

Community Cancer Investigation for the Colorado Smelter Site



COLORADO
Department of Public
Health & Environment

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What is cancer?

- Not a single disease
- Group of 100 different diseases
- Cancer is common
- Second leading cause of death in Colorado
- 1 out of 3 people will be diagnosed in their lifetime

Major risk factors



- Older age
- Family history/genetics
- Tobacco use
- Sun exposure
- Hormones
- Alcohol use
- Infections
- Diet
- Obesity
- Lack of physical activity



What about chemicals?



- Relatively few cancers definitively linked to environmental or occupational exposures
- Risk depends on amount and duration of exposure
- Cannot easily separate chemical exposure risk from other risk factors

Why study cancers in a community?

- Environmental exposures to a cancer-causing chemical
- Suspected cancer “cluster”
- Prioritize prevention efforts
- Public concern

Goal of a cancer investigation

Determine whether there is a greater than expected number of people diagnosed with specific types of cancer during a limited time period in a specific geographical area.

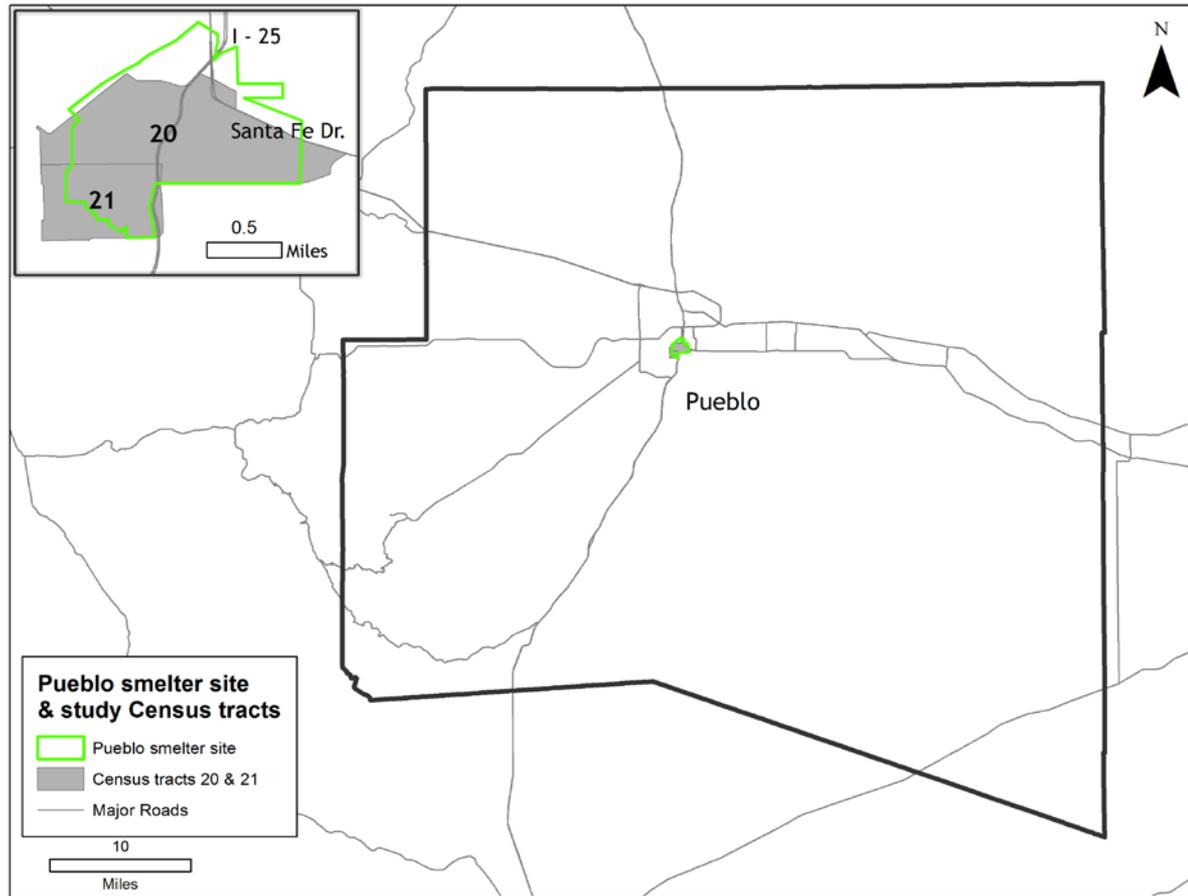
Colorado Smelter Investigation Details



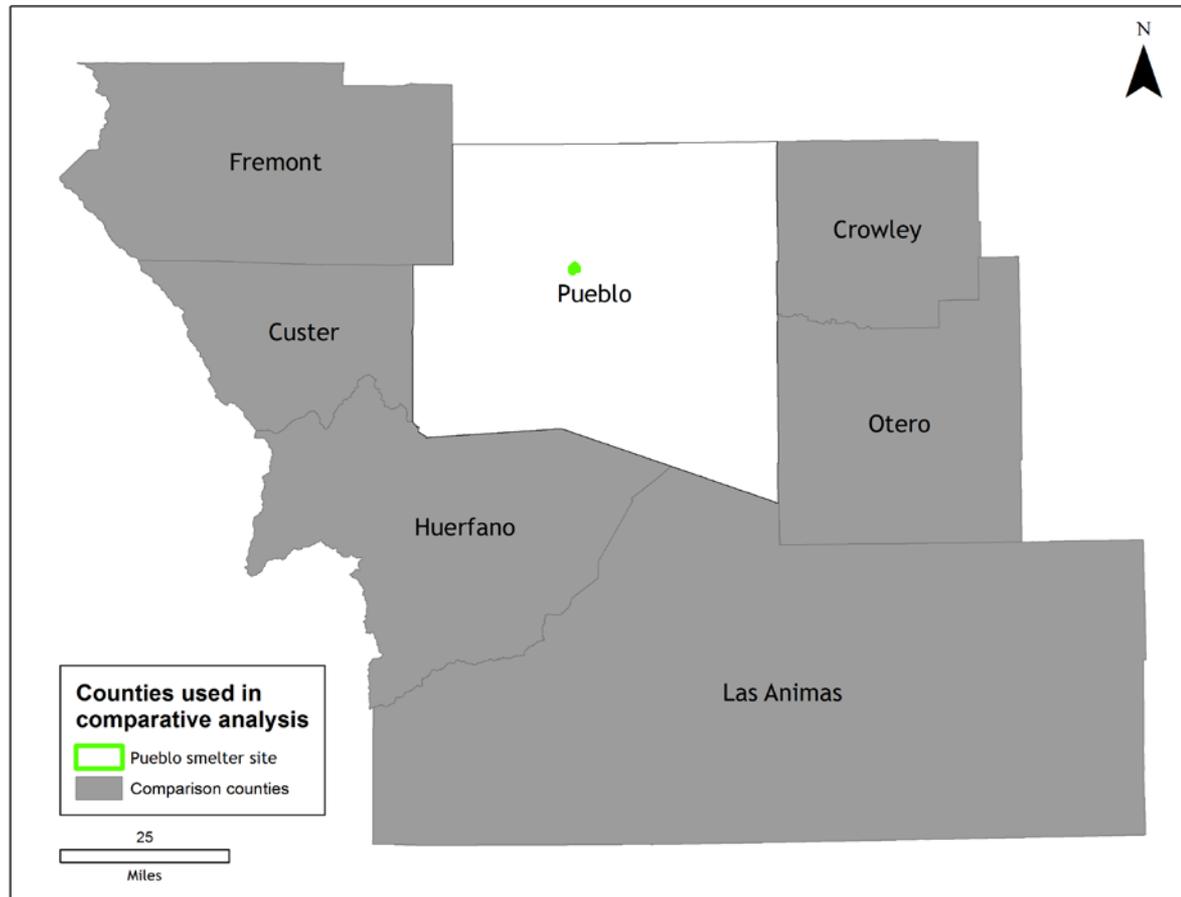
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- Study time period
 - 1990-2014
- Comparison areas
 - The rest of Pueblo County
 - Crowley, Custer, Fremont, Huerfano, Las Animas, and Otero
- Estimated completion
 - October 2017

Comparison area 1: the rest of Pueblo County



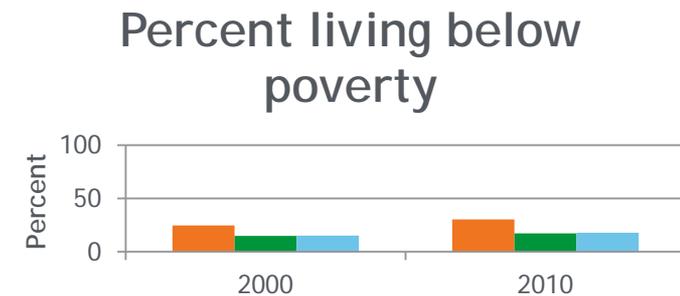
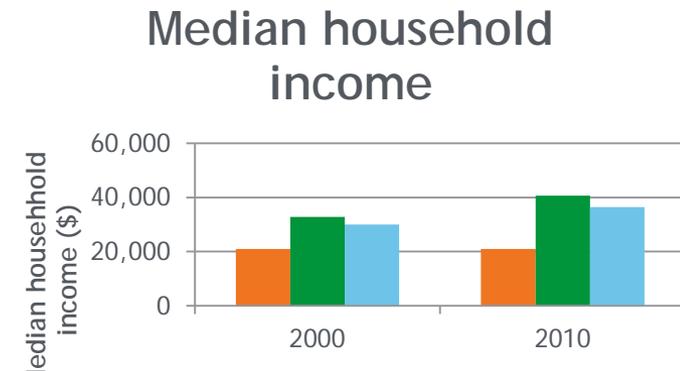
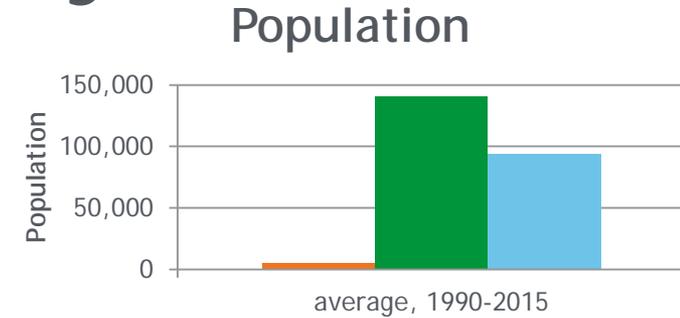
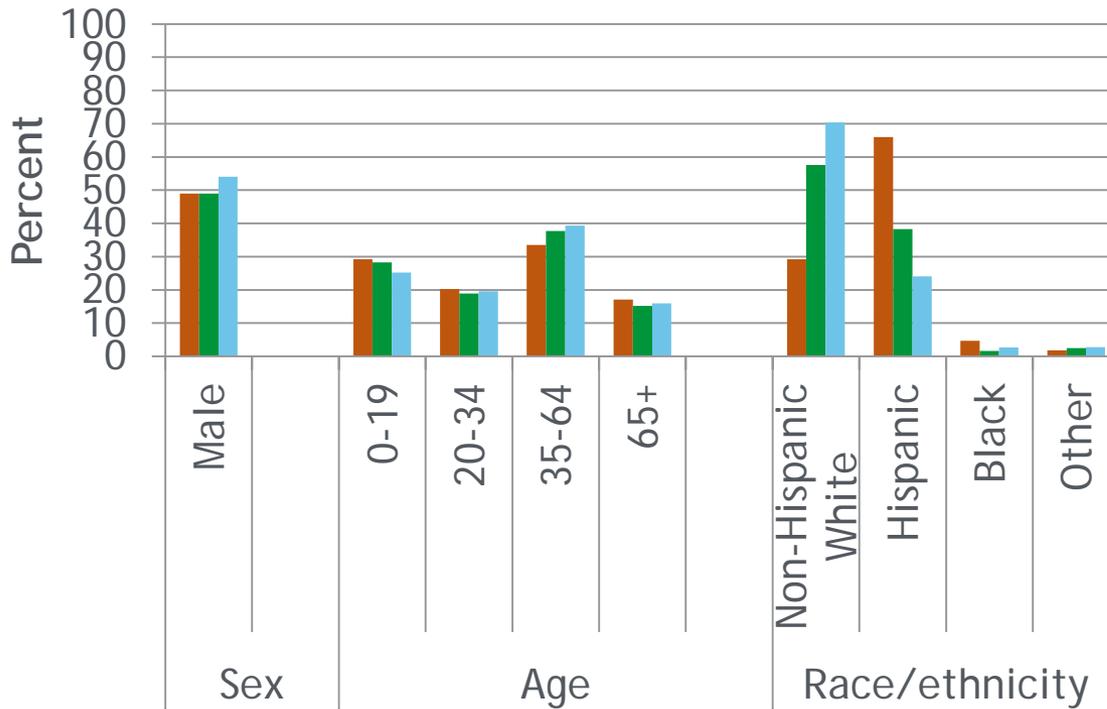
Comparison area 2: six surrounding counties



Demographics of analysis areas

Demographics of smelter and comparison areas

■ Study area
 ■ Rest of Pueblo County
 ■ Six surrounding counties



List of Cancer Types

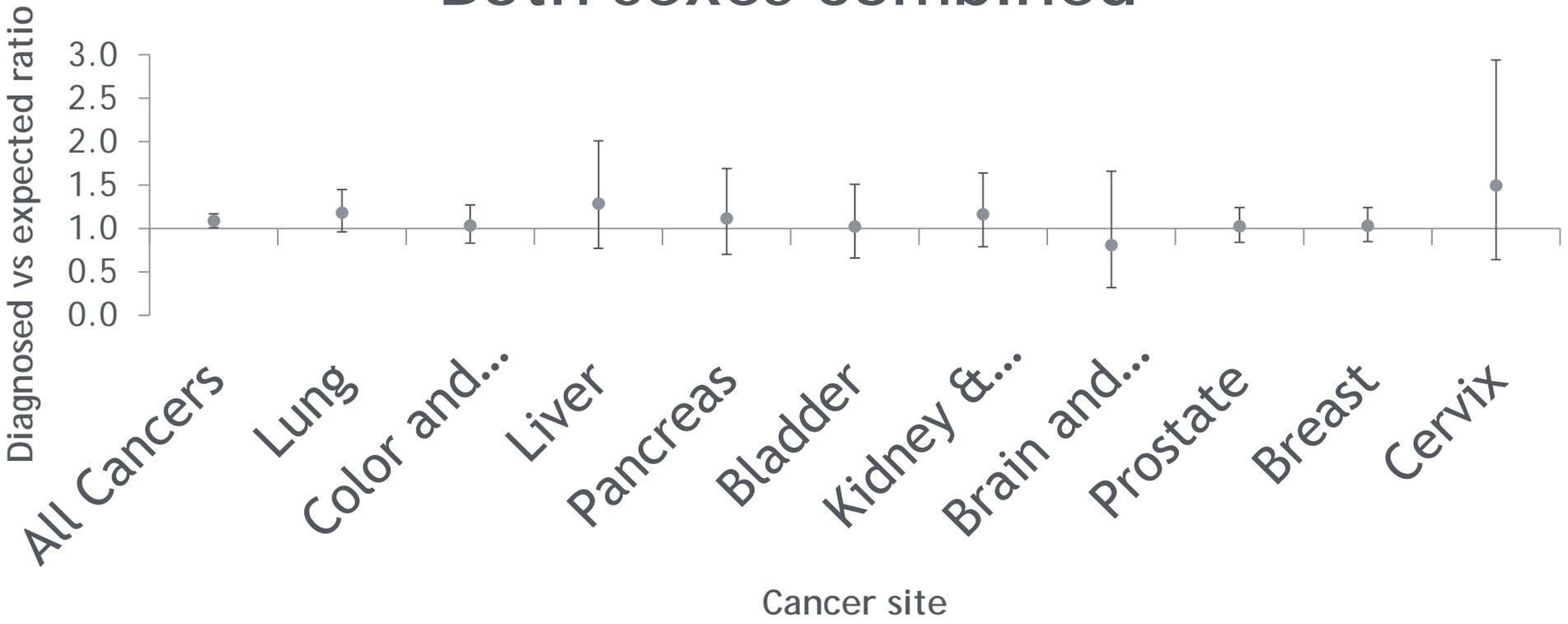
- Possibly related to exposure
 - Lung
 - Bladder
 - Kidney
 - Liver
 - Prostate
- Not likely related to exposure
 - Colon
 - Breast
 - Cervix
 - Pancreas
 - Brain

How does it work?

- Count number of cases observed in the study area
- Calculate the number of cases expected based on population data from the study area and cancer data (rates) from comparison area

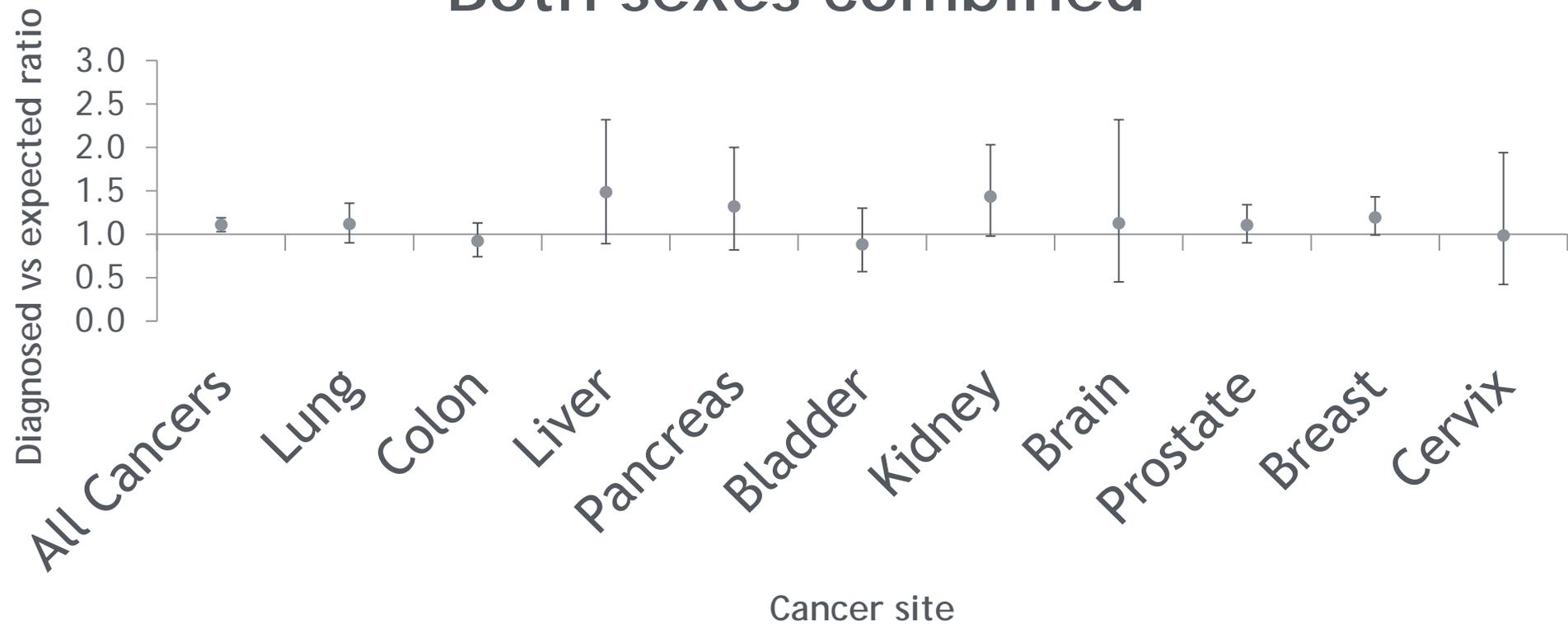
Ratio of observed versus expected cancers for Pueblo smelter compared to the rest of Pueblo County

Both sexes combined

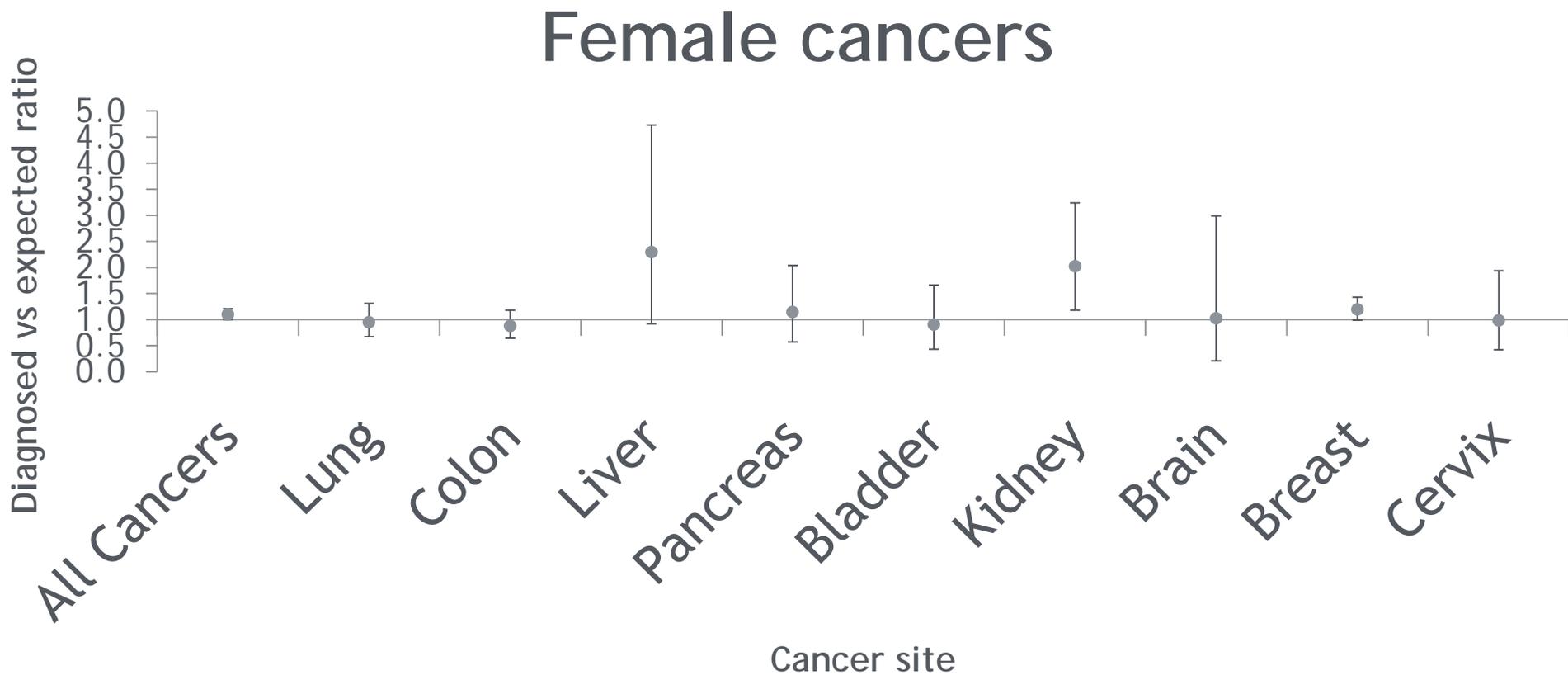


Ratio of observed versus expected cancers for Pueblo smelter compared to six surrounding counties

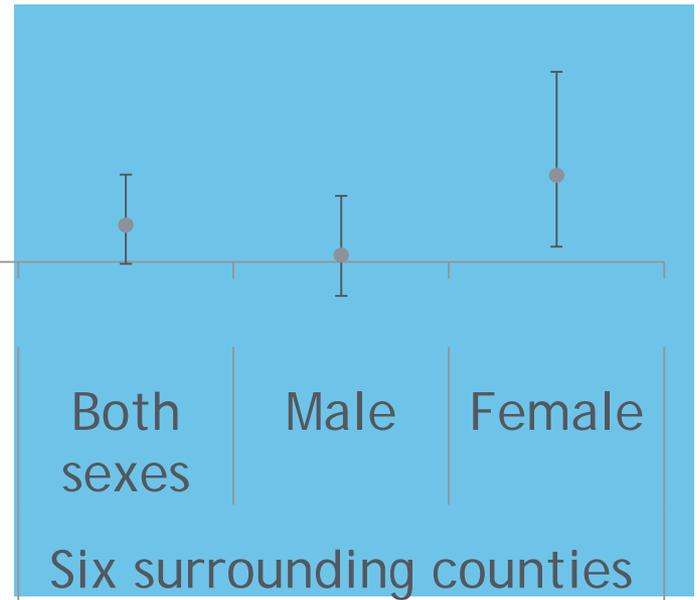
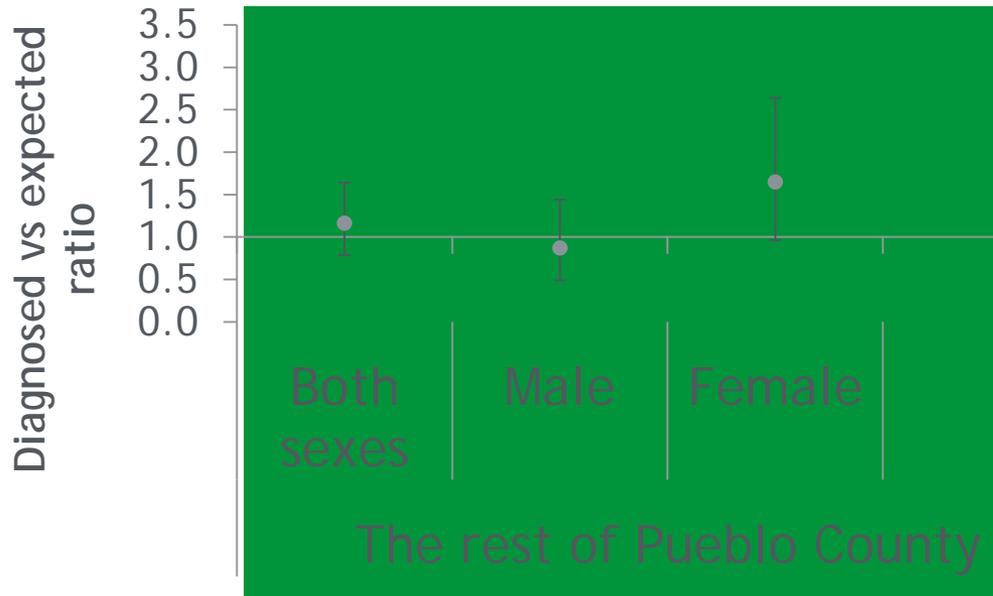
Both sexes combined



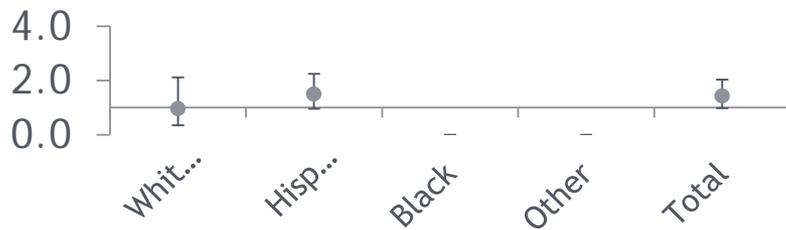
Ratio of observed versus expected cancers for Pueblo smelter compared to six surrounding counties



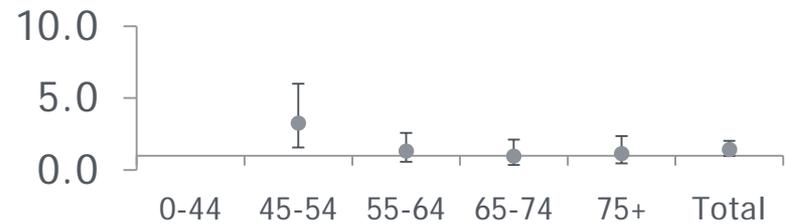
Ratio of observed versus expected kidney cancers



Race/ethnicity



Age group



Kidney cancer risk factors

- Smoking
- Obesity
- Physical inactivity
- Analgesic abuse

Risk factors in smelter area

- Between 58% and 82% of kidney cancer cases had a history of tobacco use
- Highest 20% of smoking rates for state
- Higher obesity rate in study area (32%) compared to six surrounding counties (25%)

Possible outcomes for cancer investigations

1. No difference
 - The numbers and types of cancer in the study community are the same or similar to the comparison community.
2. Undeterminable difference (maybe more study)
 - Specific types of cancer in the study community are elevated compared to the comparison community, but there are clear differences in general cancer risk factors (smoking, obesity, etc.) between the two communities.
3. Significant elevation (definitely more study)
 - Specific types of cancer in the study community are elevated compared to the comparison community, and there are no clear differences in general cancer risk factors between the two communities.

Take home points

- Rates of 7 of the 8 cancers studied were similar in study and comparison areas (i.e., not elevated)
- Kidney cancer was elevated in females when comparing to 6-county area
 - Possibly unusual in that finding was driven by 45-54 age range

Take home points too

- Factors arguing for an environmental cause
 - Arsenic has been linked with kidney cancer
- Factors arguing against an environmental cause
 - Usually kidney cancer is from an ingestion exposure (i.e., drinking water)
 - Disparity in females vs. males
 - Higher prevalence of smoking, obesity in the study area

Questions?

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