

Meeting Summary

Subject Matter Experts Conference Call

Assessment of the Occurrence of Cancer, Houston, Texas

August 17, 2020

11:00 AM – 1:30 PM CST

PARTICIPANTS

External Subject Matter Experts (Affiliation; Specialty)

Bryan Brooks, PhD (Baylor University; Environmental Health Science and Toxicology)

Keith Downey (Kashmere Garden neighborhood, Super Neighborhood Council President; Community Representative)

Sandra Edwards (IMPACT and 5th ward neighborhood; Community Representative)

Ernest Hawk, MD, MPH (MD Anderson Cancer Center, Cancer Prevention and Population Sciences; Oncology)

Denae King, PhD (Texas Southern University; Environmental Health Justice)
Phillip Lupo, PhD, MPH (Baylor College of Medicine; Epidemiology)

Hilary Ma, MD (University of Texas MD Anderson Cancer Center, Harris Health System's Lyndon B. Johnson Hospital; Oncology)

Jennifer Przybyla, PhD (Agency of Toxic Substances and Disease Registries; Environmental Epidemiology, Risk Assessment and Toxicology)

Rita Robles (Denver Harbor neighborhood, Vice President of Harbor Civic

Association; Community Representative)

Elaine Symanski, PhD, MSPH (Baylor College of Medicine; Environmental Health Science, Environmental Epidemiology, Exposure and Risk Assessment)

Aaron Thrift, PhD (Baylor College of Medicine; Epidemiology)

Wendy Wattigney, MStat (Agency of Toxic Substances and Disease Registries; Statistics)

Huey Wilson (Trinity Garden neighborhood, Northeast Redevelopment Council President; Community Representative)

TX Department of State Health Services Staff:

Natalie Archer, PhD; Heidi Bojes, PhD, MPH; Kitten Holloway, MPH; Jessica Kessinger, MPH; Nusaybah Khan, MPH; Ketki Patel, MD, PhD, MPH; Taj Sheikh

EXPECTED OUTCOME

The purpose of the call was to determine whether an epidemiologic study of associations between specific elevated cancers and environmental contaminants in the area investigated is feasible.

BACKGROUND

Texas Department of State Health Services (DSHS) staff, who facilitated the meeting, provided a brief description of the site and the assessment of cancer reports conducted by DSHS in August 13, 2019; January 2, 2019; and March 20, 2020. Staff provided relevant background, explaining that citizen concern prompted DSHS to examine the occurrence of cancer in

neighborhoods surrounding a former creosote wood treating facility. Assessments of the occurrence of cancer in this area found that observed numbers of 5 cancer types were higher than expected based on Texas rates, when looking at the whole area (21 census tracts together). These included: acute myeloid leukemia, esophagus, larynx, liver, and lung and bronchus

cancers. When looking at individual census tracts, numbers of certain cancers were higher than expected in some census tracts but not in others. The full report can be accessed online at <https://dshs.texas.gov/epitox/CancerClusters.shtm>.

In accordance with the Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE) 2013 guidelines, DSHS organized the meeting to review these results with a group of subject matter experts to assess the feasibility of follow-up epidemiologic study.

Several participants had additional questions, and the following additional background information was provided by DSHS staff.

- DSHS did not evaluate any potential exposures from the former creosote facility; the purpose of the cancer assessments conducted was solely to determine whether observed numbers of cancer cases were statistically significantly greater than expected. This approach is consistent with CDC/CSTE cancer assessment guidelines.
- The number of liver cancers was higher than expected in several census tracts including census tract 2112. Census 2112 was highlighted in the background discussion because it is located directly north of the facility and is an area of known offsite groundwater contamination.
- The Texas Commission on Environmental Quality (TCEQ) regulates Union Pacific Railroad (current owner of the site) and oversees environmental sampling and cleanup activities. The former creosote facility was operational for approximately 80 years and up until the mid-1980's. Union Pacific Railroad bought the facility but did not conduct any operations. Union Pacific Railroad is responsible for addressing all existing contamination at the site.
- Soil and groundwater data are available from the early 1990's until 2020. The most recent groundwater monitoring event for which TCEQ was provided data was conducted in January-March 2020 and includes analysis of samples for volatile organic compounds (VOCs), semi-VOCs

and arsenic. The most recent soil sampling was conducted in February and June 2020 for total petroleum hydrocarbons and benzene, toluene, ethylbenzene and xylenes during installation of soil gas probes, and for pentachlorophenol from collection of shallow soil samples collected on and near the western and northwestern portion of the site.

- The shallow groundwater is contaminated but not used for any residential purposes. The community members receive drinking water from the City of Houston and this water is not contaminated.
- Air monitoring data from when the former creosote facility was operational was not collected. Cancer types analyzed were selected based on community concerns. These concerns were relayed to DSHS by the TCEQ for the first assessment and then by Houston Health Department for the second and third assessments. Some cancers were also selected based on the scientific literature as being associated with creosote or contaminants associated with the former facility.
- The cancer assessments did not include analysis of any 'control' cancers that are possibly unrelated to potential environmental exposures of concern.
- Childhood cancers and adult kidney-related cancers were not evaluated in the assessments.
- Based on a review of the scientific literature, TCEQ requested that adult skin cancers be included in the assessments. However, there were too few skin cancer cases over the time examined to evaluate this cancer type. Per DSHS cancer assessment protocol, cancer types with five or fewer cases are not analyzed due to unreliability of results when analyzing small numbers of cancers as well as confidentiality issues when reporting small numbers over a limited geographic area.
- The risk factors for esophageal cancers can be heterogenous. However, evaluation of histologic subtypes, which could help to determine risk factors, was not conducted because of the relatively small number of cases associated with these subtypes. Again, analyses

involving small numbers of cancers can lead to unreliable results and potential issues with protected health information.

- A 17-year time-period (2000-2016) for analysis was chosen in consultation with TCEQ (who requested the first assessment on behalf of the community members). Census tracts were not selected by DSHS according to proximity to the former creosote site. They were selected by TCEQ and then Houston Health Department based on community concerns and had varying proximities to the former creosote site.
- Based on the current scientific literature, long-term creosote exposure is associated with scrotal and skin cancers.
- CDC/CSTE recommends a standard incidence ratio (SIR) threshold value of 10 (or 10 times greater observed numbers than expected) to determine (along with other factors) if additional evaluation is necessary in a cancer assessment. DSHS is not aware of any epidemiologic studies proceeding with an SIR below 10. For all combined areas evaluated in the assessments, the SIR was below 2 (less than 2 times greater). When looking at individual census tracts, there were a few cancer types with SIRs between 3.0 and 4.3, but nothing above this. Furthermore, most of the census tracts with these higher SIRs were not adjacent to the site or near the potential exposure.
- Following CDC/CSTE guidelines, DSHS adjusted for race/ethnicity, sex, and age. DSHS did not adjust for other well-known risk factors for some of these cancers like smoking, hepatitis, fatty liver disease, cirrhosis, obesity, and alcohol consumption because this information is unavailable from the Texas Cancer Registry.
- Long-term exposure to arsenic or other chemicals in air was not considered in the assessment because environmental sampling data are not available.
- Time-trend analysis may not be meaningful or relevant because the exposure the community is concerned about existed prior to 1995 when the Texas Cancer Registry began to collect reliable data.

Additionally, long latency periods and residential mobility is a limitation in time-trend analysis.

- Residential census tracts for cancer patients are coded at the time of diagnosis and may not represent their residence during the exposure time period.

DISCUSSION

Participants discussed issues related to community concerns, potential environmental exposures, hypothesis, and study design to reach a decision about the feasibility of an epidemiologic study. The following points summarize comments made by the subject matter experts during the discussion.

Community Concerns

- Although quite a lot of residents have moved away, there are residents who have lived in the area for a long time and can't move away. This includes residents living in census tract 2112.
- Community members expressed concern about children being exposed to contaminants while playing in the soil and about people using contaminated soil for their gardens. In general, many community members are concerned about residential soil contamination, that the site has not been cleaned up, and the integrity of the onsite soil cap. The community wanted to know when the onsite soil contamination was capped in place.
- Community members were concerned that the groundwater contamination may be moving in a northerly direction.
- Community members were worried about being exposed to creosote when it rains. They mentioned that creosote appears to come up through the soil when it rains and that rainwater with creosote can accumulate in ditches and may contaminant gardens/yards.

- The community expressed concern about the health impacts, including cancer, from widespread flooding caused by Hurricane Harvey, especially in Denver Harbor neighborhood.
- The community would like an analysis of cancers diagnosed after 2016.
- Because LBJ hospital is in Kashmere Gardens, a community representative wanted to know if more current cancer data (past 2016) could be obtained from the hospital based on census tracts.

Environmental Exposures

- There are many possible causes of cancer aside from being exposed to creosote, especially for the types of cancers identified in these assessments. Some risk factors include smoking, hepatitis, fatty liver disease, cirrhosis, obesity, and alcohol consumption.
- There is no dosage evaluation (amount of exposure to creosote over time) for this population, which would make it extremely difficult to relate cancer to this specific exposure.
- There are too many risk factors associated with the cancers identified to do a study specific to the former creosote facility.
- There are too many limitations to determine whether environmental exposure is occurring. There needs to be a better understanding of current and historical exposures.

Hypothesis

- Questions about latency and the lack of information on residential history prevents one from forming a testable hypothesis.
- Given the limited environmental data available, a hypothesis for an epidemiologic study is not possible.
- It is not clear if there was any exposure, so it is not possible to come up with a testable hypothesis.

- The cancer assessments are a preliminary look at cancers occurring in the community using cancer registry data. A full-scale epidemiologic study will be resource- and time-intensive. The results of the epidemiologic study would not prove causation.
- It is premature to determine a hypothesis for an epidemiologic study because the data thus far does not support a research approach to elevated cancers identified in the DSHS cancer assessment reports.

Study Design

Given the lack of a hypothesis, discussion on a study design for an epidemiologic study was not pursued.

CONCLUSION

Outcome

The external subject matter expert group determined that, based on the information discussed during the meeting, an epidemiologic study of associations between specific cancers and environmental contaminants in the area investigated is not feasible at this time. Based on this conclusion, DSHS will not pursue an epidemiologic study related to the community's concerns about the occurrence of cancer in the area surrounding the former creosote facility.

Other Items for Consideration

Below are items suggested by the participants for additional consideration by DSHS.

1. Reconsider the timeframe selected for analysis to include 1995-1999 and for the years after 2016.
2. Conduct an exposure assessment for the community in the area surrounding the former creosote facility.

3. Depending on the exposure assessment results, consider conducting biomonitoring activities to determine whether people have been exposed to contaminants from the former creosote facility, along with a community survey to gain a better understanding of occupational and long-term exposures and other risk factors.
4. Investigate the need for additional environmental monitoring of offsite soil, groundwater, and indoor air for vapor intrusion.
5. Because there are many other known risk factors for the types of cancers identified by the assessments, explore ways to provide community education on how to mitigate known risk factors and to promote and conduct more cancer screening in the area.
6. Share community concerns about TCEQ's regulation and oversight of the Union Pacific Railroad's actions to clean up soil and groundwater contamination with the TCEQ.
7. Calculate standardized incidence ratios (SIRs) for childhood cancers (acute lymphocytic leukemia and acute myeloid leukemia) and cancers of urinary system in adults (includes cancers of kidney and renal pelvis, ureter and other urinary organs), if there are sufficient cases.