ROYAL PHARMACEUTICAL SOCIETY

Science, technology, data and ethics: Preparing pharmacy for the future

Professor Amira Guirguis
Chief Scientist,
Royal Pharmaceutical Society

Meet the Science and Research Team (SRT)



Amira Guirguis
Chief Scientist



Diane Ashiru-Oredope
Deputy Chief Scientist



Yen Truong
Senior S&R Manager



Helena Rosado
Senior S&R Manager



Jegak Seo
S&R Manager

Team objectives

- Develop research capacity and capability in pharmacy
- Increase the profile of science and research within pharmacy
- Drive innovation and build the evidence-base
- Ensure internal processes and products are driven by research/evidence-based decision making

Interested in what we do?
Scan here!

Royal Pharmaceutical Society
Key Products of Science and Research

NIHR e-Learning & Academic Journals

- 9 modules for pharmacists and pharmacy technicians interested in research.
- The Pharmaceutical Journal

Celebrating Excellence

- The Barnett Award
- The Hanbury & Harrison Medal
- Outstanding Pharmacy Early-career Researcher Award (OPERA)

Research Support Services

- 1:1 sessions
- Mock interviews
- Publishing guidance
- Proposal development help

Research support form

Pharmacy Research Guides

In-depth guidance for all research stages, from developing research question to project evaluation.

Networking &Voices

- Blog posts
- RPS Annual Conference
- Industrial and Antimicrobial Expert Advisory groups
- Science and Research Committee

Research Funding Opportunities Hub

26 currently available funding calls including internships, doctoral, post-doctoral, large project, and funders.

Pharmaceutical Sciences & Industry Hub

Connecting pharmacists & scientists with industry – Opportunities, Skills, and Networks

QR CODE

Why Industry? – *Why this matters*

- **Pharmacists and scientists** are key across the medicine lifecycle **from research to safe use**.
- **Career pathways** into industry are often **unclear or difficult to navigate**.
- Our Hub provides a single, trusted space to **explore roles, build skills, and access real opportunities**.

Where You Can Work – *Role families*

- Medical Affairs
- Clinical Development
- Regulatory Affairs
- Quality (QA/QC/QP)
- Pharmacovigilance
- Manufacturing & Supply
- Market Access
- HEOR
- RWE & Data Science
- Digital & AI
- Medical Comms
- Strategy & Policy

How to Get In – *Routes to industry*

- Internships & Industrial Placement
- Graduate & Associate-level roles
- Fellowships & Secondments
- Returnships for those re-entering the workforce

*Our **Transition Playbook** helps translate NHS/community experience into industry-recognised competencies.*

Take Action Today – *RPS got you*

- **RPS Industrial Pharmacy Expert Advisory Group (IPEAG)** - our expert network that can help shape and quality-assure the Hub.
- **Visit the Industry Opportunities Hub** – links to live roles, programmes and events
- **Request 1:1 support** – mock interviews, application reviews, role shadowing pathways

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Session Summary - *Science, AI, Data and Ethics: preparing Pharmacy for the future*

- How **AI, big data and pharmacogenomics** are transforming pharmacy and medicines optimisation
- Practical examples of applying **data-driven approaches to patient care**
- **Ethical and professional considerations** in digital adoption
- **Lessons** for future readiness and workforce development

PUBLISHED

Learning Objectives

Personalisation	Explain how AI, real-world data and pharmacogenomics are influencing drug discovery, personalised medicine and safety monitoring.
Optimisation	Assess how data-driven methods can improve medicines optimisation and reduce harm.
Ethics	Recognise ethical, patient consent, data governance and algorithmic fairness issues.
Resilience	Apply lessons from pandemic-driven digital innovations to strengthen service resilience.

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Live poll: Your Experience with AI and Data in Practice

Open the Q&A/Polling icon within the conference app to answer the poll

How would you describe your current level of experience with AI / data-driven tools in pharmacy practice?

Options

1. I have not used these tools yet
2. I have some basic awareness but limited hands-on use
3. I use data tools occasionally in my role
4. I regularly work with AI/analytics in practice or research

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The Potential of Pharmacy Data and AI to do Good

Professor James Goulding
Chair of Data Science,
University of Nottingham


N LAB
University of Nottingham
UK | CHINA | MALAYSIA
→ A centre of academic excellence at NUBS in Machine Learning for Social Good, established in 2017
→ 23 multidisciplinary academic staff, RFs and PhDs
→ AI Projects in UK, East Africa, Brazil, India, Philippines, China
→ Research Funding won >£25 million (UK Research councils, Gates, World Bank, FCDO, Innovate UK)
→ Vast experience of Big Data analytics with a range of data partners
(e.g. Boots, Tesco, Co-op, M&S, UKHSA, NHS, OLIO, Ipsos Mori, NHS, Experian, TiGo, Dialog)
A Single Goal – produce advances in Machine Learning for Social Good
Core applications in domains of health, wellbeing, and environment
www.nlab.org.uk

Nottingham?






Nottingham?

Pharmacy has been in the blood of Nottingham, since the 1800's…



SUPPORT BOOT'S, THE TRADE REFORMER!

Who supplies the Public at Wholesale Prices for Cash.

ALL GOODS ARE SOLD AT A REDUCTION OF FROM 30 TO 50 PER CENT.

PATENT MEDICINES AND HOUSEHOLD ARTICLES.

Adams' Furniture Polish, 8d. size for 6d., 1/2 for 10d.
Allen's Hair Restorer, 6/- for 3/4½
Allcock's Plasters, 13½d size for 7d.
Bond's Marking Ink, 6d. for 3d., 1/- for 6d.
Borax lump, 7d. per lb., ground 8d.
Coal Tar Soap, five 6d. tablets for 1/-
Cream of Tartar, 4d. quarter lb., 1/3 per lb.
Camphorated Chalk, 4½d. per quarter lb.
Epsom Salts, 2d. per lb., 7 lbs. for 1/-
Eno's Fruit Salt, 2/9 bottle for 2/-
Freidrichshall Bitter Water, 1/4 bottle for 11d.
Hunyadi Janos Water, 2/- size for 1/3, 14/6 per doz.
Jewsbury's Oriental Tooth Paste, 1/6 for 10d½, 2/6 for 1/4
Lamplough's Pyretic Saline, 2/6 size for 1/9.
Mother Siegel's Syrup, 2/6 bottles for 1/10
Quinine Wine, 2/6 size for 2/-
Rooke's Oriental Pills, 13½d. size for 8½d.
Whelpton's Pills, 13½d. size for 8½d.
Woodward's Gripe Water, 13½d. size for 9d.
Woodward's Gripe Water, 2/8 size (great saving) for 1/10
All other Patent Medicines at equally cheap rates.

COD LIVER OIL.

BOOT'S Extra Quality PURE COD LIVER OIL is the Finest that can be procured, and is sold at half the usual prices.

The following certificate has been given by Dr. Truman, Borough Analyst.

THE LABORATORY,
Municipal Offices, Nottingham.

I have examined the Cod Liver Oil from Mr Boot's Stock; it is pure and genuine, specific gravity, 923. Has a bland sweet taste, and can be taken easily.

E. BECKETT TRUMAN, M.D.

BOOT'S EXTRA QUALITY
COD LIVER OIL
is sold at the following prices:
8 ounces for 8d. usually sold for 1/3
16 ounces for 1/3, usually charged 2/6 for.

PURE GLYCERINE.

BOOT'S PURE GLYCERINE has likewise been examined by Dr. TRUMAN, and reported to be perfectly pure, free from lead and other organic impurities, and equally adapted for internal or external use.

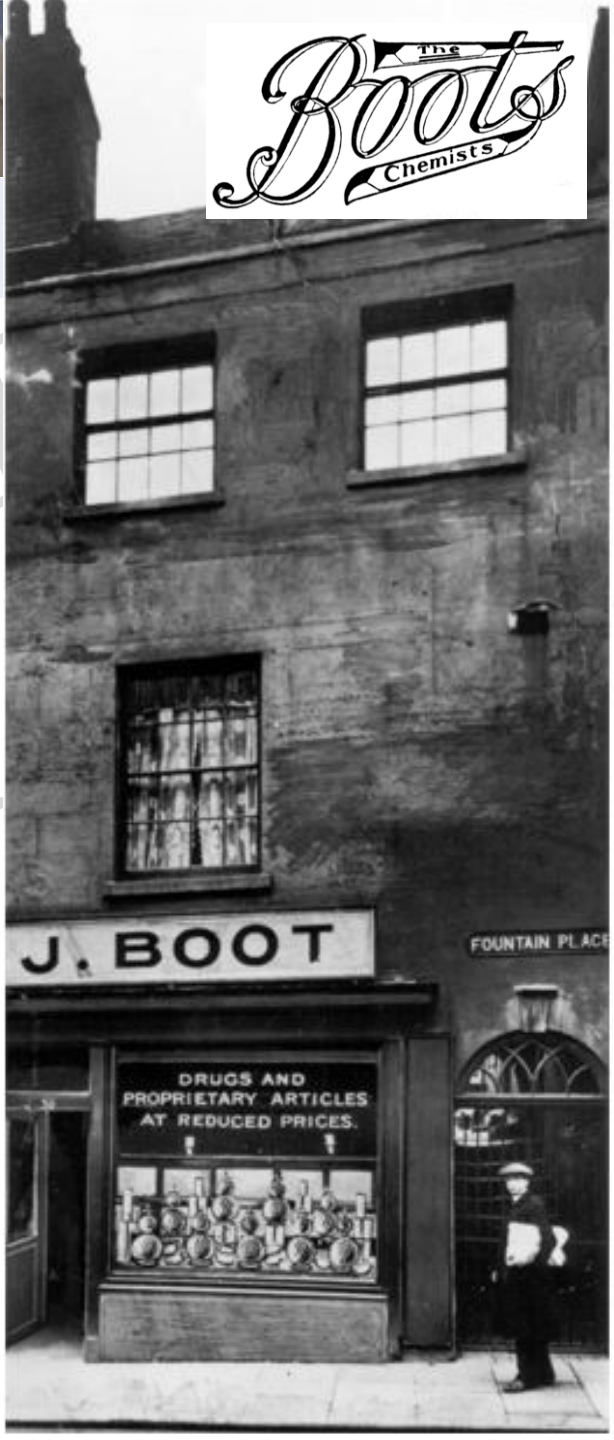
Price 4 ounces for 4½d., 16 ounces for 1/3.

Note the Address—

BOOT'S STORES,
16, GOOSE GATE.

NOTE THE ADDRESS:

BOOT'S PATENT MEDICINE STORES,
16, GOOSE GATE, NOTTINGHAM.



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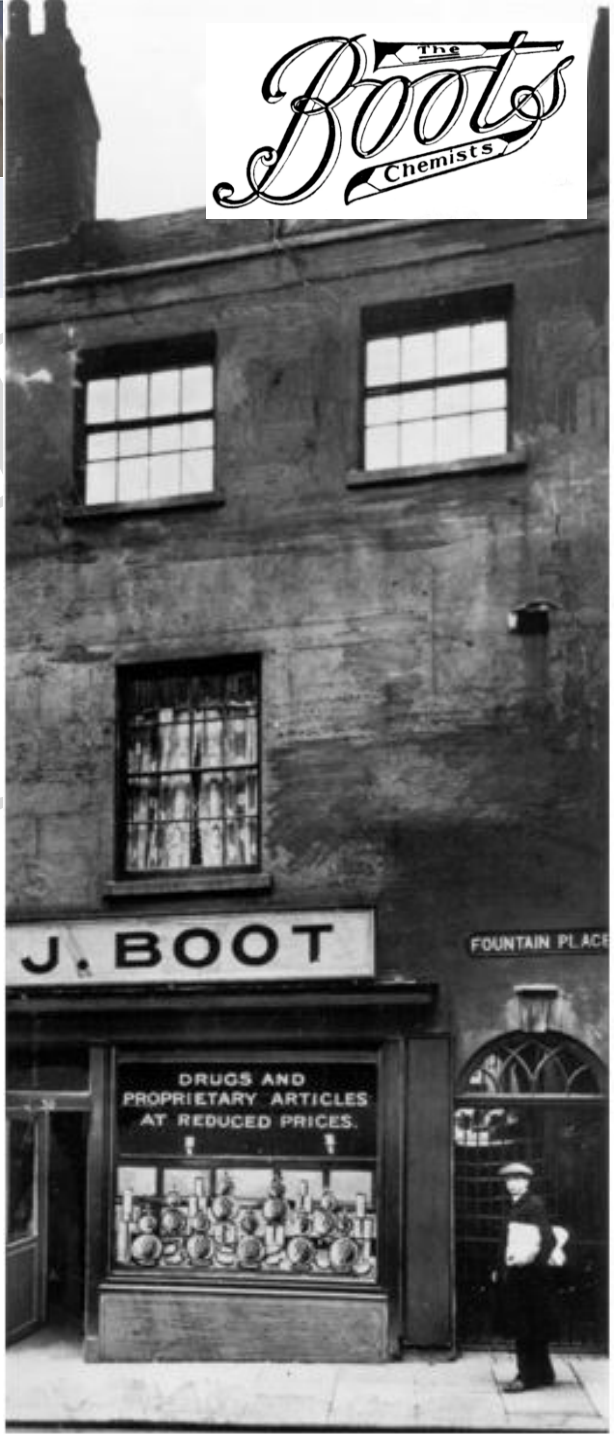
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16, GOOSE GATE.

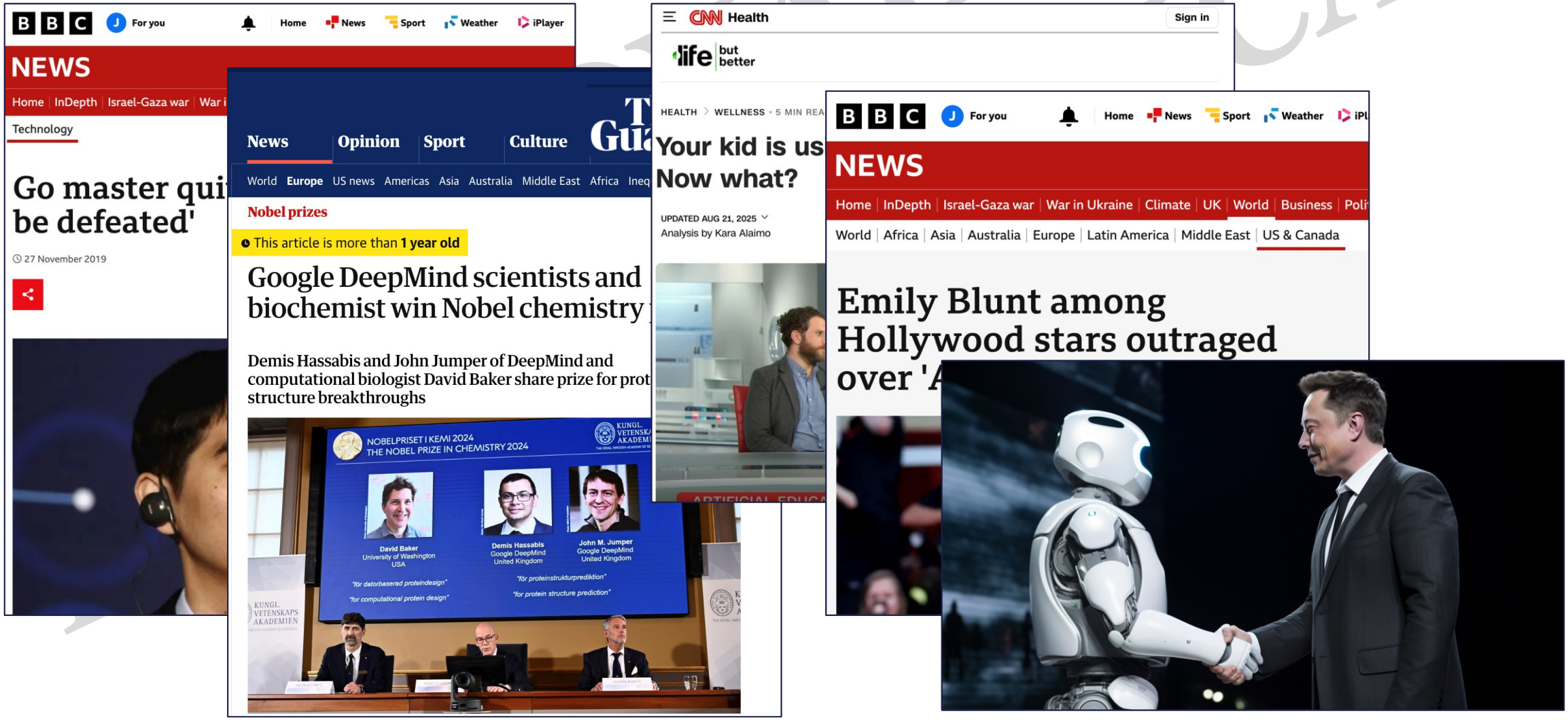
NOTE THE ADDRESS:

BOOT'S PATENT MEDICINE STORES,

16, GOOSE GATE, NOTTINGHAM.



Has anyone everyone heard about this AI thing?



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But what actually is AI?

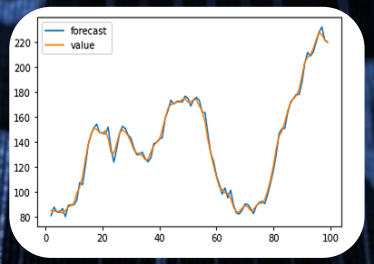
AI Text Generation



Large Language Models, Transformers

AI / MACHINE LEARNING

AI Predictive Modelling



Recurrent Neural Networks, Gradient Boosting, TFTs, Causal Modelling, Explanatory AI

AI Image Generation



Convolutional Models, Generative Adversarial Networks, Diffusion Models

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Ignore the "Hype"

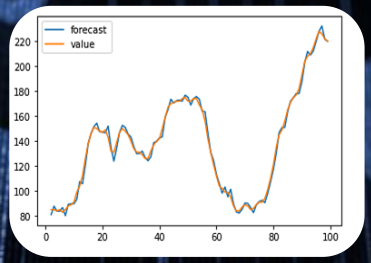
This is the bit we should be focussing on if we care about doing "social good"

AI / MACHINE LEARNING

AI Predictive Modelling

PROPHET

GLUONTS



Recurrent Neural Networks, Gradient Boosting, TFTs, Causal Modelling, Explanatory AI

FORECASTING

How many people <u>will</u> likely get cancer next year?

NOWCASTING

E.g. classification – Do we think someone <u>has</u> cancer?

BACKCASTING

What were the reasons someone <u>got</u> cancer?

This is where there is potential real benefits in health and pharmacy

1. Drug Discovery and Development

2. Clinical Trial Optimization

3. Pharmacy Workflow and Dispensing Automation

4. Pharmacogenomics & Personalised Medicine

5. Public Health Monitoring, Diagnosis Support, Early Warning Systems

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Why is this so important?

thebmj Research Education News & Views Campaigns Jobs

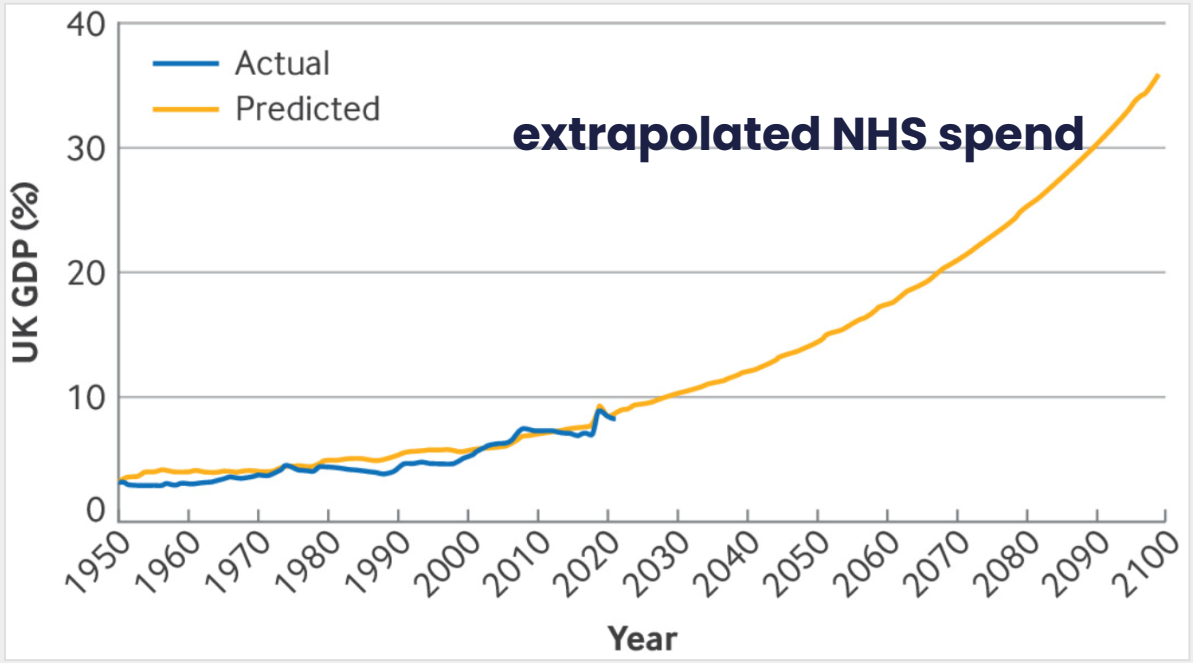


Fig 5
UK NHS spending as a percentage of gross domestic product (GDP): actual and growth projected at 3.4% per year from 1950 to 2100. Data sources: 1950-2018, NHS Funding and Expenditure Briefing Paper CBP0724[3] ; 2019-22, authors' estimates based on UK health departments annual accounts; projections, authors' calculations. From 2028-29 to 2072-73, real GDP growth as Office for Budget Responsibility long term projections.[15] From 2073-74 to 2100-01, real growth assumed to be 1.5% per year

It is become ever more critical that we formulate new innovative ways of addressing the health of citizens PRIOR to them arriving in primary care!



Pharmaceutical sales data + AI



Medication and shopping data reveals human behaviour - the best resource we have for predicting health at scale?

Loyalty card data can reveal health patterns PRIOR to primary care.



Why shopping data in relation to ovarian cancer?

- Captures **self-care behaviours often before or during diagnosis/treatment**
- Currently **absent from clinical records**, complements NHS/pharmacy data
- Reveals **early signals, hidden journeys, and inequities**
- Enabler for **explainable AI** in public health



Stage 1 - information gathering





Using Shopping Data to Improve the Diagnosis of Ovarian Cancer: Computational Analysis of a Web-Based Survey

Elizabeth Dolan, James Goulding, Laila J Tata, Alexandra Lang,
JMIR Cancer,

https://cancer.jmir.org/2023/1/e37141

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Stage 1 - information gathering



The study (survey, n=101):

1. Women reported pre-diagnosis purchases (for example antacids, IBS, incontinence, vitamins, clothes).
2. Feature shortlist
3. Tested machine learning techniques

Findings:

- Women self-medicating on doctor advice were **7× more likely** to have **>1 year of a year of health problems** pre-diagnosis (OR 7.33, 95% CI 1.58–33.97).
- **Predictive AI models identified distinct shopping behaviours in women self-medicating because their doctor believed their health problems might be due to a condition other than ovarian cancer**
(RF in-sample accuracy score 89.1%, RF Nested Cross-Validation out-of-sample score of 70.1%)

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Stage 2 – testing AI models on real pharmaceutical sales data

CLOCS

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Cancer Loyalty Card Study

Association Between Purchase of Over-the-Counter Medications and Ovarian Cancer Diagnosis in the Cancer Loyalty Card Study

https://publichealth.jmir.org/2023/1/e41762/

Applied the **learnings from study 1**, the survey of women with ovarian cancer, and the products women reported buying to the **CLOCS** data from a **machine learning** perspective.

"Using loyalty card data to improve model predictions to aid early cancer diagnosis: An exploration of the value of shopping transactions in predicting ovarian cancer." E. Dolan (University of Nottingham), J. Goulding (University of Nottingham), L.J. Tata (University of Nottingham), A.R.Lang (University of Nottingham), H. Brewer (Imperial College London), Y. Hirst (University College London), J. Flanagan (Imperial College London).

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Stage 2 – testing AI models on real pharmaceutical sales data

What were the results?

Patterns suggested **early warning signs.** The models gave **better predictions** when comparing women with **even with more closely comparable ages and shopping habits**, but this made the sample even smaller (**55 cases and 43-45 controls, depending on the shopping time period used**).

However, these improvements were **not consistent across all timeframes** - they were seen in **2 out of 3 tested periods**.

The products that drove the improved predictions were **Antacids, Vitamins, and New Clothes** (which may reflect body shape changes).

These purchases happened **months before diagnosis, with predictive improvements seen up to 5.3 months (160 days) before diagnosis.**







Stage 2 – testing AI models on real data, not surveys

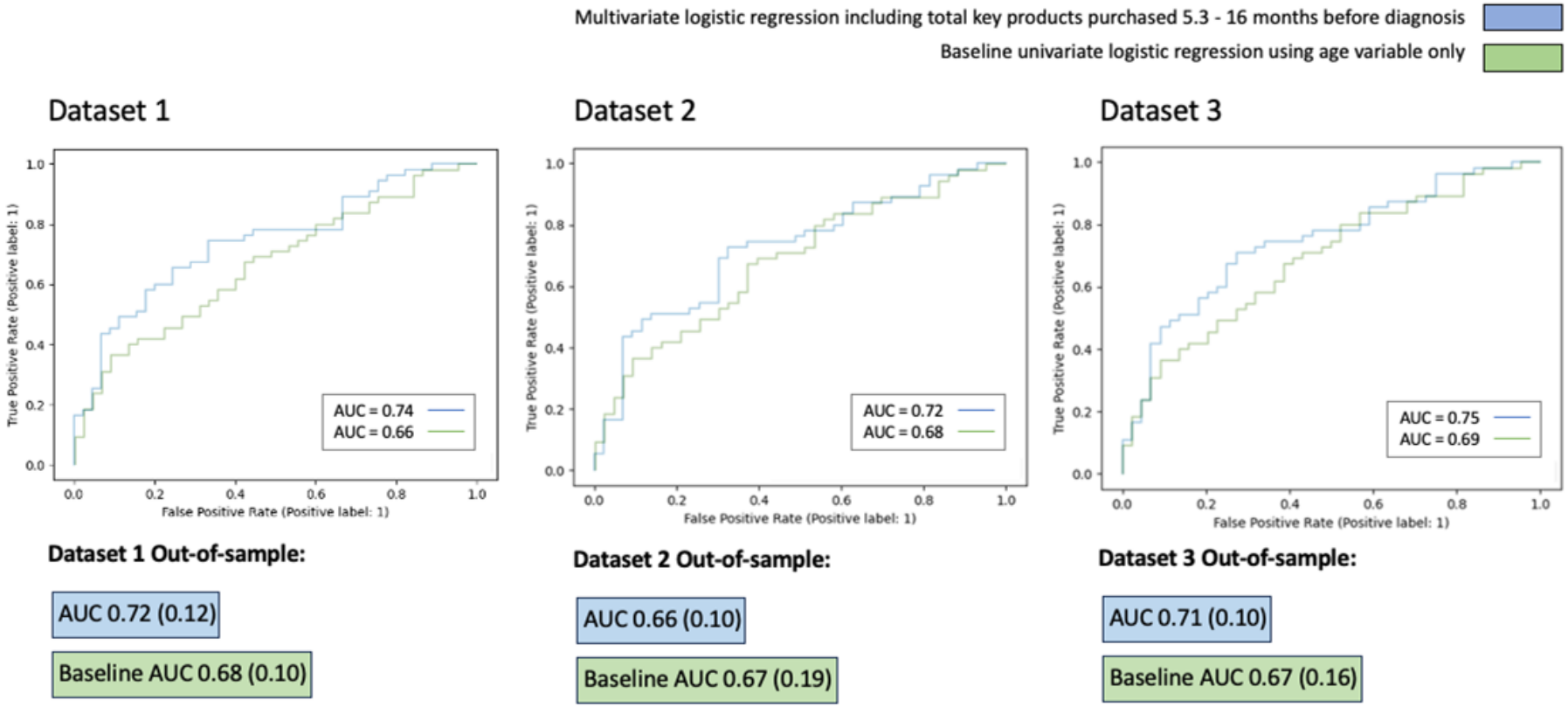


Figure. Showing AUC comparing results from multivariate logistic regression including combined key product and the univariate logistic regression baseline model only using age – results are shown for datasets 1, 2 and 3, out-of-sample results reported below plots.

Moving beyond ovarian cancer to wider women's health diagnoses?

Because this was the feedback we were getting from the public!

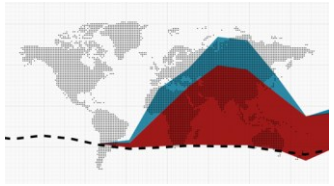


Key question:

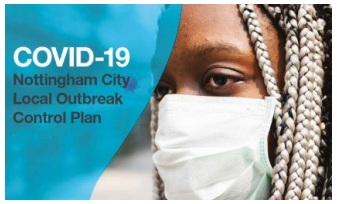
Can pharmacy and retail data support early warning and national epidemiological surveillance?



The Research Questions behind CIVIC



Could we have *improve* **estimation** of unrecorded respiratory disease cases that occurred in the UK using shopping data and AI?



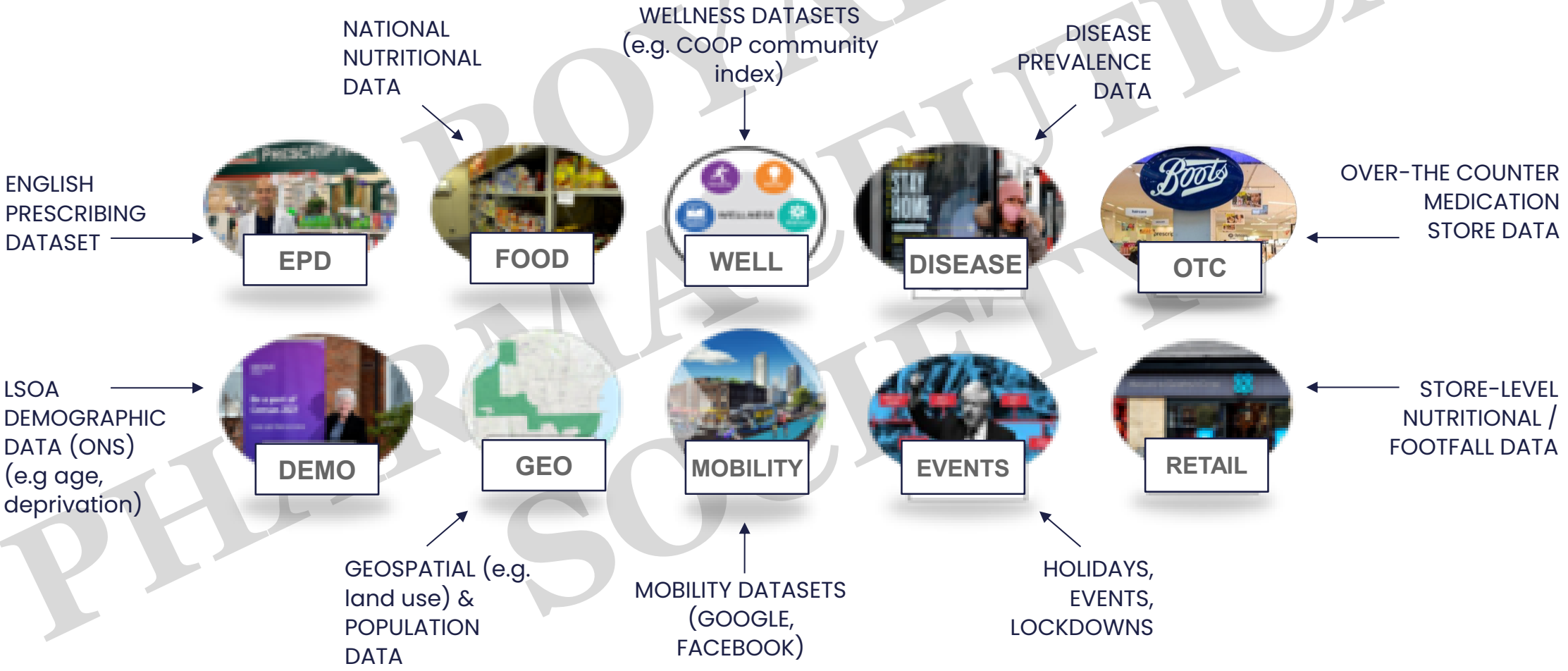
Could we identify **antecedents** of deaths in that footprint data **ahead of time?** *(for early-warning systems at scale; **without reliance on self-reporting apps**)*



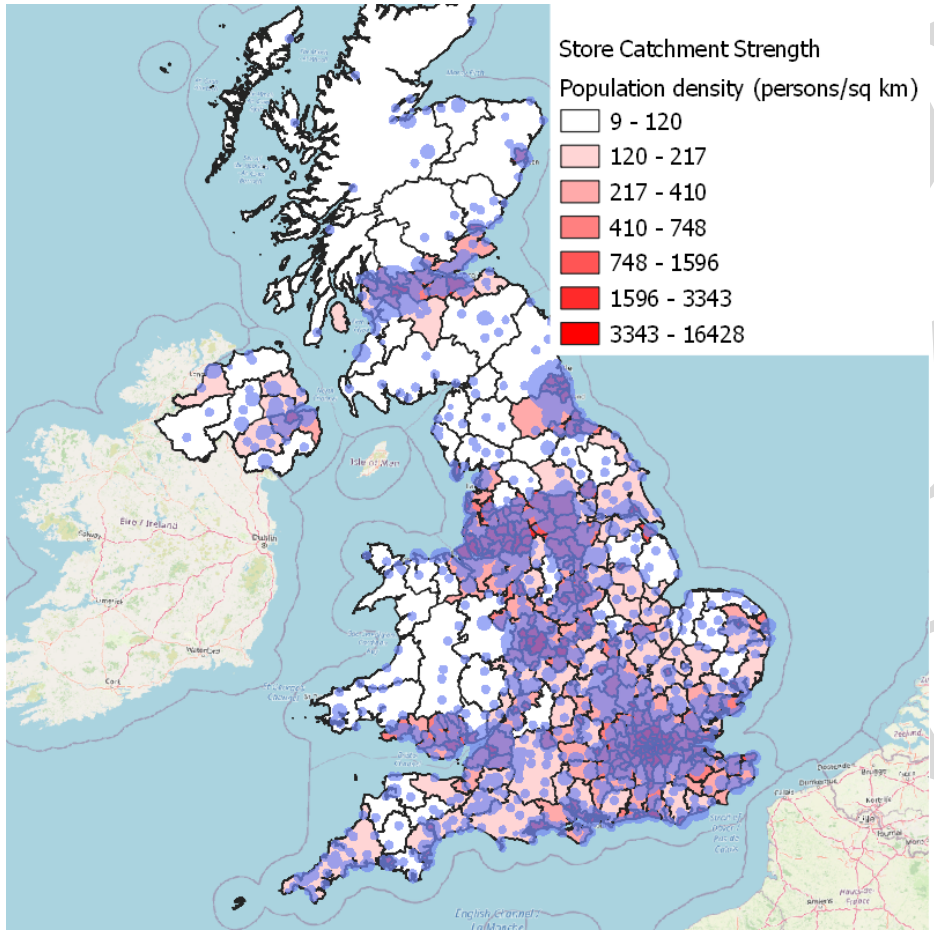
What insight can such datasets give us on the impact to **vulnerable**, potentially hidden, communities to help long-

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The Data behind CIVIC, all at LSOA Level (~1500 people)



This allowed us to build up a map of LSOA characteristics



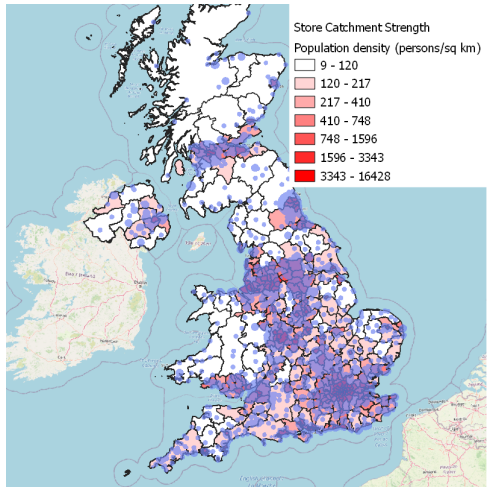
BASIC STATS:

This allowed to use >30,000 data points (LSOAs) to model, predict and try and understand disease outputs across the UK.

Data used in models was aggregated to LSOAs where store data was available, reflecting **2,155,300,393** sale units in England alone (*not including online)*

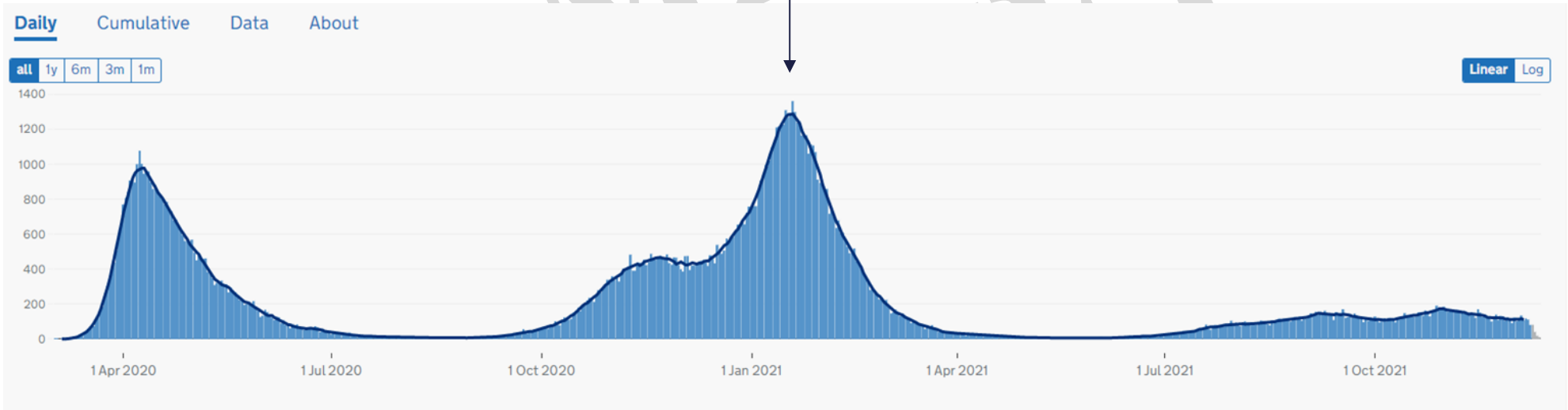
For example, 14,380,021 cough medicine sales, were geo-located between 2016-2020 alone.

And then we want to develop AI that can use these variables to predict disease



Target variables are very key, so time-series data has also been curated for each area across the UK, at LSOA where possible, but aggregated to the 314 LTLA areas in England where required small area suppression is always used to ensure differential privacy even in analysis).

For example COVID death data for each UK LTLA:



For each regions, for each week in our data we can model:

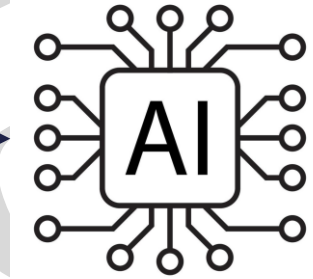
122k potential datapoints = 314 region x 408 weeks (18th March 2016 →27th March 2020)

Static Area Characteristics

- Deprivation features
- Demographics
- Population features
- Land Use features

Weekly Area Characteristics

- Weekly Weather
- Seasonality
- Weekly Med sales
- Weekly Retail sales
- Weekly Mobility
- Weekly Mobility



Investigating a range of non-linear AI models using **rigorous** cross-validation techniques

Disease Characteristics

Nowcasting hidden data?

- Current Weeks Respiratory Deaths

Forecasting future data

- Future Week Respiratory Deaths

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What are our input features / independent variables in each LSOA?

Pharmacy features

- ltla_week_sales_17
- decongestant_17
- throat_17
- cough_dry_17
- cough_all_17
- ltla_week_sales_24
- decongestant_24
- throat_24
- cough_dry_24
- cough_all_24
- decongestant_lsr
- throat_lr,
- cough_dry_lsr
- cough_all_lsr
- decongestant_lsm
- throat_lsm
- cough_dry_lsm
- cough_all_lsm

Seasonal features

- average_rainfall
- total_rainfall
- min_temp
- average_temp
- max_temp
- week_num

Land Use features

- pct_community
- pct_industrial
- pct_residential
- pct_transport
- pct_agriculture
- pct_natural
- pct_recreation

Deprivation features

- liv_env_score
- crime_score
- housing_score
- imd_rank
- imd_score
- imd_extent
- imd_concentration

Demographics

- pct_male
- pct_female
- pct_non_white
- pct_lone_parent
- pct_other_children

Population features

- pop_density
- pop_16to24
- pop_25to49
- pop_50to64
- pop_over65

Housing Features

- pct_pre1919
- pct_pre1940
- pct_pre1973
- pct_pre1983
- pct_detached
- pct_semi,
- pct_terraced
- pct_flat

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Summary of Results

Optimal AI Model type: Random Forest Regressor.
(Optimized using a time series cross-validation grid-search on training data to prevent over-fitting).

Target: Predict weekly respiratory deaths 17 days in advance **for each of the 314 LTLA areas** (Lower Tier Local Authority) in England from 18th March 2016 to 27th March 2020.

Results from predicting on test data:

Mean Absolute Error	Root Squared Mean Error	R^2
2.39	3.42	**0.78**

Inputs*: 56 features

Training Datapoints: 45,844

Testing Datapoints: 20,410

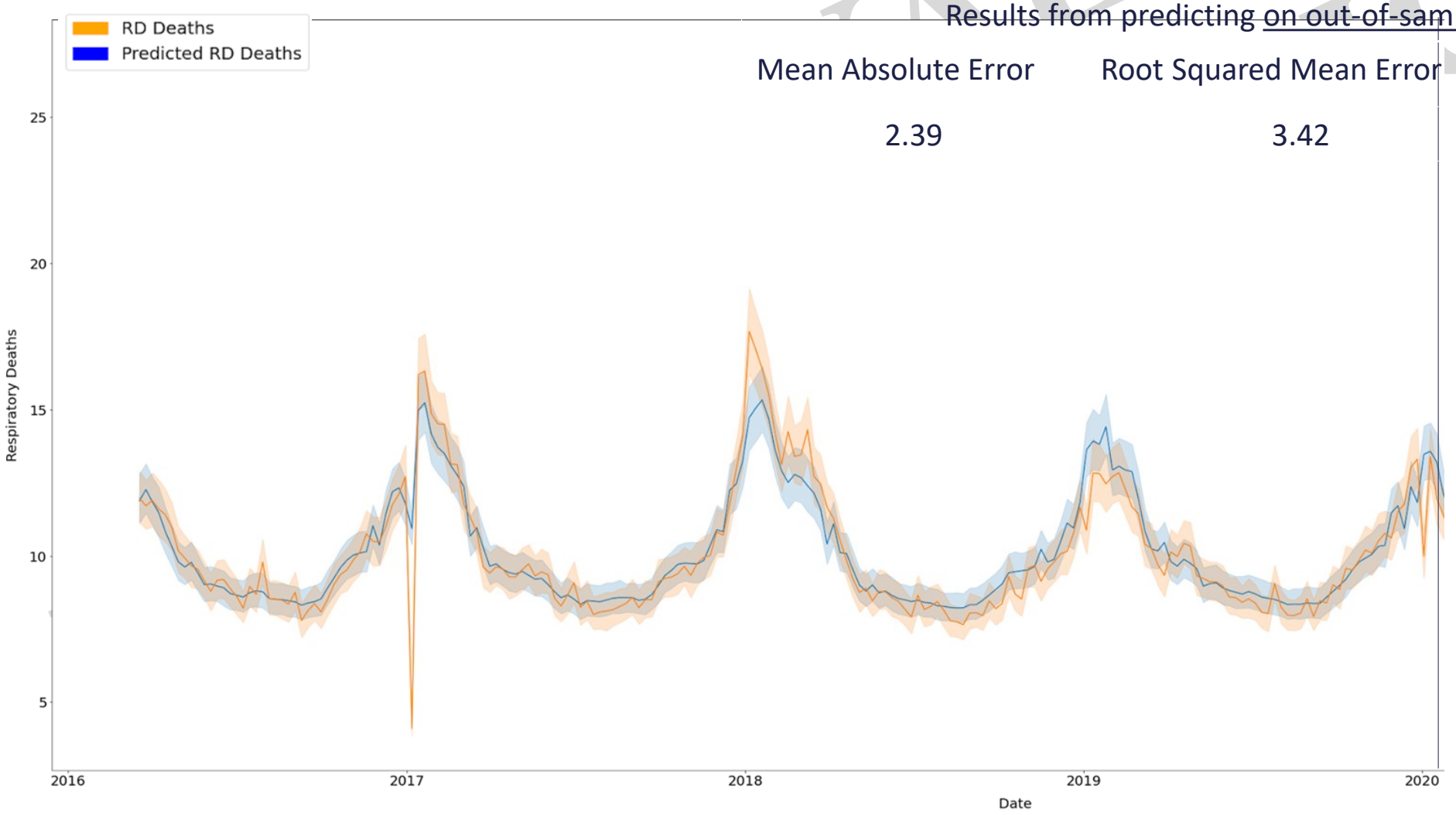




Predicting amount of deaths from respiratory disease using sales data alone → **With all variables R^2 increases to 0.82**

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Forecasting **Future** Deaths with **Current** Pharmecuitcal Product Sales

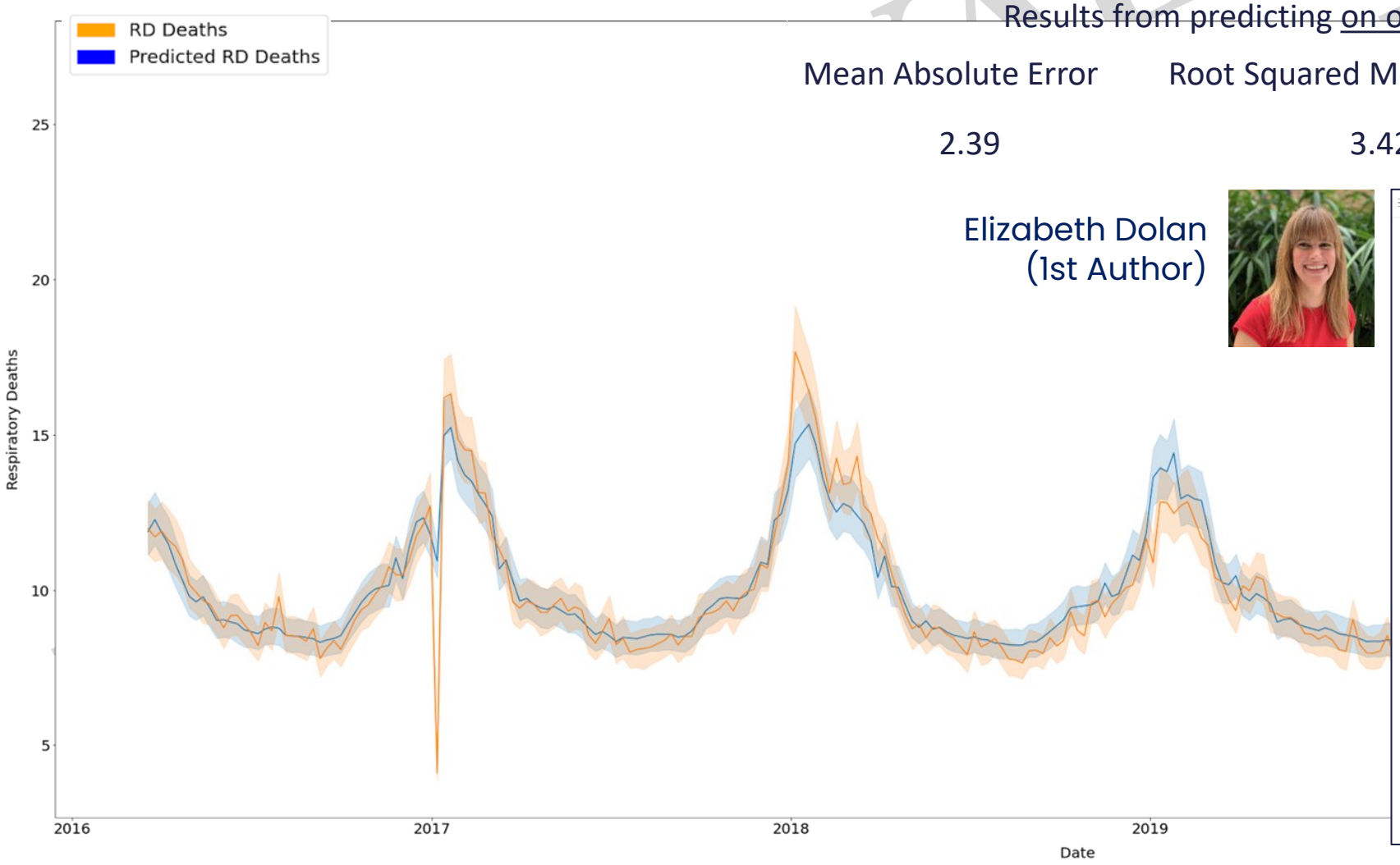


Results from predicting on out-of-sample data:

Mean Absolute Error	Root Squared Mean Error	R^2
2.39	3.42	**0.78**

Graph shows an aggregate of deaths each week (both reality and forecasts), summing the model's predictions across its 314 geographical districts (LTLAs) each week - **Predicting 3 weeks in advance**

Forecasting **Future** Deaths with **Current** Pharmaceutical Product Sales



Results from predicting on out-of-sample data:

Mean Absolute Error	Root Squared Mean Error	R^2
2.39	3.42	**0.78**

Elizabeth Dolan
(1st Author)



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Article

Assessing the value of integrating national longitudinal shopping data into respiratory disease forecasting models

Elizabeth Dolan[1] ORCID Email
James Goulding[1]
Harry Marshall[1]
Gavin Smith[1] ORCID
Gavin Long[1]
Laila Tata[1]

[1] *University of Nottingham*

This is a preprint; it has not been peer reviewed by a journal.

https://doi.org/10.21203/rs.3.rs-2226531/v1
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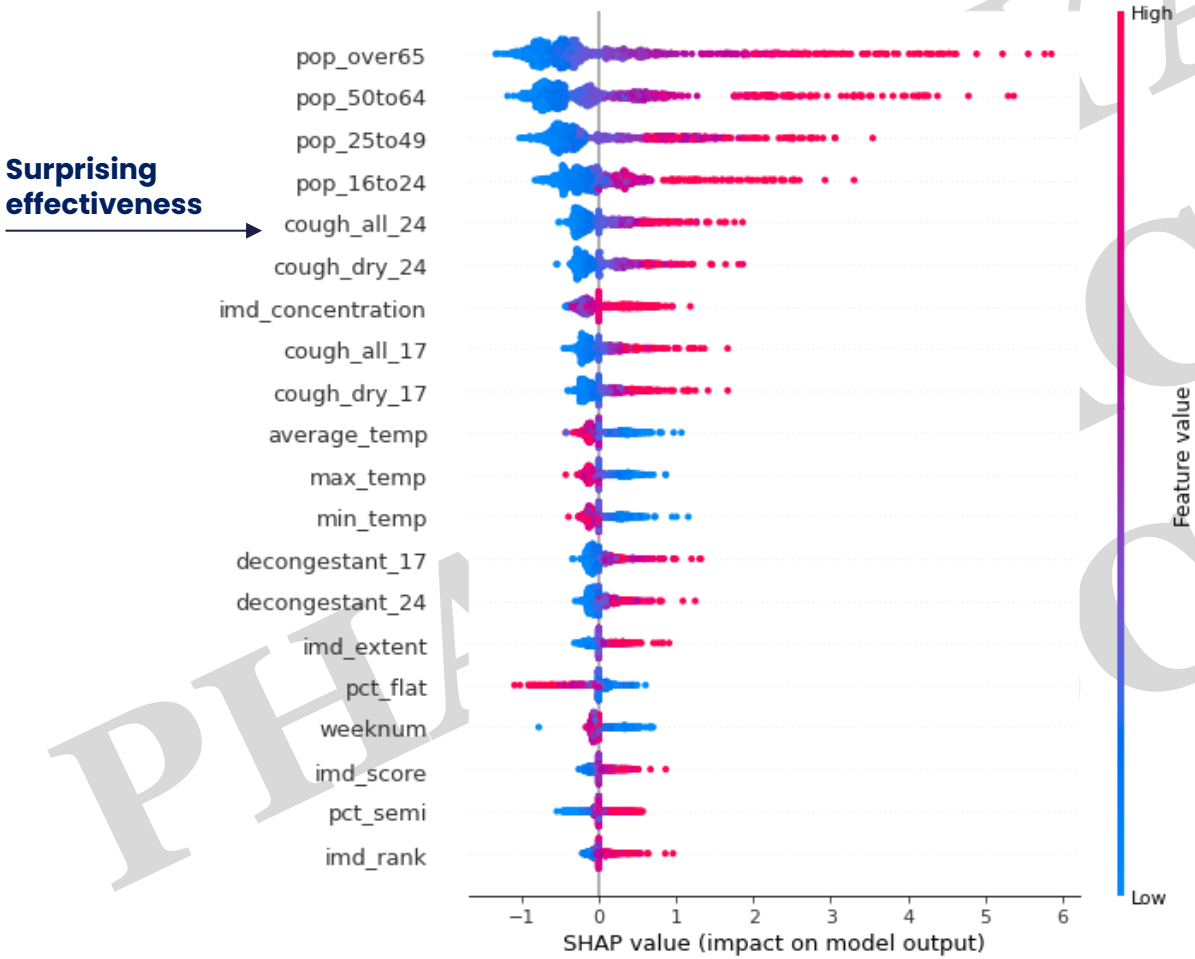
Abstract

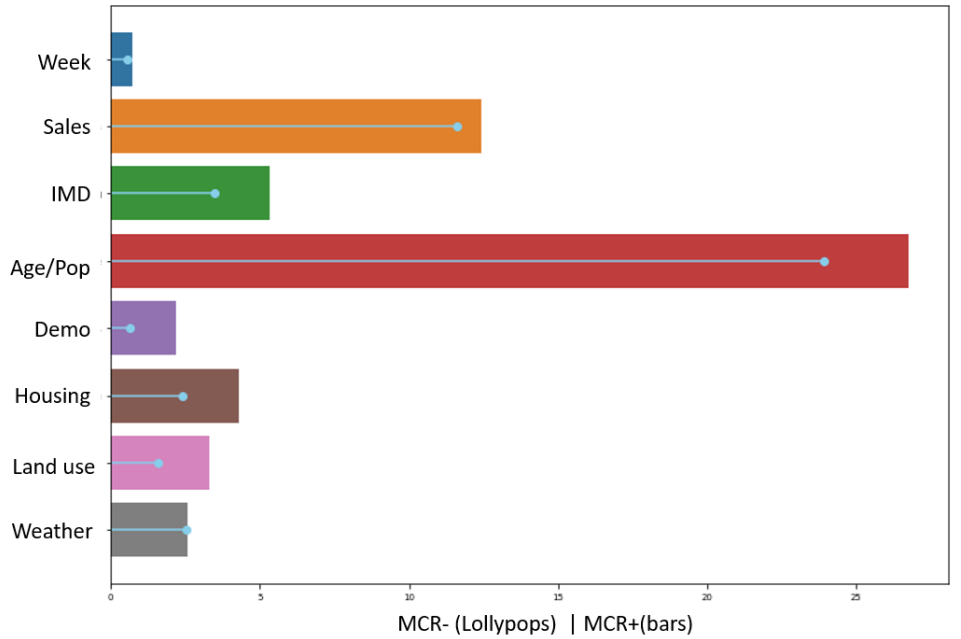
The COVID-19 pandemic led to unparalleled pressure on healthcare services. Improved health-care planning in relation to diseases affecting the respiratory system has consequently become a key concern. We investigated the value of integrating sales of non-prescription medications commonly bought for managing respiratory symptoms, to improve forecasting of weekly registered deaths from respiratory disease at local levels across England, by using over 2 billion transactions logged by a UK high street retailer from March 2016 to March 2020. We report the results from the novel AI explainability variable importance tool Model Class Reliance implemented on the PADRUS model. PADRUS is a machine learning model optimised to predict registered deaths from respiratory disease in 314 local authority areas across England through the integration of shopping sales data and focused on purchases of non-prescription medications. We found strong evidence that models incorporating sales data significantly out-perform other models that solely use vari-ables traditionally associated with respiratory disease (e.g. sociodemographics and weather data). Accuracy gains are highest (increases in R2 between 0.09 to 0.11) in periods of maximum risk to the general public. Results demonstrate the potential to utilise sales data to monitor population health with information at a high level of geographic granularity.

Social science/Science, technology and society
Health sciences/Health care/Public health/Epidemiology
Health sciences/Diseases/Respiratory tract diseases
Health sciences/Diseases/Infectious diseases/Viral infection
Health sciences/Diseases/Infectious diseases/Influenza virus

Variable Importance Analysis - Shapley values

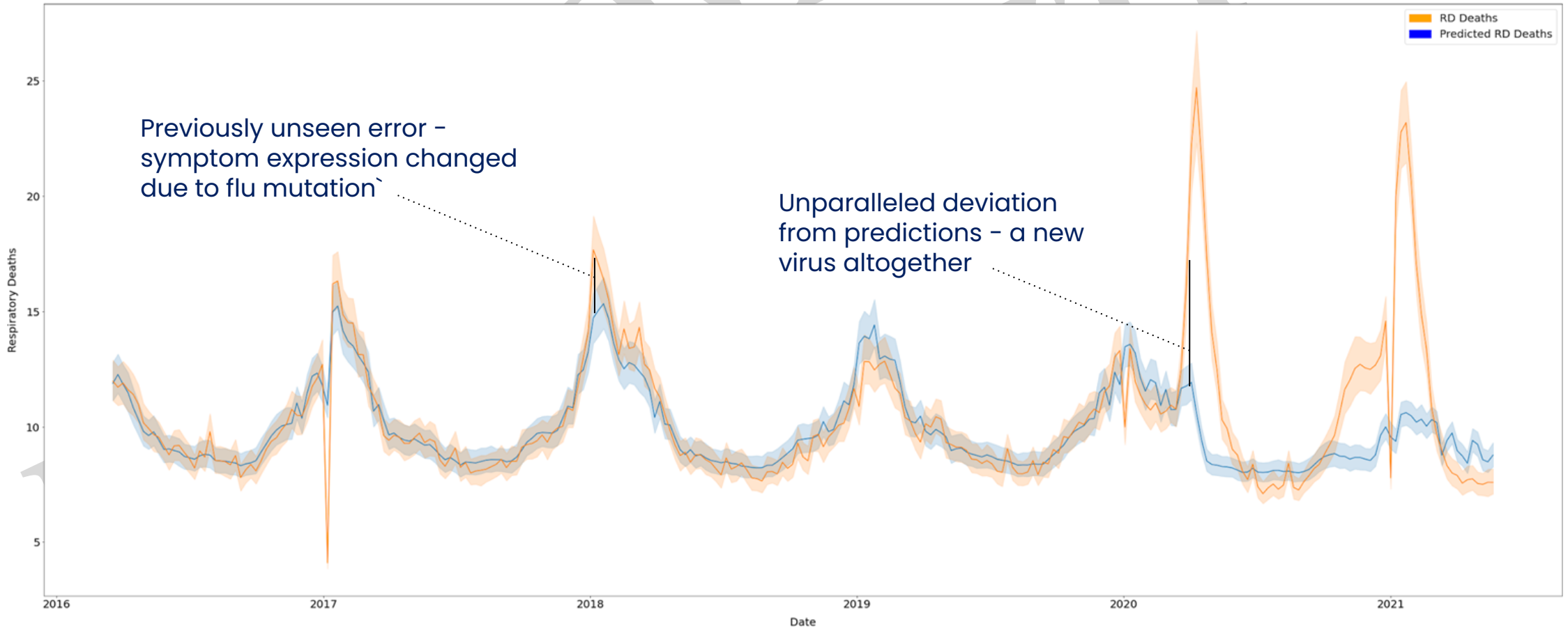
Surprising effectiveness





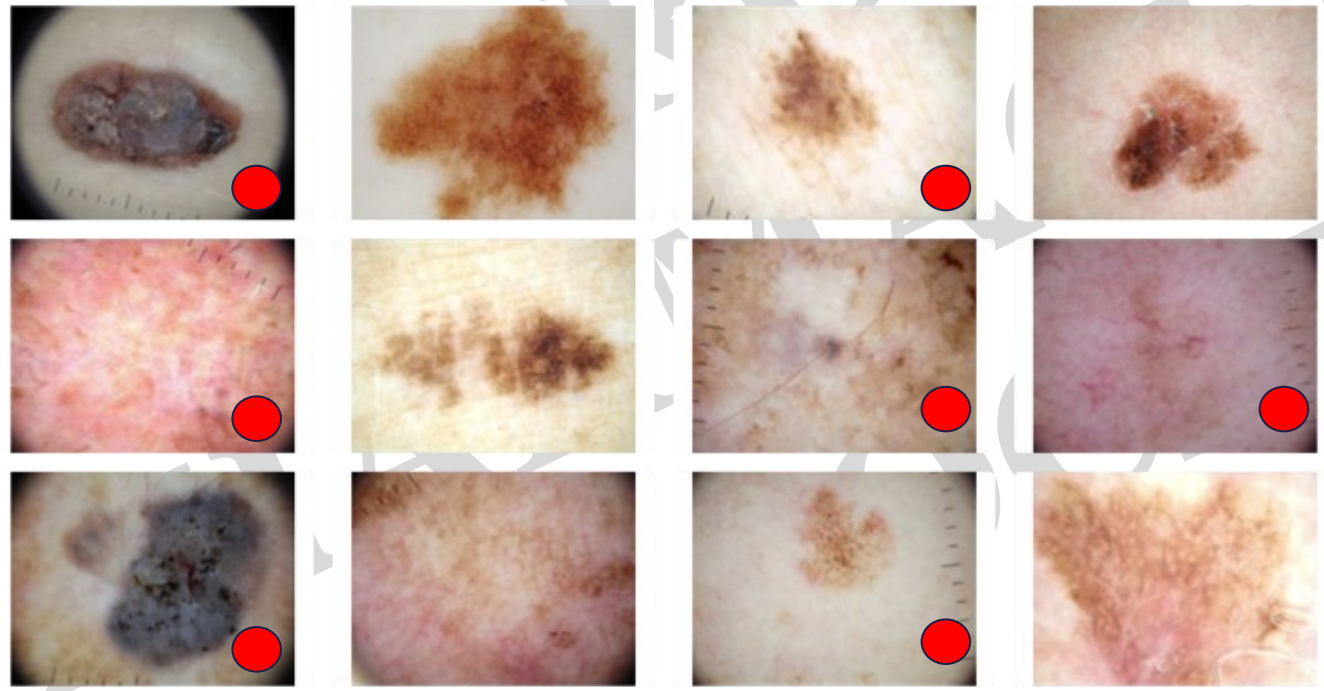
Feature Drift - models must be monitored! They are a tool, not a replacement.

You may have noticed the graphs were cunningly cut of at a certain point...



Confounders ("shortcut learning") - we must carefully curate training data

A famous AI system, achieved fantastic results in predicting malignant skin lesions, with fantastic performance ~86% AUC.

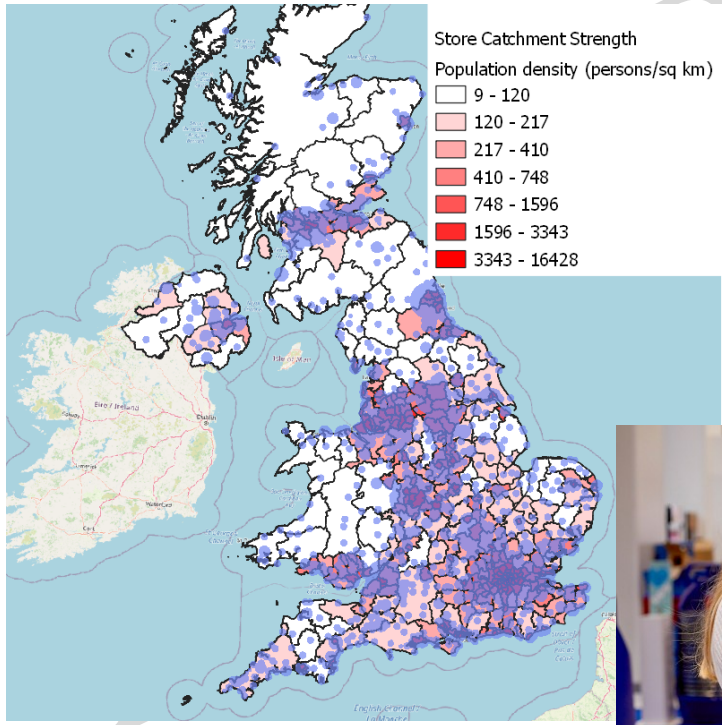




The model didn't generalize because (it was eventually found) the AI was in fact detecting not malignancy but rulers placed by concerned clinicians - that weren't in lesions considered of less risk!

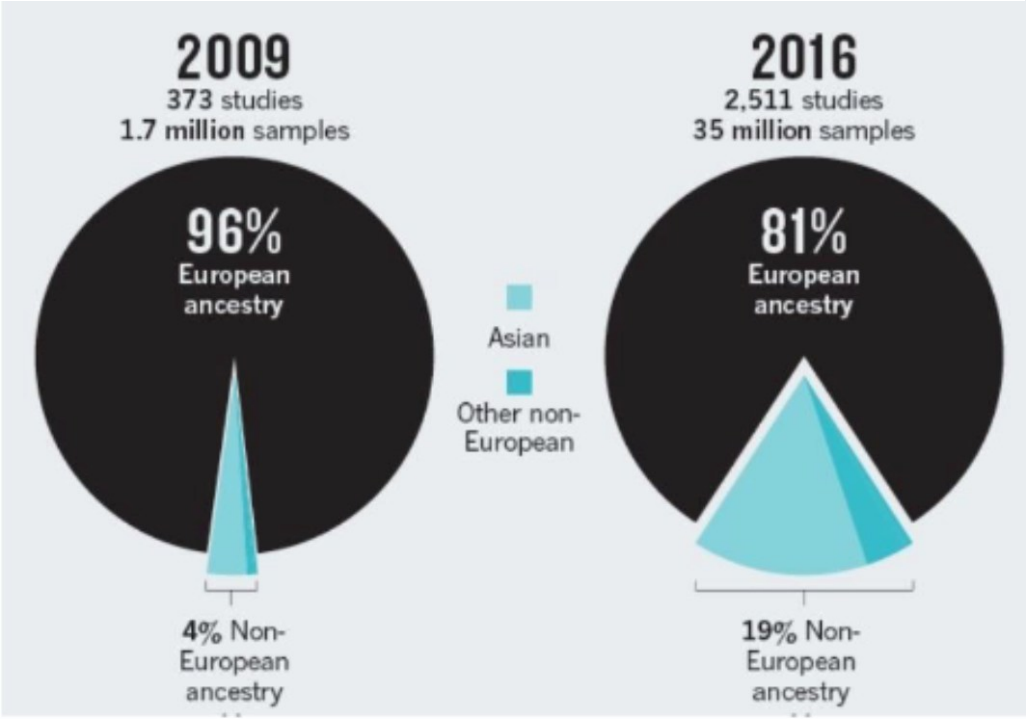
Bias - we must understand who our model's might be missing

The data underpinning our work, while having much predictive value, is biased to a certain demographics and geospatial patterns.





Panpejoy et al reported that over the past 7 years, the proportion of participants in genome studies from asian ancestry had increased, yet data remained highly biased to european ancestries.



Panpejoy and Fullerton (2016): Bias in pa-genome (GWAS) databases

A path forwards?

1. In reality these are problems that are a danger to ALL STATISTICAL METHODS, not just machine learning and AI! But if we carefully attend to them, the potential remains significant

2. Black boxes are insufficient. We must invest more in Explanatory AI, so these tools can justify their outputs to practitioners.

3. If we work together, data holders, AI modellers, policy makers, NHS decision makers we can revolutionize our response to health. However this is a socio-technical problem not an AI one!

You'll hear lots about LLMs, but they're very bad at 2 things critical for real world impact:

A. Making predictions

B. Truthfully explaining their decisions.

The future of AI to support real-world impacts are working together on:

Causal AI modelling



Explanatory Artificial Intelligence



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University of Nottingham
UK | CHINA | MALAYSIA

QUESTIONS?

Professor James Goulding
james.goulding@nottingham.ac.uk

N/LAB

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Navigating the Digital Shift: Lessons for Pharmacy

Fiona B McIntyre FRPharmS
Policy and Practice Lead,
Royal Pharmaceutical Society

Session Overview

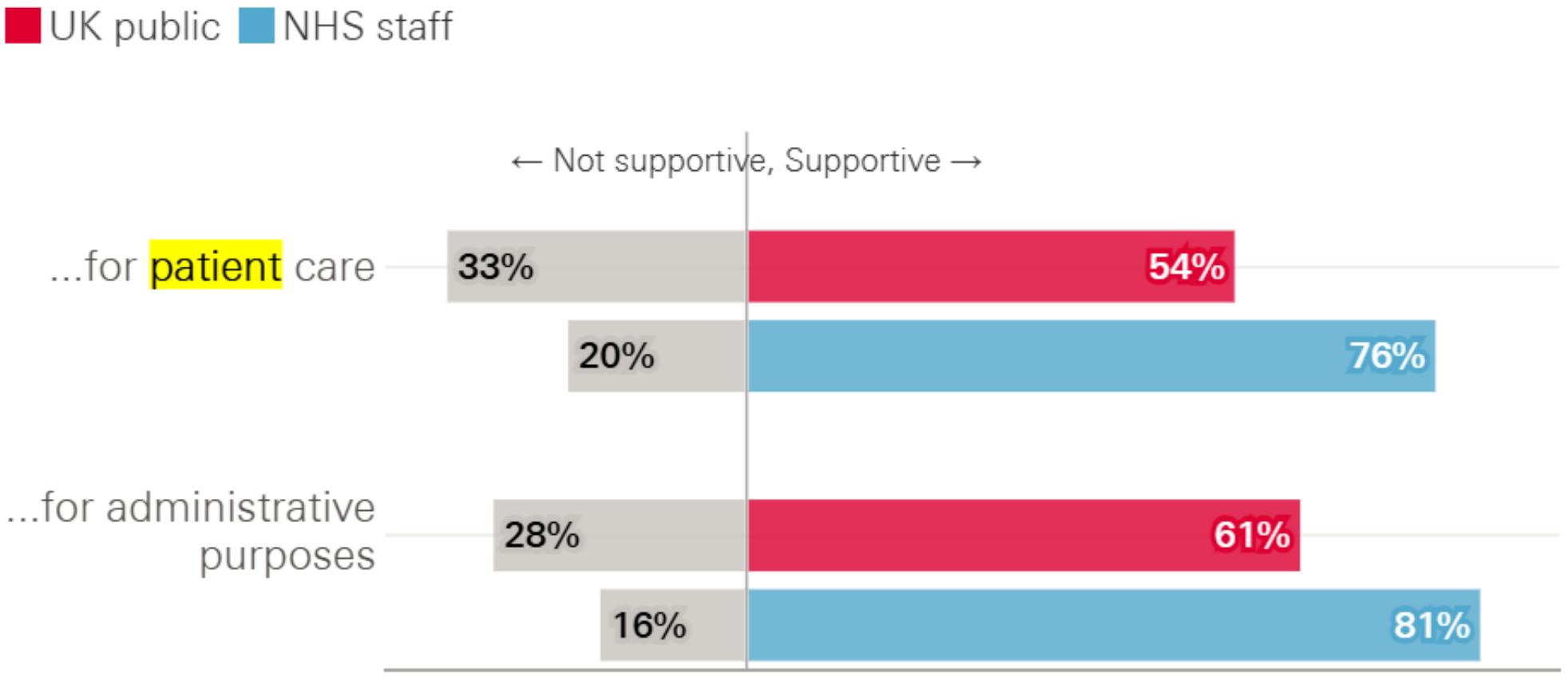
- Understand the evolving landscape in digital health technologies and AI and its relevance to pharmacy
- Explore national initiatives and policy frameworks
- Identify challenges and opportunities for pharmacy professionals

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Why this matters now



How supportive, if at all, are you of the NHS using AI...



The Health Foundation
© 2024

Source: UK NHS staff survey fieldwork carried out online by Censuswide, 7 June to 8 July 2024; total sample size 1,292 NHS staff aged 16 years and older, UK public survey fieldwork carried out online and by phone by Censuswide, 7 June to 8 July 2024; total sample size 7,201 adults (85% from England, 8% Scotland, 5% Wales and 3% Northern Ireland); figures have been weighted and are representative of all UK adults (aged 16 years and older). • Rows show percentage of respondents selecting 'very supportive' or 'quite supportive'.

National Context – UK Government

Government Digital Service

Introducing the AI Playbook

Department for Science, Innovation & Technology



A pro-innovation approach to AI regulation

March 2023

PHARMACEUTICAL SOCIETY

National Context - MHRA

Medicines & Healthcare products Regulatory Agency

Impact of AI on the regulation of medical products

Implementing the AI White Paper principles

Published April 2024



GOV·UK

Home > Business and industry > Science and innovation > Artificial intelligence

Press release

New Commission to help accelerate NHS use of AI

New National Commission unites clinical leaders, patient advocates and leading tech firms to make the NHS the most AI-enabled healthcare system in world

NICE

NICE National Institute for Health and Care Excellence

Evidence standards framework for digital health technologies

Corporate document
Published: 10 December 2018
Last updated: 9 August 2022

www.nice.org.uk/corporate/ecd7

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Ethical Principles

- Transparency & Explainability
- Safety & Robustness
- Accountability & Governance
- Fairness & Non-discrimination
- Data Protection & Privacy
- User-Centred Design

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National Context-England

AI knowledge repository

Transformation Directorate



Information governance





National Context-Wales

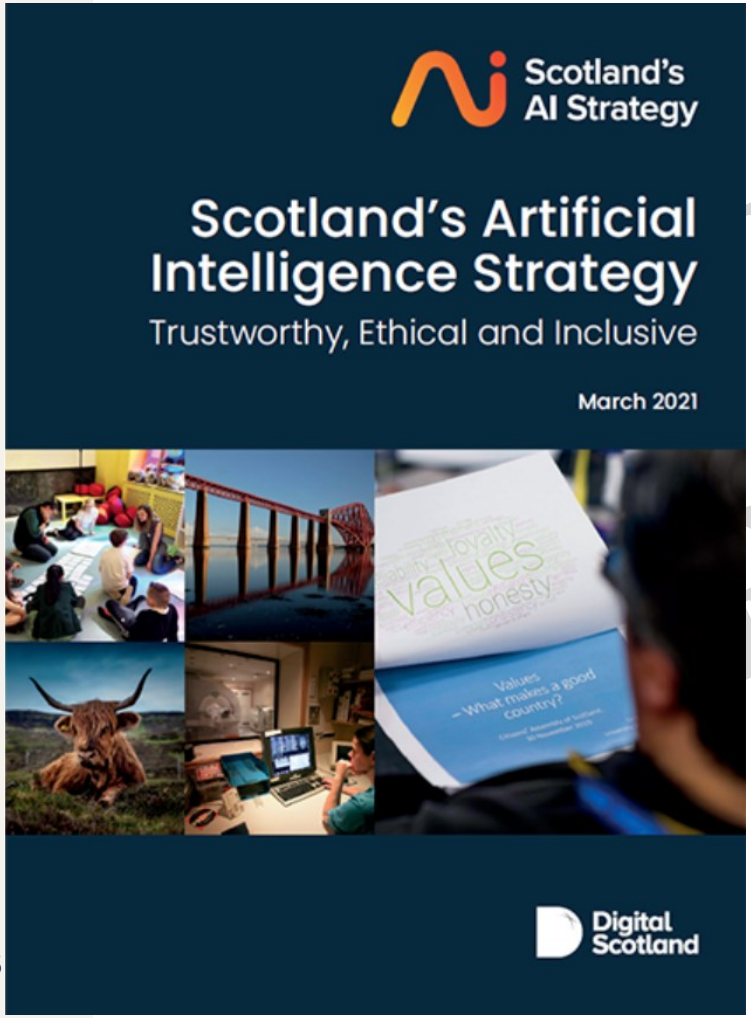


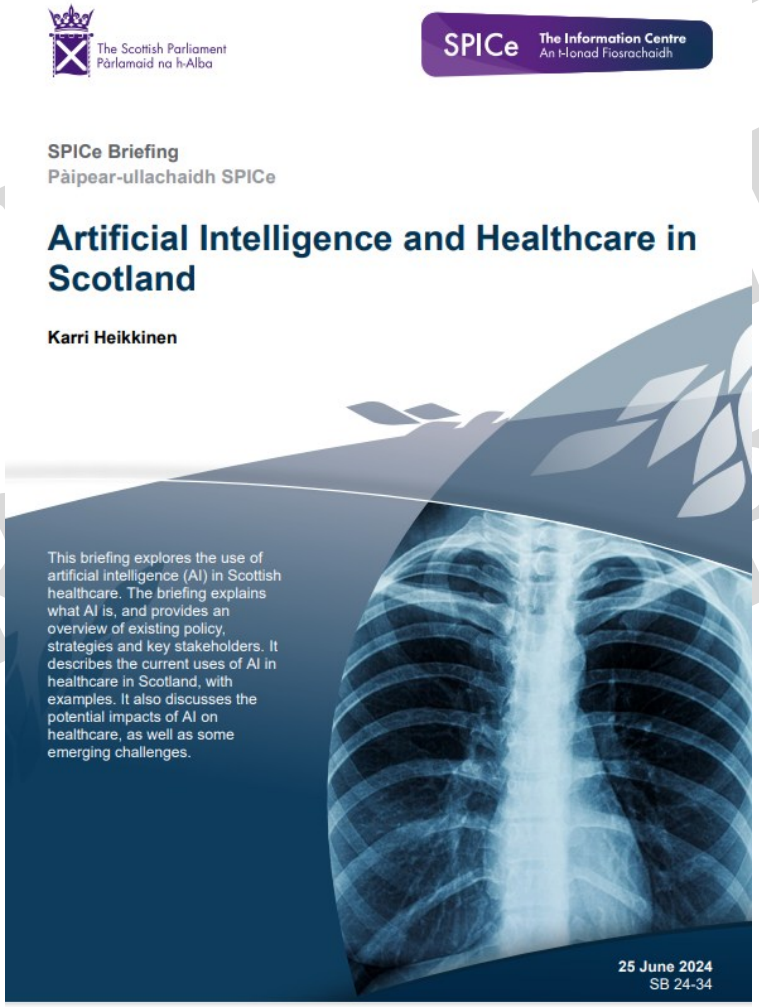
AI Commission for Health and Social Care

Moddion Digidol
Digital Medicines
IGDC • DHCW

GIG CYMRU NHS WALES
Iechyd a Gofal Digidol Cymru
Digital Health and Care Wales

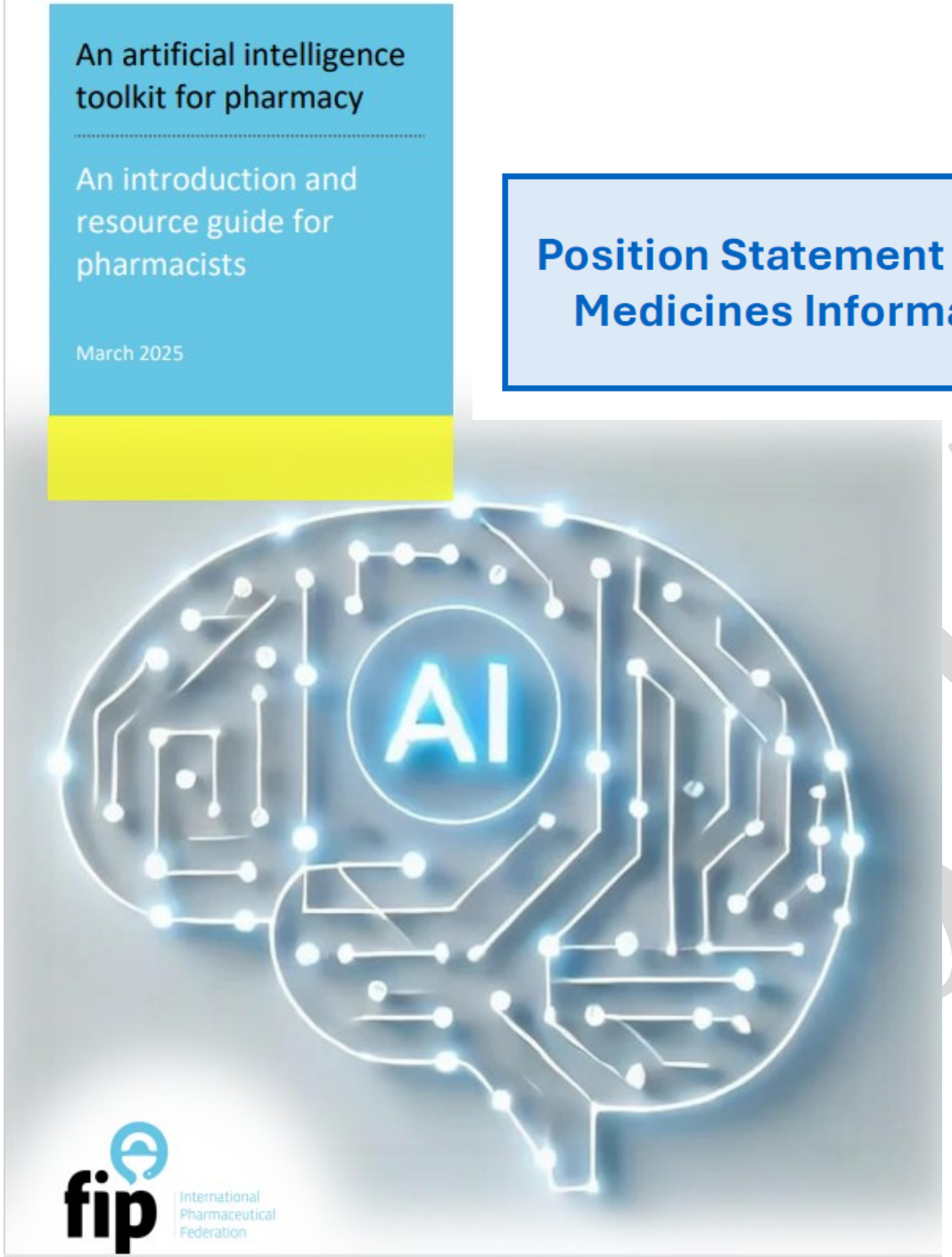
National Context - Scotland











UKMi
UK Medicines Information

Position Statement on the use of Artificial Intelligence (AI) in Medicines Information (MI) or Medicines Advice Services

UK and global positioning of AI in pharmacy practice

Royal Pharmaceutical Society

Artificial Intelligence (AI) in Pharmacy

Contents

1 Recommendations
2 Introduction
3 Scope for AI in pharmacy practice
4 Considerations for AI in pharmacy practice
- Development and Collaboration
- Regulatory risks
- Education & Training
- Governance
- Environmental Impact

5 Conclusion
6 References



Digital Pharmacy

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RPS Digital Innovation and Education Roundtable Report

5 JUNE 2025

Digital pharmacy

Preparing for the future of the profession

In today's changing healthcare landscape, digital literacy helps streamline workflows, reduce medication errors, enhance patient safety and improve collaboration between teams.

Digital literacy can also help inform decision-making to navigate the benefits and risks of AI deployment in your pharmacy practice.



Pharmacy use-cases for AI

QUEEN'S UNIVERSITY BELFAST | SCHOOL OF PHARMACY

QAIRx



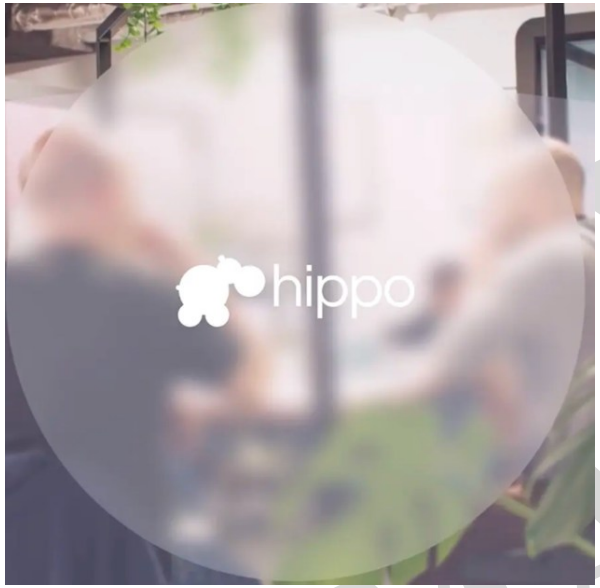
Pharmacy Education

SamurAI

Tackling Antimicrobial Resistance

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Pharmacy use-cases for AI



Automated Work Processes

Sciensus

NHS
Mid Yorkshire Teaching
NHS Trust

PERSONAL
Homecare Pharmacy

Clinical Pharmacy Prioritisation Software Tool

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the PHARMACEUTICAL JOURNAL

Pharmacy practice

18 July 2025

By **Natalie Lewis**

Applications of AI in pharmacy practice

Generative artificial intelligence (AI) has the potential to transform many aspects of the healthcare sector. This article looks at how AI can be used in pharmacy practice.

Drug discovery and development

21 August 2025

By **Rachel Brazil**

Designed by AI: the future of antibody drugs

Artificial intelligence is enabling the next generation of antibody drugs — and helping to 'drug the undruggable'. Meet the start-ups that are designing these treatments from scratch.

Hot topic!

Clinical Pharmacy Congress

The Home of Clinical Pharmacy



PM Healthcare
PROGRESS THROUGH PARTNERSHIP

DIGITAL TECHNOLOGY & AI

The Future for Pharmacy and Medicines Usage
(Primary & Secondary Care)



THURSDAY 10TH JULY 2025 | 09:15 - 16:15
RCGP, 30 EUSTON SQUARE, LONDON

NON-COMMERCIAL



Challenges for pharmacy professionals

- Ownership and accountability
- Ethics
- Privacy
- Information quality

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What you can do now

- Inform
- Engage
- Enquire
- Caution in use



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Thank you

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Together,
we are pharmacy.