CDRI Cancer Disparities Geocoding Project

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Cancer Data Registry of Idaho

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CDRI Cancer Disparities Geocoding Project

- Purpose:
  - To describe and understand variations in cancer incidence, treatment and survival in Idaho.

    By:
    - Individual-Level
      - Race/Ethnicity
    - Area-Level
      - Poverty
      - Urban/Rural gradient
    - Geographic
      - Location

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- How do we do that?

  1. Use combination of medical records, Indian Health Service and Northwest Portland Area Indian Health Board linkages, and NAACCR place of birth/surname algorithm to determine race and ethnicity of cancer cases.
  2. Geocode address of residence at time of diagnosis and assign Census Tract 2000 based on location.
  3. Estimate annual Census Tract population by age group, sex, race, ethnicity.
  4. Calculate Area-Based Socioeconomic Measures for Census Tracts.
  5. Add county-level BRFSS screening and risk factor estimates.
  6. Aggregate over areas into strata by categorical ABSM.
  7. Conduct multilevel modeling.
  8. Create maps of results.

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- Geographic Level of Analysis for Project
  - Census Tract
    - Subdivision of county
    - Contains on average about 4,000 persons.
    - Drawn such that population covered is relatively homogenous.
    - Idaho has 280 Census Tracts (2000 Census).

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- Area-Based Socioeconomic Measures
  - Poverty
    - From 2000 Census, calculate percent of population with incomes below federal poverty guidelines by Census Tract.
    - Categorize Census Tracts into 4 categories:

      Less than 5%

      5% to 9.9%

      10% to 19.9%

      20%+ (Federally Designated Poverty Area)

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- Area-Based Socioeconomic Measures
  - RUCA
    - Rural Urban Commuting Areas refer to a Census Tract-based classification scheme that utilizes the standard Bureau of Census urban area and place definitions in combination with commuting information.
    - Categorize Census Tracts into 3 categories:
      - Urban (50,000+ population OR 30% or more of residents of Census Tract commuted to an urban core)
      - Large Towns (10,000 – 49,999 population AND <30% of residents of Census Tract commuted to an urban core)
      - Small Rural Towns (<10,000 population AND <30% of residents of Census Tract commuted to an urban core)

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- Example:
  - Colorectal Cancer Incidence, Ages 50+, Idaho, 1996-2004

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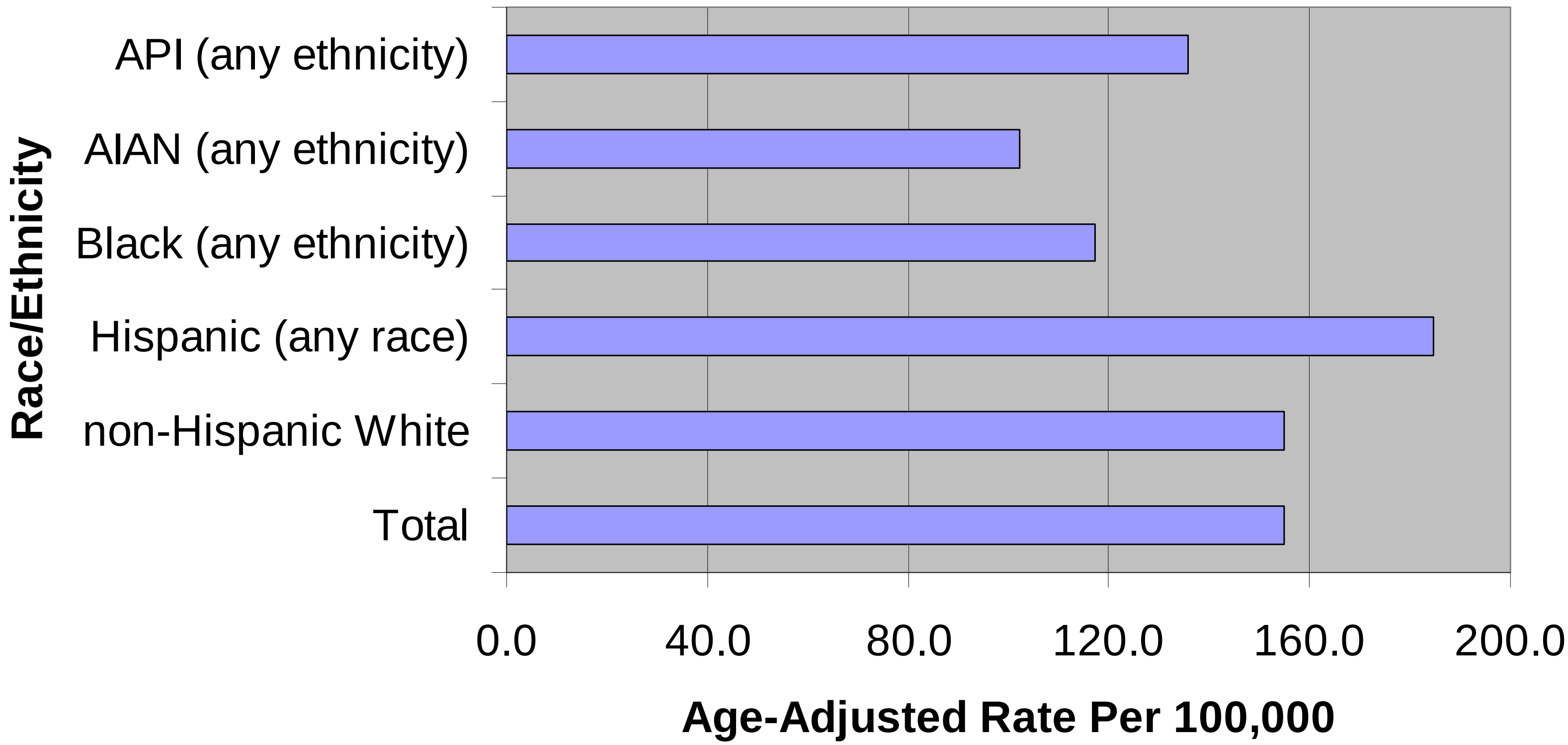
Age-Adjusted Invasive Colorectal Cancer Incidence Rates, Ages 50+, Idaho, 1996-2004



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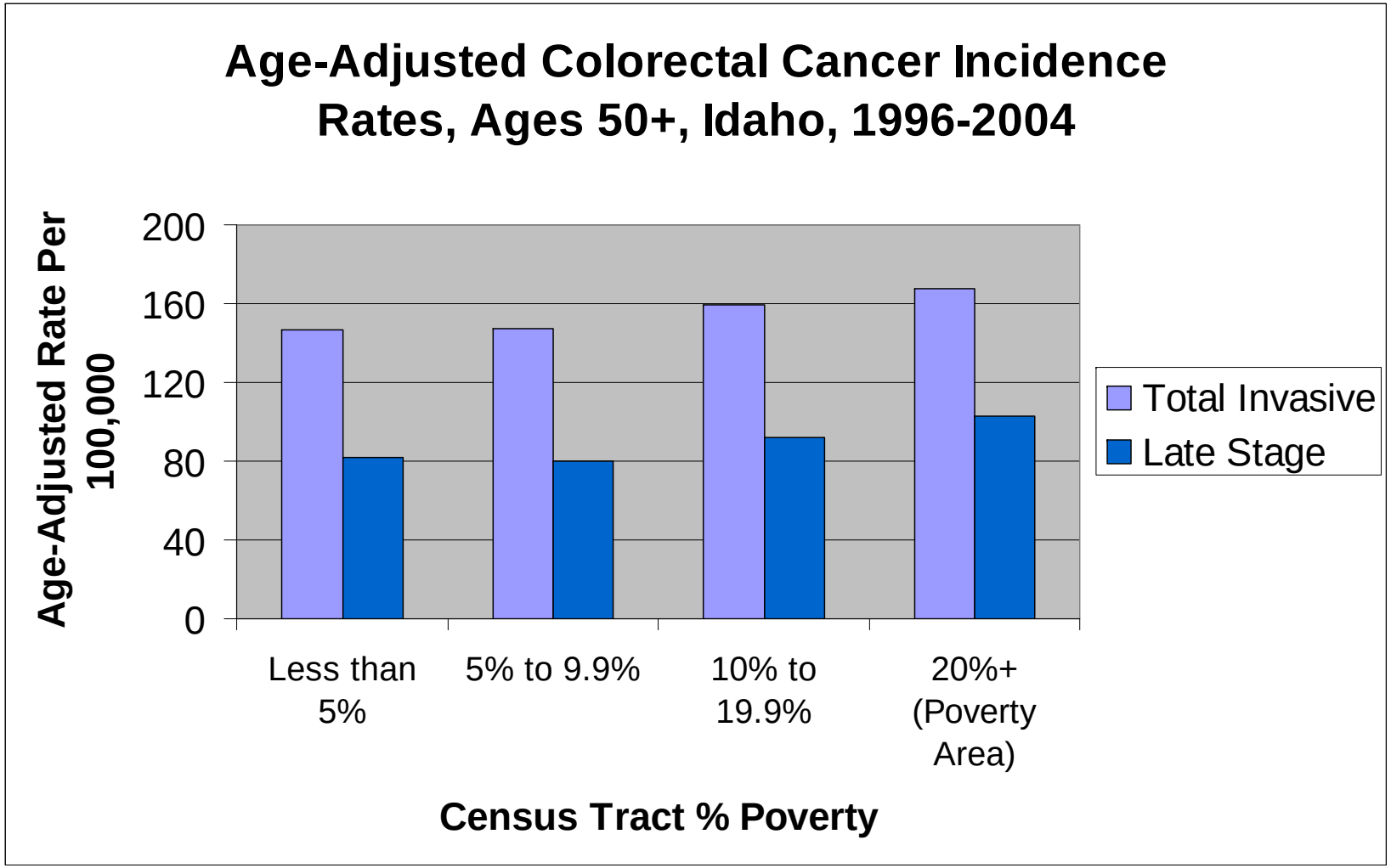

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Population-Attributable Fraction

- What percent of cases *WOULD NOT HAVE OCCURRED* if all groups had the same rates as the low poverty group?

Povety Status-Related Population Attributable Fraction
Invasive Colorectal Cancer Cases, Ages 50+, Idaho, 1996-2004

Area Poverty Status	Person-Years	Cases Counts		Potentially Averted	
		Observed	Expected	Cases	Percent
Less than 5%	324,129	394	394	0	0.0%
5% to 9.9%	858,067	1,179	1,175	4	0.3%
10% to 19.9%	1,696,614	2,742	2,534	208	7.6%
20%+ (Poverty Area)	149,871	263	235	28	10.5%
Total	3,028,681	4,578	4,338	240	5.2%

Expected counts = age-specific rates from low poverty area applied to populations of other areas.

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Stage-Specific Age-Adjusted Colorectal Cancer Incidence Rates by Urban/Rural Category, Ages 50+, Idaho 1996-2004

SEER Summary Stage	Urban		Large Town		Small Rural Town	
	Rate	Cases	Rate	Cases	Rate	Cases
Total Invasive	157.4	2,685	135.8	583	160.4	1,310
In situ	5.1	86	10.2	44	7.3	60
Localized	60.2	1,024	48.3	207	48.2	394
Regional	60.6	1,032	52.5	224	67.8	555
Distant	26.6	457	24.4	104	27.1	223
Unstaged	10.0	172	10.6	48	17.3	138
Late Stage	87.2	1,489	76.9	328	94.9	778

Rates are per 100,000 and age-adjusted to the 2000 US Std Population (18 age groups - Census P25-1130) standard.

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Invasive Colorectal Cancer Incidence
Ages 50+, Idaho, 1996-2004
Results from Multilevel Poisson Regression Modeling

Incidence Density Ratios and 95% Confidence Intervals for Fixed Parameters

Main Effect	IDR*	95% CI
Ethnicity		
non-Hispanic	1.00	
Hispanic	1.16	0.95 - 1.40
Tract-Level Poverty		
Less than 5%	1.00	
5% to 9.9%	1.05	0.92 - 1.20
10% to 19.9%	1.12	0.99 - 1.27
20%+ (Poverty Area)	1.19	0.99 - 1.42
Tract-Level RUCA Code		
Urban	1.00	
Large Town	0.86	0.78 - 0.96
Small Rural Town	0.99	0.91 - 1.08

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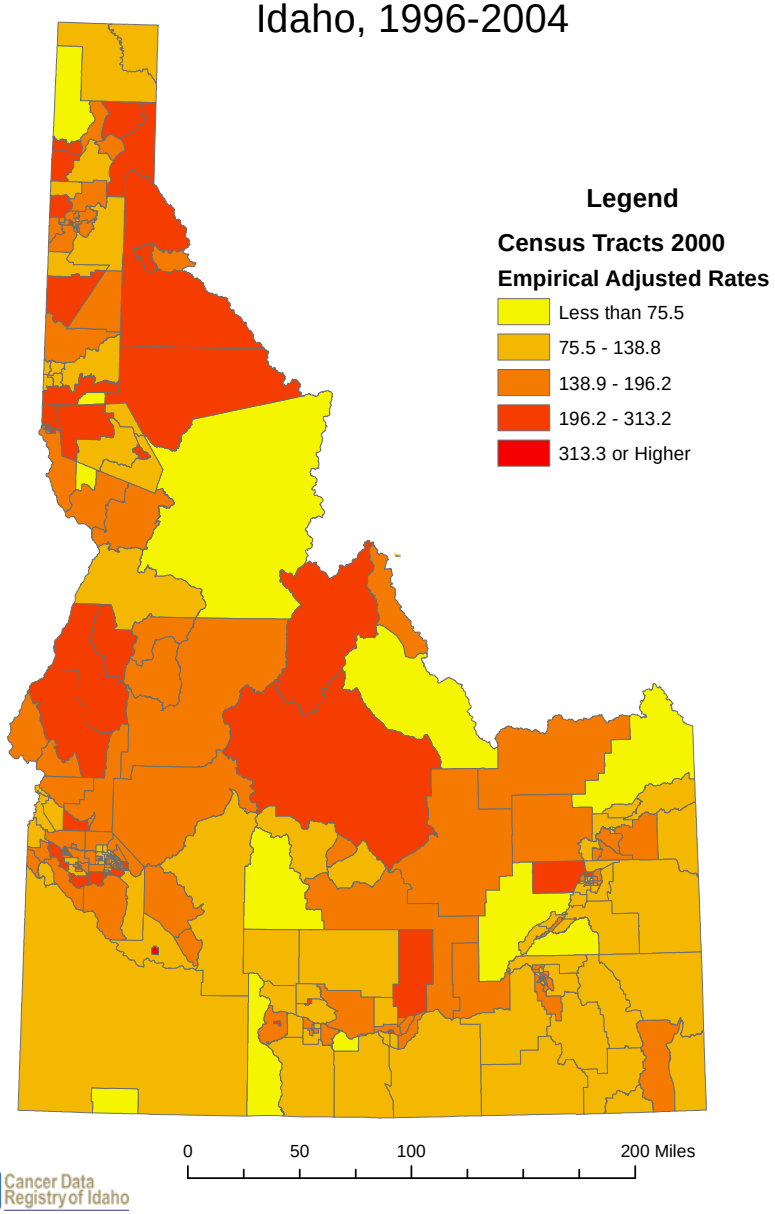
Invasive Colorectal Cancer Incidence
Idaho, 1996-2004



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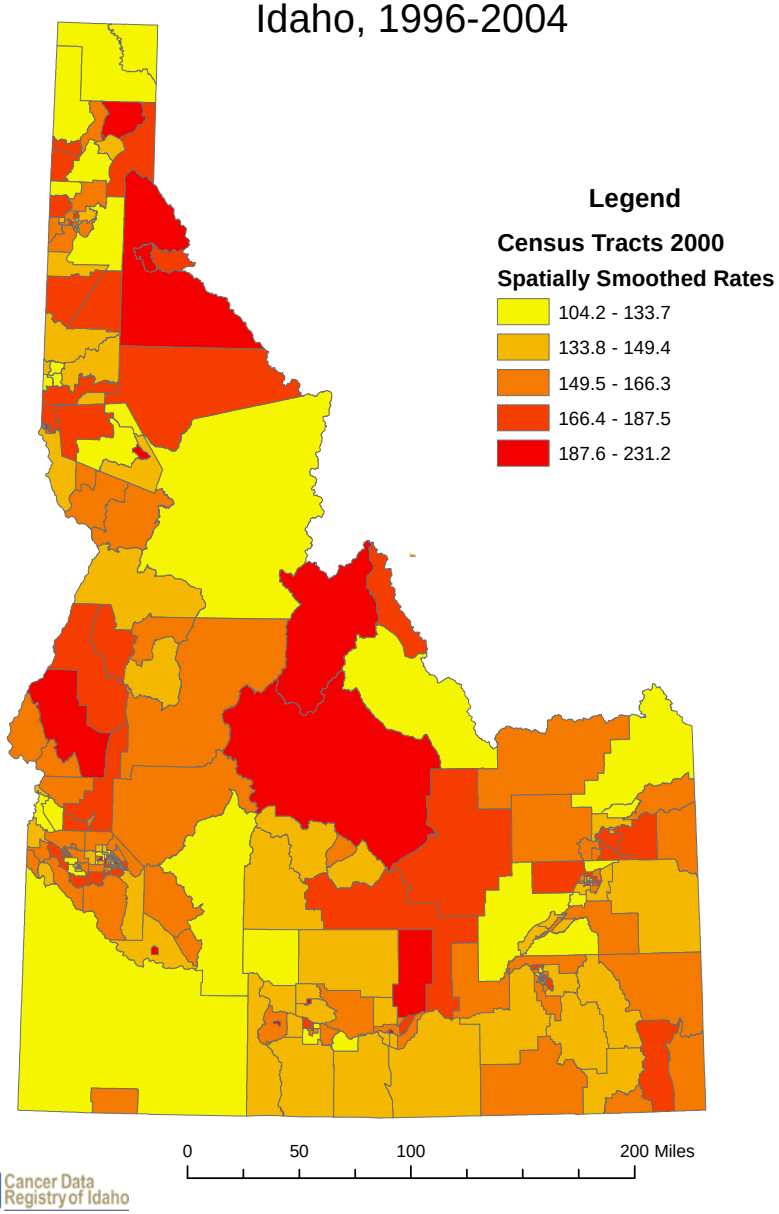

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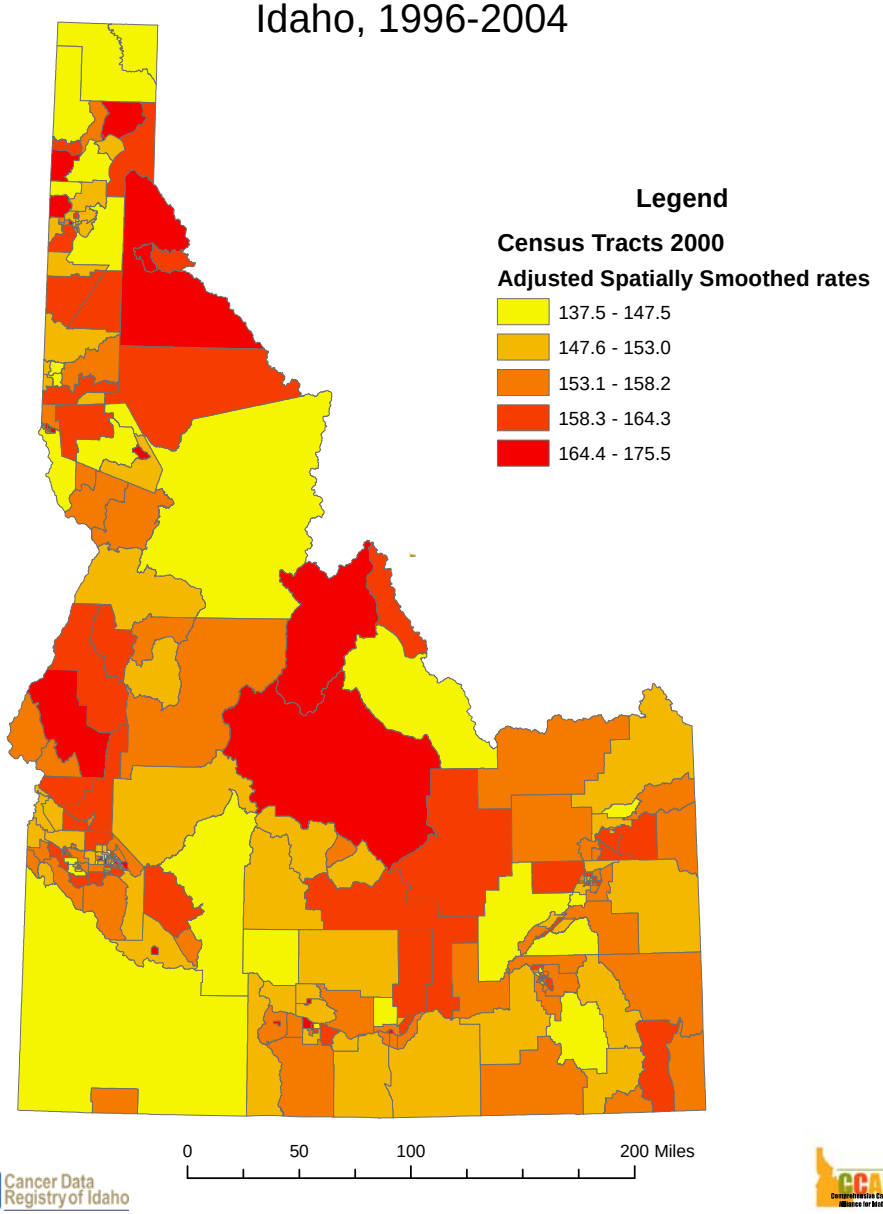

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Future Directions

- Questions?? Comments??

- I would like a prioritized list of topics to analyze using this framework.
- One list per CCAI Work Group.
- Only Cancer Registry data are available for this type of analysis:
  - Incidence
  - Stage-Specific Incidence
  - Treatment
  - Survival

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