

Assessing Capacity for Monitoring Chronic Disease Outcomes in Health Disparate Populations

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Background

Currently, public health data collected by most major surveillance systems are available at national and state levels, and to a lesser extent, county level, limiting the ability to produce prevalence estimates for populations known historically to have a disproportionately high burden of disease and risk factors. Using current surveillance system data, key chronic disease outcome estimates identified as strategic directives by the Patient Protection and Affordable Care Act (weight, nutrition, physical activity, tobacco use prevalence, and emotional well-being)¹ are evaluated to determine their usefulness in monitoring health disparate populations in a comparative analysis of 28 counties. Our findings indicate that no single or combined set of surveillance systems exists to allow estimation of changes in chronic disease outcomes or their distribution across the range of ages, racial, and socioeconomic groups targeted by community health programs.

Learning Objectives

- Identify the greatest gaps in current surveillance system coverage for monitoring community health with regards to health disparate populations.
- Describe the growing need to assess the utility of existing surveillance systems for monitoring chronic disease outcomes in populations with documented health disparities.
- Describe raking techniques that can be used to create estimates for sub-state geographies.
- Discuss the importance of consistency in sampling as well as the reliability and validity of measures/definitions of "health disparity".

Methods

A total of 41 data sources were identified as potentially able to monitor chronic disease outcomes (weight, nutrition, physical activity, tobacco use prevalence, and mental health) on the county level for various health disparate populations in 28 counties throughout the continental United States. Data sources and relative indicators were examined for both youth and adults. The availability of indicators was examined overall, but also stratified by racial/ethnic groups as well as educational attainment.

Adult Indicators (Behavioral Risk Factor Surveillance System)

- Weight (BMI)
- Physical activity
- Vegetable consumption
- Current smoking status
- Mental health

Youth Indicators (Youth Risk Behavior Surveillance System)

- Current smoking status
- Physical activity
- Vegetable consumption
- Weight
- Mental Health

A comparative analysis of the availability of estimates within health disparate populations was conducted within the 28 counties. Estimate availability for selected indicators was compared between publicly available BRFSS data and the estimates made by subsetting and reweighting the same dataset.

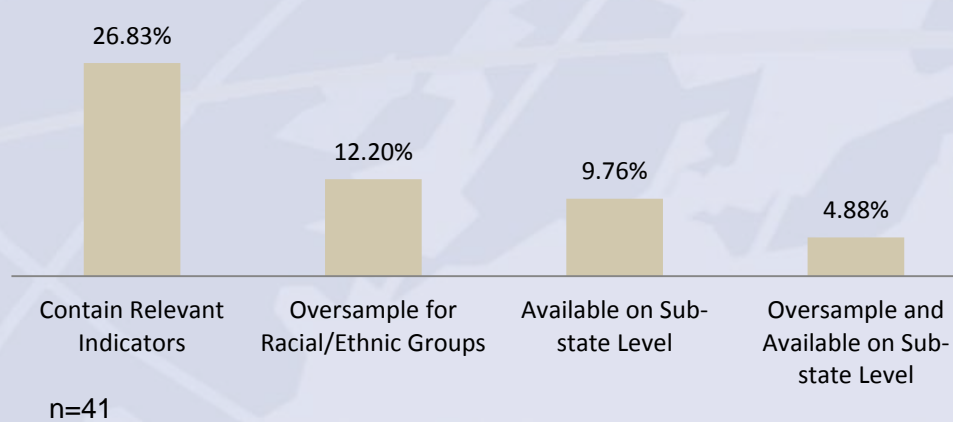
Applying BRFSS Data to Substate Areas

- Used to adjust the design weights so that the sample reflects the total population
- BRFSS final weights are adjusted to state population totals, however the distribution between weights for the substate area may be different than the population total
- Iterative raking was used to determine weights for substate level (e.g., age, sex, race/ethnicity/marital status)
- Examined changes in estimate availability by racial/ethnic subgroups, as well as by educational attainment.

Findings

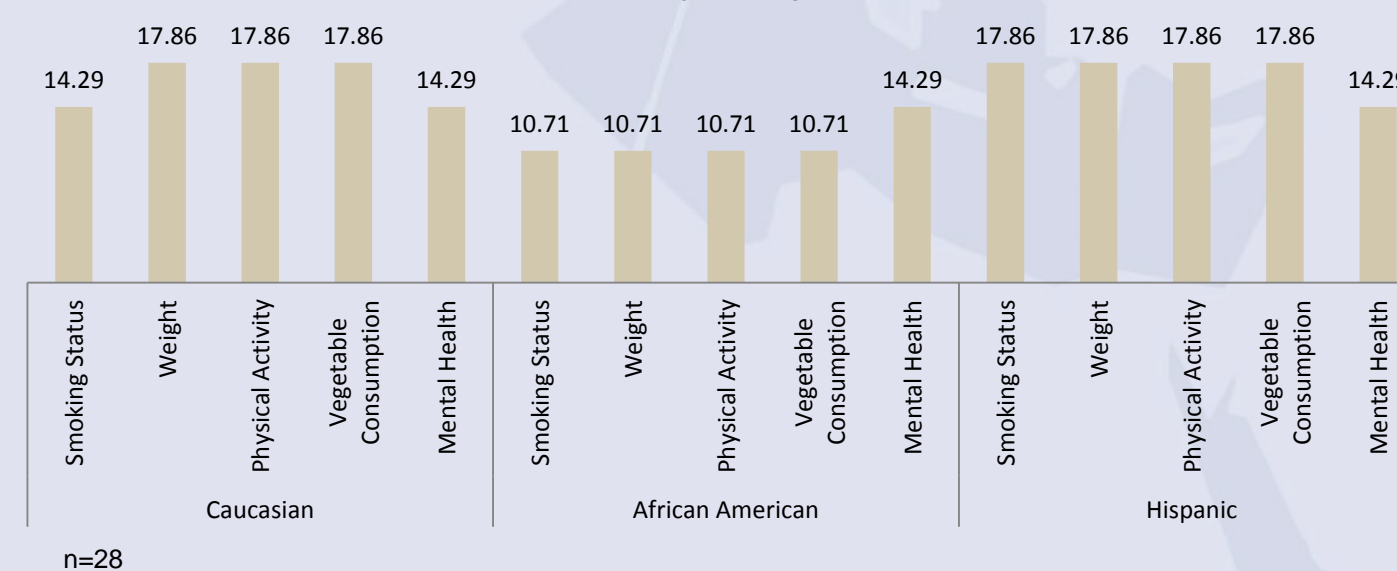
- The extent to which changes in outcomes of health disparate populations can be monitored using current surveillance systems is limited. (Exhibit 1)

Exhibit 1. Capacity of Existing Surveillance Systems to Monitor Chronic Disease Outcomes



- Youth indicators were less readily available on the substate level, with 17.86% of the counties included in the comparative analysis having available Youth Risk Behavior Surveillance System (YRBS) data. The availability decreases when conducting subgroup analyses (e.g. racial/ethnic minorities). (Exhibit 2)

Exhibit 2. Youth Indicator Availability by Race & Ethnicity (YRBS)



- The SMART BRFSS (Selected Metropolitan/Micropolitan Area Risk Trends) provides estimates on the county level. Counties that do not meet the reporting criteria (population of 10,000) can be combined with other counties within the Metropolitan/Micropolitan Statistical Area (MMSA) to provide estimates³. Certain counties within an MMSA have their own prevalence estimates because they have enough respondents to generate weighted data sets. For this analysis, weighting required at least 19 sample members in each of the weighting classes, which are based on age, sex, and in some states. The sample sizes, however, are too small in most cases to allow for subgroup analyses.
 - This approach provides estimates which may not be representative of the county's population. Although 82.4% of the counties in the comparison are included in the SMART BRFSS Project, only 21.43% were representative of the individual county's population.

- As expected, the overall greatest gaps in current surveillance systems exist within racial/ethnic subgroups, as well as within groups with lower than college educational attainment.

- With the application of raking tool to adjust the design weights, the sample reflected the total population and allowed for more readily available and accurate estimates for health disparate populations on the county level. (Exhibits 3, 4)

Exhibit 3. Indicator Availability Overall (BRFSS)

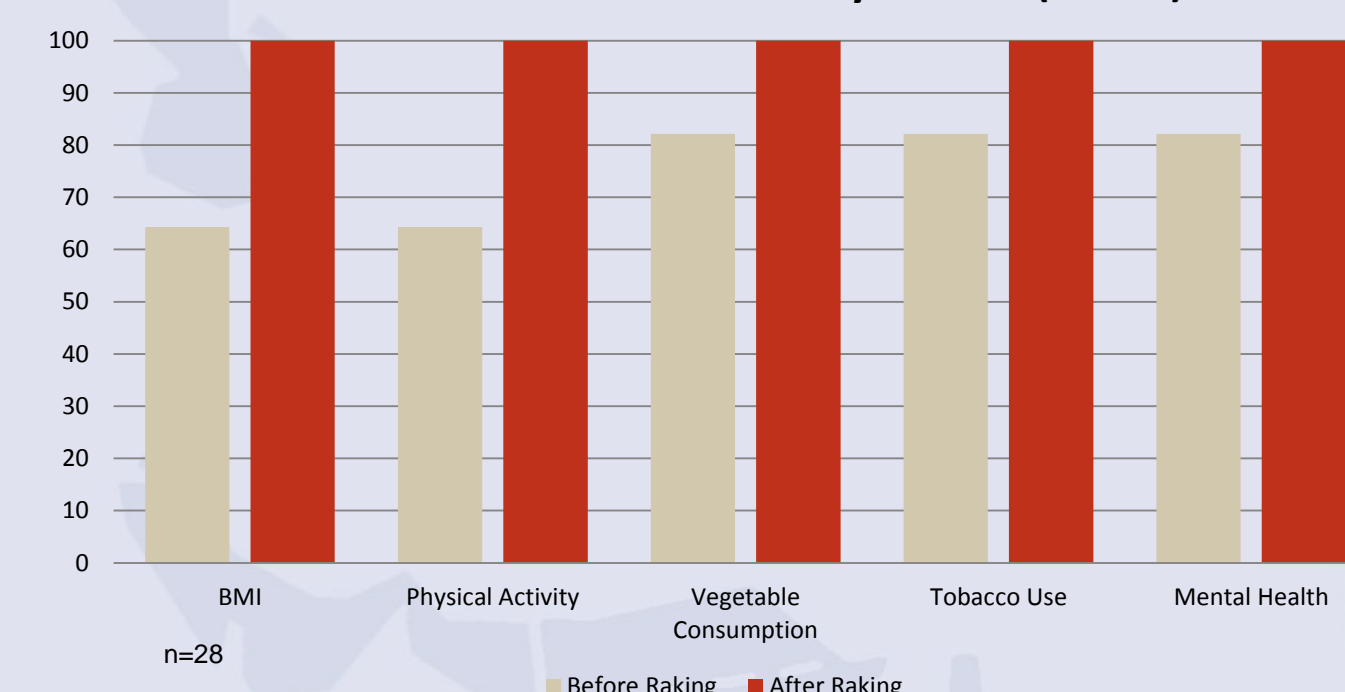
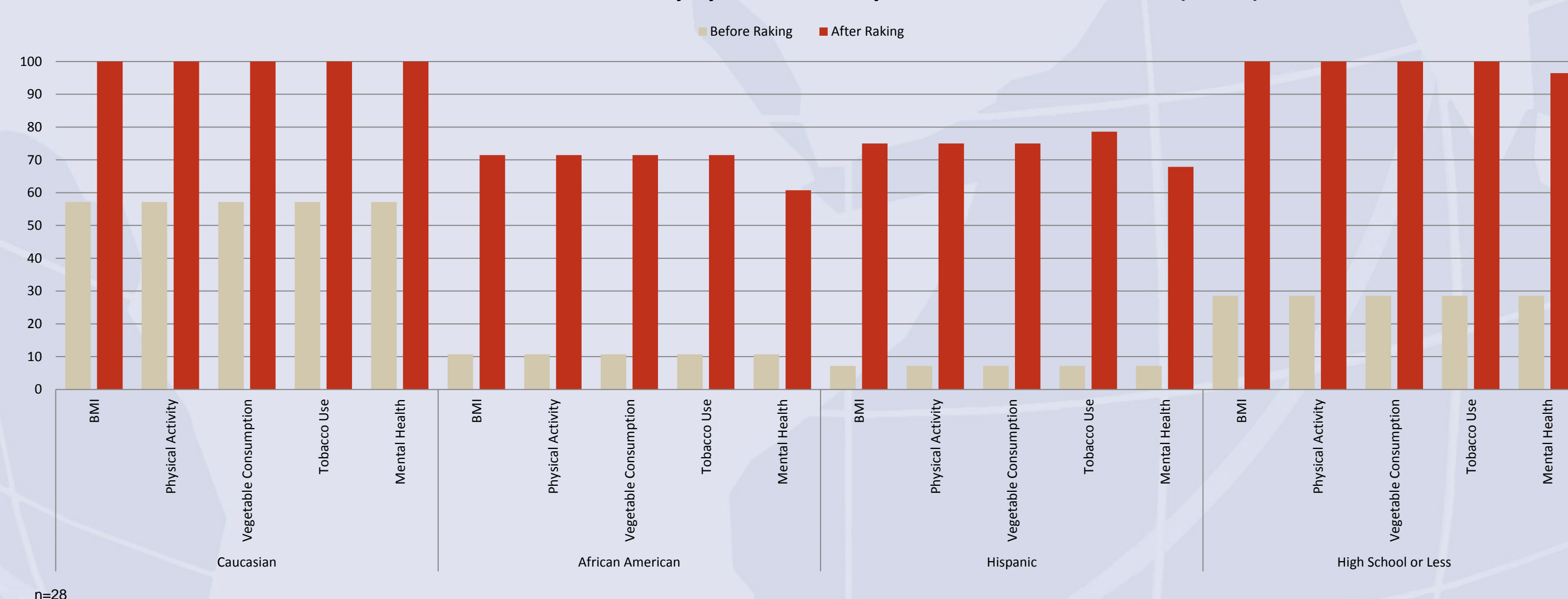


Exhibit 4. Indicator Availability by Race/Ethnicity & Educational Attainment (BRFSS)



Limitations

- This comparative analysis was limited to surveillance systems that specifically monitor five strategic directives mandated by the ACA and not all chronic disease outcomes.
- Only 1 dataset, the Behavioral Risk Factor Surveillance System, had sufficient sample sizes to examine the application and accuracy of iterative raking to generate substate estimates for adults.
 - When comparing estimates generated by raking and estimates that use weights calculated for state-based estimates, absolute and relative differences were observed (Exhibit 5)

Exhibit 5. Comparison of Smoking Rates with and without Raking	10 NC Counties	7 MD Counties
Smoking rate (%) using raking	25.75	22.32
Smoking rate (%) by subsetting BRFSS	26.92	19.97
Absolute difference (%)	1.17	2.35
Relative difference (%)	4.54	11.77

Next Steps

- Identify and compare a greater sample of available substate estimates with estimates derived using raking to determine validity of methodology
- It would be beneficial to improve access to current data by dedicating resources to create statistics for substate geographies as public health shifts its focus to the community level by:
 - Dedicating resources to create statistics for smaller-level geographies
 - Increase oversampling for racial/ethnic minorities

References

- Centers for Disease Control and Prevention (CDC). *The Patient Protection and Affordable Care Act*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013.
- Centers for Disease Control and Prevention (CDC). *Youth Risk Behavior Surveillance System Survey Questionnaire*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2001-2011.
- Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Questionnaire*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2002-2011.

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