

Meeting Notes

Assessment of the Occurrence of Cancer, East Harris County, TX, 1995-2012
Subject Matter Expert Conference Call
July 24, 2015
1:30 p.m. - 3:30 p.m. CST

PARTICIPANTS

External Subject Matter Experts (Affiliation; Specialty):

Philip Lupo, PhD, MPH (Baylor College of Medicine; Molecular Epidemiology)
Manuela Orjuela, MD, ScM (Columbia University; Pediatric Oncology, Epidemiology)
Heather Reddick, DrPH (Texas Commission on Environmental Quality; Toxicology)
Michael Scheurer, PhD, MPH (Baylor College of Medicine; Molecular Epidemiology)
Elaine Symanski, PhD (UT Health Science Center at Houston; Environmental Health, Epidemiology)
Philip Turner, PhD (U.S. Environmental Protection Agency; Toxicology)
Wendy Wattigney, MStat (Agency Toxic Substances and Disease Registries; Statistics)
Jackie Young, BS (San Jacinto River Coalition; Community Representative)

TX Department of State Health Services Staff:

Heidi Bojes, PhD, MPH; Emily Hall, MPH; Kitten Holloway, MPH; Leticia Nogueira, PhD, MPH

EXPECTED OUTCOME

The purpose of this meeting (conducted via conference call) was to determine if follow-up epidemiologic study of the associations between specific cancers and environmental contaminants in the area investigated is feasible. The expected outcome was a decision on the feasibility of such a study.

BACKGROUND

Texas Department of State Health Services (DSHS) staff, who facilitated the meeting, provided a brief description of the site and the report, "Assessment of the Occurrence of Cancer, East Harris County, Texas, 1995-2012." Staff provided relevant background, explaining that citizen concern prompted DSHS to examine the occurrence of cancer in east Harris County.

Observed numbers of several of the 17 cancers analyzed were statistically significantly greater than expected, while others were statistically significantly less than expected. 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. The full report can be accessed online at:

<http://www.dshs.state.tx.us/epitox/CancerClusters.shtm>.

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

- Cancers were selected based on community concerns.
- The all-ages cancers included adult and childhood cancers.
- The geographic area of investigation was selected in accordance with community concerns.
- The report did not evaluate any particular exposures; it only compared expected and observed cancer rates. Therefore, DSHS requested that the feasibility evaluation include all cancers with statistically significant standard incidence ratios (SIRs), and focus especially on the childhood cancers with large SIRs.
- In accordance with CDC/CSTE guidelines, DSHS did not select a magnitude of effect cut-off point to determine which cancers should be further evaluated.
- Texas Cancer Registry (TCR) data only includes address at diagnosis. DSHS attempted to link to data sources with prior addresses, but had limited success; therefore, case residential history is not currently available.
- Time-trend analysis is not relevant, because the exposure the community is concerned about existed prior to 1995, when TCR began to collect reliable data.
- Following CDC/CSTE guidelines, adjustments were not made to account for multiple comparisons.
- Analysis was conducted by census tract and for the aggregate area at the request of the community. According to CDC/CSTE guidelines, census tracts are the smallest geographic unit of analysis that can produce reliable results.
- Census tracts were not selected by DSHS according to proximity to the San Jacinto River Waste Pits (SJWP). They were selected by the community, and had varying proximities to the SJWP.

DISCUSSION

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

Hypothesis

- Any hypothesis would need to be formulated based on environmental exposure data, and specifically, exposures with known associations with cancer outcomes.
- The body of scientific evidence regarding environmental exposures and cancer outcomes won't necessarily address community concerns, but is crucial for formulating a hypothesis that could be tested.

Study Design

- Designing an epidemiologic study that covers 18 years would be difficult; there would be great potential for bias.
- There is a lack of consistency of rates across census tracts, between individual tracts and the aggregate area, and between all-age and childhood cancers. This suggests that statistically significant results could be due to chance alone, especially given the number of multiple comparisons performed in the analysis. There do not appear to be any clear patterns in the data that suggest an epidemiologic study is warranted.
- The numbers of the statistically significant childhood cancers are very small and diagnoses span a large time frame. Furthermore, while the SIRs for these cancers may appear concerning, the confidence intervals for these SIR estimates are very unstable. From an expert clinical and epidemiological perspective, the data from the assessment are not alarming and do not suggest the need for additional study.
- Due to the small numbers of childhood cancer cases, it would be impossible to design an epidemiologic study with sufficient statistical power in this geographic area.
- A study focused on these particular cancers would not likely yield informative results. A better approach would be to focus on exposures and then define health outcomes of interest, rather than focusing on specific cancers.
- It might be interesting to further examine adult or all-age cancers broken down by subtype; however, additional information would be needed about the cases and environmental exposures before proceeding with an epidemiologic study.
- It could be worthwhile to look at auto-immune or other health outcomes besides cancer. DSHS does not have the resources to conduct such a study, but would lend technical support.

Environmental Exposures

- There is a lack of consistency in the scientific literature regarding associations between environmental exposures and childhood cancers; currently, there are no environmental exposures that have been clearly shown to be a main risk factor associated with childhood cancers.
- Exposure to dioxin is a concern in the area of investigation. Contaminants of concern in the Houston Ship Channel include furans, dioxins, polychlorinated biphenyl (PCBs), and some metals. The SJWP has a unique fingerprint, with different types of dioxins than are found in the rest of the ship channel.
- The ship channel, which contains the SJWP, is one of the most industrialized areas in the country, and it contains contaminants from a variety of sources. Most of this is legacy contamination dating back to the first half of the 20th century. It would be very difficult to pinpoint the source of contamination and subsequent exposures in this area.

- Flooding is a possible mode of transport for dioxins at the SJWP, and flooding over the SJWP has occurred. However, fingerprint analysis showed that the extent of dioxin contamination from the SJWP was small. Residential soil samples collected in the immediate area and in flood surge zones had dioxin levels below U.S. Environmental Protection Agency (EPA) regulatory clean-up requirements. Additionally, dioxins would not travel upstream.
- In one census tract farther from the SJWP, soil dioxin levels were elevated. However, the DSHS assessment found that the number of cancer cases in this census tract was not statistically significantly higher than expected.
- Groundwater samples collected from under the SJWP did not contain dioxins above EPA regulatory requirements. Additional groundwater sampling in the area was primarily motivated by metals, because the community reported metals poisonings.

Community Concerns

- Community members have expressed concern about cancer over the last three to four years, especially rare cancers; cancers of concern were selected according to what community members heard during door-to-door surveying of the community.
- The community is concerned about historical pollution sources, and sources of current, ongoing contamination. For this particular report, the community expressed concern about the SJWP.
- The community would like an analysis of cancers diagnosed after 2012 to occur. Particularly, multiple myeloma is of concern.
- There is also community concern about immune disorders, such as Lupus.

CONCLUSION

Outcome

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

Other Items for Consideration

Below are items suggested by participants for additional consideration by DSHS. A response to each of these items may be found in an addendum to the report, "Assessment of the Occurrence of Cancer, East Harris County, Texas, 1995-2012," available at <http://www.dshs.state.tx.us/epitox/CancerClusters.shtm>.

1. Calculate SIRs for leukemia and lymphoma subtypes for all ages.
2. Reconsider the geographic area and timeframe selected for analysis.

3. Analyze cancers among adults only, in addition to children and all ages combined.
4. Investigate the possibility of conducting biomonitoring of dioxin levels in adipose tissue.
5. Conduct a small area estimation analysis of hospital discharge data for autoimmune disorders.
6. Establish a health registry or distribute a questionnaire to the community.