International Journal of Population Data Science

Journal Website: www.ijpds.org

Developing a Data-driven Approach to inform Planning in County Health and Human Services Departments in the Context of a Case Study on Obesity

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Since the 1970s, the obesity rate has steadily increased due to growing availability of food and declining physical activity. The existing environments within a community, including active recreation opportunities, access to healthy food options, the built environment, and transportation options, can moderate obesity. In Virginia, Fairfax County Health and Human Services (HHS) system is interested in developing the capacity for data-driven approaches to gain insights on current and future issues, such as obesity, to characterize factors at the county and sub-county level, and to use these insights to inform policy options. In exploring these questions, we developed statistical methods to combined data from a multitude of different sources including local administrative data (e.g., tax assessments, land use, student surveys), place-based data, and federal collections. Using synthetic data methods based on imputation, we recomputed American Community Survey statistics for non-Census tract geographic regions for political districts and high school attendance areas. We combined this with environmental factors, such as land dedicated to parks and recreation facilities, as well as measures of the density of healthy and unhealthy food locations to create a map of potentially obesogenic factors. Finally, we combined these data sources with Fairfax County's youth survey and trained a random forest model to predict the effects of the environment on healthy food consumption and exercise. Our analysis highlights the need for (administrative) data at a fine scale and recommends policy changes concerning the recording and sharing of local data to better inform the policy and program development.

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