International Journal of Population Data Science

Journal Website: www.ijpds.org

Predicting Healthy Start Scheme Uptake using Deprivation and Food Insecurity Measures.

Kuzivakwashe Makokoro[1], Gavin Long[1], John Harvey[1], Andrew Smith[1], Simon Welham[2], Roberto Mansilla[1], Evgeniya Lukinova[1], and James Goulding[1]

[1]N/LAB, Nottingham University Business School, Jubilee Campus, University of Nottingham

[2]Division of Food, Nutrition & Dietetics, School of Biosciences, Sutton Bonington, University of Nottingham

Introduction & Background

The level of food insecurity in England is widening, with low-income families requiring more support to reduce income inequalities. The government have introduced policies to address these issues with targeted subsidies on healthy food on programs such as the Healthy Start Scheme. Despite this, national uptake of the Healthy Start Scheme remains lower than the government target.

Objectives & Approach

Our study aims to predict uptake and take up discrepancies at a local authority level and understand the measures contributing to the prediction using anonymised supermarket loyalty card data records for over 4 million customers, deprivation and food insecurity measures. We used a machine-learning approach utilising transactional data, ONS Index of Deprivation datasets, neighbourhood statistics, and NHS Healthy Start Scheme uptake data. Regression prediction models were used to evaluate and predict the outcomes, whilst feature importance tools were used to evaluate the variables weighing within the model.

Relevance to Digital Footprints

This study leverages transaction data from a UK retailer to understand lifestyle factors at a local authority level and assesses their usefulness in predicting the scheme's uptake. Loyalty card transactional data can provide valuable insight into purchase behaviour linked to health and nutrition.

Results

The Linear and Ridge Regression models performed better than other prediction models. Analysis of measures revealed that whilst deprivation and population-related measures had a high contribution to the prediction model, findings from transactional data measures provided valuable insight into shopping behavioural characteristics that contribute to the model performance. Results suggested that areas with higher spending on fruits and vegetables and high-calorie food were associated with higher uptake prediction in test data but the converse for high spend on fish.

Conclusions & Implications

Our study indicates that shopping data measures such as spend on fruits and vegetables, high-calorie food, fish and products bought can be utilised for prediction models for uptake and take-up discrepancy of the Healthy Start Scheme. This study highlights the complexity of understanding factors influencing public policy effectiveness and the need for tailored approaches in diverse urban contexts.

https://doi.org/10.23889/ijpds.v9i4.2435