Predicting Cervical Screening Non-Attendance in Suffolk: a Machine Learning Approach

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- **Screening is important** in preventing cervical cancer.
- Cervical screening is free and can save lives by detecting **HPV (Human Papillomavirus)** and **abnormal cells** early, before they turn into cancer.
- Most people who are over 25 and assigned female at birth with a cervix are invited by the NHS every 5 years, **but non-attendance is common.**
- By predicting who is unlikely to attend, we can offer targeted interventions to **boost screening rates** and **cut cancer risk**.

Research Question:
What factors are indicative of screening non-attendance?

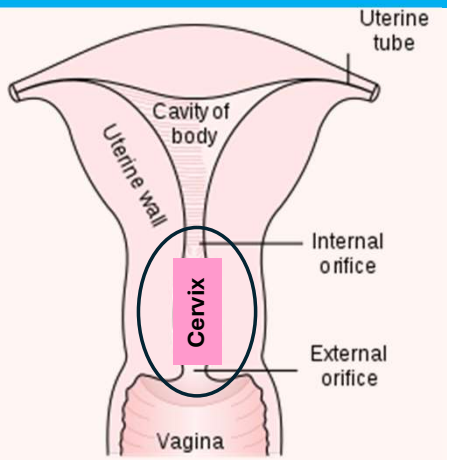
Methods

Literature Review & Data Preparation

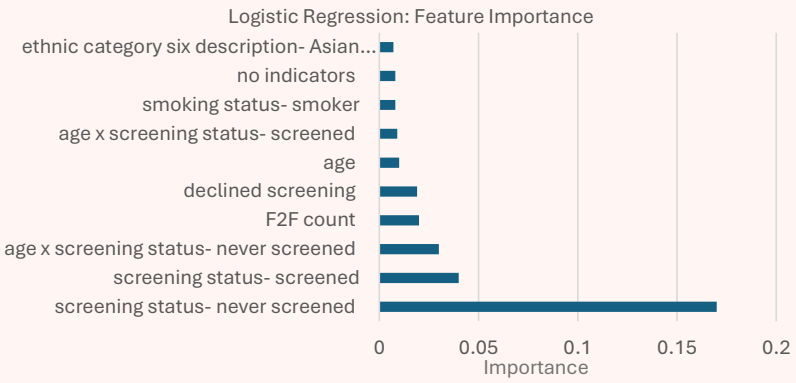
Exploratory Data Analysis

Model: Decision Tree & Logistic Regression

Results & Evaluation



Results



Our models predict that screening status (declined, never screened, recently screened), the number of times an individual visits their GP (F2F count) and age were the biggest predictors of screening non-attendance.

Discussion

Our data only includes information recorded in NHS patient records, so it misses important reasons people might not attend, like feeling uncomfortable, embarrassed or not having enough time to go to their screening[1] .

Talking to people through interviews or surveys could help us better understand these reasons and find ways to improve attendance.

Next Steps

Targeted or personalised[2] approaches for younger people and those who rarely see their GP may help improve screening attendance[3].
To build a fuller picture of why people miss appointments, future work could include patient interviews or surveys.

References:
1 Wilding, S., Wighton, S., Halligan, D., West, R., Conner, M. and O'Connor, D.B. (2020). What factors are most influential in increasing cervical cancer screening attendance? An online study of uk-based women1. Health Psychology and Behavioral Medicine, [online] 8(1), pp.314–328. doi:https://doi.org/10.1080/21642850.2020.1798239.
2 Brandzel, S. (2017). Cancer Screening Reminders: Addressing the Spectrum of Patient Preferences. The Permanente Journal, 21(17). doi:https://doi.org/10.7812/tpp/17-051.
3 McLean, S., Booth, A., Gee, M., Salway, S., Cobb, M., Bhanbhro, S. and Nancarrow, S. (2016). Appointment reminder systems are effective but not optimal: results of a systematic review and evidence synthesis employing realist principles. Patient Preference and Adherence, [online] 10, p.479. doi:https://doi.org/10.2147/ppa.s93046.