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Title: Unravelling the dynamics of healthcare workforce attrition in the Eastern Cape: A multidimensional analysis

Abstract:

Background: The Eastern Cape's public healthcare system faces a persistent challenge of high workforce attrition rates, significantly impacting service delivery and resource management. High turnover rates not only strain the system's capacity but also compromise the quality of service provided to patients. This can consequently reduce patient satisfaction, or in more extreme cases, lead to avoidable patient deaths. There are also significant economic implications such as recruiting, hiring and training new staff.

Aim: To conduct a comprehensive analysis of the multifaceted factors associated with attrition and potentially drive evidence-based interventions to foster a more stable and resilient healthcare workforce in the Eastern Cape.

Methods: Demographic variables, compensation data, facility information, and employment histories were extracted from the PERSAL dataset. Analysis was then conducted using both statistical methods (generalised linear mixed models) and machine learning approaches (decision trees, XGBoost and long-short term memory models) to identify and interpret factors contributing to attrition.

Findings: Job security emerged as the strongest protective factor against attrition, with fixed appointments reducing the odds of departure by 82%. Career stagnation increased attrition likelihood by 6% with each additional year spent in the same position. Management instability was also detrimental, as each percentage point rise in turnover within leadership raised attrition odds by 34%. Machine learning models further confirmed these patterns and provided complementary predictive insights, with SHAP values highlighting job security, career progression and management turnover, in addition to compensation, as consistent drivers across approaches.

Conclusion: The study demonstrates that healthcare workforce attrition in the Eastern Cape is shaped by both individual career trajectories and broader organisational dynamics. Targeted retention strategies that address career stagnation and management instability, while ensuring job security, could reduce attrition, strengthen the healthcare workforce and enhance patient care delivery.