

## **Rural Atlas Highlights Differences in Cancer Incidence, Proportion Late Stage, and Survival Using Two Different Definitions of Rurality**

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### **1. Background**

Rural populations in the United States have different cancer rates and patterns than populations in urban areas. However, there are multiple measures to define urban and rural areas and using different measures may produce different outcomes.

### **2. Goals**

The [Rural Atlas](#) aimed to visualize differences for five cancer sites across two different definitions of rurality in the UCSF Helen Diller Family Comprehensive Cancer Center catchment area.

### **3. Solutions and Methods**

We explored various definitions of rurality for the Rural Atlas and narrowed our choice to those with classification at the census tract level to enable more geographically granular insights. We chose to include both Rural-Urban Commuting Area (RUCA) codes 4 to 10 and greater than 30 percent rural to define rurality and focused on the five most common cancer sites in the catchment area: female breast, prostate, lung, colorectal, and skin (melanoma).

California Cancer Registry 2018-2022 data was used to generate incidence, late stage, and survival rates. Rates were generated using the Statistical Analysis System (SAS) 9.4 software. We used Tableau Prep to clean and organize data before importing into Tableau Desktop to generate the user-facing interactive content. To allow for a more regional approach to evaluating cancer rates in the 25-county catchment area, we organized these counties into four regions using California Census 2020 Regions.

### **4. Outcomes**

Using the Rural Atlas, we observed some regional differences between rural and urban areas. Male prostate cancer incidence is lower in rural areas compared to urban areas in the Central Coast using the RUCA definition but higher using the percent rural definition. Male and female melanoma incidence was higher in rural areas using the percent rural definition. However, using the RUCA definitions, there were higher rates of melanoma only in the San Francisco Bay Area and there were lower rates of melanoma in rural areas of the Central Coast. Proportion of late-stage prostate cancer was higher in rural areas of the San Francisco Bay Area, especially when using the percent rural definition. Male lung cancer survival was higher in rural areas using the percent rural definition, but lower using the RUCA definition, especially in the Central Coast.

### **5. Lessons Learned and Future Directions**

The Rural Atlas can highlight differences in rural cancer rates using different definitions of rurality. The Rural Atlas is a flexible tool for informing local efforts to reduce cancer incidence, morbidity, and mortality.