



DIETARY COUNSELING DISPARITIES, MORTALITY, AND COST IN CORONARY ARTERY DISEASE, OBESITY, AND CANCER IN 47,900 HOSPITALIZATIONS NATIONALLY

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Background

- Despite the demonstrated clinical benefit of dietary counseling, its national trends in coronary artery disease (CAD), obesity, and cancer are not well understood.

Methods

- This is the first known nationally representative artificial intelligence-augmented clinical, cost effectiveness, and computational ethical analysis of cardio-oncology inpatient dietary counseling disparities, mortality, and cost.
- BAyesian Machine and deep learning-augmented Propensity Score (BAM-PS) within Artificial Intelligence-driven Computational Ethics and policy analysis (AiCE) was performed on the United States' largest all-payer hospitalized dataset, National Inpatient Sample (NIS), from 2016-2020 in this retrospective cohort study.

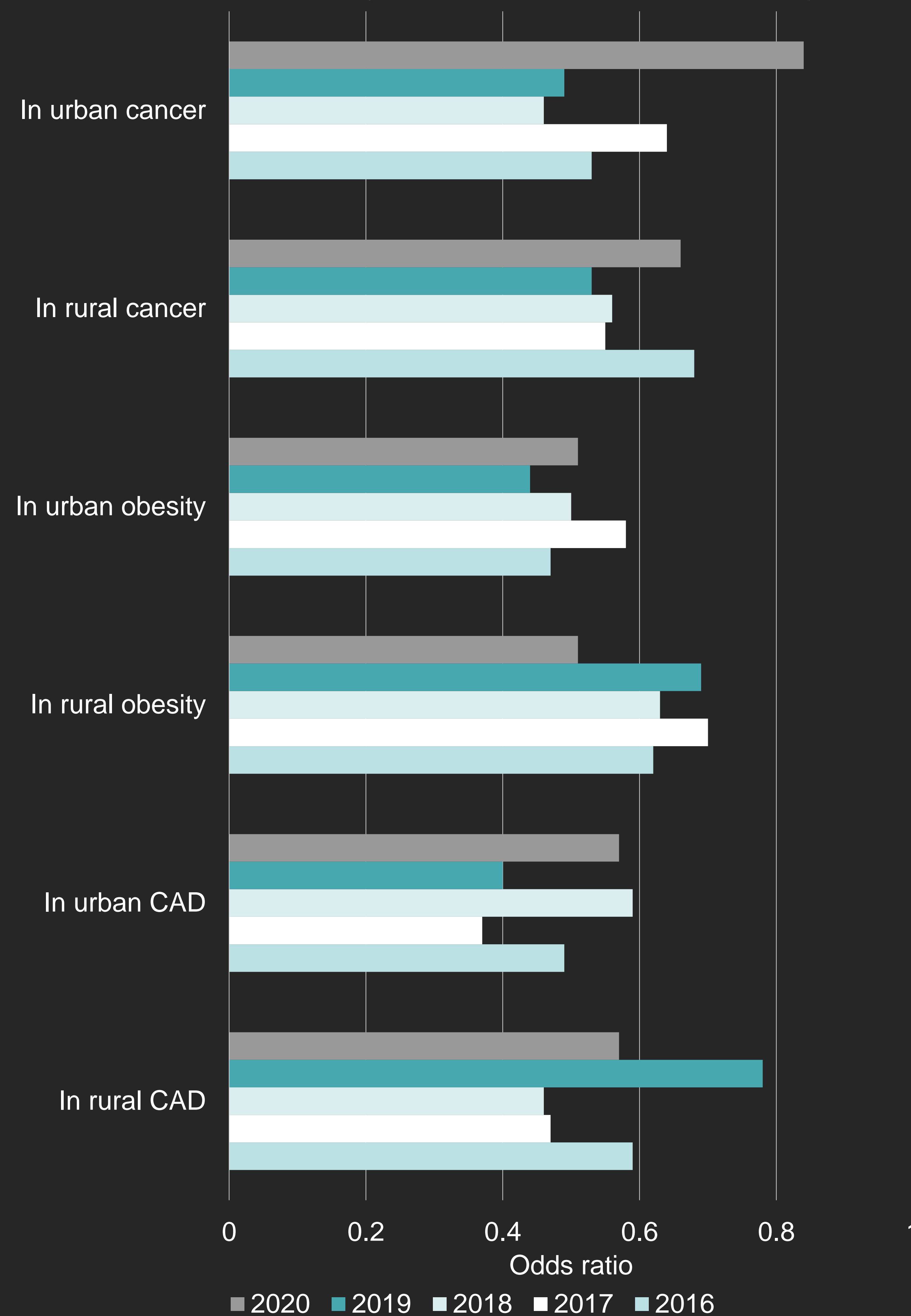
Results

- Of the 148,755,036 adult hospitalizations from 2016-2020, there were 29,307,555 (19.70%) with CAD, of whom 5,352,204 (18.26%) were obese; of these, only 47,900 (0.89%) received dietary counseling.
- In BAM-PS multivariable regression controlling for clinical confounders, the odds of receiving dietary counseling were significantly reduced by CAD (OR 0.85, 95%CI 0.80-0.89, $p < 0.001$) and increased by poor diet (OR 2.46, 95%CI 1.72-2.81, $p < 0.001$).

Results

AI-guided national analysis supports **significant mortality disparities** not explained by clinical severity

Sub-group analysis for BAM-PS multivariable regression of mortality by dietary counseling from 2016-2018 (controlling for known clinical confounders) according to rural versus urban (metros of at least 1 million citizens)



Results

- In BAM-PS multivariable regression controlling for clinical confounders, the odds of receiving dietary counseling were also significantly increased by obesity (OR 6.91, 95%CI 6.65-7.17, $p < 0.001$), while there was no association with cancer.
- Mortality odds were significantly reduced by dietary counseling most in sub-group analysis within CAD (OR 0.53, 95%CI 0.40-0.69, $p < 0.001$), followed by within obesity (OR 0.56, 95%CI 0.45-0.71, $p < 0.001$) and then within cancer (OR 0.60, 95%CI 0.44-0.81, $p = 0.016$).
- Total hospitalization costs were not increased by dietary counseling within CAD, cancer, or poor diet, and actually were reduced within obesity.
- In CAD and obesity, private insurance and less dense urban metros were associated with lower odds of receiving such counseling. Reversing the counseling disparities in just CAD may save 88,345 additional hospitalized lives annually with cost savings of \$10.82 million per life saved.

Conclusions

- This large comprehensive analysis details national disparities in dietary counseling, along with the mortality and cost savings especially in CAD when counseling is provided to better optimize population and public health.
- It additionally suggests that cancer patients may not be receiving the dietary counseling that can holistically benefit their comprehensive care, while providing it may significantly reduce mortality.