td>
<td>Corpus Christi</td>
<td>Nueces</td>
<td>Benzene</td>
<td>1998</td>
<td>2010</td>
</tr>
</tbody>
</table>
Passage of House Bill 3030, 78th Regular Legislative Session (2003), resulted in the new Texas Water Code, §26.408. The statute requires that when the TCEQ receives notice from another agency, or when the TCEQ independently documents a case of groundwater contamination, the TCEQ must make every effort to provide notice, via first class mail, to each owner of a private drinking water well that may be affected by the contamination. The notice must be provided within 30 days of the determination, or of the receipt of information from another agency.

Eighteen new cases of contamination during calendar year 2018 required notice to private drinking water well owners (Table 3).

### TABLE 3

<table>
<thead>
<tr>
<th>TCEQ Region</th>
<th>Number of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Amarillo</td>
<td>1</td>
</tr>
<tr>
<td>2 – Lubbock</td>
<td>3</td>
</tr>
<tr>
<td>4 – Dallas</td>
<td>2</td>
</tr>
<tr>
<td>7 – Midland</td>
<td>1</td>
</tr>
<tr>
<td>9 – Waco</td>
<td>2</td>
</tr>
<tr>
<td>12 – Houston</td>
<td>8</td>
</tr>
<tr>
<td>14 – Corpus Christi</td>
<td>1</td>
</tr>
</tbody>
</table>

Health indicators are quantitative or qualitative measures that can be used to assess the health of a given population. In epidemiology studies, air quality is often linked to premature death, cancer, and damage to the respiratory and cardiovascular systems. In order to gain a better understanding of the health of Texans in the various regions of the state, the TCEQ Toxicology, Risk Assessment, and Research Division began routinely reviewing health data collected by the Texas Department of State Health Services (DSHS) and the Centers for Disease Control and Prevention (CDC). All data presented on the following pages are estimates, because it may only include a sample of the population. Self-reported and underreported cases of disease and illness are also limitations of the data sets. Differences in results from various reporting agencies may also occur.

### Lead Data

In 1995, the 74th Texas legislature passed a law requiring the reporting of elevated blood lead levels in children under age 15. DSHS maintains the registry of blood lead results.

- According to the Texas Childhood Lead Poisoning Prevention Program (TX CLPPP) statewide elevated blood lead levels (>5 μg/dL) in children have demonstrated a decreasing trend from 2012 to 2017 (Figure 4).
- The number of children tested for elevated blood lead levels has been consistent from 2012 to 2017 (Figure 5).
Cancer Data

- According to the United States Surveillance, Epidemiology, and End Results Program (SEER), statewide cancer incidence rates (all cancers) in Texas from 2013 to 2017 are among the lowest in the United States (Figure 6).
- Available data indicate that Texans have no more, or less, cancer than many other states and the nation as a whole, even though Texas has more industry than any other state. It is important to note that the environment is only one factor that may contribute to adverse health outcomes such as cancer.

Region-specific cancer rates are presented in subsequent sections.

![Interactive Map](https://statecancerprofiles.cancer.gov/map/map.noimage.php)

**FIGURE 6**
Cancer Incidence Rates for the United States, 2013–2017

**FIGURE 7**
Cancer Incidence Rates in Texas, 2012–2017

**FIGURE 8**
Average Age-Adjusted Cancer Incidence Rates for Leukemias, Lung and Bronchus Cancers, and Non-Hodgkin’s Lymphoma, 2013–2017

- General risk factors for cancer include:
  - Personal or family history of cancer
  - Tobacco use/smoking
  - Obesity
  - Alcohol consumption
  - Some types of viral infections, such as human papillomavirus (HPV)
  - Exposure to carcinogenic chemicals
  - Exposure to radiation, including ultraviolet radiation from the sun
  - Older age

Source: Division of Cancer Prevention and Control, CDC

- According to the Texas Cancer Registry, statewide cancer incidence rates in Texas have demonstrated a decreasing trend from 2012 to 2017 (the most recent rates currently available) (Figure 7).
- From 2013 to 2017, Texas average age-adjusted cancer rates per 100,000 for leukemias, lung and bronchus cancers (not adjusted for smoking), and non-Hodgkin’s lymphoma were similar to California and the overall United States rates (Figure 8).

Notes:
- Incidence rates (cases per 100,000 population per year) are age-adjusted to the 2000 US standard population (19 age groups: <1, 1-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85+). Rates are for invasive cancer only (except for bladder which is invasive and in situ) or unless otherwise specified. Rates calculated using SEER*Stat. Population counts for denominators are based on Census populations as modified by NCI. The 1969–2017 US Population Data File is used for SEER and NPCR incidence rates.
- Rates are computed using cancers classified as malignant based on ICD-O-3. For more information see malignant.html
- Data not available for this combination of geography, statistic, age and race/ethnicity.
- Data for the United States does not include data from Puerto Rico

Interactive Map: [https://statecancerprofiles.cancer.gov/map/map.noimage.php](https://statecancerprofiles.cancer.gov/map/map.noimage.php)
Asthma Data

Asthma is a complex disease that is difficult to measure. As reported by the Texas Asthma Control Program (TACP) for the DSHS, the burden of asthma disproportionately affects people with certain demographic characteristics, socioeconomic status, and those living in particular geographic locations. To understand the entire burden of asthma in a community, all asthma indicators should be considered.

Region-specific asthma data are presented in subsequent sections.

Risk factors for asthma include:
- Family history of asthma
- Viral respiratory infection in infancy or childhood
- Atopy/allergies
- Occupational exposure to dust or chemical fumes
- Tobacco smoking, maternal smoking during pregnancy, or exposure to secondhand smoke
- Exposure to air pollution
- Obesity

Sources: National Center for Environmental Health and CDC’s National Asthma Control Program.

Asthma Hospitalizations (2009–2018)
- In 2018, for every 10,000 children, 7.1 asthma hospitalizations occurred annually in Texas. This represents a decrease of more than 2-fold compared to 2009, when the age-adjusted asthma hospitalization rate was 18.6 per 10,000 (Figure 9a).
- In 2017, the crude national asthma hospitalization rate for children under 18 was 10.3 per 10,000 compared to the crude rate of 7.8 per 10,000 for children under 18 in Texas (Figure 9b).

- In Texas, the age-adjusted asthma mortality rate decreased from 9.7 per 1 million people in 2008 to 8.3 per 1 million people in 2017, a reduction of approximately 15% (Figure 10a).
- Crude asthma mortality rates per 1 million people for Texas were lower than the national rates from 2008 to 2017 (Figure 10b).
Mortality in Texas

- In 2018, the top 10 leading causes of death in Texas were: diseases of the heart; malignant neoplasms; cerebrovascular diseases; chronic lower respiratory tract diseases; accidents; Alzheimer’s disease; diabetes mellitus; septicemia; kidney disease; and chronic liver disease.

- From 2012 to 2018, Texas mortality rates for all causes (Figure 11), diseases of the circulatory system (Figure 12), and diseases of the respiratory system per 100,000 (Figure 13) were similar to the overall United States rates.

**FIGURE 11**
Mortality Rates for All Causes, 2012–2018

**FIGURE 12**
Mortality from Diseases of the Circulatory System, 2012–2018

**FIGURE 13**
Mortality from Diseases of the Respiratory System, 2012–2018

Data Source: Centers for Disease Control and Prevention, National Center for Health Statistics, Underlying Cause of Death
Regional Updates

- Regional updates on asthma hospitalization rates per 10,000 among children under 18 years of age, as well as cancer incidence per 100,000 among people of all ages are reported in subsequent sections. Regional data were compared to those of the state of Texas and the United States. Asthma hospitalization results do not include HIV and drug/alcohol-use patients and are based on hospital records listing ICD-10 code J45-J46 as the principal diagnosis.

- Asthma hospitalization rate per 10,000 people for the United States are not age-adjusted. Thus, crude (non-age-adjusted) asthma hospitalization rates per 10,000 were used when regional and Texas data were compared to national values. In 2015, national asthma hospitalization statistics were not reported due to a change in reporting codes for asthma hospitalizations.

Region 1: Amarillo Area
(Armstrong, Carson, Oldham, Potter, and Randall Counties)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

- From 2010 to 2018, Amarillo area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 14) were higher than the overall Texas, and United States (2010–2017) rates for children under 18 years of age.

- From 2013 to 2017, Amarillo area average cancer incidence rates for all cancers per 100,000 (Figure 15) were slightly above Texas rates for all ages in Potter and Randall counties but were similar for Armstrong, and were lower than Texas rates for Carson and Oldham counties. Cancer incidence rates for all the counties were similar to or lower than United States rates.

**FIGURE 14**
Amarillo Area:
Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

**FIGURE 15**
Amarillo Area:
2013–2017 Average Cancer Incidence Rates per 100,000


Data Source: Texas Cancer Registry and the CDC’s National Program of Cancer Registries Cancer Surveillance System.
Region 2: Lubbock Area
(Crosby, Lubbock, and Lynn Counties)

- From 2010 to 2018, Lubbock area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 16) were higher than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

- From 2013 to 2017, Lubbock area average cancer incidence rates for all cancers per 100,000 (Figure 17) were similar to the Texas rates for all ages and were similar to or lower than the rates in the United States as a whole.

**FIGURE 16**
Lubbock Area: Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

**FIGURE 17**
Lubbock Area: 2013–2017 Average Cancer Incidence Rates per 100,000


Data Source: Texas Cancer Registry and the CDC’s National Program of Cancer Registries Cancer Surveillance System.
In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

From 2010 to 2018, Abilene area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 18) were higher than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

From 2013 to 2017, Abilene area average cancer incidence rates for all cancers per 100,000 (Figure 19) were similar to the overall Texas rates for all ages and were similar to or lower than the rates in the United States as a whole.
Region 4: Dallas-Fort Worth Area
(Dallas, Hunt, Parker, Kaufman, Johnson, Tarrant, Ellis, Hood, Denton, Rockwall, Collin, and Wise Counties)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.
- From 2010 to 2018, Dallas-Fort Worth area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 20) were lower than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

**FIGURE 20**
Dallas-Fort Worth Area:
Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

- From 2013 to 2017, average cancer incidence rates for all cancers per 100,000 (Figure 21) in the majority of the counties in the Dallas-Fort Worth area were similar to the overall Texas and United States rates for all ages.

**FIGURE 21**
Dallas-Fort Worth Area:
2013–2017 Average Cancer Incidence Rates per 100,000

Region 5: Tyler Area
(Smith County)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

- From 2010 to 2018, Tyler area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 22) were lower than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

- From 2013 to 2017, Tyler area average cancer incidence rates for all cancers per 100,000 (Figure 23) were higher than the overall Texas rates for all ages, but were similar to the United States average.

**FIGURE 22**
Tyler Area: Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

**FIGURE 23**
Tyler Area: 2013–2017 Average Cancer Incidence Rates per 100,000


Data Source: Texas Cancer Registry and the CDC’s National Program of Cancer Registries Cancer Surveillance System.
In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

Reported concentrations of hydrogen sulfide (H$_2$S) collected at the El Paso Lower Valley monitor in 2018 exceeded the state 30-min H$_2$S standard 157 times; thus, it is likely that conditions would have been odorous at times, although direct health effects from exposure to H$_2$S are not expected to occur. This area of El Paso is currently on the APWL (APWL0601) for H$_2$S.

From 2010 to 2018, El Paso area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 24) were higher than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

From 2013 to 2017, El Paso area average cancer incidence rates for all cancers per 100,000 (Figure 25) were similar to or lower than both the United States and overall Texas rates for all ages.
Region 7: Midland Area
(Midland and Martin Counties)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.
- From 2010 to 2018, Midland area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 26) were similar to the overall Texas and United States (2010–2017) rates for children under 18 years of age. The rates in the Midland area increased from 2013 to 2016, but decreased in 2017 to levels that were again similar to the Texas and United States rates.
- From 2013 to 2017, Midland area average cancer incidence rates for all cancers per 100,000 (Figure 27) were similar to the overall Texas rates for all ages and were lower than the United States rates.

**FIGURE 26**
Midland Area: Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

**FIGURE 27**
Midland Area: 2013–2017 Average Cancer Incidence Rates per 100,000

From 2010 to 2018, San Angelo area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 28) were higher than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

From 2013 to 2017, San Angelo area average cancer incidence rates for all cancers per 100,000 (Figure 29) were similar to the overall Texas and United States rates for all ages.
Region 9: Waco Area  
(McLennan and Falls Counties)

- From 2010 to 2018, Waco area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 30) were higher than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

- From 2013 to 2017, Waco area average cancer incidence rates for all cancers per 100,000 (Figure 31) were similar to the overall Texas and United States rates for all ages.

**FIGURE 30**  
Waco Area:  
Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

**FIGURE 31**  
Waco Area:  
2013–2017 Average Cancer Incidence Rates per 100,000


Data Source: Texas Cancer Registry and the CDC’s National Program of Cancer Registries Cancer Surveillance System.
Region 10: Beaumont Area
(Hardin, Jefferson, Newton, and Orange Counties)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.
- From 2010 to 2018, Beaumont area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 32) were similar to the overall Texas and United States (2010–2017) rates for children under 18 years of age.
- From 2013 to 2017, Beaumont area average cancer incidence rates for all cancers per 100,000 (Figure 33) were similar to the overall Texas and United States rates for all ages.

**FIGURE 32**
Beaumont Area: Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

**FIGURE 33**
Beaumont Area: 2013–2017 Average Cancer Incidence Rates per 100,000

Region 11: Austin Area
(Bastrop, Caldwell, Hays, Travis, and Williamson Counties)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

- From 2010 to 2018, Austin area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 34) were similar to, and for 2014 and 2016 were slightly higher than, the overall Texas and United States (2010–2017) rates for children under 18 years of age.

- From 2013 to 2017, Austin area average cancer incidence rates for all cancers per 100,000 (Figure 35) were similar to or lower than the overall Texas and United States rates for all ages.

**FIGURE 35**
Austin Area: 2013–2017 Average Cancer Incidence Rates per 100,000

Data Source: Texas Cancer Registry and the CDC’s National Program of Cancer Registries Cancer Surveillance System.
Region 12: Houston Area
(Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs. Measured short-term concentrations of VOCs were below their respective AMCVs, except for a single one-hour concentration of benzene, which was 1.02 times higher than the one-hour AMCV, but was still well below concentrations where health effects would be expected to occur. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

- From 2010 to 2018, Houston area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 36) were lower than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

- From 2013 to 2017, Houston area average cancer incidence rates for all cancers per 100,000 (Figure 37) were similar to the overall Texas rates for all ages and were similar to or lower than the rates in the United States as a whole.

**FIGURE 36**
Houston Area: Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

**FIGURE 37**
Houston Area: 2013–2017 Average Cancer Incidence Rates per 100,000


Data Source: Texas Cancer Registry and the CDC’s National Program of Cancer Registries Cancer Surveillance System.
Region 13: San Antonio Area
(Guadalupe, Comal, Kendall, Bexar, Bandera, Atascosa, Wilson, and Medina Counties)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

**FIGURE 38**
San Antonio Area: Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

- From 2010 to 2018, San Antonio area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 38) were higher than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

- From 2013 to 2017, San Antonio area average cancer incidence rates for all cancers per 100,000 (Figure 39) were similar to or lower than the overall Texas and United States rates for all ages.

**FIGURE 39**
San Antonio Area: 2013–2017 Average Cancer Incidence Rates per 100,000


Data Source: Texas Cancer Registry and the CDC’s National Program of Cancer Registries Cancer Surveillance System.
Region 14: Corpus Christi Area
(Aransas, Nueces, and San Patricio Counties)

- In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, with the exception of annual concentrations of vinyl chloride reported at one of five industrial monitoring locations in Point Comfort. All short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs (including levels of vinyl chloride at Point Comfort) would not be expected to cause adverse acute or chronic health or vegetation effects.

- From 2010 to 2013, Corpus Christi area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 40) were higher than the overall Texas and United States rates for children under 18 years of age. Starting in 2014 the asthma rates in Corpus Christi were similar to the overall Texas and United States rates. Asthma hospitalization rates in this area decreased from 29.7 per 10,000 people in 2010 to 8.6 per 10,000 people in 2018, more than a 3-fold reduction.

- From 2013 to 2017, Corpus Christi area average cancer incidence rates per 100,000 (Figure 41) were similar to the overall Texas and United States rates for all ages.

![FIGURE 40](Corpus Christi Area: Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018)

![FIGURE 41](Corpus Christi Area: 2013–2017 Average Cancer Incidence Rates per 100,000)

In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

From 2010 to 2018, Harlingen area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 42) were lower than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

From 2013 to 2017, Harlingen area average cancer incidence rates for all cancers per 100,000 (Figure 43) was somewhat lower than the overall Texas and United States rates for all ages.
In 2018 annual averages for all monitored VOCs were below their respective long-term AMCVs, and short-term concentrations of VOCs were below their respective AMCVs. Measured concentrations of VOCs would not be expected to cause adverse acute or chronic health or vegetation effects.

From 2010 to 2018, Laredo area crude (non-age-adjusted) asthma hospitalization rates per 10,000 (Figure 44) were lower than the overall Texas and United States (2010–2017) rates for children under 18 years of age.

From 2013 to 2017, Laredo area average cancer incidence rates for all cancers per 100,000 (Figure 45) were lower than the overall Texas and United States rates for all ages.

**FIGURE 44**
Laredo Area:
Crude Child Asthma Hospital Discharge Rates (per 10,000), 2010–2018

**FIGURE 45**
Laredo Area:
2013–2017 Average Cancer Incidence Rates per 100,000

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