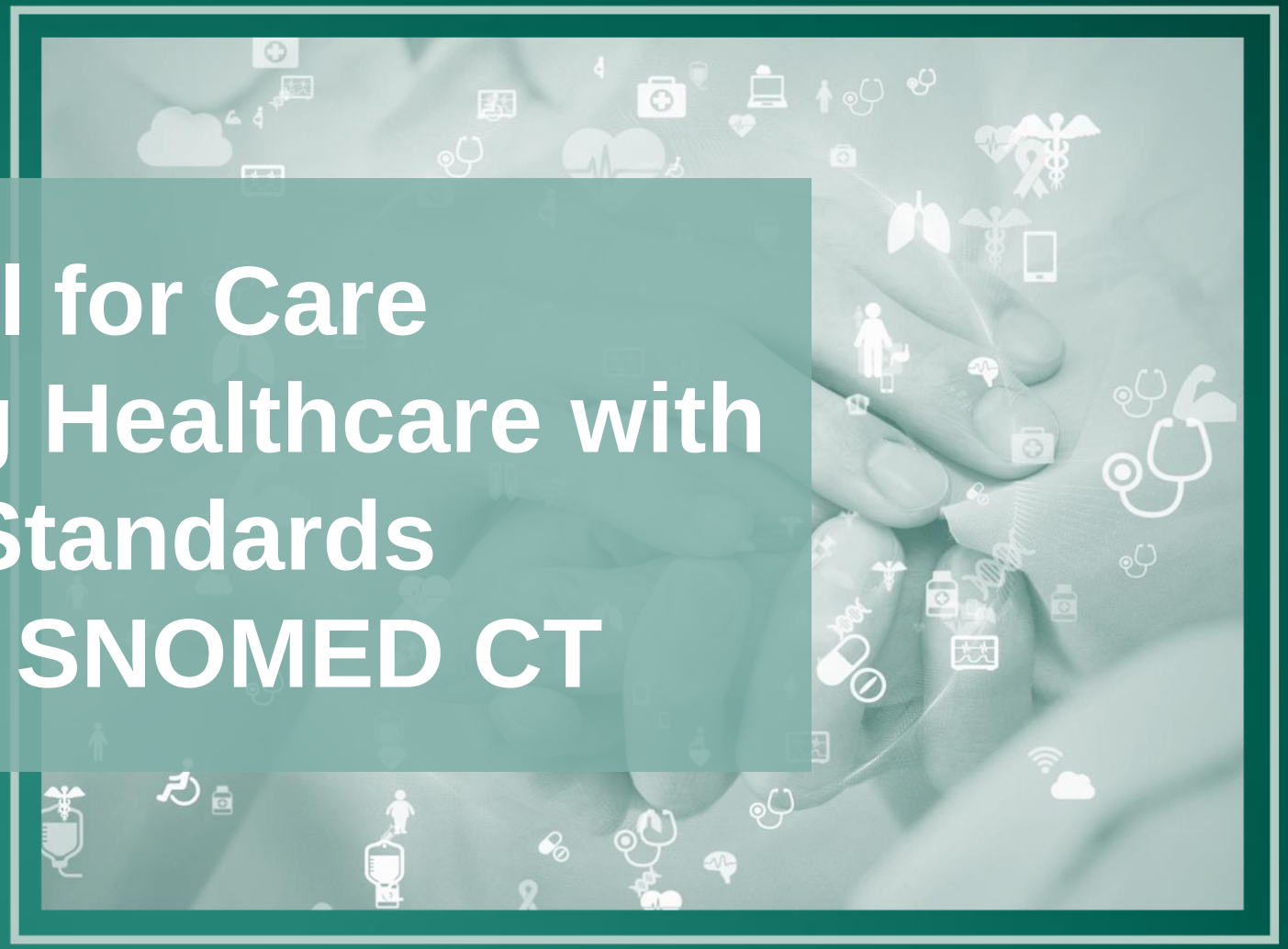
Digital for Care
Transforming Healthcare with Data Standards including SNOMED CT



Empowering People. Connecting Lives.

Lightening session: AI for Care

Kevin Kelly
Head of AI & Automation
CoE, HSE

Ian Green
Customer Relations Lead,
Europe & Global Clinical
Engagement Manager
(SNOMED International)

Rachel Dunscombe
CEO
OpenEHR

Patricia Maguire
Professor and Director of UCD
Institute for Discovery

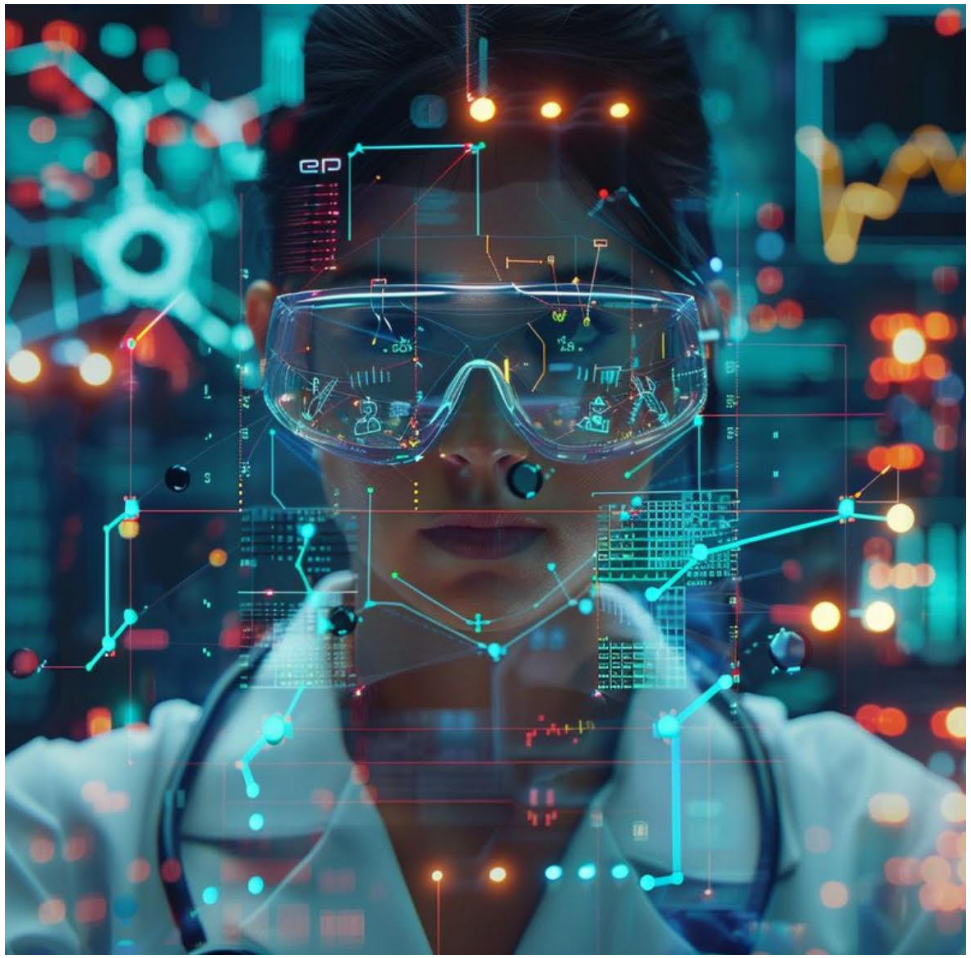
DIGITAL FOR CARE

CONFERENCE

Digital for Care Transforming Healthcare with Data Standards including SNOMED CT

ARTIFICIAL INTELLIGENCE

Applications in Healthcare



Prof. Patricia B. Maguire,
University College Dublin

patricia.maguire@ucd.ie

Unlocking value in Healthcare Data

Lots of Challenges, therefore how?

Large and Complex Data Sets

Multiple Industry Standards

Standards Not Suited for Analytics

Limited IT Staff

Data Duplication due to Multiple Sources and Solutions

40% Increase from 2010 to 2020

23% Expected Increase by end 2025

2% Data Retained in 2021

97% Unused

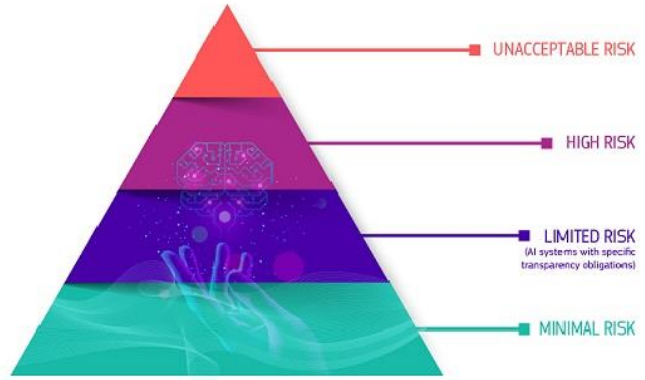
It is all about the data!!

https://www.deloitte.com/be/en/Industries/health-

Balancing AI Innovation with Ethical Considerations in Healthcare

Ensure equitable AI-driven healthcare solutions

- **Adherence to EU AI Act:** Ensure AI systems in healthcare comply with the EU AI Act, which mandates safety, transparency, & accountability to foster trustworthy AI.
- **Risk Management:** Implement robust risk management strategies to identify and mitigate potential harms associated with AI applications in healthcare.
- **Data Privacy and Security:** Prioritise patient data privacy & security, aligning with GDPR requirements to maintain confidentiality and trust.
- **Human Oversight:** Maintain human oversight in AI-driven healthcare decisions to ensure ethical standards and patient safety.
- **Continuous Monitoring and Evaluation:** Establish processes for ongoing monitoring and evaluation of



https://www.coalitionforhealthai.org/papers/blueprint-for-trustworthy-ai_V1.0.pdf

Developing and deploying trustworthy AI systems

Ensuring they are ethical, fair, and safe for society

1. Transparency
Clear, understandable AI models and decision-making processes.
Open communication about AI capabilities, limitations, & potential risks.

2. Fairness and Non-Discrimination
Ensuring AI systems are free from bias.
Equal treatment and fairness across all demographic groups.

3. Account
Clear respor
Mechanisms

4. Privacy and Data Security
Robust protection of personal data.
Compliance with data protection regulations (e.g., GDPR).

5. Reliability and Safety
Consistent, accurate, and safe AI performance.
Rigorous testing and validation processes.

6. Ethical Considerations
Alignment with societal values and ethical norms.
Regular ethical reviews and updates.

7. Human-Centred Design
Ensuring AI augments human capabilities.
Keeping humans in the loop in critical decision-making processes.

Always need a human in the loop

https://www.socialtechlab.eu/

AI at the Mayo Clinic

An Exemplar in the Science of Artificial Intelligence

John Halamka MD

https://www.mayo.edu/research/faculty/halamka-john-d-m-d-m-s/bio-20542748

With emerging capabilities in the science of AI, we at the Mayo Clinic can reach even more patients and create new ways to diagnose, treat, predict, prevent and cure disease.

We see a future in which AI will:

- Help select and match patients with the most promising clinical trials
- Develop and deploy remote health monitoring devices,
- Leverage imaging technology to detect currently imperceptible conditions
- Anticipate disease-risk years in advance.

"Teams of data scientists, clinician & researchers working together"

"more than 200 on-going AI projects…"

"Built a new Research Department for AI and Informatics, established a Center for Digital Health and a Department of Quantitative Health Sciences, and launched the Mayo Clinic Platform."

https://www.mayoclinic.org/giving-to-mayo-clinic/our-

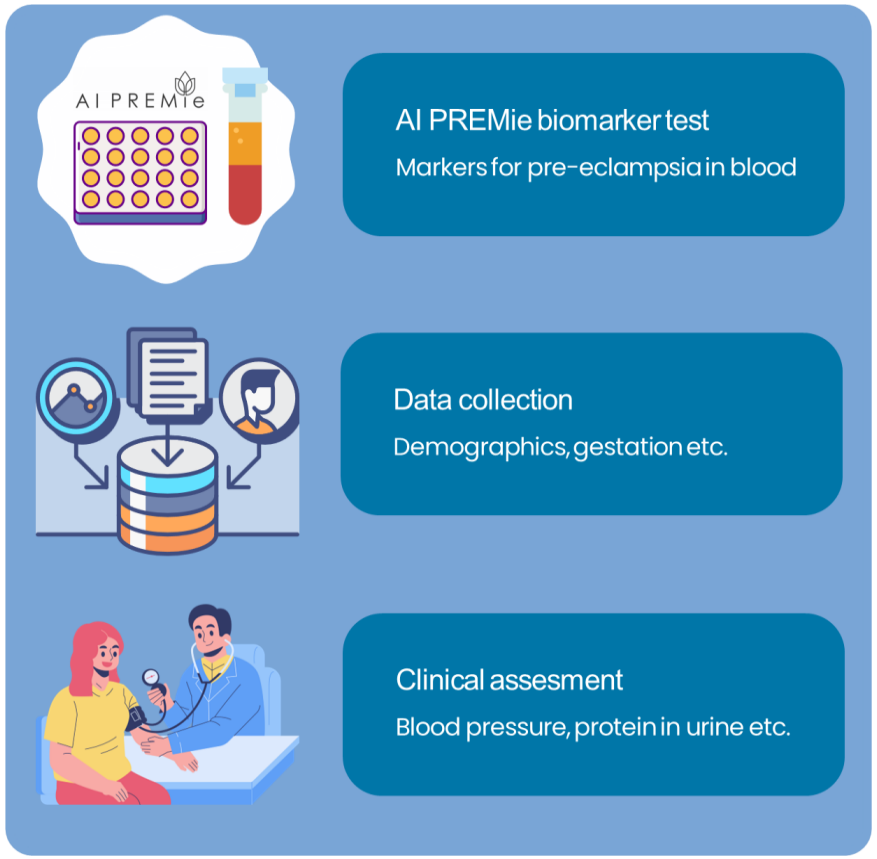
The UCD AI Healthcare Hub

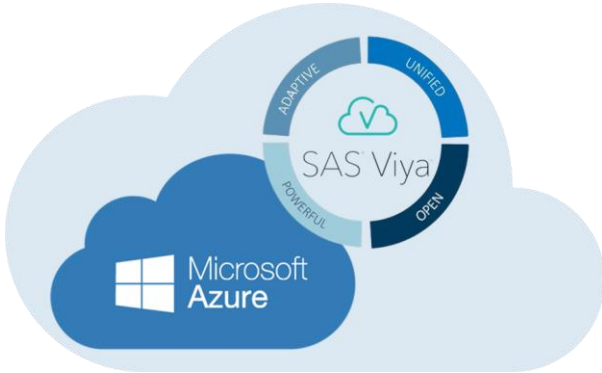
The vision of the UCD AI Healthcare Hub is to revolutionise healthcare through AI-driven translational research to rapidly translate scientific discoveries into tangible patient benefits.

It brings together a growing interdisciplinary community of practice at UCD and associated hospitals that are engaged in transformative and highly multidisciplinary, data-rich, translational research projects.

SOLUTION

AI_PREMie





Preeclampsia risk score

Effective, Efficient Clinical Decision Making in the diagnosis & risk stratification of Preeclampsia

Clinical

Prof Fionnuala Ní Áinle

Assoc Prof Mary Higgins

Prof Jennifer Donnelly

Assoc Prof Neil O'Gorman

Prof Amy O'Higgins

Dr Shauna Callaghan

Lab Management

Dr John O'Loughlin

Prof Patricia Maguire

Data Analytics

Dr Brian Mac Namee

Ms Ana Le Chevillier

Dr Luisa Weiss

Dr Suzy Whoriskey

Health Economics

Prof Gerardine Doyle

Dr Kate Cullen

Lab/Research/Data Collection

Ms Ella Fouhy

Dr Martin Kenny

Ms Sirisha Bellamkonda

Vanessa Carvalho

Molly Hong-Minh

Dr Zara Molphy

Project Management

Dr Katrina Comerford

Partners

Mr Andrew Warrington

Mr John Curran

Ms Mandy Daly

Commercial

Mr Edward Simons

Ms Cora McCann

AI PREMIe

The National Maternity Hospital
Vita Gloriosa Vita ~ Life Glorious Life

THE ROTUNDA HOSPITAL DUBLIN

The Coombe Hospital

sas

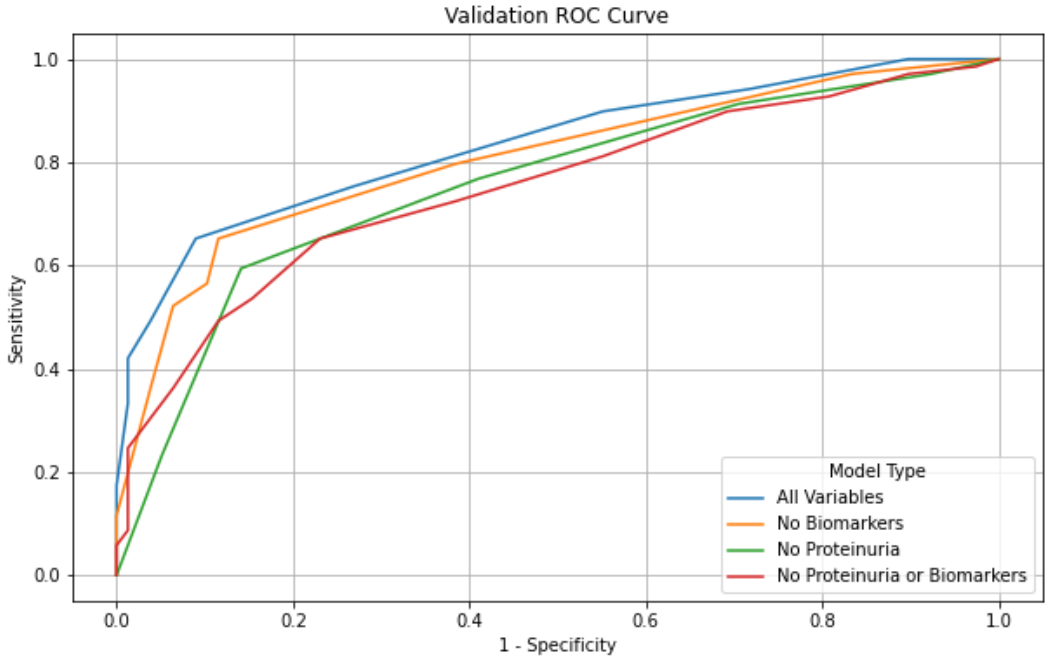
Science Foundation Ireland sfi For what's next

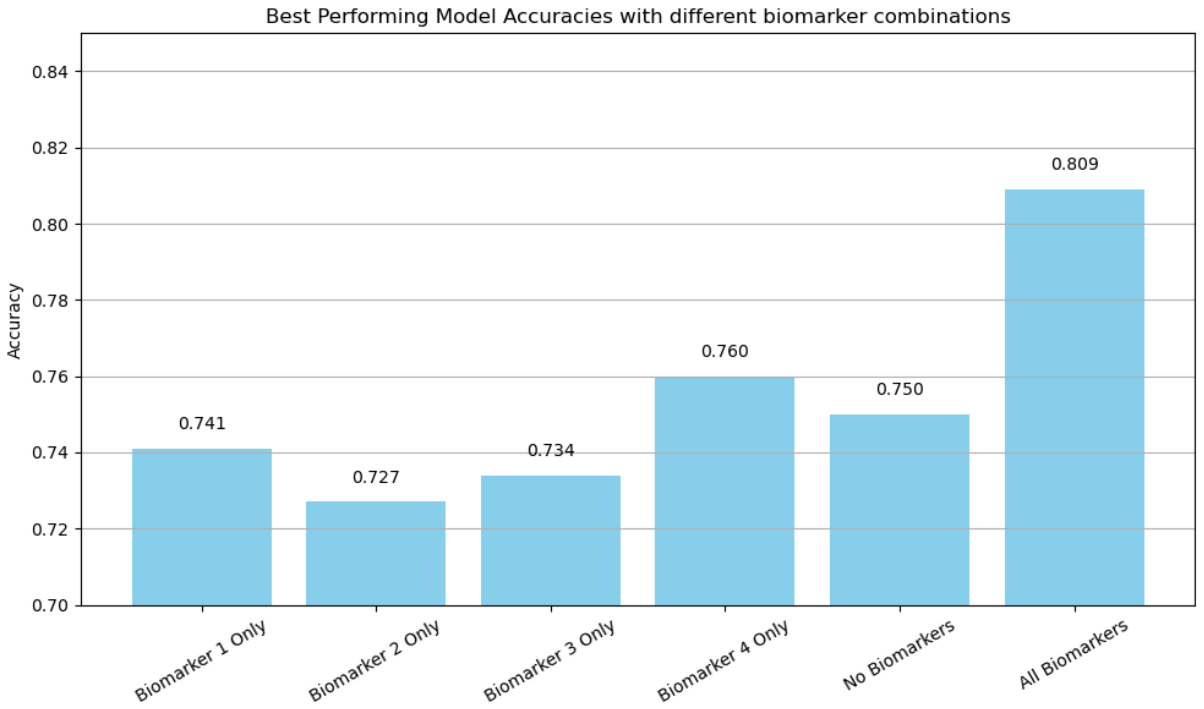
ENTERPRISE IRELAND

RCSI

UCD DUBLIN

Status: Jan 2025



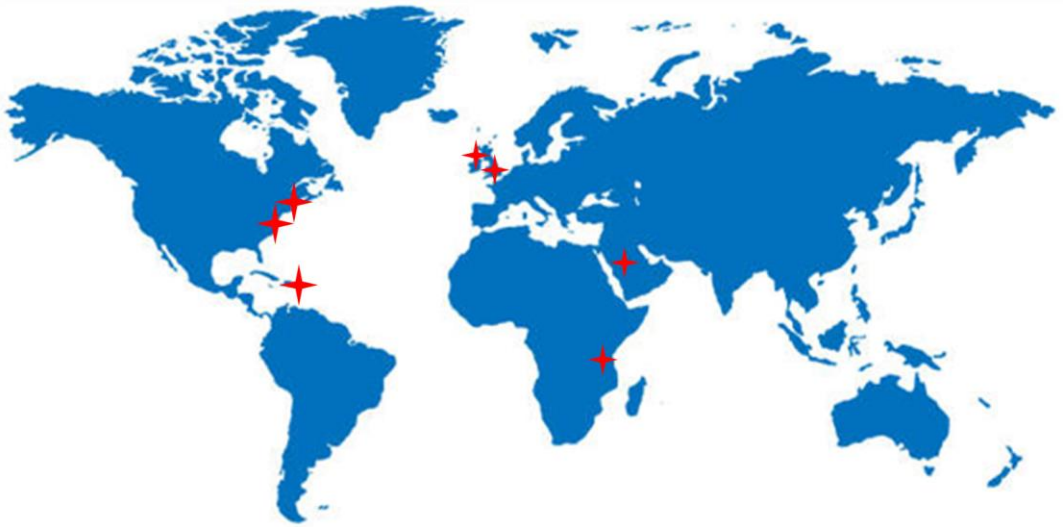


All metrics from the validation set (n = 124)
Unpublished data

OUR VISION

Revolutionising Maternity Care

Our team wants to get our test to every person who needs it across the world



PRE-CLINICAL HEART FAILURE

CASE STUDY

1,425 Enrolled Patients

64% Stage A at Baseline
36% Stage B at Baseline

55% Female Patients
45% Male Patients

CARDIAC STAGE EVOLUTION

A

- 74% remained in A
- 24% progressed to B
- 02% progressed to C

B

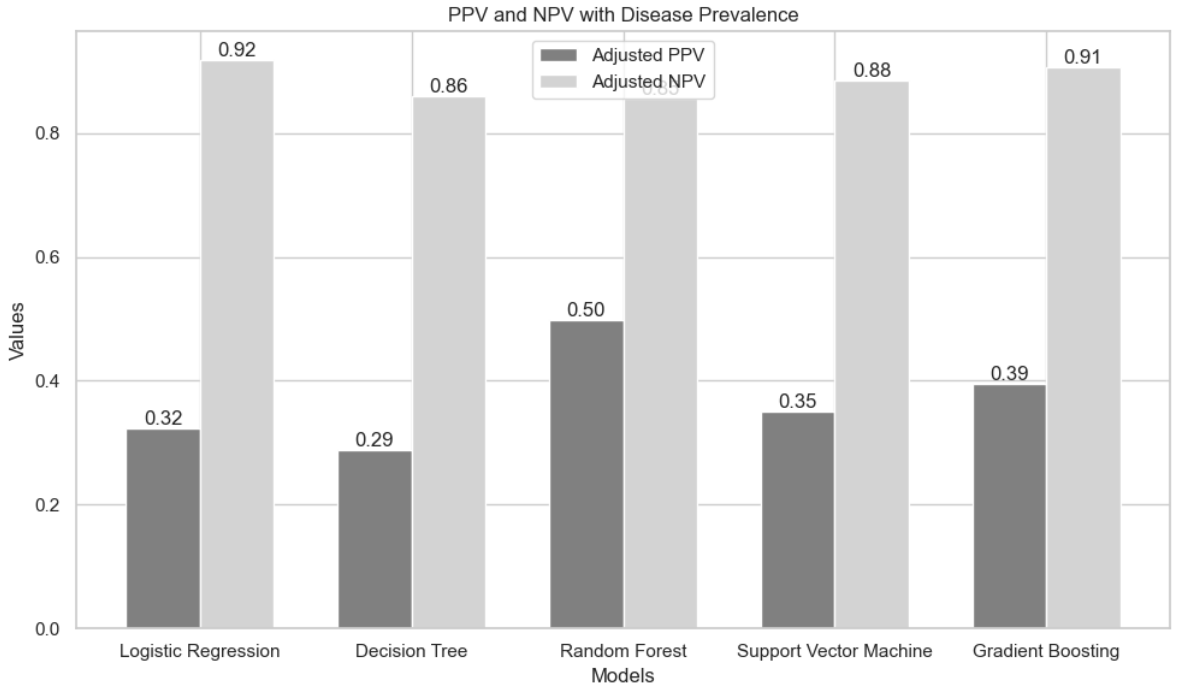
- 65% remained in B
- 11% progressed to C
- 24% regressed to A

ST. VINCENT'S UNIVERSITY HOSPITAL
Elm Park

DATA MODELLING

STRONG CORRELATION FEATURES

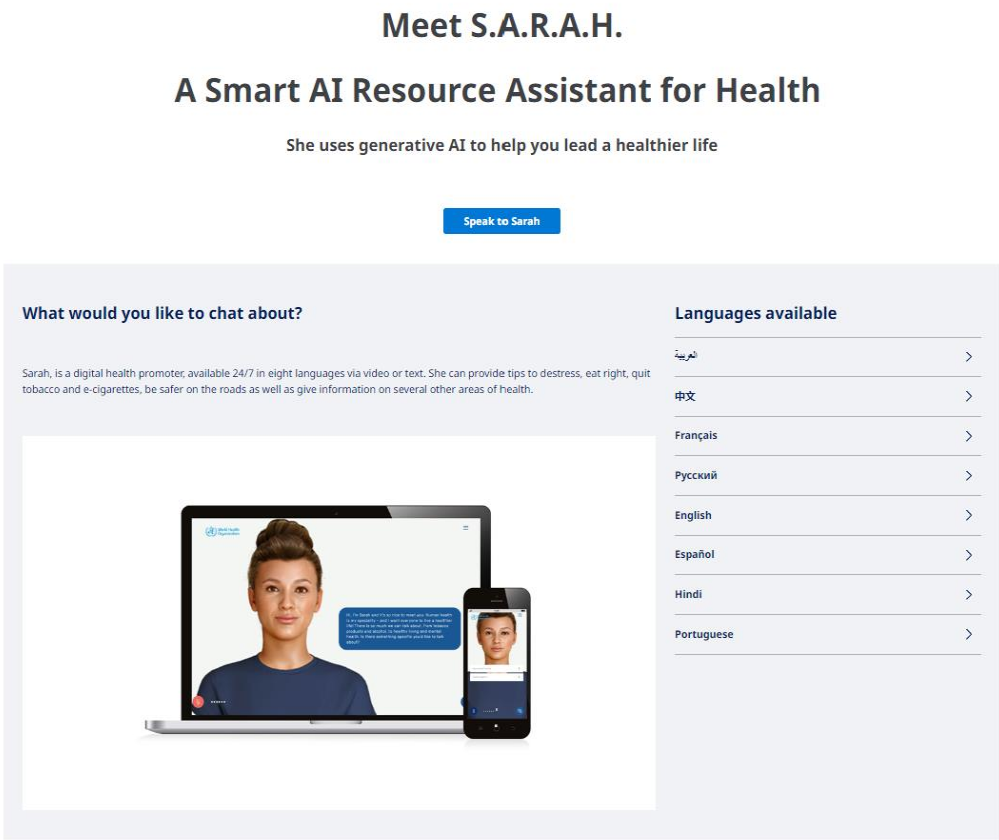
MODEL	ACCURACY	SENSITIVITY	SPECIFICITY	NPV
Logistic Regression	72%	65%	74%	92%
Decision Tree	78%	23%	88%	86%
Random Forest	83%	13%	97%	85%
SVM	78%	41%	85%	88%
Gradient Boosting	79%	54%	84%	91%



Rule-Out Model Recommendation: *Gradient Boosting [High Accuracy and NPV]*

Uses Gen AI as a base and has been trained with the latest information and available data from the WHO and trusted partners.

Provides information across major health topics, including mental health, and has expertise to help prevent some of the biggest causes of death in the world including cancer, heart disease, lung disease, and diabetes.



Answers may not always be accurate because they are based on patterns and probabilities in the available data. WHO takes no responsibility for any conversation content created by Generative AI. Furthermore, the conversation content created by Generative AI in no way represents or comprises the views or beliefs of WHO, and WHO does not warrant or guarantee the accuracy of any conversation content. Please check the WHO website for the most accurate information.

https://www.who.int/campaigns/s-a-r-a-h

Thank You