Simulating Personalized Patient Journeys for Early Cancer Detection Using Artificial Intelligence and Synthetic Data

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Key takeaway: Synthetic data and MRF modeling can safely simulate real-world settings to advance personalized cancer prevention at scale.

BACKGROUND

Problem

- AI/ML models for early cancer detection face limited access to real patient data.
- Data scarcity, privacy, and ethical constraints hinder validation.

Desired Solution

- **Synthetic data** enables rigorous model testing in a privacy-preserving environment.
- Integrating **Modifiable Risk Factors** (**MRFs**), such as diet, exercise, alcohol use, sleep, and smoking, enables more realistic risk modeling.

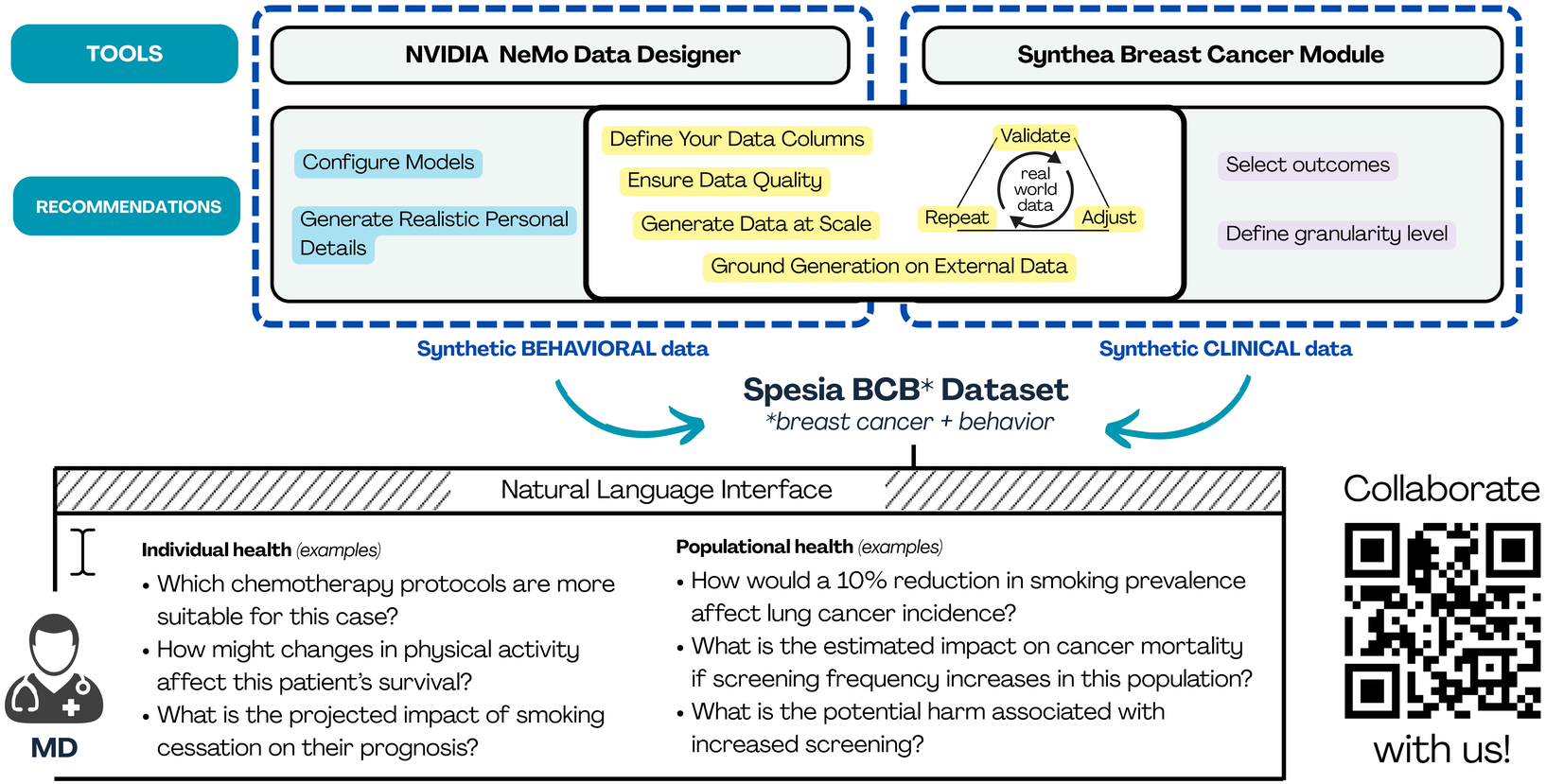
Aim

- Develop a **privacy-preserving framework** capable of simulating personalized patient journeys for early cancer detection.
- Focus: **breast cancer prevention and precision risk modeling**.

Core objetives

- Develop a **synthetic dataset** of patient personas enriched with detailed MRFs and longitudinal data.
- Enable **"what-if" scenario analyses** analyses to evaluate how behavioral and clinical changes affect individual risk trajectories.

METHODS & EXPECTED RESULTS



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