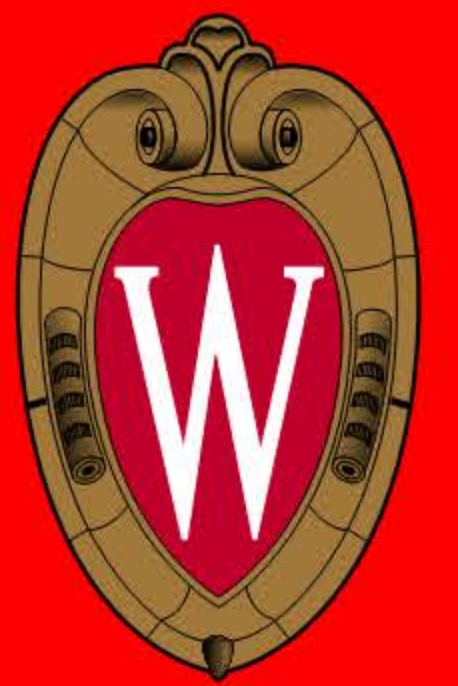


Applying the County Health Rankings Model to Identify Priorities for Cancer Prevention and Control Interventions

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Background

- The County Health Rankings (CHR) Model includes four major Health Factors (health behaviors, clinical care, social and economic factors, and physical environment) and was developed to provide a framework for prioritizing health-related investments including setting agendas, implementing policies, and sharing resources for improving community health and health equity¹.
- The CHR Model may be utilized to inform approaches to reduce cancer incidence and mortality, however data analysis guided by the CHR Model for cancer outcomes has not been reported.
- We aim to describe associations between metrics based on the CHR Model and county-level cancer incidence and mortality rates for Wisconsin.

Methods

- Using county-level publicly available data, Health Factor summary scores were derived for determinants of health in four areas: health behaviors (e.g., smoking, obesity), clinical care (e.g., health insurance, vaccination), social and economic factors (e.g., education, income), and physical environment (e.g., air pollution).
- A composite Health Factor z-score was calculated as the weighted (30%, 20%, 40%, and 10%, respectively) average of the four Health Factor summary scores among all US counties.
- Wisconsin's 72 counties were clustered by z-scores using k-means clustering into unequally sized groups ranging from least to most healthy factors, or community conditions. Higher z-scores reflect counties with less healthy community conditions².
- County-level cancer incidence and mortality rates (total cancer, breast, prostate, lung, and colorectal cancer) were obtained from the Wisconsin Interactive Statistics on Health (WISH) online system³.
- We fit age-adjusted negative binomial regression models with the Health Factor groups as the predictor variable and cancer incidence and mortality rates as the outcome to estimate rate ratios (RR) and 95% confidence intervals (CIs).

References

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- Wisconsin Dept. of Health Services, Division of Public Health, Office of Health Informatics. Wisconsin Interactive Statistics on Health (WISH) data query system, <https://dhs.wisconsin.gov/wish/index.htm>. Cancer Module, accessed 12/30/2024.

Funding

- This study was supported by the University of Wisconsin Carbone Cancer Center Support Grant P30 CA014520 from the National Cancer Institute.

Results

Figure 1: County groups based on health factor scores show which communities have conditions with greater potential for improvement

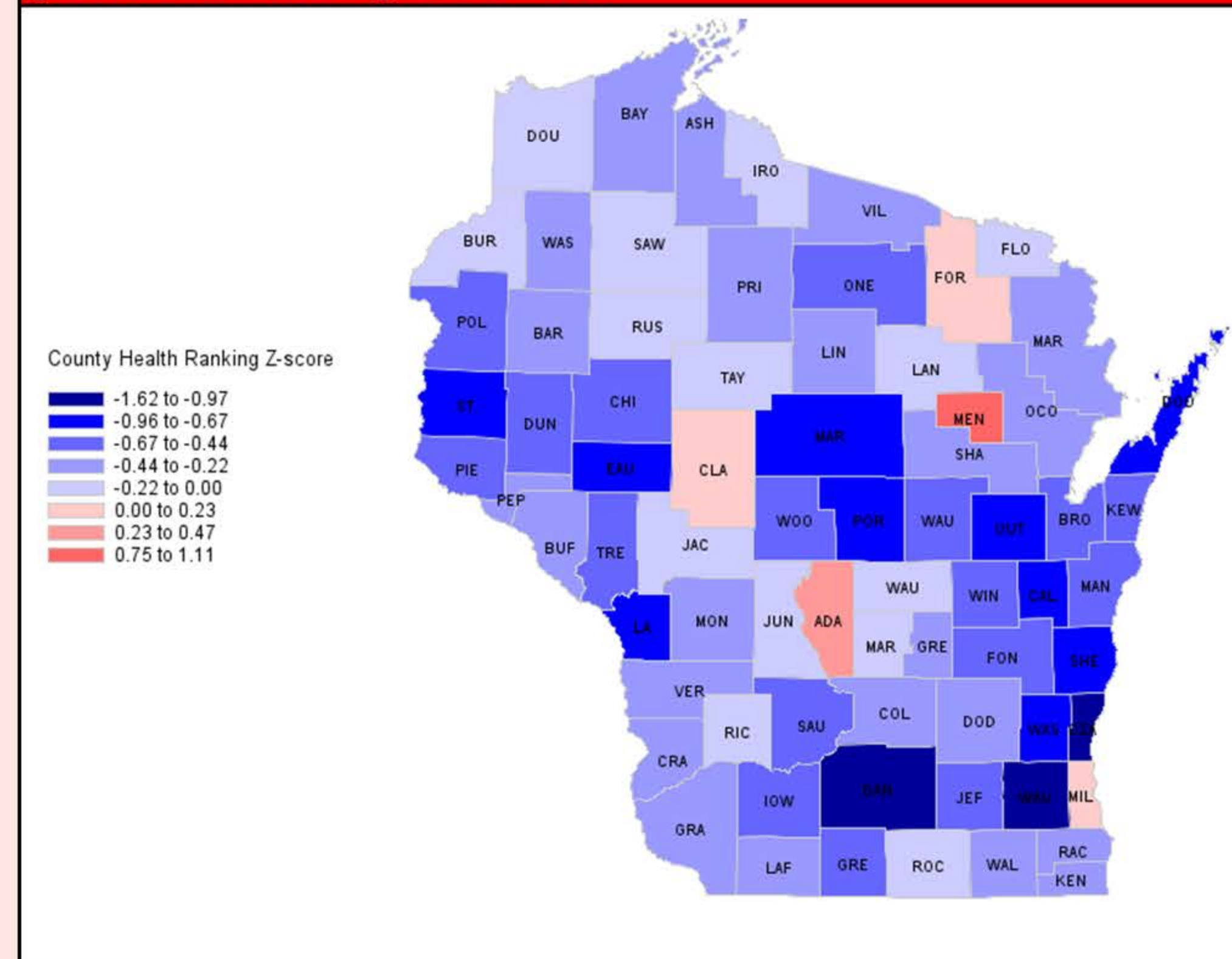


Table: County groups based on greater health factors scores have higher cancer incidence and mortality

CHR z-score (2024)	Number of counties	Incident cases (2017-2021)	Cancer incidence rate* (2017-2021)	Cancer mortality rate* (2016-2020)
-1.62 to -0.97	3	30,416	472.8	135.5
-0.96 to -0.67	10	29,375	439.1	140.0
-0.67 to -0.44	17	37,527	455.2	152.6
-0.44 to -0.22	23	36,307	476.5	160.5
-0.22 to 0.00	14	14,043	470.9	164.2
0.00 to 0.23	3	26,636	495.6	169.3
0.23 to 0.47	1	604	308.9	172.1
0.75 to 1.11	1	132	604.5	153.9

* Incidence and mortality rates are expressed as the number of cases per 100,000 population, age-adjusted using the standard US 2000 census population with 19 age groups. Rates are obtained from the Wisconsin Interactive Statistics on Health (WISH) online query system. Abbreviations: CHR – County Health Rankings

Conclusions

- Wisconsin counties with less healthy community conditions have higher levels of cancer incidence and mortality.
- The CHR Health Factor scores are based on factors with known evidence-based interventions. States, communities and cancer centers may be able to use the CHR factor scores and groupings to identify interventions that hold promise for specific geographic areas, which could ultimately improve the cancer burden.

Results - continued

Figure 2: Wisconsin counties with less healthy community conditions have higher rates of overall cancer, as well as colorectal and lung cancer rates, but not breast and prostate cancer rates.

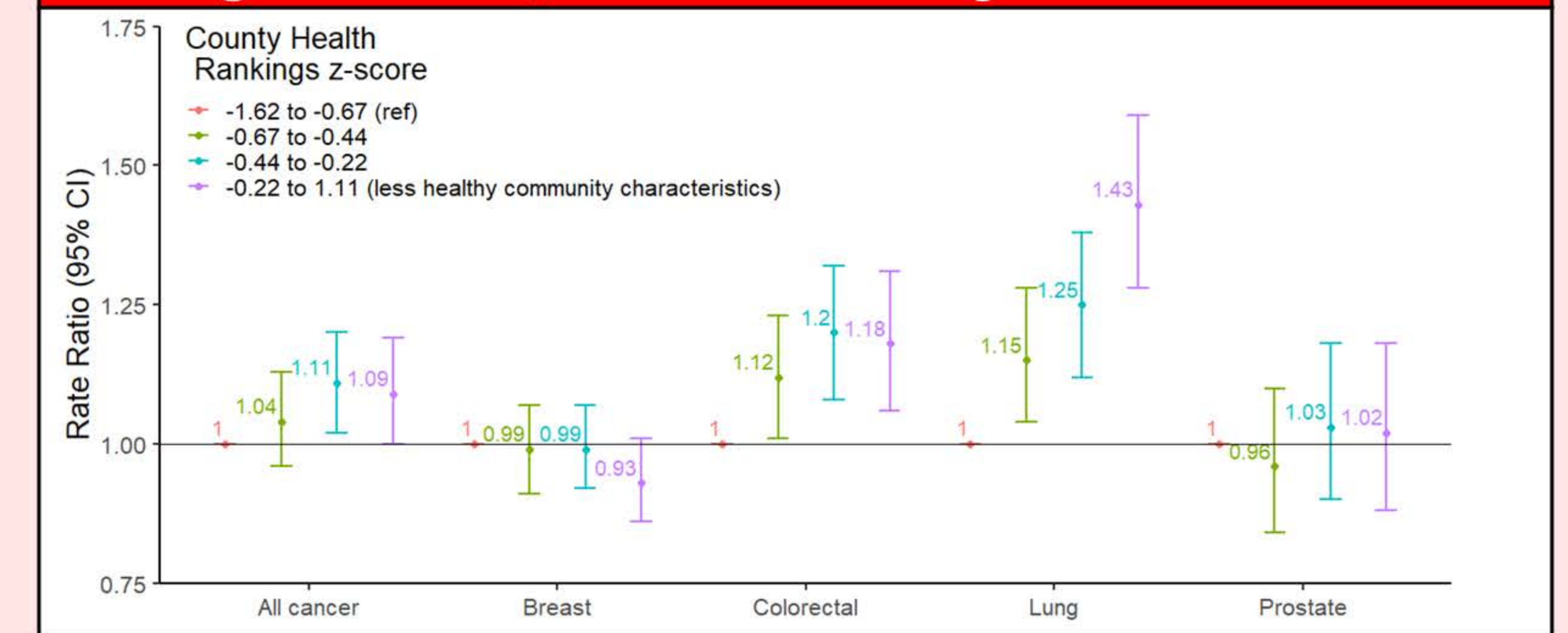


Figure 3: Wisconsin counties with less healthy community conditions have higher rates of overall cancer mortality, as well as mortality from colorectal, lung, and prostate cancers.

