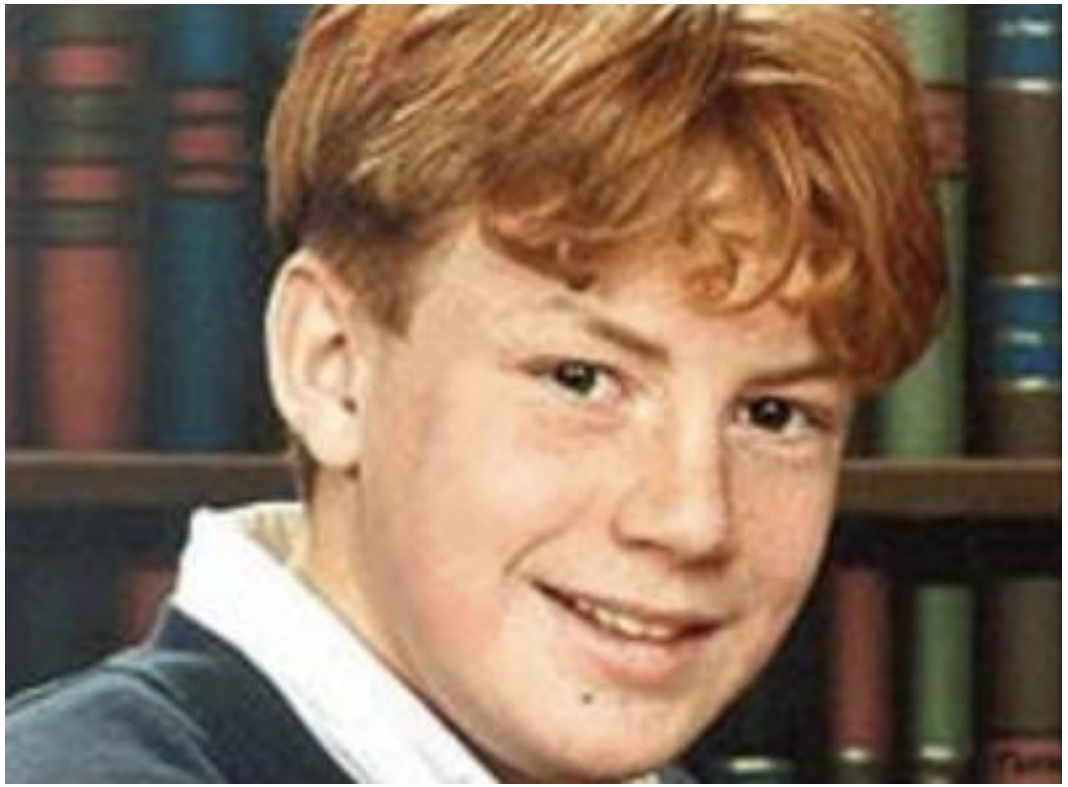
Sarah Slight

Professor of Patient Safety and Digital Health, Newcastle University

Photo by Matt Howard on Unsplash

Medication Errors



Lifestyle > Health & Families > Health News

Doctor admits manslaughter after error with injection killed teenager

GROSS NEGLIGENCE MANSLAUGHTER

Wayne Jowett (deceased)

Paul Balen, *Freethcartwright Solicitors*

Teenager given wrong drug dies

MAYO CLINIC Mayo Clinic Proceedings

Sub

EDITORIAL | VOLUME 89, ISSUE 8, P1027-1029, AUGUST 01, 2014

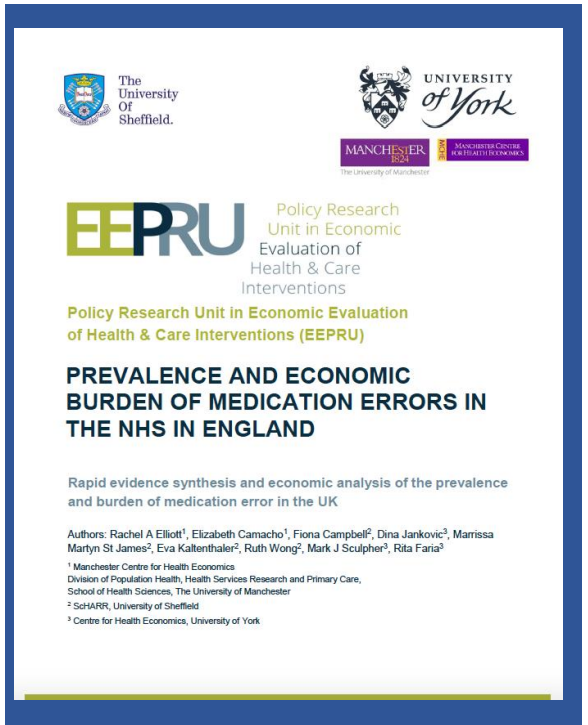
Medication Errors: What Is Their Impact?

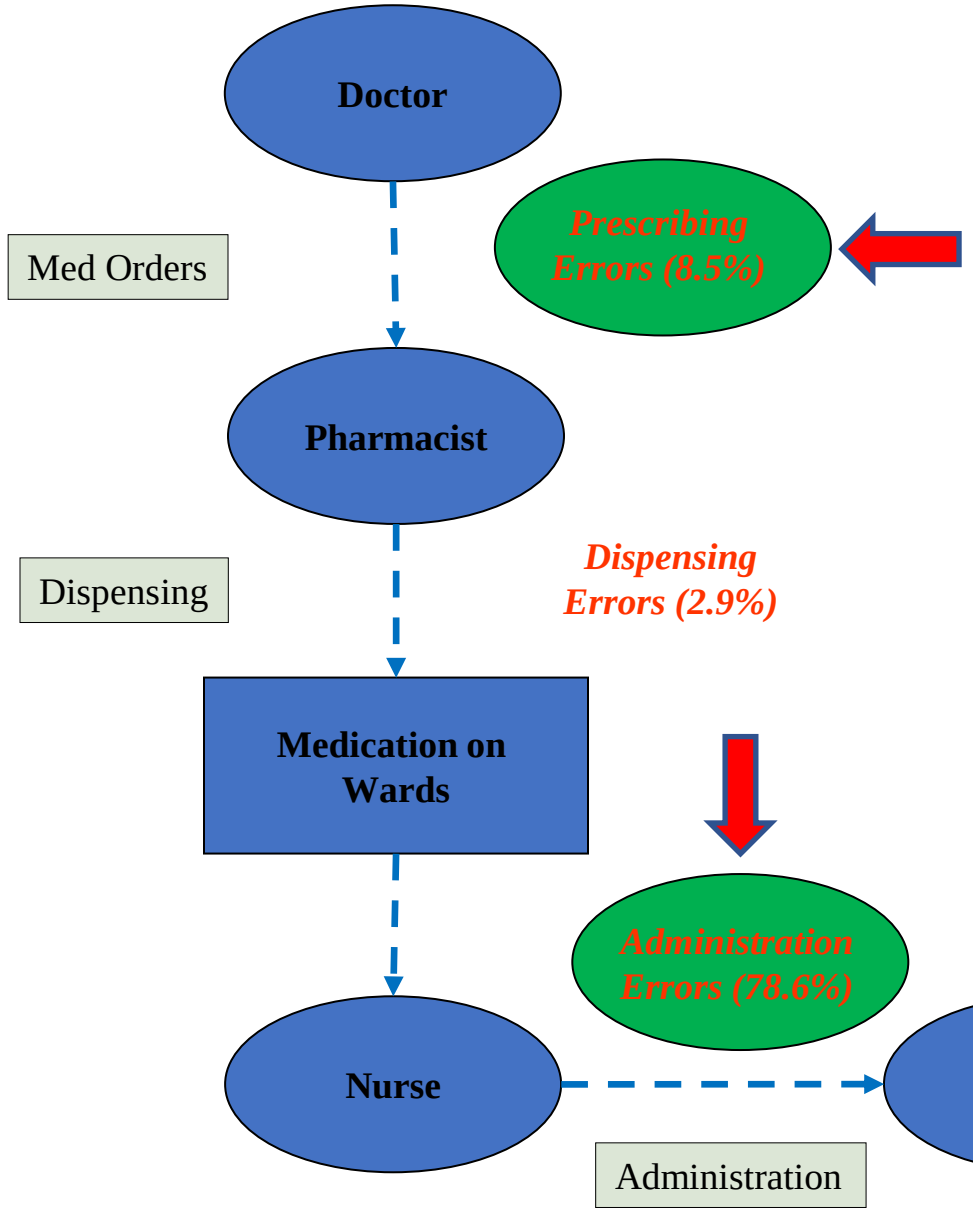
David W. Bates, MD, MSc • Sarah P. Slight, MPharm, PhD, PGDip

DOI: https://doi.org/10.1016/j.mayocp.2014.06.014

The loss of a loved one can be devastating. The knowledge that their death could have been prevented makes it harder still. Medication errors can result in severe patient injury or death, and they are preventable. Although most errors are minor, there is a huge spectrum—and some are fatal. On January 4, 2001, Englishman Wayne Jowett was injected with a dose of the cytotoxic drug vincristine intrathecally rather than intravenously,

Medication Errors





How can Health Information Technologies help prevent medication errors?

David W. Bates, MD, MSc

VE RI TAS

HARVARD
UNIVERSITY

Alert Clinicians

Newcastle University
UK | Malaysia | Singapore

Are We Heeding the Warning Signs? Examining Providers' Overrides of Computerized Drug-Drug Interaction Alerts in Primary Care

Sarah P. Slight[1,2,3*], Diane L. Seger[4], Karen C. Nanji[3,5], Insook Cho[1,3,6], Nivethietha Maniam[4], Patricia C. Dykes[1,4], David W. Bates[1,3,4]

Overrides of Clinical Decision Support Alerts in Primary Care Clinics

Sarah P. Slight[a,b,c], Karen C. Nanji[b,d,e], Diane L. Seger[e], Insook Cho[a,b], Lynn A. Volk[e], David W. Bates[a,b,e]

[a]Division of General Internal Medicine, Brigham and Women's Hospital, Boston, MA, USA;

A cross-sectional observational study of high override rates of drug allergy alerts in inpatient and outpatient settings, and opportunities for improvement

Sarah Patricia Slight,[1,*] Patrick E Beeler,[2,*] Diane L Seger,[3] Mary G Amato,[4,5] Qoua L Her,[5] Michael Swerdloff,[5] Olivia Dalleur,[6]

Understanding physicians' behavior toward alerts about nephrotoxic medications in outpatients: a cross-sectional analysis

Insook Cho[1,2,3*], Sarah P Slight[1,3,5], Karen C Nanji[3,6], Diane L Seger[4], Nivethietha Maniam[4], Patricia C Dykes[1,3] and David W Bates[1,3,4]

The vulnerabilities of computerized physician order entry systems: a qualitative study

Sarah P Slight[1,2], Tewodros Eguale[2,3], Mary G Amato[2,3], Andrew C Seger[3], Diana L Whitney[4], David W Bates[2,5,6], Gordon D Schiff[2,5]

Cost

Newcastle University
UK | Malaysia | Singapore

The frequency of inappropriate nonformulary medication alert overrides in the inpatient setting

REC
REVISED
ACCEPT

AMIA
INFORMATICS PROFESSIONALS. LEADING THE WAY.

Qoua L Her[1], Mary G Amato[2], Diane L Seger[3], Patrick E Beeler[1,4], Sarah P Slight[5], Olivia Dalleur[6], Patricia C Dykes[7], James F Gilmore[8], John Fanikos[8], Julie M Fiskio[3], David W Bates[1]

JMIR MEDICAL INFORMATICS Slight et al

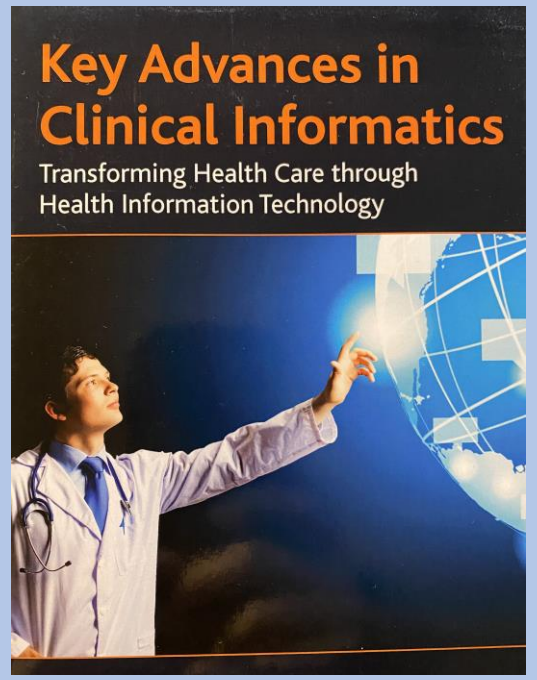
Original Paper

Meaningful Use of Electronic Health Records: Experiences From the Field and Future Opportunities

Sarah Patricia Slight[1,2], MPharm, PhD, PGDip; Eta S Berner[3], EdD; William Galanter[4], MS, MD, PhD; Stanley Huff[5,6], MD; Bruce L Lambert[7], PhD; Carole Lannon[8,9], MD, MPH; Christoph U Lehmann[10], MD, FAAP, FACMI; Brian J McCourt[11], BA; Michael McNamara[12], MD; Nir Menachemi[13], MPH, PhD; Thomas H Payne[14], MD; S Andrew

The national cost of adverse drug events resulting from inappropriate medication-related alert overrides in the United States

Sarah P Slight,[1,2,3] Diane L Seger,[3,4] Calvin Franz,[5] Adrian Wong,[3] and David W Bates[3,6,7]



A qualitative study identifying the cost categories associated with electronic health record implementation in the UK

Sarah P Slight,[1,2,3] Casey Quinn,[4] Anthony J Avery,[5] David W Bates,[2,6,7] Aziz Sheikh[2,3,6]

Durham University

Newcastle University

UK Medication Error and ADE Study

THE LANCET
Digital Health

Articles

Medication errors and adverse drug events in a UK hospital during the optimisation of electronic prescriptions: a prospective observational study

Sarah P Slight, Clare L Tolley, David W Bates, Rachel Fraser, Theophile Bigirumurame, Adetayo Kasim, Konstantinos Balaskonis, Steven Narrie, Andrew Heed, E John Orav, Neil W Watson

Summary

Background WHO's Third Global Patient Safety Challenge, Medication Without Harm, focused on reducing the substantial burden of iatrogenic harm associated with medications by 50% in the next 5 years. We aimed to assess whether the number and type of medication errors changed as an electronic prescribing system was optimised over time in a UK hospital.

Methods We did a prospective observational study at a tertiary-care teaching hospital. Eight senior clinical pharmacists reviewed patients' records and collected data across four adult wards (renal, cardiology, general medical, and orthopaedic surgical) over a 2-year period (from Sept 29, 2014, to June 9, 2016). All medication errors and potential and actual adverse drug events were documented and the number of medication errors measured over the course of four time periods 7–10 weeks long. Pharmacists also recorded instances where the electronic prescribing system contributed to an error (system-related errors). A negative-binomial model and a Poisson model were used to identify factors related to medication error rates.

Findings 5796 primary errors were recorded over the four time periods (period 1, 47 days [Sep 29–Dec 2, 2014]; period 2, 38 days [April 20–June 12, 2015, for the renal, medical, and surgical wards and April 20–June 15, 2015, for the cardiology ward]; period 3, 35 days [Sep 28–Nov 27, 2015] for the renal ward, 37 days [Sep 28–Nov 23, 2015] for the medical ward, and 40 days [Sep 28–Nov 20, 2015] for the cardiology and surgical wards; and period 4, 37 days [Feb 22–April 15, 2015] for the renal and medical wards and 39 days for the cardiology [April 13–June 7, 2015] and surgery [April 18–June 9, 2015] wards; unanticipated organisational factors prevented data collection on some days during each time period). There was no change in the rate of primary medication errors per admission over the observation periods: 1·53 medication errors in period 1, 1·44 medication errors in period 2, 1·70 medication errors in period 3, and 1·43 medication errors in period 4, per admission. By contrast, the overall rate of different types of medication errors decreased over the four periods. The most common types of error were medicine-reconciliation, dose, and avoidable delay-of-treatment errors. Some types of errors appeared to reduce over time (eg, dose errors [from 52 errors in period 1 to 19 errors in period 4, per 100 admissions]), whereas others increased (eg, inadequate follow-up of therapy [from 12 errors in period 1 to 24 errors in period 4, per 100 admissions]). We also found a reduction in the rates of potential adverse drug events between the first three periods and period 4. 436 system-related errors were recorded over the study period.

Lancet Digital Health 2019

Published Online
October 31, 2019
https://doi.org/10.1016/S2589-7500(19)30158-X

See Online/Comment
https://doi.org/10.1016/S2589-7500(19)30157-8

School of Pharmacy, Newcastle University, Newcastle upon Tyne, UK (S P Slight PhD); The Newcastle upon Tyne Hospitals National Health Service Foundation Trust, Newcastle upon Tyne, UK (S P Slight, C L Tolley PhD, R Fraser MPharm, A Heed BPharm, N W Watson MSc); The Centre for Patient Safety Research and Practice, Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital, Boston, MA, USA (S P Slight, Prof D W Bates MSc, E J Orav PhD); Institute of Health and Society, Newcastle University, Newcastle upon Tyne, UK (S P Slight, C L Tolley, T Bigirumurame PhD); Department of Medicine, Harvard Medical School,

Prospective observational study

Range of clinical settings

- Some errors ↑↓ over time
- Certain errors occurred together
- System functionality

Unintended consequences

A systematic review of the types and causes of prescribing errors generated from using computerized provider order entry systems in primary and secondary care

RECEIVED 4 March 2016
REVISED 27 May 2016
ACCEPTED 8 July 2016

Clare L Brown,[1,2] Helen L Mulcaster,[1] Katherine L Triffitt,[1] Dean F Sittig[3], Joan S
David W Bates[6,7,8], and Sarah P Slight[1,2,6]

ABSTRACT

J Am Med Inform Assoc. 2018 May 1;25(5):575-584. doi: 10.1093/jamia/ocx124.

Factors contributing to medication errors made when using computerized order entry in pediatrics: a systematic review

Clare L Tolley [1 2 3], Niamh E Forde [2], Katherine L Coffey [2], Dean F Sittig [4], Joan S Ash [5], Andrew K Husband [1], David W Bates [6 7 8], Sarah P Slight [1 3 6]

Affiliations + expand

PMID: 29088436 PMCID: PMC7646858 DOI: 10.1093/jamia/ocx124

Free PMC article

FULL TEXT LINKS

OXFORD ACADEMIC

FREE Full text PMC

ACTIONS

Cite

Collections

SHARE

BJCP British Journal of Clinical Pharmacology

ORIGINAL ARTICLE | Open Access

An e-Delphi study to obtain expert consensus on the level of risk associated with preventable e-prescribing events

Jude Heed, Stephanie Klein, Ann Slee, Neil Watson, Andy Husband, Sarah Patricia Slight

Medication Use Process

Doctor

Med Orders

Prescribing Errors (8.5%)

Pharmacist

Dispensing

Dispensing Errors (2.9%)

Medication on Wards

Administration Errors (78.6%)

Nurse

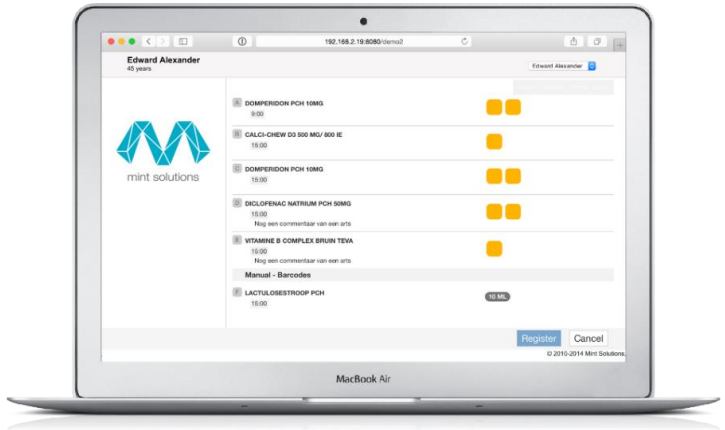
Administration

Patient

Monitoring Errors (2.9%)

Monitoring

MedEye



Funded by the Horizon 2020 framework programme of the European Union

Dr. Clare Tolley
Project Manager

med eye

Tolley et al.
BMC Medical Informatics and Decision Making (2022) 22:86
https://doi.org/10.1186/s12911-022-01828-3

BMC Medical Informatics and Decision Making

RESEARCH Open Access

The impact of a novel medication scanner on administration errors in the hospital setting: a before and after feasibility study

Clare L. Tolley[1,2*], Neil W. Watson[2], Andrew Heed[2], Jochen Einbeck[3,4], Suzanne Medows[2], Linda Wood[2], Layla Campbell[2] and Sarah P. Slight[1,2,5]

Abstract

Objective: The medication administration process is complex and consequently prone to errors. Closed Loop Medication Administration solutions aim to improve patient safety. We assessed the impact of a novel medication scanning device (MedEye) on the rate of medication administration errors in a large UK Hospital.

Methods: We performed a feasibility before and after study on one ward at a tertiary-care teaching hospital that used a commercial electronic prescribing and medication administration system. We conducted direct observations of nursing drug administration rounds before and after the MedEye implementation. We calculated the rate and type ('timing', 'omission' or 'other' error) of medication administration errors (MAEs) before and after the MedEye implementation.

Rate of **non-timing** (wrong drug, dose errors) reduced from 4.77% to 2.55%

Impact of Errors

Surgical Safety

Systematic review

BJS Open
Open Access

Systematic review of psychological, emotional and behavioural impacts of surgical incidents on operating theatre staff

N. Serou[1,4,5], L. Sahota[1], A. K. Husband[1], S. P. Forrest[1], K. Moorthy[4], C. Vincent[6], R. D. Slight[2] and S. P. Slight[1,3,7]

[1]School of Pharmacy, Faculty of Medical Sciences, Newcastle University, and [2]Cardiothoracic and [3]Pharmacy Departments, Freeman Hospital, Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, [4]Theatres and Anaesthetics, Surgery, Cancer and Cardiovascular

OXFORD

BJS Open, 2020, **00**, 1–6
DOI: 10.1093/bjsopen/zraa007
Original Article

Surgical incidents and their impact on operating theatre staff: qualitative study

N. Serou [1,2,3], S.P. Slight[1,4,5,*], A.K. Husband[1], S.P. Forrest[6] and R.D. Slight[4,5]

[1]School of Pharmacy, Newcastle University, Newcastle upon Tyne, UK
[2]Operating Theatres, Singleton Hospital, Swansea Bay University Health Board, Swansea, UK
[3]Swansea Medical School, Swansea University, Swansea, UK
[4]Population Health Sciences Institute, Newcastle University, Newcastle upon Tyne, UK
[5]Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK
[6]Department of Sociology, Durham University, Durham, UK

*Correspondence to: School of Pharmacy, King George VI Building, Queen Victoria Road, Newcastle upon Tyne NE1 7RU, UK (e-mail: sarah.slight@ncl.ac.uk)

International Journal for Quality in Health Care, 2021, 33(1), 1–9
doi: 10.1093/intqhc/mzab046
Advance Access Publication Date: 17 March 2021
Systematic Review

ISQua

OXFORD

Systematic Review

Learning from safety incidents in high-reliability organizations: a systematic review of learning tools that could be adapted and used in healthcare

NARESH SEROU [1,2,3], LAUREN M. SAHOTA[1], ANDY K. HUSBAND[1], SIMON P. FORREST[4], ROBERT D. SLIGHT[5,6], and SARAH P. SLIGHT[1,5,6]

Surgical Safety

News

Survey of UK doctors highlights blame culture within the NHS

BMJ 2018 ; 362 doi: https://doi.org/10.1136/bmj.k4001 (Published 20 September 2018)
Cite this as: *BMJ* 2018;362:k4001

Another sad story of toxic culture – A failure to learn from avoidable medical mistakes

20 NOVEMBER 2019

A failure of leadership and management: toxic cultures, ENRON and the Francis Report

Digital Health Technologies and Care Pathway

SYSTEMATIC REVIEW:

Effectiveness of digital technologies to support surgical patients in changing their health behaviours: a systematic review

BJS Open, 2020

Variability/heterogeneity in the way the interventions are delivered, designed and evaluated.

THE GAPS:

Timings of the technology:
1) start, 2) duration?

Peer support features:
1) online, 2) in-built?

Desires/wants/needs of patients:
1) features, 2) content?

Robinson *et al. Perioperative Medicine* (2020) 9:2
https://doi.org/10.1186/s13741-019-0133-z

Perioperative Medicine

COMMENTARY Open Access

The value of teachable moments in surgical patient care and the supportive role of digital technologies

Anna Robinson[1*], Robert Slight[2,3], Andrew Husband[1] and Sarah Slight[1,3]

JMIR PERIOPERATIVE MEDICINE Robinson et al

Review

Digital Support for Patients Undergoing Bariatric Surgery: Narrative Review of the Roles and Challenges of Online Forums

Anna Robinson[1], MPharm, PGDip (Adv); Andrew K Husband[1], PhD; Robert D Slight[2], PhD; Sarah P Slight[1], PhD

[1]School of Pharmacy, Institute of Population Health Sciences, Newcastle University, Newcastle Upon Tyne, United Kingdom
[2]Institute of Population Health Sciences, Newcastle University, Newcastle Upon Tyne, United Kingdom

J Med Internet Res. 2021 Mar; 23(3): e25885. PMCID: PMC7985803
Published online 2021 Mar 8. doi: 10.2196/25885 PMID: 33683208

Designing the Optimal Digital Health Intervention for Patients' Use Before and After Elective Orthopedic Surgery: Qualitative Study

Monitoring Editor: Mircea Focsa

Reviewed by Adam Pattison, Dorothy Szinay, and Annemieke van der Horst

Anna Robinson, MPharm, PGDip,[1,2] Robert D Slight, PhD,[2,3] Andrew K Husband, PhD,[1,2] and Sarah P Slight, PhD[1,2]

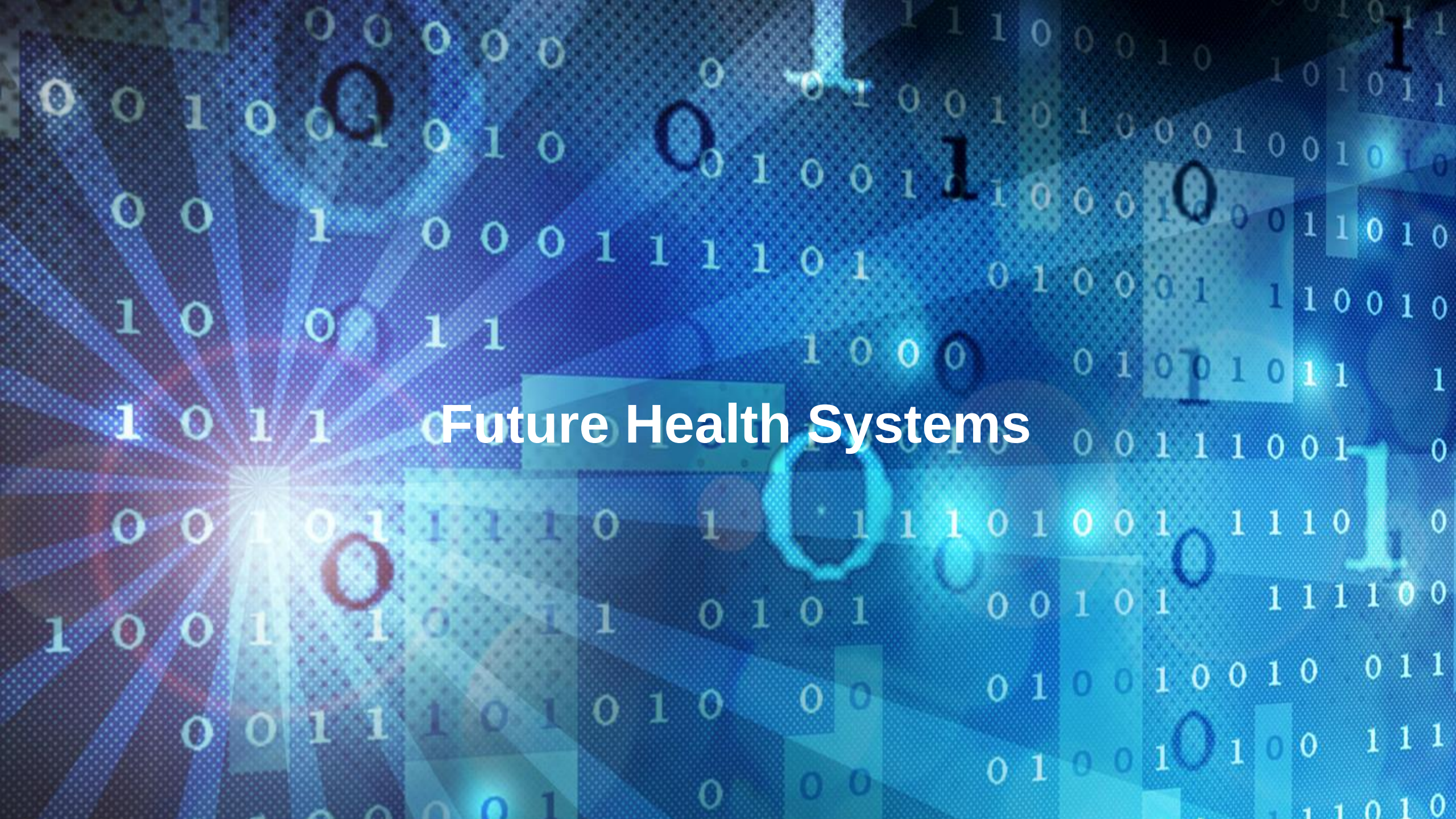
JMIR Hum Factors. 2022 Jan-Mar; 9(1): e29782. PMCID: PMC8933804
Published online 2022 Mar 4. doi: 10.2196/29782 PMID: 35254271

Designing Digital Health Technology to Support Patients Before and After Bariatric Surgery: Qualitative Study Exploring Patient Desires, Suggestions, and Reflections to Support Lifestyle Behavior Change

Monitoring Editor: Andre Kushniruk

Reviewed by Charlotte Richardson and Stephanie Goldstein

Anna Robinson, MPharm, PG Clin Dip (Adv),[1,2] Andrew Husband, PhD,[1,2] Robert Slight, PhD,[2,3] and Sarah P Slight, PhD[1,2]


Future Health Systems

INNOVATIVE TECHNOLOGIES

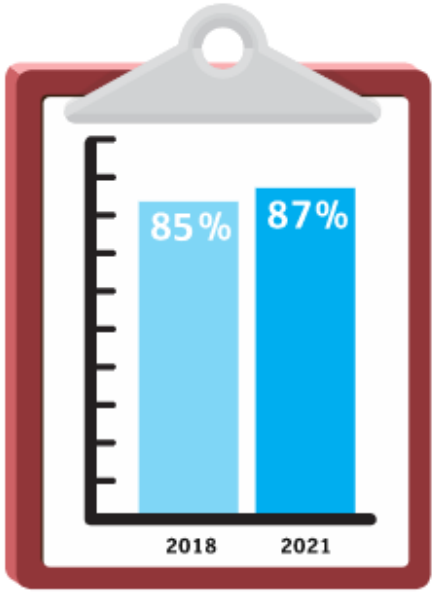
The power of digital data

Subtle changes or ‘clues’ in our everyday lives:

What if we could predict the likelihood of an individual developing dementia?

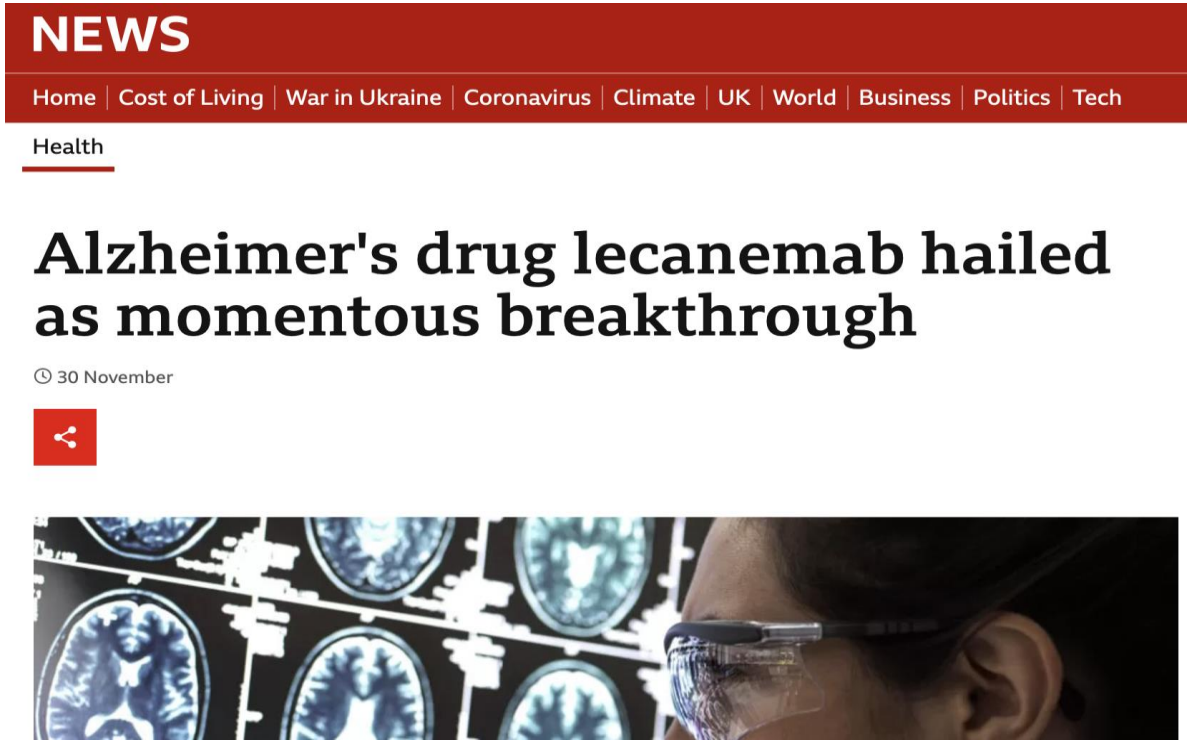
Would I really like to know?

Would take a test, or set of tests, that could tell whether they were in the very early stages of Alzheimer's or another form of dementia, even before any symptoms appeared



Would take the test.

Why is this important?



PERSPECTIVE
https://doi.org/10.1038/s43587-022-00269-x
nature aging
Check for updates

Designing the next-generation clinical care pathway for Alzheimer's disease

Harald Hampel[1]✉, Rhoda Au[2], Soeren Mattke[3], Wiesje M. van der Flier[4], Paul Aisen[5], Liana Apostolova[6], Christopher Chen[7], Min Cho[1], Susan De Santi[1], Peng Gao[1], Atsushi Iwata[8], Ricky Kurzman[1], Andrew J. Saykin[9], Stefan Teipel[10,11], Bruno Vellas[12], Andrea Vergallo[1], Huali Wang[13] and Jeffrey Cummings[14]

The reconceptualization of Alzheimer's disease (AD) as a clinical and biological construct has facilitated the development of biomarker-guided, pathway-based targeted therapies, many of which have reached late-stage development with the near-term potential to enter global clinical practice. These medical advances mark an unprecedented paradigm shift and requires an optimized global framework for clinical care pathways for AD. In this Perspective, we describe the blueprint for transitioning from the current, clinical symptom-focused and inherently late-stage diagnosis and management of AD to the next-generation pathway that incorporates biomarker-guided and digitally facilitated decision-making algorithms for risk stratification, early detection, timely diagnosis, and preventative or therapeutic interventions. We address critical and high-priority challenges, propose evidence-based strategic solutions, and emphasize that the perspectives of affected individuals and care partners need to be considered and integrated.

Use of digital health technologies in clinical care pathway

The rise of digital health technologies represents another major opportunity to improve the AD clinical care pathway (Fig. 1). Such technologies are particularly poised for early detection/case finding and tracking longitudinal disease progression and/or treatment response.

1. Early Detection

2. Monitoring Disease Progression

3. Tracking Treatment Response


DATA
SCIENCE

Spatial biomarkers of early Alzheimer's disease (SABRE)

- £2 million – NIHR Invention for Innovation (i4i) Dementia Call
- Five-year project (just starting)





Tier 1 – Evidence Standards

1. Accurate and reliable measurements
2. Accurate and reliable transmission of data
3. Credibility with UK health professionals
4. Relevant to current care pathways in UK
5. Acceptability with users
6. Equality considerations

EDoN Early Detection of Neurodegenerative diseases

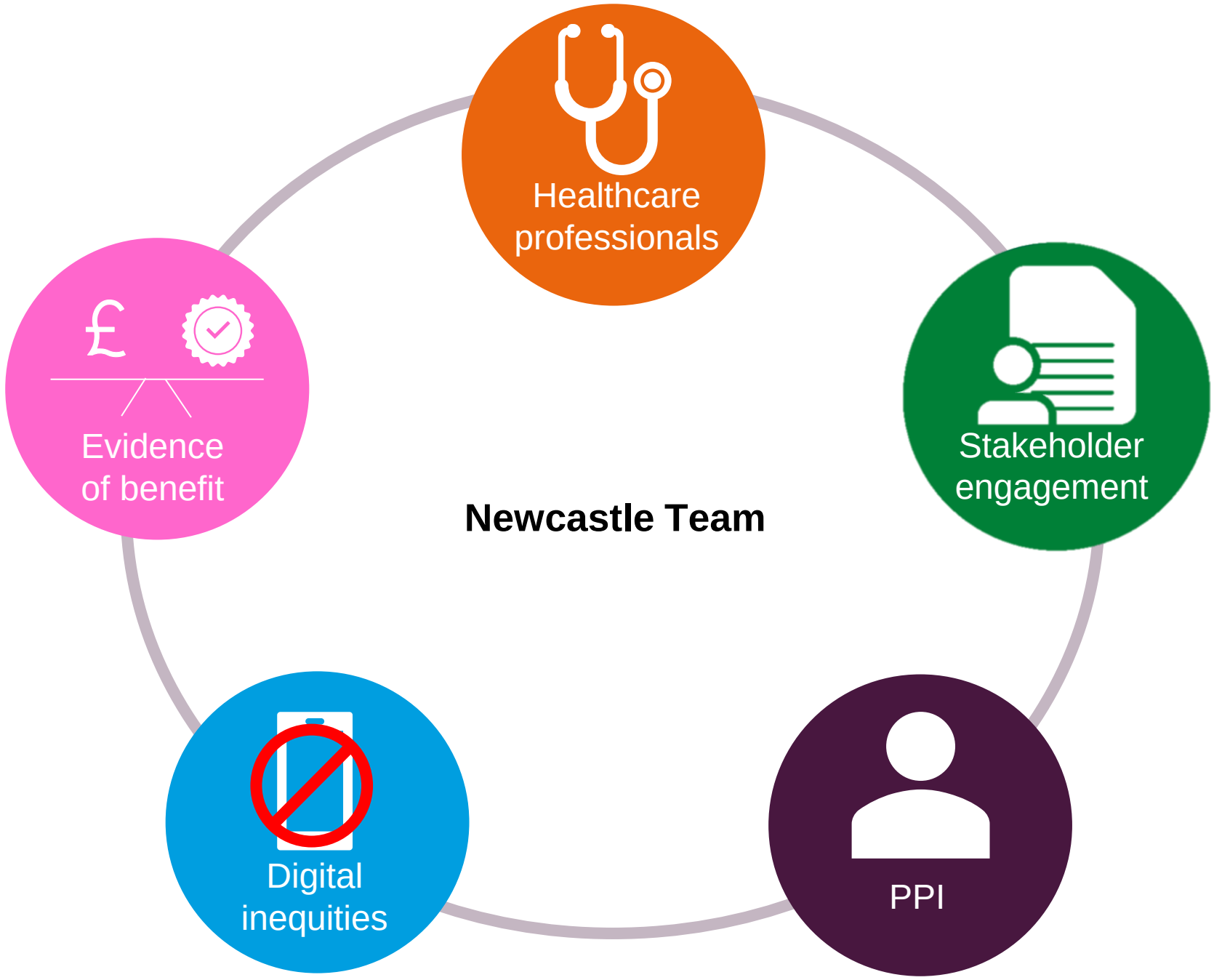
Alzheimer's Research UK

Tier 1 – Evidence Standards

1. Accurate and reliable measurements
2. Accurate and reliable transmission of data
3. Credibility with UK health professionals
4. Relevant to current care pathways in UK
5. Acceptability with users
6. Equality considerations

EDoN Early Detection of Neurodegenerative diseases

Alzheimer's Research UK


Healthcare professionals
Stakeholder engagement
PPI
Digital inequities
Evidence of benefit
Newcastle Team

J Med Internet Res. 2023; 25: e46711.
Published online 2023 Aug 22. doi: 10.2196/46711
PMCID: PMC10481214
PMID: 37606986

Key Considerations When Developing and Implementing Digital Technology for Early Detection of Dementia-Causing Diseases Among Health Care Professionals: Qualitative Study

Monitoring Editor: Taiane de Azevedo Cardoso

Reviewed by Boyd Davis, Pascale Heins, Alex Hall, and Si Qi Yoong

Sarah Wilson, MSc,[✉1] Clare Tolley, PhD,[1] Riona Mc Ardle, PhD,[2] Emily Beswick, PhD,[1] and Sarah P Slight, PhD[1]

1. Patients

- Target group
- Health disparities
- Impact of early detection

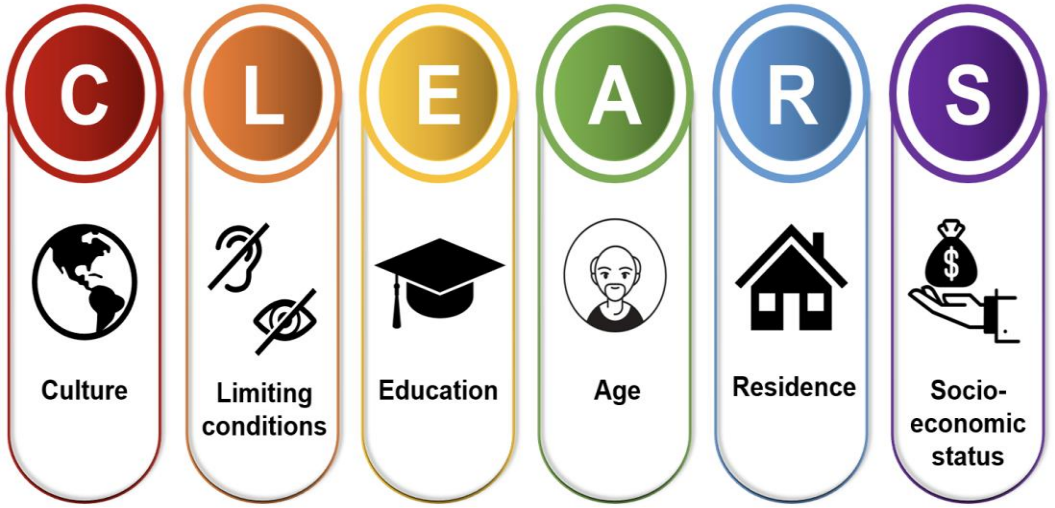
2. Healthcare professionals

- Clinical pathway
- Burden
- Acceptance
- Dissemination

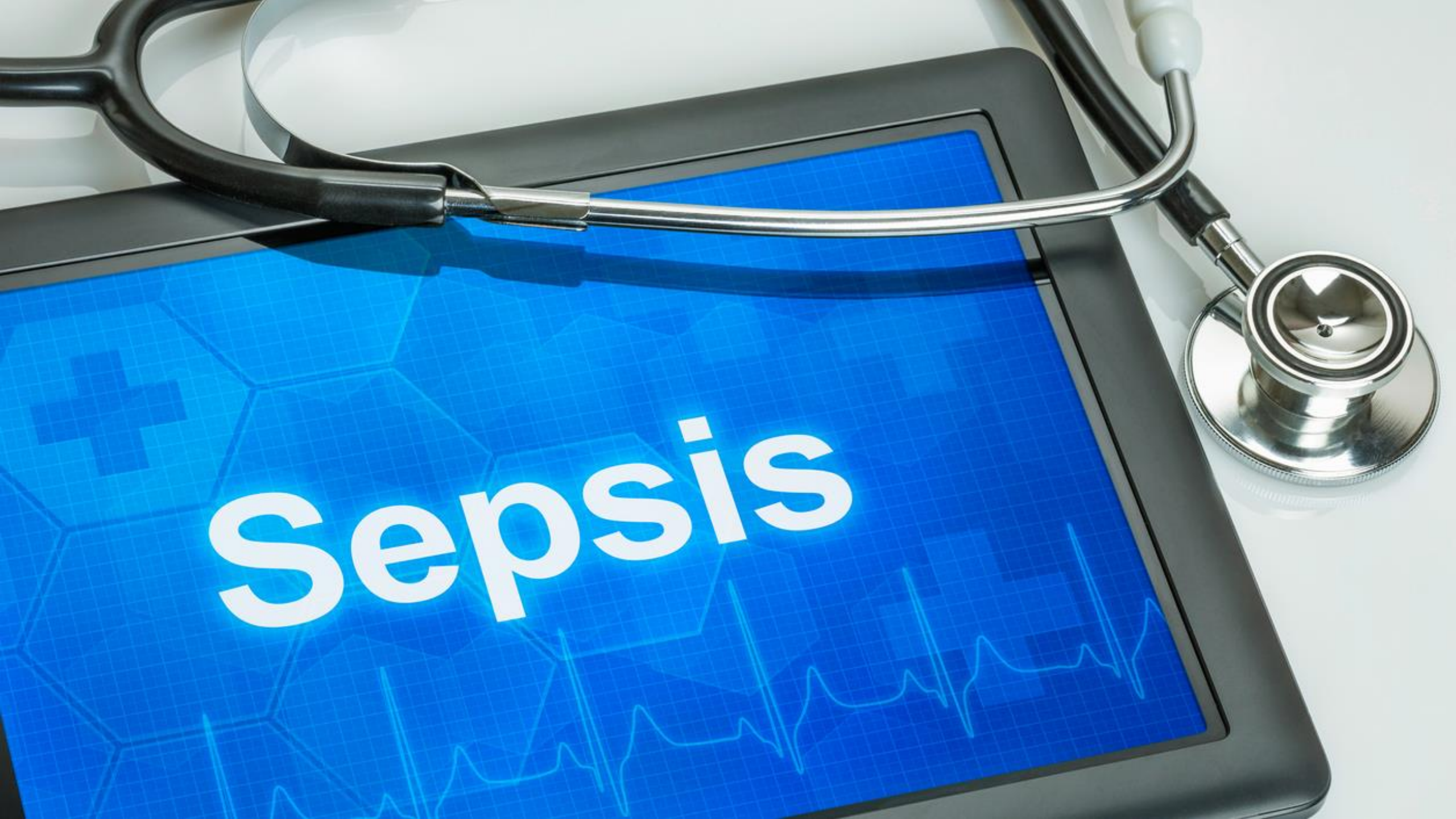
3. Digital tool

- Accuracy & feasibility
- Technology appraisals

Strategies to promote digital inclusivity



- **Systematic Review** *(Submitted for publication)*
- **Qualitative study - underserved groups** *(ongoing)*

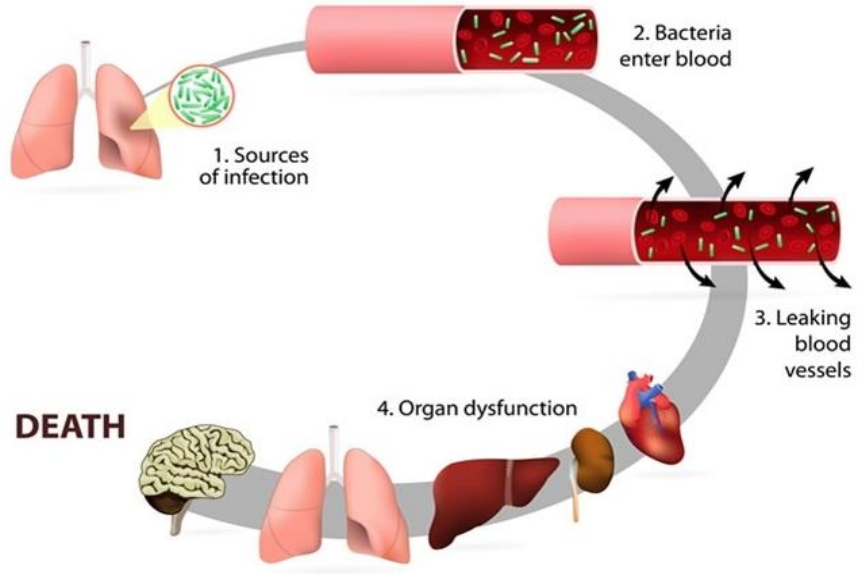

Sepsis

World Health Organization

Health Topics | Countries | Newsroom | Emergencies

Home / News / WHO calls for global action on sepsis - cause of 1 in 5 deaths worldwide

WHO calls for global action on sepsis - cause of 1 in 5 deaths worldwide



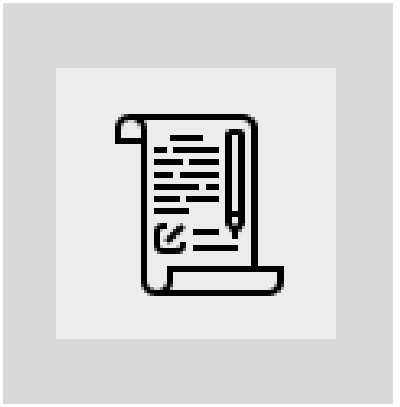
Effects of sepsis. Presence of numerous bacteria in the blood, causes the body to respond in organ dysfunction. Image Credit: Designua / Shutterstock

What if we could predict the likelihood of a patient developing infection & subsequent sepsis?

Why is this important?

Intervene earlier

Reduce healthcare costs

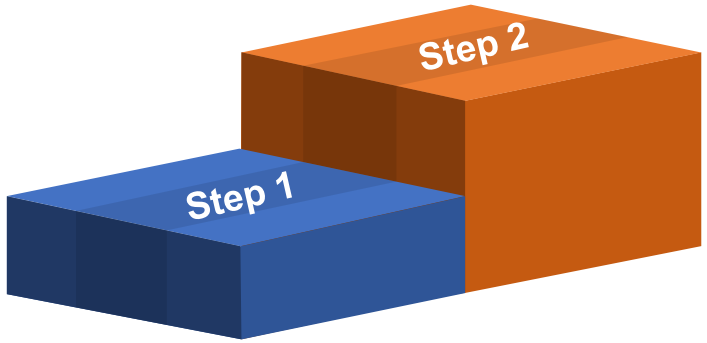


Consent

Images from https://icons8.com

The Team

What is the likelihood of a patient developing an infection and subsequent sepsis as an inpatient?



Outcome(s) of interest

Appropriate Predictors

ELSEVIER

International Journal of Medical Informatics

Volume 150, June 2021, 104457

Review article

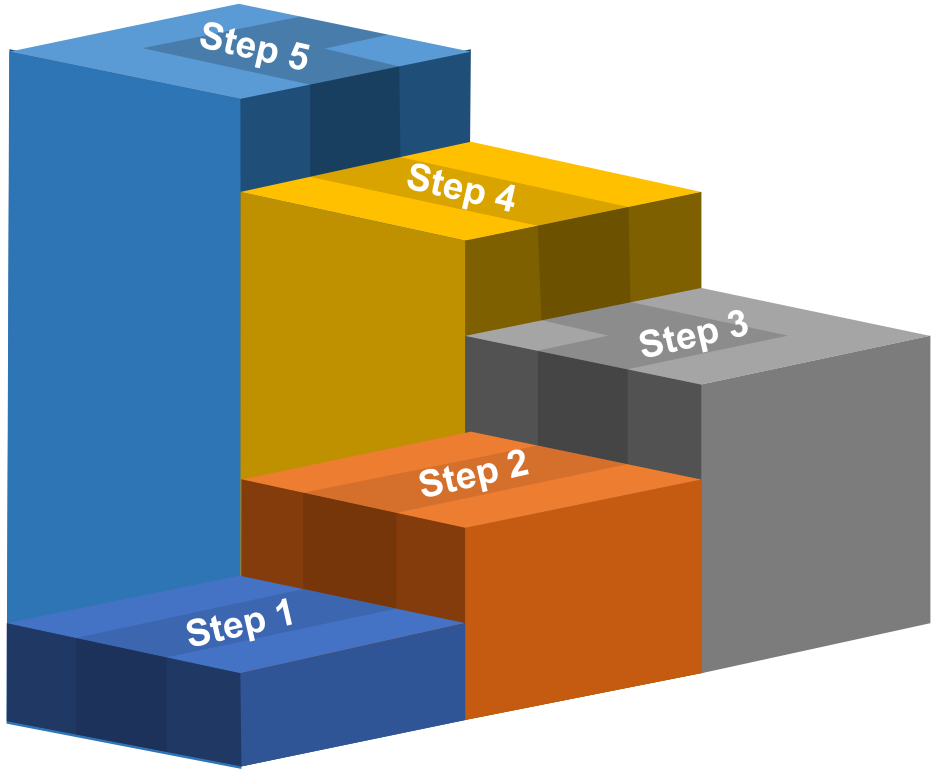
Preventing sepsis; how can artificial intelligence inform the clinical decision-making process? A systematic review

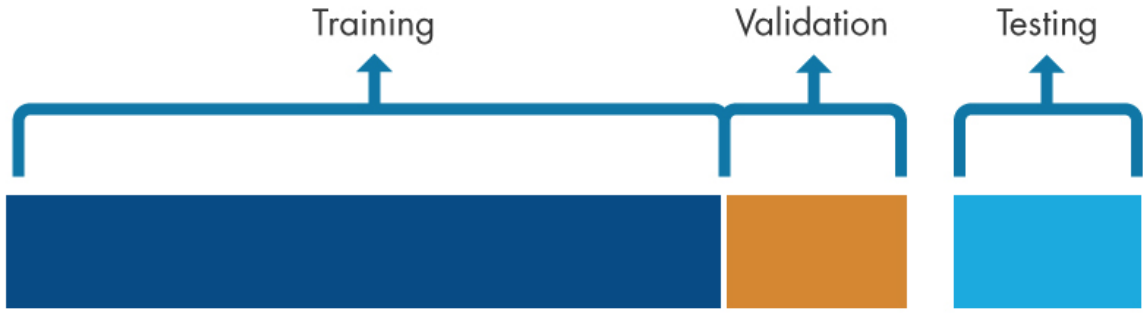
Nehal Hassan [a] ✉, Robert Slight [b] ✉, Daniel Weiand [b] ✉, Akke Vellinga [c] ✉, Graham Morgan [d] ✉, Fathy Aboushareb [e] ✉, Sarah P. Slight [a] ✉

PIONEER

The Health Data Research Hub for Acute Care

- Outcome(s) of interest
- Appropriate Predictors
- Relevant Datasets
- Development of AI model
- Validating & Testing





NINE STEPS

MHRA
Regulating Medicines and Medical Devices

On-going Evaluation

Maintenance

Licencing

Presentation & Interpretation

Open access Review

BMJ Health & Care Informatics

Road map for clinicians to develop and evaluate AI predictive models to inform clinical decision-making

Nehal Hassan [1,2] Robert Slight,[2,3] Graham Morgan,[4] David W Bates,[5] Suzy Gallier,[6,7] Elizabeth Sapey [6,7] Sarah Slight[1,2]

Editorial

BMJ Global Health

The Gates Foundation's new AI initiative: attempting to leapfrog global health inequalities?

Jonathan Shaffer ,[1] Arsenii Alenichev,[2] Marlyn C Faure[3]

To cite: Shaffer J, Alenichev A, Faure MC. The Gates Foundation's new AI initiative: attempting to leapfrog global health inequalities? *BMJ Glob Health* 2023;**8**:e013874. doi:10.1136/bmjgh-2023-013874

The Bill & Melinda Gates Foundation has long been criticised for championing the trend of socially reductive, 'magic bullet' technical 'solutions' to the complex, historically shaped, politically conflicted problems at root of global health inequities.[1–5] Their August 9th announcement of the launch of

VIEWPOINTS

Artificial intelligence and algorithmic bias: implications for health systems

Trishan Panch[1,2], Heather Mattie[3], Rifat Atun[4]

Review | Open access | Published: 07 January 2021

Short-term exposure to air pollution and hospital admission for pneumonia: a systematic review and meta-analysis

Jeong Yee, Young Ah Cho, H

Environmental Health **20**, A

Review > Lancet. 2013 Sep 21;382(9897):1039-48. doi: 10.1016/S0140-6736(13)60898-3.
Epub 2013 Jul 10.

Global association of air pollution and heart failure: a systematic review and meta-analysis

Anoop S V Shah [1], Jeremy
Ken Donaldson, David E Nev

Affiliations + expand

PMID: 23849322 PMCID:

Free PMC article

Review > BMJ. 2015 Mar 24:350:h1295. doi: 10.1136/bmj.h1295.

Short term exposure to air pollution and stroke: systematic review and meta-analysis

Anoop S V Shah [1], Kuan Ken Lee [2], David A McAllister [3], Amanda Hunter [2], Harish Nair [3], William Whiteley [4], Jeremy P Langrish [2], David E Newby [2], Nicholas L Mills [2]

Affiliations + expand

PMID: 25810496 PMCID: PMC4373601 DOI: 10.1136/bmj.h1295

Free PMC article

Why multimorbid patients?

By 2030, 1 in 6 people in the world will be aged 60 years or over.

By 2050, 2.1 billion people aged 60 years or over

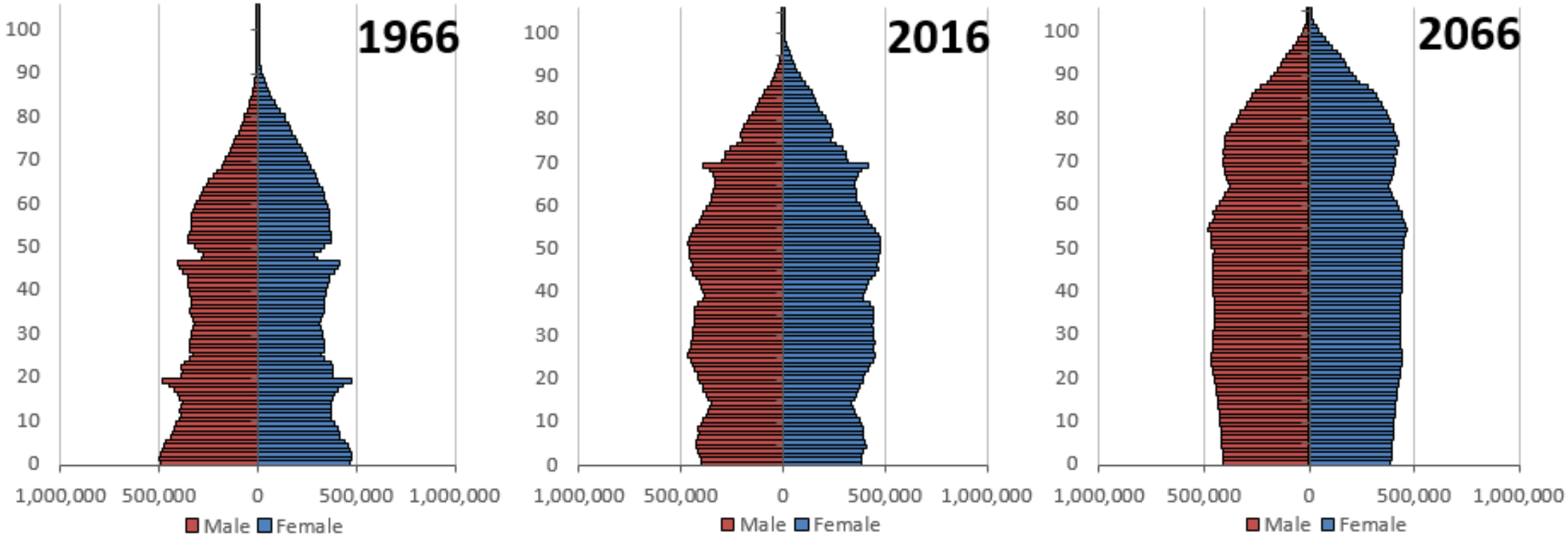


Figure 1 - Population pyramids, 1966, 2016 and 2066 (principal projection), UK.

KING'S College LONDON

CERC

North Tyneside Council

Newcastle University

NIHR | National Institute for Health and Care Research

Harn**E**ssing
Artifical
Intelligence
to
Lead
Transformative
Healthcare
(HEALTH)

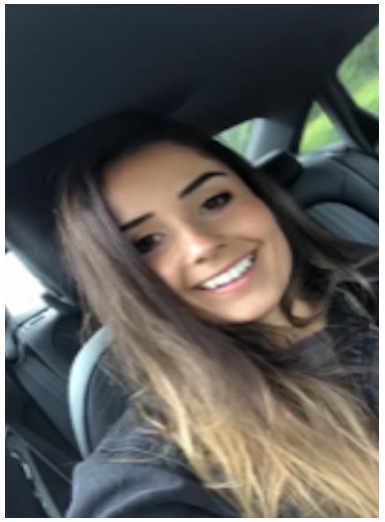
King's College London

University of Southampton

Newcastle University

UKRI Natural Environment Research Council

Undergraduate MPharm Students



Lauren Sahota

Esther Moore

Kweku Bimpong

Sophie Brouat

Arisha Ahmed

Radin Karimi

Evie Connolly

Kaye Robson

Charlotte March

Alya Al Rawi

Aim: To assess the impact of poor air quality on hospitalisations of multimorbid patients

Which air pollutants did we look at?

PARTICULATE MATTER (PM) 2.5 AND 10

CARBON MONOXIDE (CO)

SULPHUR DIOXIDE (SO_2)

NITROGEN DIOXIDE (NO_2)

OZONE (O_3)

Aim: To investigate the use of medication to prevent or delay the effects of air pollution on human health

Open access Original research

BMJ Open

Relationship between labour force satisfaction, wages and retention within the UK National Health Service: a systematic review of the literature

Kweku Andrew Ampadu Bimpong ,[1] Ausaf Khan,[1] Robert Slight,[2] Clare L Tolley,[1,3] Sarah P Slight[1,3]

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Health

NHS in England facing worst staffing crisis in history, MPs warn

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journal homepage: www.elsevier.com/locate/imu

What unique knowledge and experiences do healthcare professionals have working in clinical informatics?

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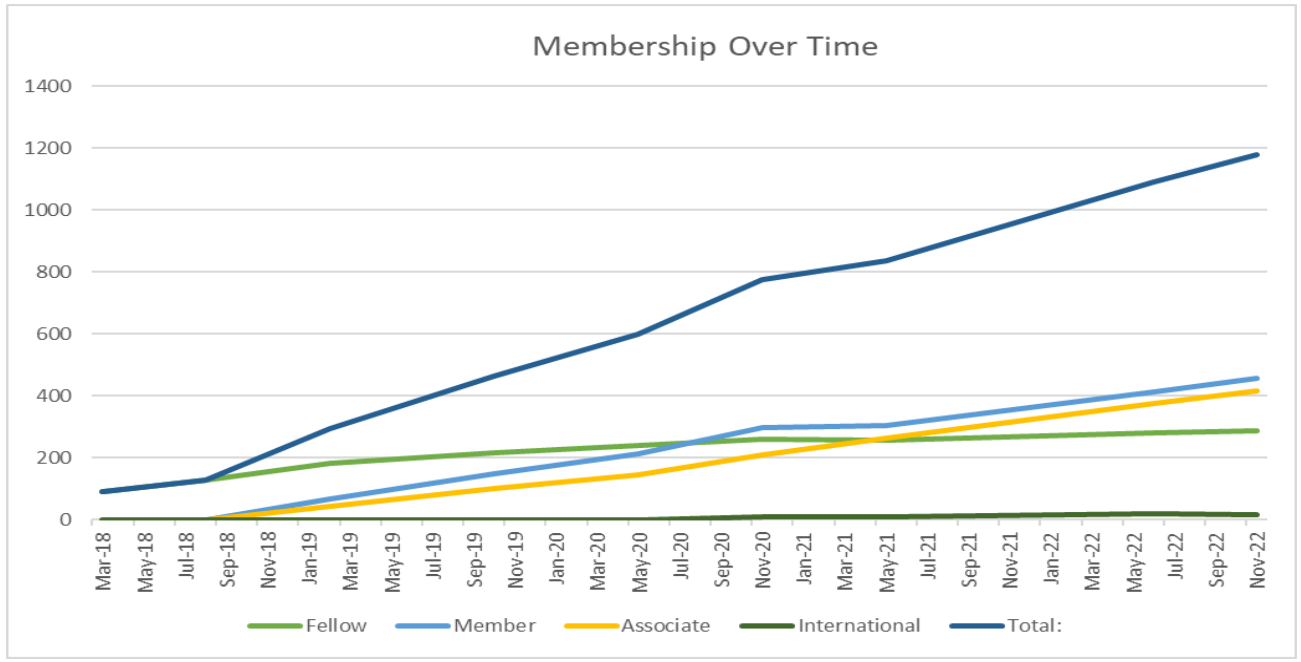

- Artificial Intelligence
- Clinical Safety
- Diagnosis Recording
- Early Careers

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