

## **Cancer Incidence and Mortality Rates in Ohio: Impact of Appalachian and Metropolitan/Non-Metropolitan Residence**

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### **1. Background**

Ohio has a significant cancer burden. The incidence rate for all cancers combined (470.0 per 100,000 persons) is the 10th highest in the nation, and the mortality rate (161.1 per 100,000 persons) is 9th highest. Ohio is geographically diverse, comprised of both highly metropolitan and rural areas, and the 32 eastern and southern counties of the state are part of Appalachia. The Appalachian region, along with rural areas of Ohio, is characterized by higher poverty and unemployment rates as well as lower education levels, income, and cancer screening rates than non-Appalachian and metropolitan areas of the state. Because these geographically distinct areas face different structural, cultural, and logistical challenges, it is essential to distinguish differences in cancer rates driven by urban/rural and Appalachian factors. This abstract presents an examination of regional differences in cancer incidence and mortality across four groups of counties: non-Appalachian metropolitan, non-Appalachian non-metropolitan, Appalachian metropolitan, and Appalachian non-metropolitan.

### **2. Goals**

Incidence and mortality rates for all invasive cancers combined lung, colorectal, female breast, prostate, and cervical cancers for each of the four county groupings described above.

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

We created four groupings of Ohio's 88 counties and compared the most recent, average annual, age-adjusted incidence and mortality rates for all cancer sites combined and five leading cancers in these four county groupings for males and females, separately. We looked for and highlighted substantive differences (defined as 5 percent or higher) between the four groups to determine whether differences are evident for Appalachia vs. non-Appalachia, metropolitan vs. non-metropolitan, or a combination of those (Appalachia and non-metropolitan, for instance).

### **4. Outcomes**

Incidence Disparities:

- All cancers combined: highest rates among non-metropolitan Appalachian females
- Lung and cervical cancers: higher rates in Appalachia, especially non-metropolitan Appalachian counties for lung cancer
- Colon and rectum: higher rates among Appalachian metropolitan males and females and non-Appalachian non-metropolitan females
- Female breast cancer and prostate cancer: higher rates in non-Appalachian metropolitan areas

Mortality Disparities:

- All cancers combined: higher rates in Appalachian and non-metropolitan counties, with highest rates among non-metropolitan Appalachian males and females
- Lung and cervical cancers: higher rates in Appalachia, and an additional non-metropolitan lung cancer disparity among males
- Colon and rectum: complex disparities of higher rates among non-metropolitan males, non-Appalachian non-metropolitan females, and Appalachian non-metropolitan males and females

Category: Catchment Area Data, Social Determinants of Health, and Equity – Work in Progress – Faculty

- Female breast cancer and prostate cancer: no substantive disparities

### 5. Lessons Learned and Future Directions

Appalachian Ohio consistently has higher cancer incidence and mortality burdens, especially lung, cervical, and colorectal cancers, and these disparities are often worse in non-metropolitan Appalachian counties. Disparities in cancer incidence and mortality are apparent in non-metropolitan Ohio counties for some cancers (e.g., lung and colorectal), even outside Appalachia. These data can help inform us where to focus cancer screening and prevention strategies.

**Figure: Average Annual (2019-2023), Age-Adjusted Cancer Mortality and Incidence Rates (per 100,000) by Gender and Geography**

Average Annual (2019-2023), Age-adjusted Cancer Mortality Rates (per 100,000) by Gender and Geography						Average Annual (2018-2022), Age-adjusted Cancer Incidence Rates (per 100,000) by Gender and Geography					
Males			Females			Males			Females		
	Non-Appalachia	Appalachia		Non-Appalachia	Appalachia	Site	Non-Appalachia	Appalachia	Site	Non-Appalachia	Appalachia
	Rate	Rate		Rate	Rate		Rate	Rate		Rate	Rate
All Malignant Cancers			All Malignant Cancers			All Malignant Cancers			All Malignant Cancers		
Metropolitan	186.6	201.4	Metropolitan	135.3	141.5	Metropolitan	512.5	509.0	Metropolitan	445.1	441.0
Nonmetropolitan	199.8	219.9	Nonmetropolitan	140.4	149.1	Nonmetropolitan	501.3	520.8	Nonmetropolitan	431.8	459.6
Colon and Rectum			Colon and Rectum			Colon and Rectum			Colon and Rectum		
Metropolitan	15.8	17.2	Metropolitan	10.8	12.4	Metropolitan	42.6	46.5	Metropolitan	32.1	36.0
Nonmetropolitan	19.2	19.6	Nonmetropolitan	13.1	12.8	Nonmetropolitan	45.4	45.6	Nonmetropolitan	36.7	36.3
Lung and Bronchus			Lung and Bronchus			Lung and Bronchus			Lung and Bronchus		
Metropolitan	43.2	54.9	Metropolitan	31.4	37.1	Metropolitan	67.9	79.3	Metropolitan	56.1	62.2
Nonmetropolitan	49.8	60.3	Nonmetropolitan	32.2	39.0	Nonmetropolitan	70.3	86.4	Nonmetropolitan	52.1	65.7
Prostate			Breast			Prostate			Breast		
Metropolitan	19.9	18.0	Metropolitan	20.2	19.3	Metropolitan	125.4	112.5	Metropolitan	137.3	124.1
Nonmetropolitan	18.5	20.0	Nonmetropolitan	19.7	19.9	Nonmetropolitan	111.5	102.9	Nonmetropolitan	127.6	115.5
			Cervix						Cervix		
			Metropolitan	2.2	3.0				Metropolitan	7.6	7.9
			Nonmetropolitan	2.2	2.9				Nonmetropolitan	7.1	10.2