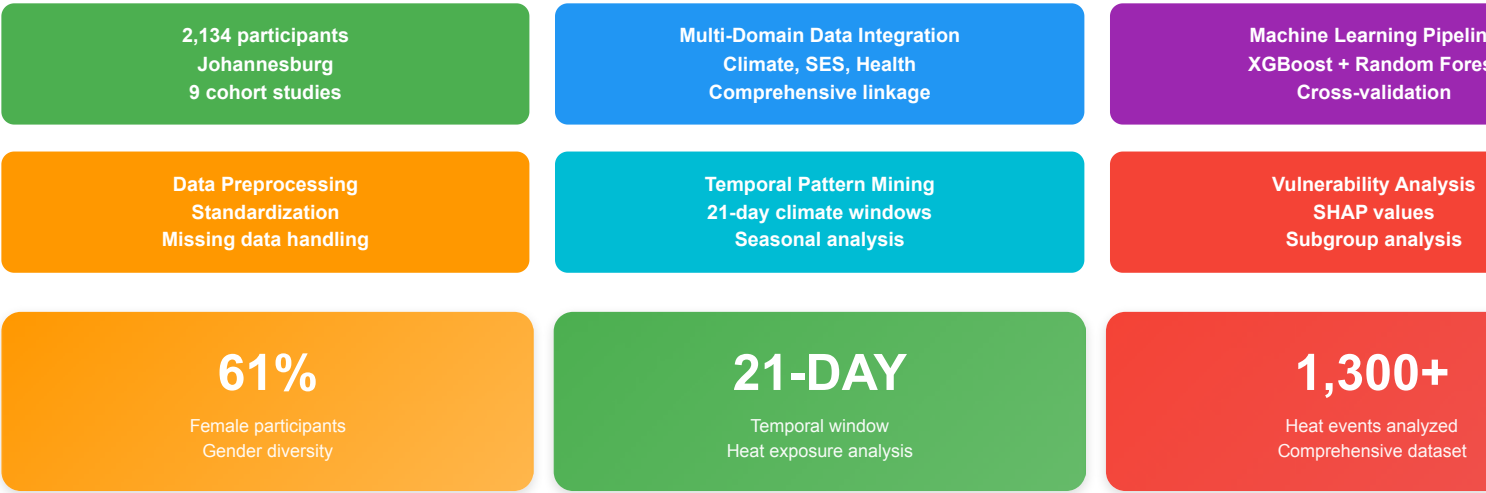


Background

Climate change disproportionately affects African urban populations through complex heat-health-socioeconomic interactions. Traditional approaches cannot capture these multi-dimensional relationships, limiting our ability to develop targeted interventions.

This study uses explainable AI to quantify predictive relationships between climate exposure, socioeconomic factors, and health outcomes in 2,134 participants from Johannesburg, South Africa.

Methods



Study Population

Health Outcome	Best Model	R ²	95% CI	MAE	P-value
Glucose (standardized)	Random Forest	0.611	0.587-0.635	0.548	0.001
Diastolic BP (standardized)	XGBoost	0.141	0.118-0.164	0.821	0.001
Systolic BP (standardized)	Random Forest	0.115	0.093-0.137	0.838	0.001
Hemoglobin (standardized)	Gradient Boosting	0.089	0.067-0.111	0.856	0.001
Potassium (standardized)	Random Forest	0.071	0.049-0.093	0.869	0.001

