SPATIAL ANALYSIS IN CANCER SURVEILLANCE: ADDRESSING COLORECTAL CANCER DISPARITIES IN A SPATIAL CONTEXT
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I OVERVIEW:
Colorectal cancer (CRC) is one of the most common invasive cancers in the US. Routine screening reduces mortality and some screening modalities have the potential to reduce the high risk of late stage CRC for Blacks, Cubans, Hispanic Whites, and non-Hispanics Whites in Florida. Numerous analysis were conducted with varying methods and parameters to determine the appropriate area for intervention. The high risk areas were selected, logistic and hierarchical modeling may be most suitable due to ease of use, geographical modeling accounts for the data's geographically nested structure. County-level screening rates were from the 2010 BRFSS. Census tract-level SES data were from the 2010 American Community Survey.

II METHODS:
CRC cases diagnosed in Florida were analyzed using SaTScan to identify clusters of late-stage at diagnosis of CRC for Blacks, Cubans, Hispanic Whites, and non-Hispanics Whites in Florida. Distance analysis was conducted with varying methods and parameters to determine the appropriate area for intervention (see Abstract 2452). Both Poisson, rate of late-stage clusters, and Bernoulli, ratio of late:early stage clusters, were conducted. Once the high risk areas were selected, logistic and hierarchical regression was performed (and compared) to identify demographic risk factors (individual from registry data; area-based from census) associated with increased risk of a late stage CRC diagnosis. Hierarchical modeling accounts for the data's geographically nested structure. County-level screening rates were from the 2010 BRFSS. Census tract-level SES data were from the 2010 American Community Survey.

III RESULTS:
There were no statistically significant clusters of late-stage at diagnosis of CRC for Cubans and only clusters detected using the Poisson method were significant for White Hispanics. Census tract poverty, a known risk factor for late-stage disease, was protective against Blacks being diagnosed in a late-stage cluster in all models and protective for non-Hispanic Whites in the Poisson Models and a risk in the Bernoulli Models. In general, increased segregation by ethnicity was protective for Hispanics and a risk for Blacks and non-Hispanic Whites. Increased segregation by race was a risk for living in a cluster of late-stage CRC diagnoses.

IV CONCLUSIONS:
Unanticipated associations between late-stage and poverty may represent a "screening effect" driven by recent cancer control efforts aimed at Florida's high-risk populations. While the differences between the logistic and hierarchical modeling were slight, they may have important policy implications. To describe a community at risk for geographic targeting of an intervention, the logistic model may be most suitable due to ease of use. But to evaluate the relationship of area-based SES measures with a population's risk of being late-stage CRC at diagnosis, hierarchical modeling may be more correct because it accounts for both direct and contextual effects. Targeting high risk communities for screening efforts should be public health policy. Successful interventions will be tailored based on the specific characteristics of the at risk population.