Air Pollution, Climate Change, Distress, & Respiratory Health

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Background

- The Beaumont-Port Arthur region is home to the world's largest oil refinery and a major global energy sector hub.

- The location and industrial activities poses significant environment risks, including air and water pollution.

- This area is susceptible to the effects of climate change and vulnerable to climate change-impacted environmental disasters including hurricanes, floods, and severe storms.

- Natural disasters like Hurricane Harvey exacerbate these risks, resulting in chemical spills and contamination.

- Contaminated sites and limited access to healthcare further contribute to the complexity of successfully addressing environmental risks and health impacts.

Cancer and Asthma Risk Disparities in the Region

▶ The health impacts of industrial emissions in oil-producing communities, particularly in Jefferson County, Texas, have been extensively studied and documented.

▶ Black residents in this area face a 15% higher likelihood of developing cancer and a 40% higher likelihood of dying from it than other Texans.

▶ The region also experiences some of the highest cancer death rates in Texas. Asthma levels are marginally higher in Beaumont than the rest of Texas.

▶ West Port Arthur residents suffer from higher rates of asthma, cancer, and other pollution-related illnesses.

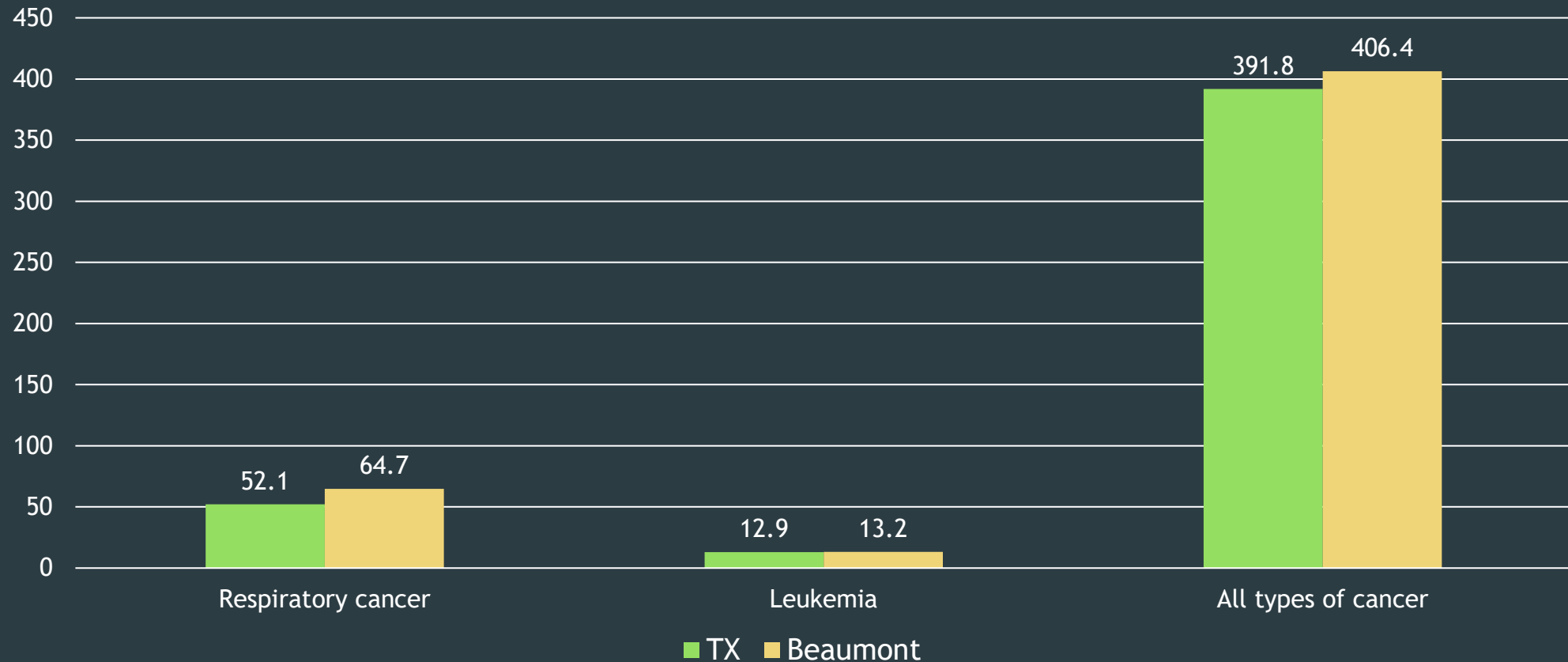▶ The region is often referred to by its residents as the "**Cancer Belt**."
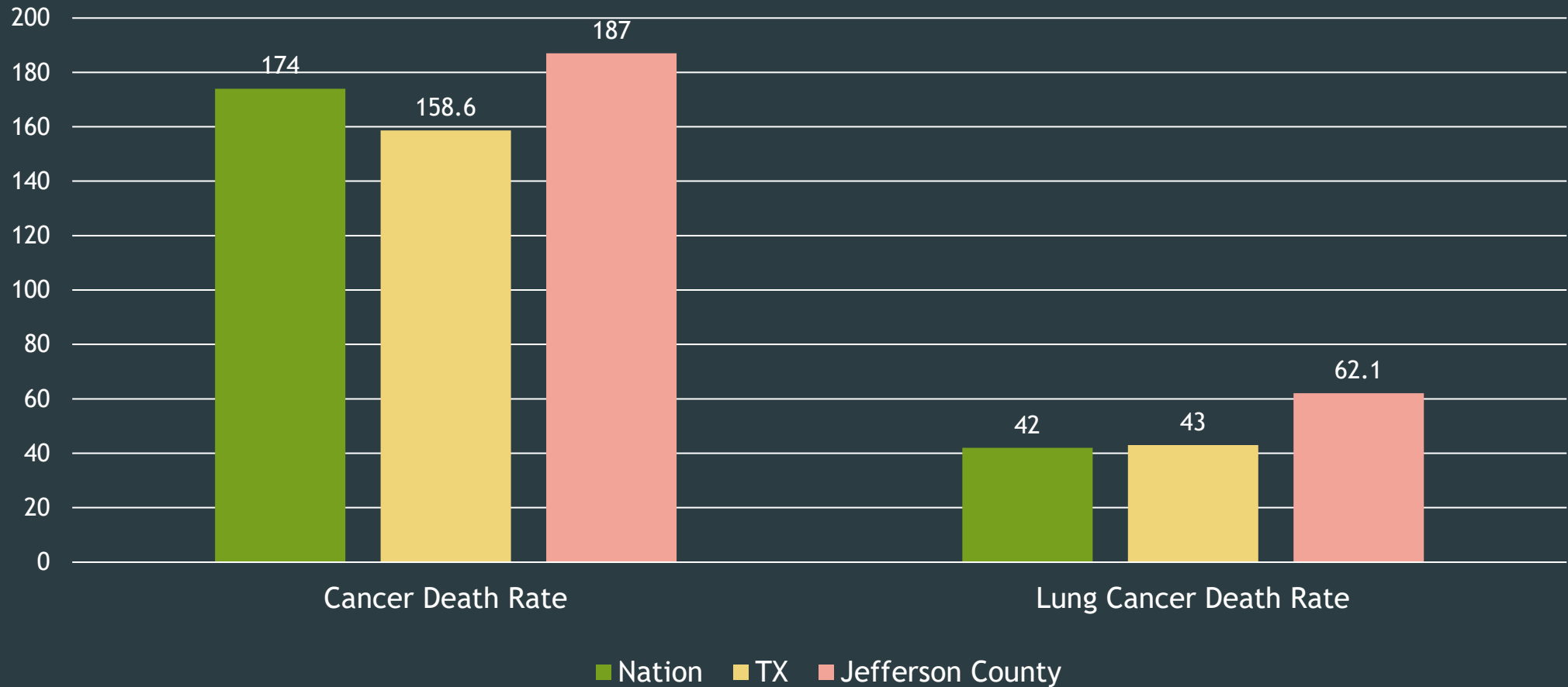
Gaps in Public Health and Environmental Data System (PHEDS)

- Public and environmental health data source:
  - CDC, Texas Dept of State Health Services– most existing data lack specific data tailored to the overburdened Gulf communities
- Identify vulnerable communities
  - Vulnerability Score– the level of social and environmental risks disproportionate impact and adverse outcomes due to public health events (e.g. pandemic and hurricanes)
    - Jefferson county (0.09554), Orange county (0.6206), Hardin county (0.4889)
- Collect air and water pollution data at community level
- Social health assessment survey via survey, interview, focus group on health equity.
- Community-based research program to engage local professionals
- Citizen-science approach with GIS and computational modeling to support data analysis– dynamically integrate and update data from multiple resources
- Generating a health equality index to connect large-scale survey data and mapping system.

Social Determinants of Health (SDOH)

▶ The social determinants of health (SDOH) are the non-medical factors that influence health outcomes.

▶ They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems.

- Income and social protection
- Education
- Unemployment and job insecurity
- Working life conditions
- Food insecurity

- Housing, basic amenities and the environment
- Early childhood development
- Social inclusion and non-discrimination
- Structural conflict
- Access to affordable health services of decent quality.

Climate Change and Distress

▶ Climate change is impacting the mental health of individuals around the world. However, the link between climate change and mental health is often overlooked.

▶ Impact of climate change on mental health is threefold:

1. Immediate impact of extreme weather (water scarcity, property destruction in storms, sea surge, and wildfire) & hotter temperatures (heat stress, mood disorder)

2. Chronic impacts– loss of biodiversity and reduced agricultural productivity severely affecting livelihoods and driving the loss of homelands and cultures through migration.

3. Climate anxiety: from concern for what is happening to others elsewhere and fear of what is to come

▶ A global study has found young people are suffering "eco-anxiety", primarily "a fear of the future" due to climate change and government inaction on the environment crisis.– nearly half (47%) of aged 18-34 in the US say the stress they feel about climate affects their daily life. (APA, 2020)

Questions & Discussions