

Modeling Maternal Outcomes By Predicting Geospatial and Social Determinants of Health

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Parkland Community Health Plan (PCHP) is a Medicaid HMO that offers low-cost insurance plans to pregnant women and children within seven counties in North Texas. PCHP members accrue higher than average costs due to repeated emergency room visits and treatment for acute and/or chronic conditions associated with pregnancy complications. To identify social determinants of health (SDOH) that might contribute to this, we developed an algorithm that utilizes geospatial analysis and logistic regression to select features from PCHP Medicaid claims data and Parkland Center for Clinical Innovation's Community Vulnerability Compass (CVC). Using the 27 selected features from the algorithm, we built a logistic regression model to predict higher or lower average percentages of premature births on a block group level. Our results show that the model is 65% accurate, with two CVC features, mental health and alcohol abuse, contributing the most to the model's performance. Using the model, we can make more informed decisions on which CVC features contribute the most to predicting specific adverse maternal outcomes, which will allow us to better address socioeconomical barriers that prevent PCHP members from receiving adequate healthcare.