Framework for selecting a representative sample of providers in implementing Provider-Based Sampling and Recruitment for the NCS in Worcester County.

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Context

Worcester County includes nearly 60 towns where almost 86% of women receive prenatal care from approximately 175 County practitioners. These practitioners' patient populations vary due to multiple factors (e.g. practice locale, cost, patient characteristics). Our proposed sampling method will use Geographic Information Systems (GIS) to integrate and analyze pre-natal patient residence, demographic, and environmental data to characterize each provider's catchment area and ensure a representative sample of providers for recruitment.

Methods

- Identify all County prenatal providers, obtain each patient's ZIP code from each provider map their locations using GIS.

- Calculate the proportion of patients residing in providers' respective zip cope. Generate "weights" to represent contributions of each zip code to the aggregated characteristics of each provider's service area

- Collect demographic and environmental data and calculate adaptability and hazard risk ("A and H") indices using GIS and weighted linear combination methodology.

- Using A and H indices per provider, classify providers into 25 "bins" (i.e., scale of 1-5 will produce 25 possible combinations) and implement a population-weighted random sampling for 'n' women from the 25 bins. As appropriate use mixed effects models to address potential bias due to clustering of patients within the bins.

Significance

This GIS-based method will enable us to ensure that women with different socio-economic characteristics and environmental exposures are represented in the random sample of providers selected for this study.

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