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Consumer purchase behaviours and over-the-counter lactic acid treatments for bacterial vaginosis

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Introduction & Background

Bacterial Vaginosis (BV) is the most common vaginal infection in women of reproductive age, with implications for gynaecological health, pregnancy outcomes, and antimicrobial resistance. Despite its prevalence, limited evidence exists on consumer behaviour and impacts following the introduction of over-the-counter lactic acid BV treatments. This study focuses on the behavioural patterns of women purchasing these treatments, exploring whether switching between products correlates with shorter repurchase intervals and identifying associated socioeconomic and demographic factors.

Objectives & Approach

We investigated consumer behaviours around BV treatment purchases, focusing on product switching in search of effective relief. Using UK retail healthcare sales data, we conducted time-to-event analyses, including Kaplan-Meier survival curves, to assess purchase patterns. An event refers to a pair of consecutive BV purchases by the same woman, with time-to-event defined as the days between them. A predictive machine learning model (Random Forest) analysed feature importance and predicted switching behaviours. The dataset included 5,907 events across 2,628 women, with 1,149 classified as switches. Data were split into training (70%) and testing (30%) sets, balanced via undersampling. Understanding switching behaviours is crucial to understand how self-medication and available over-the-counter medications might affect treatment choices and pathways to care.

Relevance to Digital Footprints

This study highlights how digital footprint data can reveal health-related behaviours at scale. Retail purchase patterns offer large-scale insights into women's urogenital health and opportunities for public health support.

Results

Preliminary findings indicate that women who switch between product types tend to repurchase more quickly. Faster repur-

chasing may indicate ineffective treatment, suggesting issues with self-medication adequacy or the need for additional care. Feature importance analyses highlight the significance of variables such as time-to-event, socioeconomic-demographic factors, and product-specific characteristics. While the predictive model achieved moderate performance (ROC-AUC: 0.70), the study demonstrates the potential for digital footprint data to provide actionable insights into consumer health behaviours.

Conclusions & Implications

Consumer transactions offer valuable insights into health behaviours and could guide interventions. Future research will expand to national datasets, address health inequities, and compare regional prescribing patterns to tackle antimicrobial resistance. These insights may improve gynaecological care and inform public health policy.

Keywords

Bacterial vaginosis, consumer behaviour, over-the-counter medications, antimicrobial resistance, machine learning

