The University of Queensland
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Queensland
Digital Health Centre

2024 Symposium

7 November 2024
Customs House, Brisbane

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Expert Panel

The use of real-world data for research

Dr Jodie Austin

Benjamin Reid

Dr Anton van der Vegt

Keren Pointon

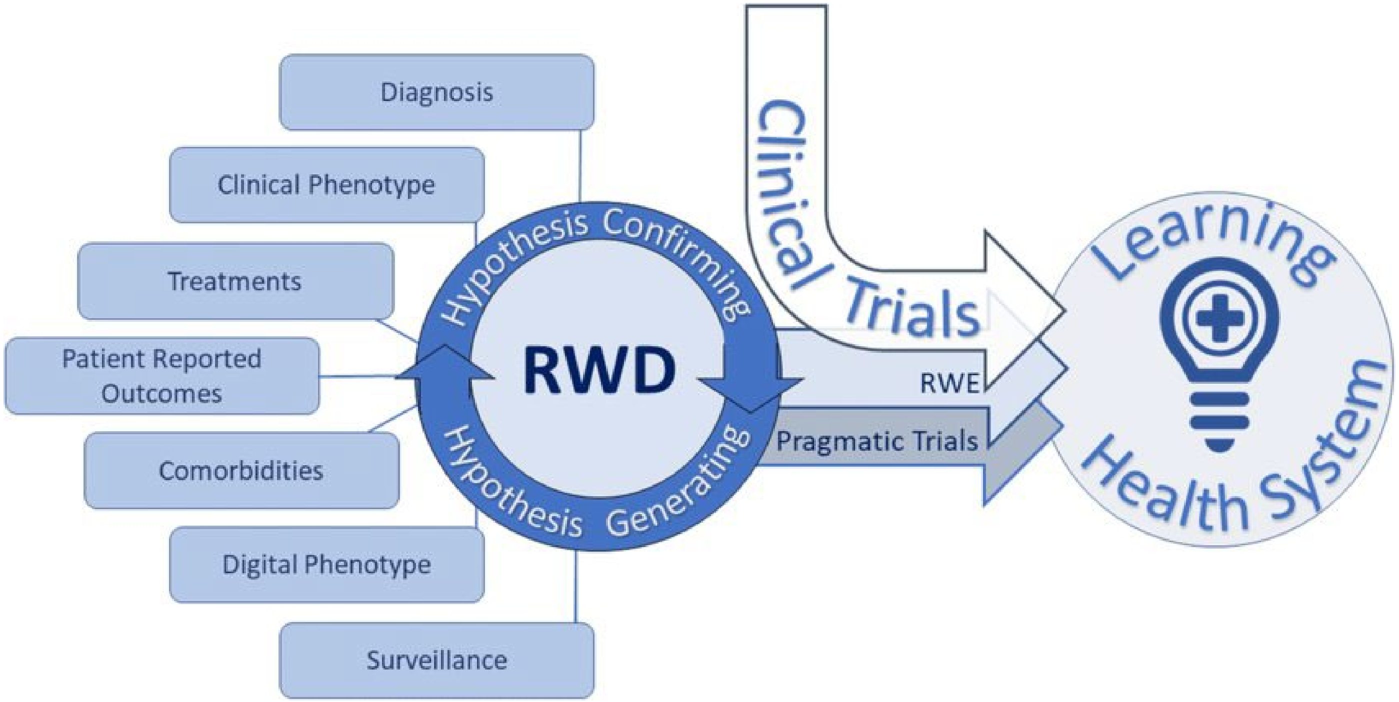
Dr David Hansen

Moderator: Prof Jason Pole

Real-world data for healthcare research

What is real-world data (RWD)?

- Collected as part of routine care in real-time using digital health infrastructure
- Renewed interest in RWD for healthcare research has coincided with rapid expansion of health information technology
- Modern day research can use findings generated through RCTs and RWD to bridge evidence gaps
  - RCTs: efficacy under controlled settings
  - RWD: effectiveness under 'real-world' conditions



Snyder J, Pawloski J, Poisson L. Developing real-world evidence-ready datasets: time for clinician engagement. Current Oncology Reports 2020;22. DOI: 10.1007/s11912-020-00904-z

Expert Panel

The use of real-world data for research

Dr Jodie Austin

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Leading Excellence in Digital Health in Queensland

Presenters:

Samantha Robertson

Graeme Mattison

Alan Robertson

Moderated by Dr Rebekah Eden

Closing remarks by Michael Draheim

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Implementation and evaluation of a clinician-led stroke Electronic Medical Record (EMR) enhancement

QDHeC Symposium 07/11/2024 – Project 0083

Samantha Robertson
BSc Nutr&Diet (Hons), CHIA, PhD Candidate
School of Health and Rehabilitation Sciences

Introduction

Electronic Medical Records (EMRs) are being implemented across health organisations worldwide

Implementation and adoption of digital health technology is complex

Optimisations to EMRs are taking place to enhance adoption, acceptance and use of these systems

The Queensland Stroke Clinical Network (QSCN) in collaboration with Queensland Health developed a novel customisation to the EMR for stroke care

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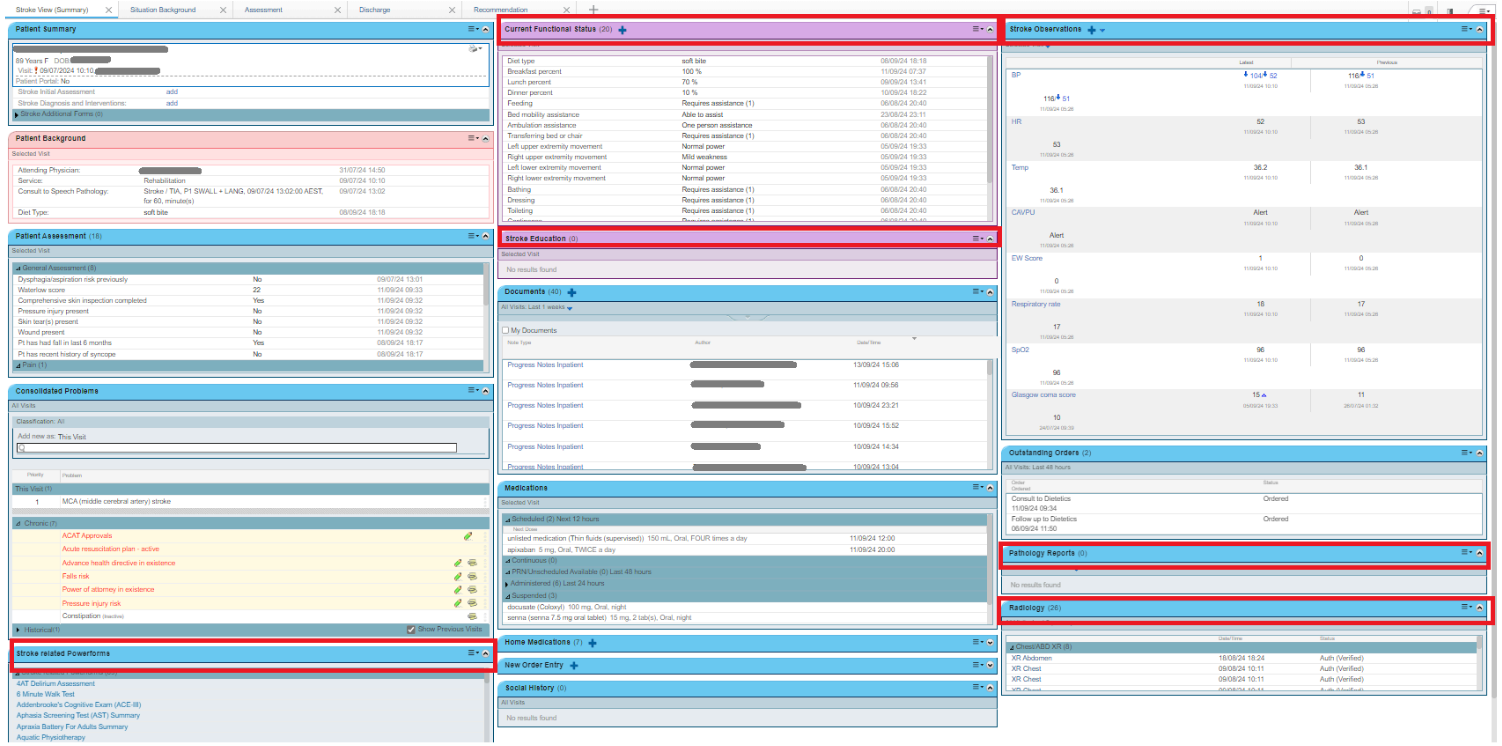
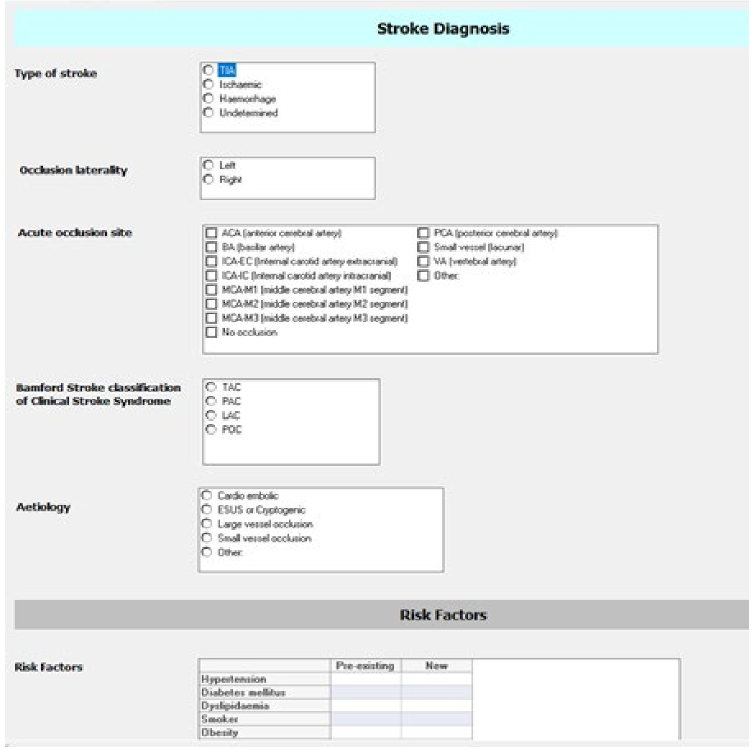
Stroke EMR Enhancement

Summary Page: Improve interprofessional practice through enhanced visibility of information and communication and coordination of patient care

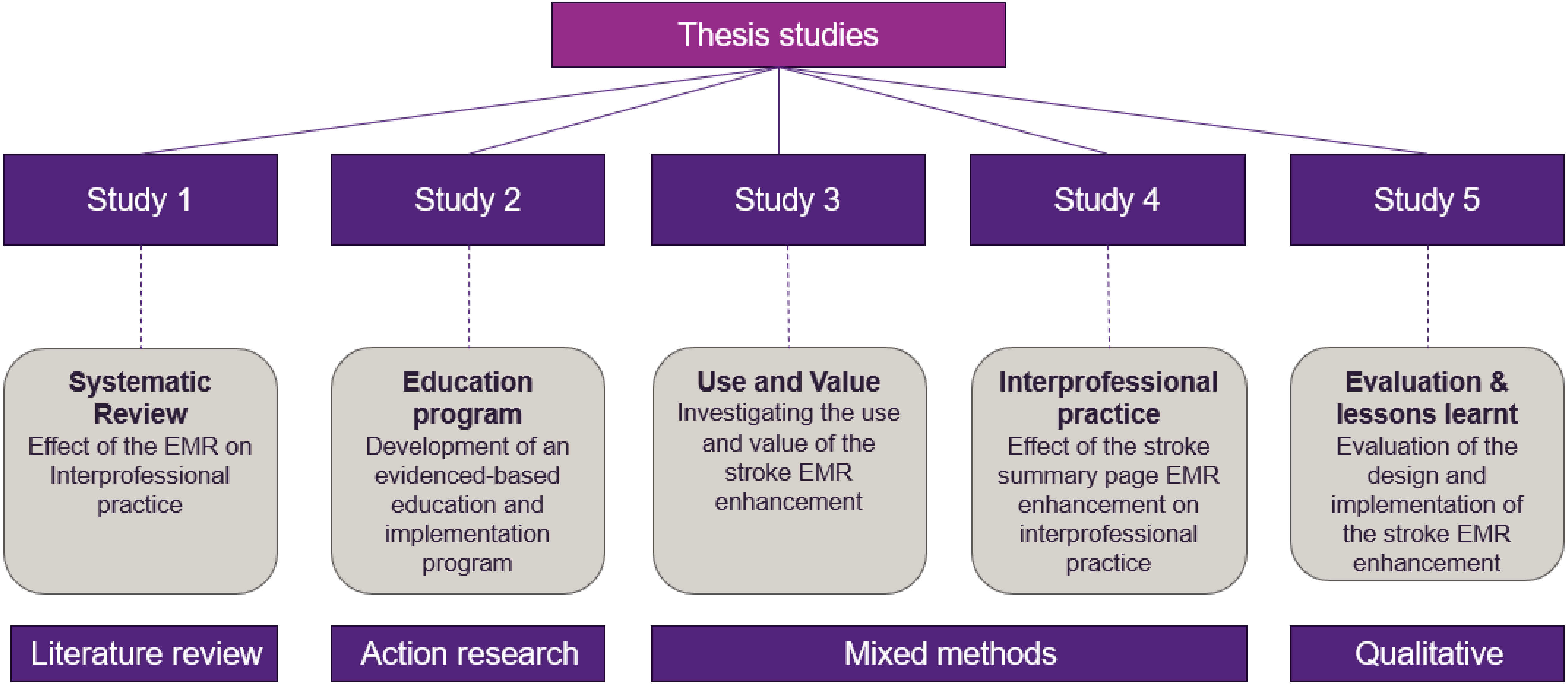
Data collection forms: Improve data collection and extraction practices for upload to the Australian Stroke Clinical Registry (AuSCR)





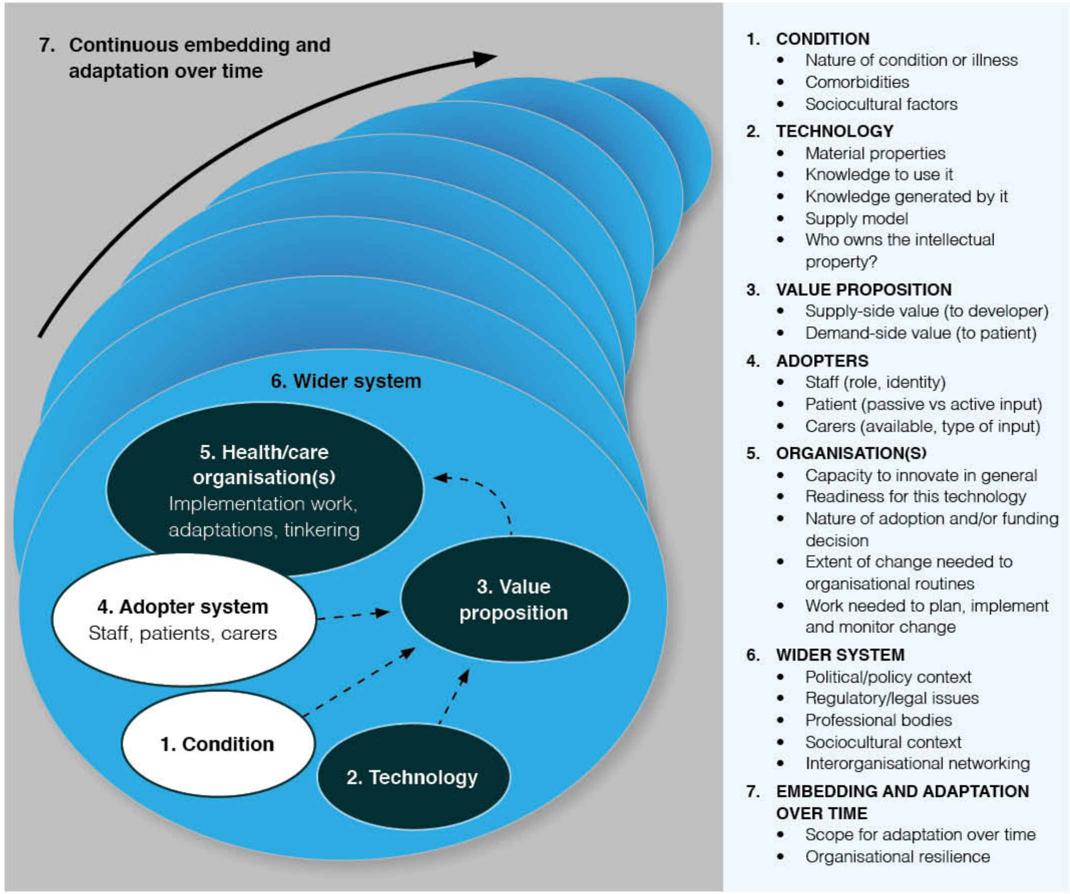
Research Question

"What is the use, perceived value and impact of an EMR enhancement for stroke on interprofessional practice and efficiency of data extraction, and what are the experiences of clinicians and stakeholders in its design and implementation?"


Thesis studies
Study 1
Study 2
Study 3
Study 4
Study 5
Systematic Review
Effect of the EMR on Interprofessional practice
Education program
Development of an evidenced-based education and implementation program
Use and Value
Investigating the use and value of the stroke EMR enhancement
Interprofessional practice
Effect of the stroke summary page EMR enhancement on interprofessional practice
Evaluation & lessons learnt
Evaluation of the design and implementation of the stroke EMR enhancement
Literature review
Action research
Mixed methods
Qualitative

Methodology

Complexity science approach



Non-adoption, Abandonment, Scale-up, Spread and Sustainability (NASSS) framework

Setting

Site 1: Metropolitan teaching hospital with 1050-beds
Site 2: Tertiary teaching hospital with a 707-beds
Site 3: Metropolitan teaching hospital with 906-beds
Site 4: Regional hospital with 318-beds

Participants

Medical, nursing, allied health end-users across study sites
Key stakeholders involved in design and implementation

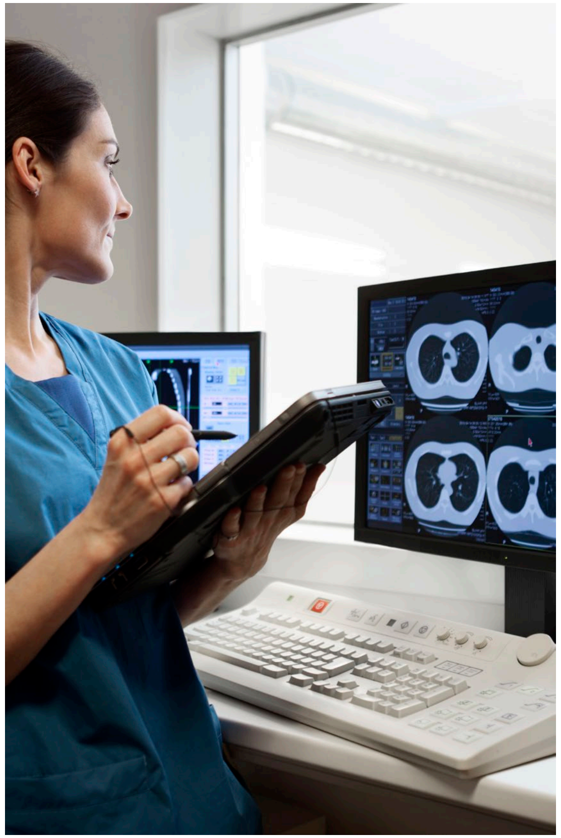
Data collection

- Observational shadowing (4 sites, 16 staff, 53 hours)
- Semi-structured interviews (23 stakeholders and end users)
- Usage log EMR data
- Pre-post survey (4 sites, 124 participants)

Results

1. EMR enhancements have the **potential to improve interprofessional practice**, particularly through improved communication and coordination of patient care. Enhancements had a greater positive effect than the EMR alone.
2. An evidenced-based, theory driven education and **implementation program** was employed to provide the opportunity for optimal adoption and utilisation of the stroke EMR enhancement.
3. There were mixed and **varied results on the use and value** of the stroke EMR enhancement. Results showed that clinicians did not always use the enhancement in line with its intended design.
4. Introduction of a summary page within the EMR had **no effect on interprofessional practice** within stroke MDTs.
5. Reasons for **non-adoption** were described as: 1) Complexity of the design and context, 2) Disconnection between frontline clinicians and clinical leadership, 3) EMR functionality limitations, 4) Resource constraints

Lessons



- Digital change extends beyond technology; it involves implementation, change management and leadership
- Understanding complexity of the health system. Acknowledging and managing complexity requires a transdisciplinary approach
- End-user involvement in the design and evaluation of digital interventions is crucial (sustaining clinician engagement in user-centered design)
- A shared language is essential for successful design implementation
- Considering EMR technology functionality

Thank you

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Published

Robertson, S. T., Brauer, S. G., Burton-Jones, A., Grimley, R. S., & Rosbergen, I. C. M. (2024). From use, value and user-centered design to context: A mixed methods analysis of a hospital electronic medical record enhancement. *DIGITAL HEALTH, 10, 20552076241279208. https://doi.org/10.1177/20552076241279208*

Robertson, S. T., Rosbergen, I. C. M., Brauer, S. G., Grimley, R. S., & Burton-Jones, A. (2023). Addressing complexity when developing an education program for the implementation of a stroke Electronic Medical Record (EMR) enhancement. *BMC Health Services Research, 23(1), 1301. https://doi.org/10.1186/s12913-023-10314-z*

Robertson, S. T., Rosbergen, I. C., Burton-Jones, A., Grimley, R. S., & Brauer, S. G. (2022). The effect of the electronic health record on interprofessional practice: a systematic review. *Applied Clinical Informatics, 13(03), 541-559. https://doi.org/The effect of the electronic health record on interprofessional practice: a systematic review*

Robertson, S.T., Grimley, R.S., Burton-Jones, A., Rosbergen, I.C.M., Brauer, S.G. (2021, October 13–15). The impact of a clinically-led electronic medical record (EMR) enhancement in stroke: Research Protocol. [Poster presentation]. Proceedings from the Stroke Society of Australasia Annual Scientific Meeting, Perth, Australia. *International Journal of Stroke, 16*(1_suppl), 3-34.

Drafted/Submitted

Robertson, S.T., Brauer, S.G., Rosbergen, I.C.M., Burton-Jones, A., Grimley, R.S. (2024). *The effect of a digital EMR communication tool on interprofessional practice in acute stroke care*. [Manuscript submitted for publication]. School of Health and Rehabilitation Sciences, University of Queensland.

Robertson, S.T., Rosbergen, I.C.M., Burton-Jones, A., Grimley, R.S, Brauer, S.G. (2024). *How can we design, implement and sustain clinician-led enhancements to the EMR: lessons learned through non-adoption*. [Manuscript submitted for publication]. School of Health and Rehabilitation Sciences, University of Queensland.

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Acknowledgements

Professor Sandy Brauer

Head of School

School of Health and Rehabilitation Sciences, UQ

Professor Andrew Burton-Jones

Professor

School of Business, UQ

Dr Ingrid Rosbergen

Lecturer and Researcher

University of Leiden, Netherlands

Professor Rohan Grimley

Stroke Consultant, Research Director

Sunshine Coast University Hospital

Collaborators

Queensland Stroke Clinical Network (QSCN)

Office of the Chief Information Officer (OCCIO)

Queensland Health participating hospital sites and clinicians

Queensland Government

digital health crc

Thank you

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Heart Rate Variability – An early biomarker of cystic fibrosis exacerbation

PhD: Integrating Wearable Devices into the Patient Centred Digital Healthcare Environment

Supported by UQ-DHCRC Project 0083

Dr Graeme Mattison
MBChB MRCP(UK) MSc PhD
Respiratory Advanced Trainee & DHCRC PhD Scholarship Recipient

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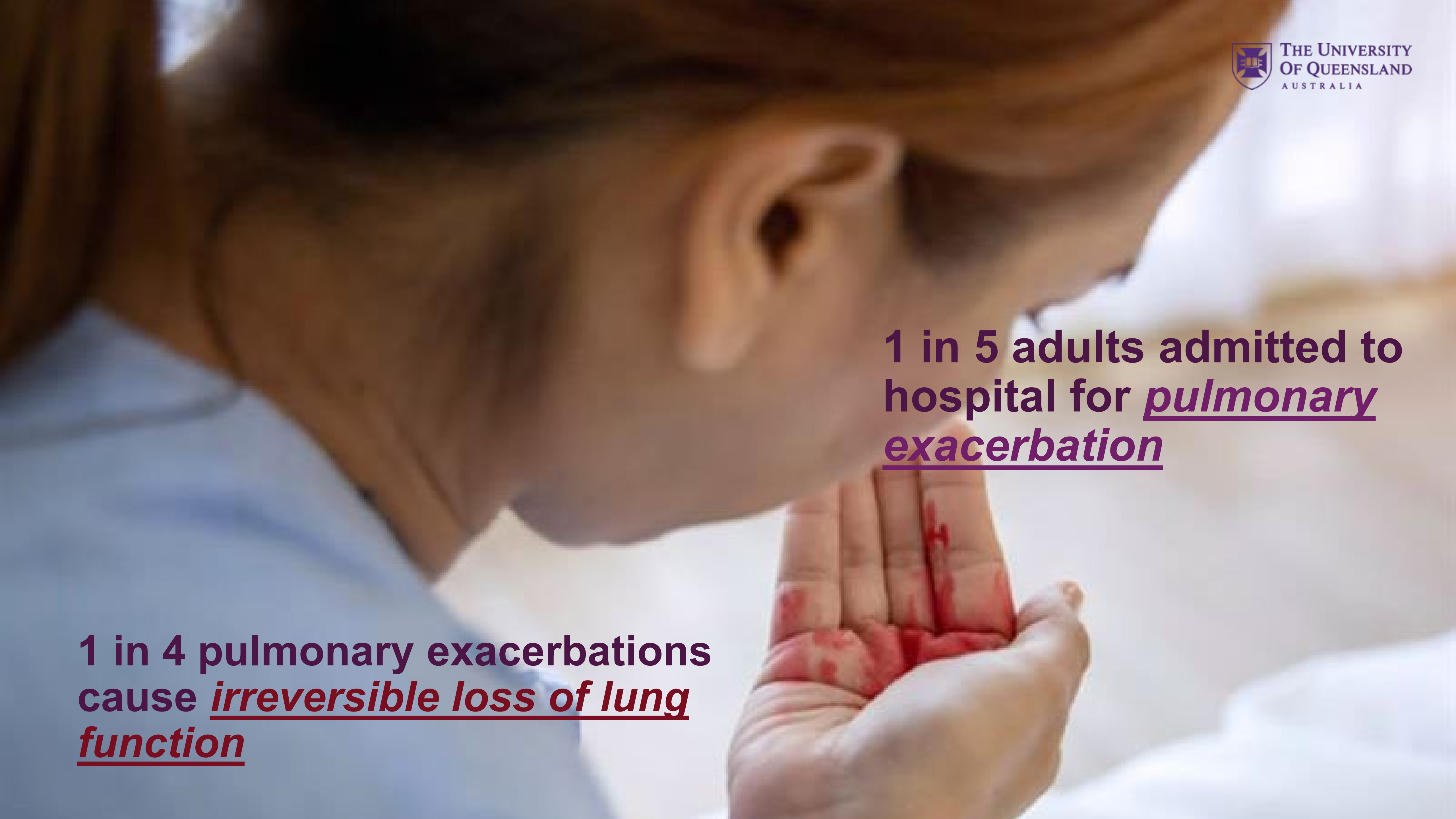
3800 Australians live with cystic fibrosis

Median life expectancy of *60 years*



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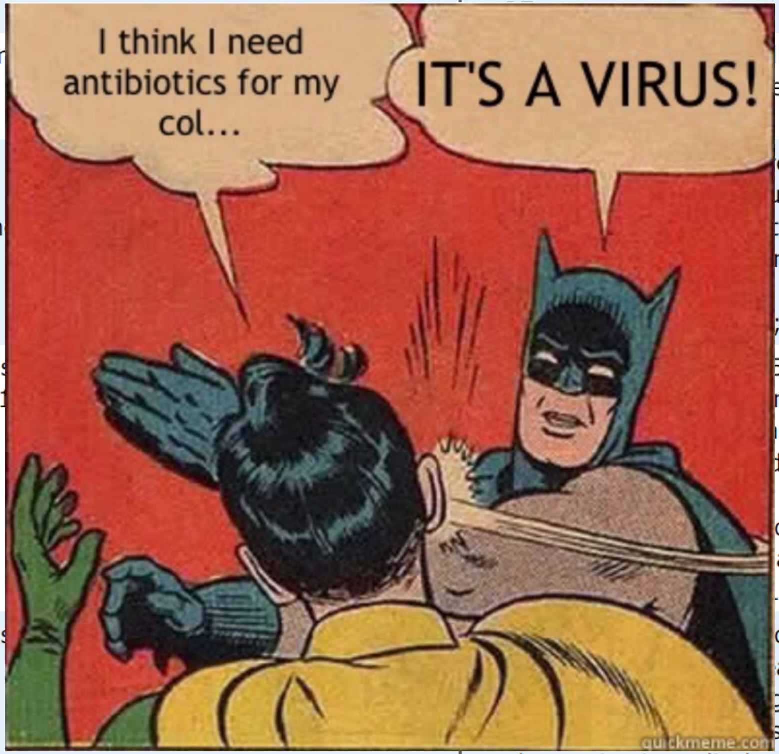
1 in 5 adults admitted to hospital for pulmonary exacerbation
1 in 4 pulmonary exacerbations cause irreversible loss of lung function

Diagnostic Criteria for Pulmonary Exacerbation of Cystic Fibrosis

Definition	Criteria to Define a PEx	Detail
EuroCareCF, 2011[6]	When additional antibiotics are needed due to a recent change in at least 2 items from a predefined list	Change in sputum volume or color; increased cough; increased fatigue, malaise, or lethargy; anorexia or weight loss; increased shortness of breath; decrease in pulmonary function by ≥ 10% compared with previous or radiographic changes consistent with a
Rabin et al,[7] 2004	Three or m	: relative decline in FEV_1; ency; new crackles;
Rosenfeld et al,[8] 2001	Combined quantify one usin	cise tolerance; increased um/cough clearance; increased tion; school or work n lung examination; decreased ; change in FEV_1
Ramsey et al,[9] 1999	At least 2 list and 1	50% increase in cough; m volume; loss of appetite; bsence from school or work for ding 7 days due to illness; respiratory tract infection of at least 10%; increase in ast 10 breaths/min; peripheral 5
Fuchs et al,[5] 1994	At least 4 list	or increased hemoptysis; ased shortness of breath; gy; temperature > 38°C; s; sinus pain or tenderness; change in sinus discharge; change in physical examination of the chest; decrease in pulmonary function by ≥ 10% compared with previous; radiographic changes consistent with a pulmonary exacerbation



Is the solution on our wrists?

1 in 3 Australians own a smartwatch

Smartwatches TGA approved for detecting atrial fibrillation

Recent FDA approval for detecting sleep apnoea


AASM American Academy of SLEEP MEDICINE™
Events | Patients | Foundation | Engage | JCSM | Search...
Standards & Guidelines | Practice Management | Career Resources | Membership & Community
‹ Previous Next ›

Samsung Galaxy Watch sleep apnea feature receives FDA authorization

On Feb. 9, 2024, Samsung Electronics announced the sleep apnea feature on the Samsung Health Monitor app received De Novo authorization from the FDA.

If we can continually monitor our health…

…could we use smartwatches to identify changes in physiology that may be suggestive of pulmonary exacerbation in cystic fibrosis?

40 adults with cystic fibrosis

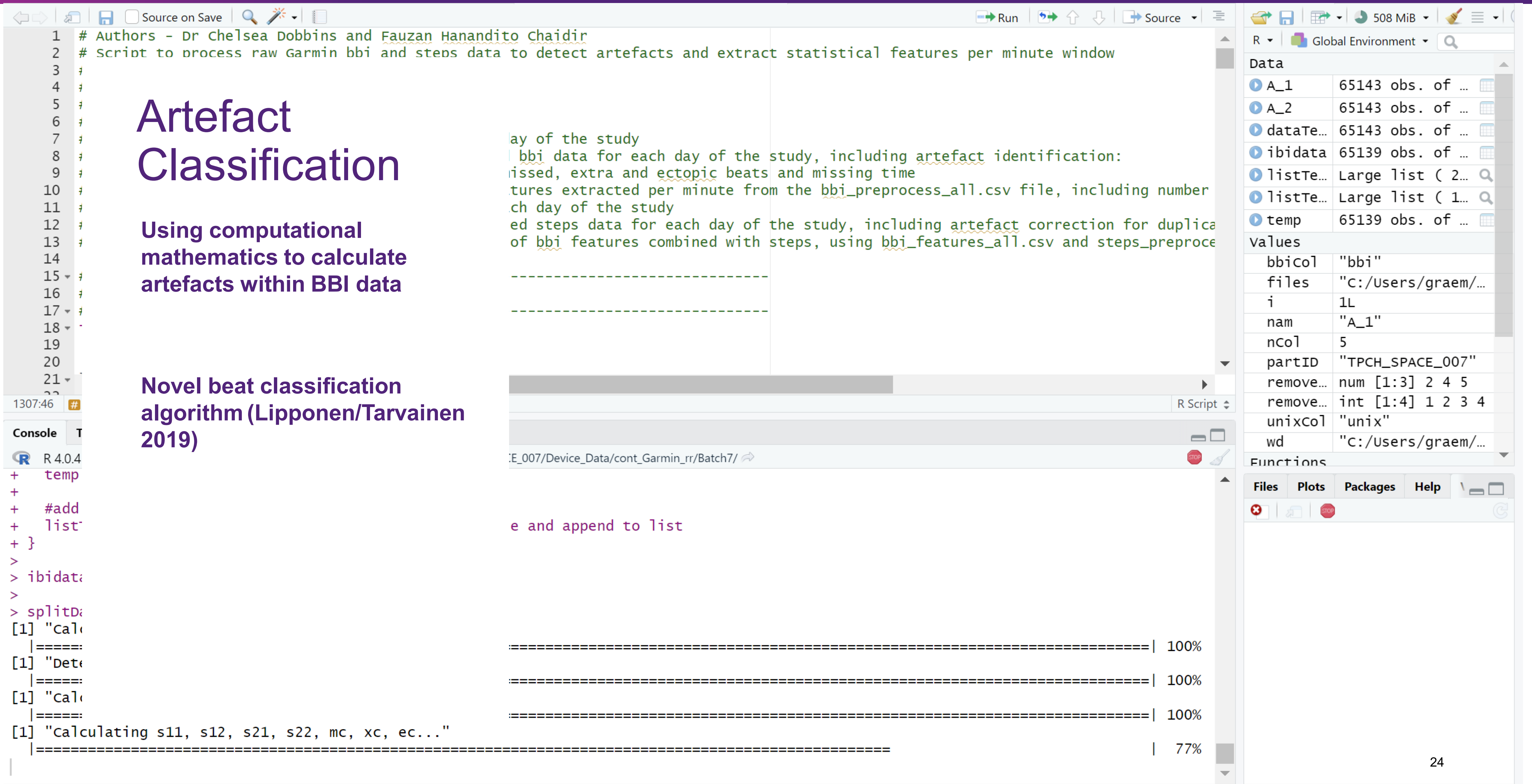
Garmin *Vivosmart 4* smartwatch

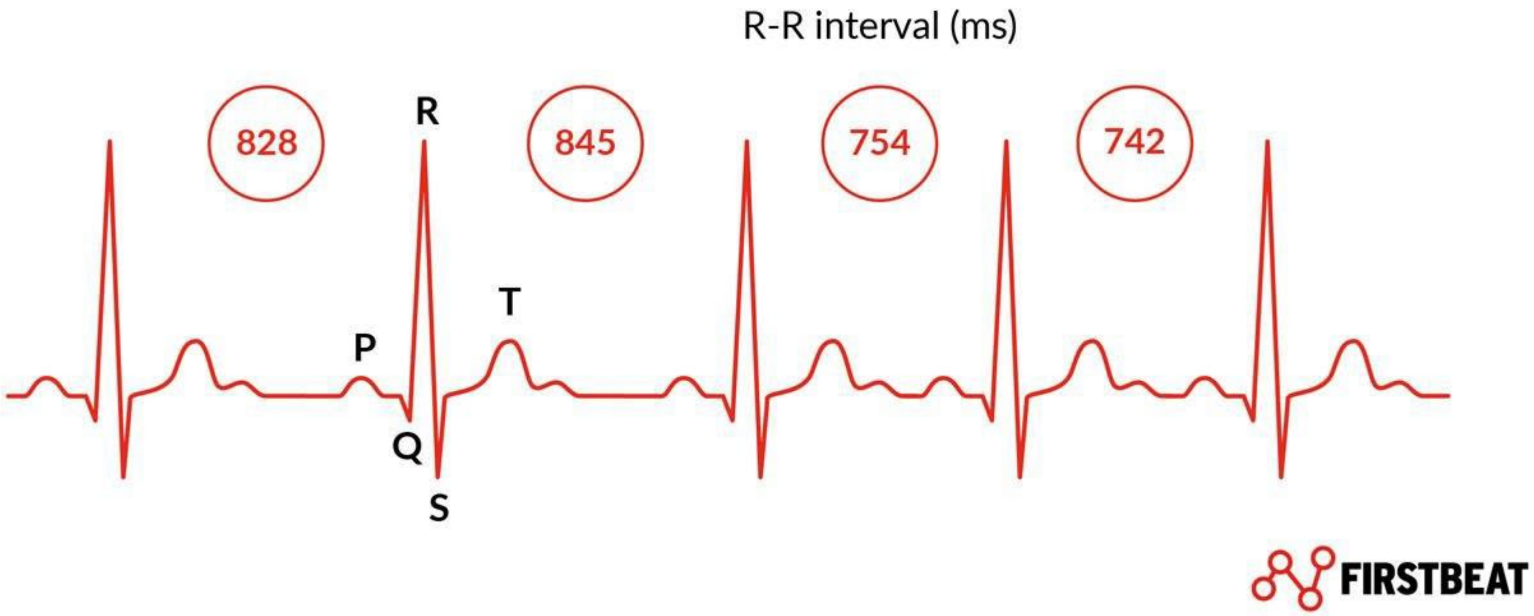
- Heart Rate
- Step Count
- “Stress”
- Sleep stage estimation
- Beat-to-Beat interval data (to calculate heart rate variability)

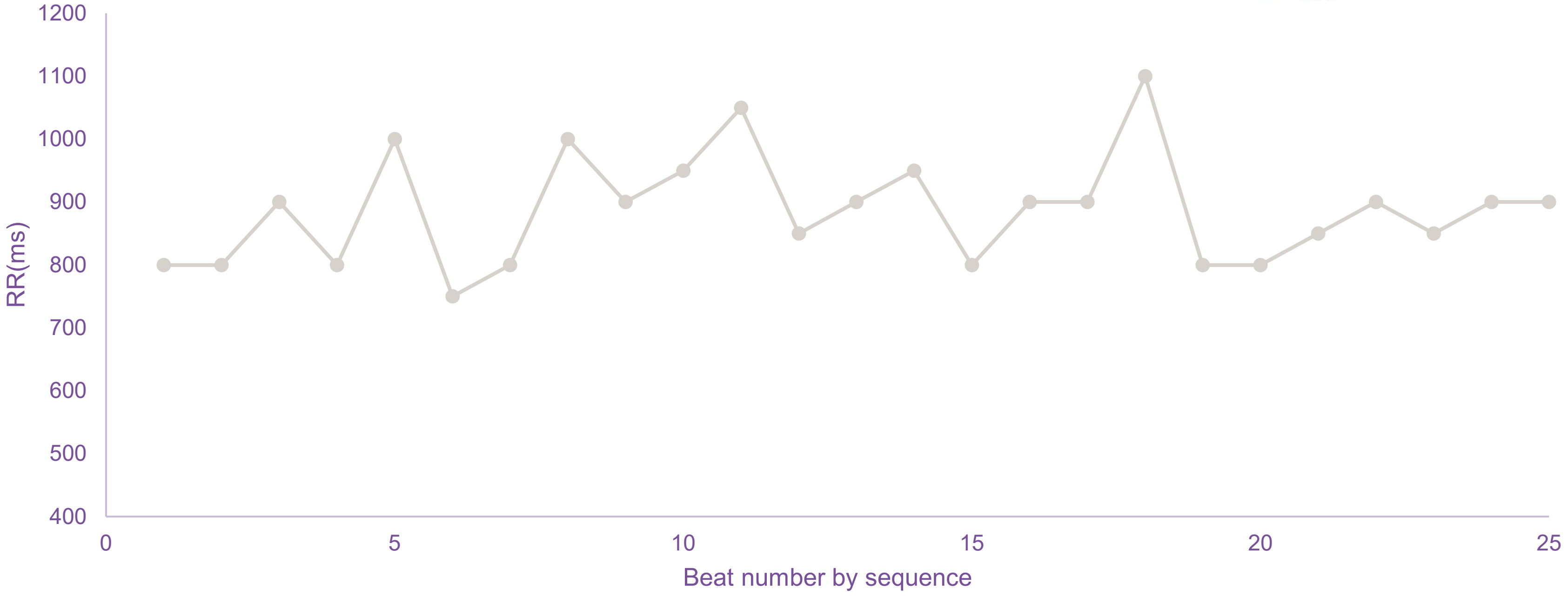
Lung function, logging exacerbations, symptom severity scoring

We got a lot of messy data!

158,722,558 heart beats of it to be precise


Artefact Classification
Using computational mathematics to calculate artefacts within BBI data
Novel beat classification algorithm (Lipponen/Tarvainen 2019)
Source on Save
Run
Source
Authors - Dr Chelsea Dobbins and Fauzan Hanandito Chaidir
Script to process raw Garmin bbi and steps data to detect artefacts and extract statistical features per minute window
ay of the study
bbi data for each day of the study, including artefact identification:
issed, extra and ectopic beats and missing time
tures extracted per minute from the bbi_preprocess_all.csv file, including number
ch day of the study
ed steps data for each day of the study, including artefact correction for duplica
of bbi features combined with steps, using bbi_features_all.csv and steps_preproce
1307:46
R Script
Console
R 4.0.4
E_007/Device_Data/cont_Garmin_rr/Batch7/
temp
#add
e and append to list
> ibidata
> splitDa
[1] "Calculating s11, s12, s21, s22, mc, xc, ec..."
100%
77%
508 MiB
Global Environment
Data
A_1 65143 obs. of ...
A_2 65143 obs. of ...
dataTe... 65143 obs. of ...
ibidata 65139 obs. of ...
listTe... Large list (2...
listTe... Large list (1...
temp 65139 obs. of ...
Values
bbiCol "bbi"
files "C:/Users/graem/...
i 1L
nam "A_1"
nCol 5
partID "TPCH_SPACE_007"
remove... num [1:3] 2 4 5
remove... int [1:4] 1 2 3 4
unixCol "unix"
wd "C:/Users/graem/...
Functions
Files
Plots
Packages
Help

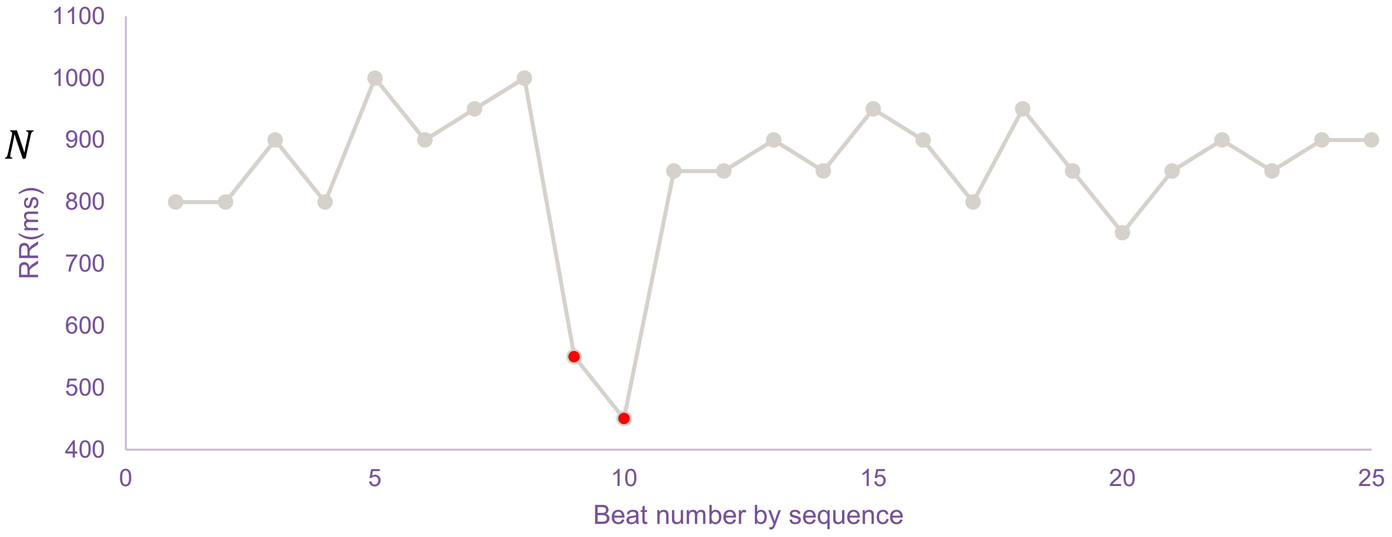

R-R interval (ms)
828
845
754
742
R
P
T
Q
S
FIRSTBEAT


RR(ms)
1200
1100
1000
900
800
700
600
500
400
0
5
10
15
20
25
Beat number by sequence

Extra beat

$$(1)\ Th2(j) = \alpha\ QD\ [|mRRs(j-45 \ldots j+45)|], j = 1 \ldots N$$

$$(2)\ Extra\ beat = |\ RR(j) + RR(j+1) - medRR(j)| < Th2$$

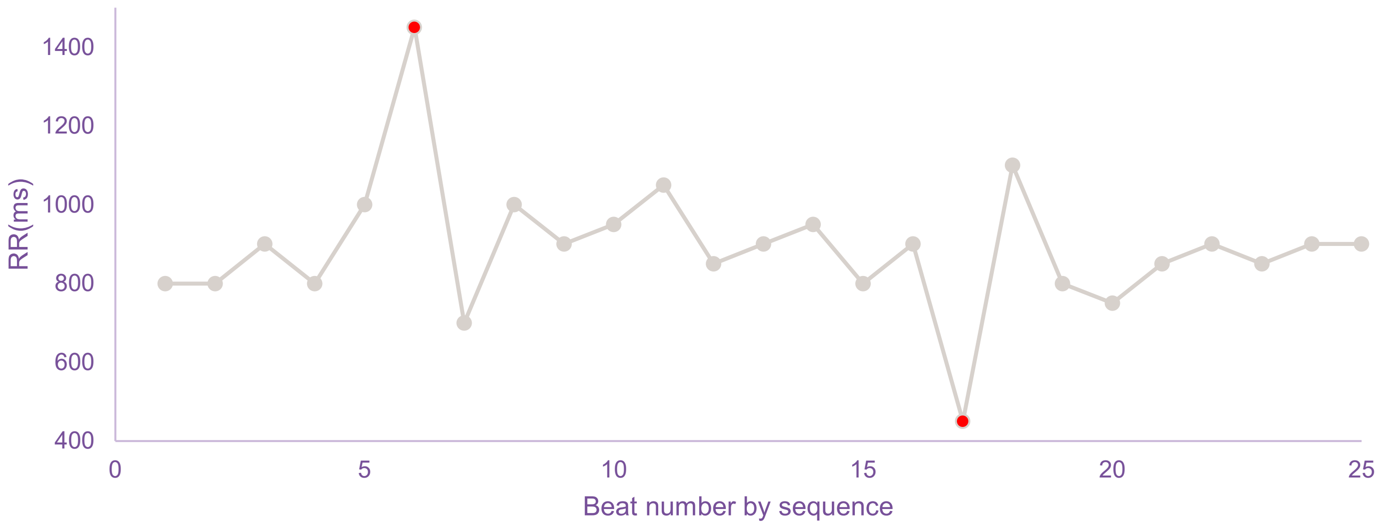


Long/Short beat

$$(1)\ S_{21} = dRR(j), j = 1 \ldots N$$

$$(2)\ S_{22} = \begin{cases} \min[dRR(j+1), dRR(j+2)], if\ dRR(j) \geq 0 \\ \max[dRR(j+1), dRR(j+2)], if\ dRR(j) < 0 \end{cases}$$

$$(3)\ Long\ OR\ Short = \begin{cases} S_{21} > 1\ AND\ S_{22} < -1 \\ OR \\ S_{21} > 1\ AND\ S_{22} < -1 \\ OR \\ |mRR > 3 \end{cases}$$

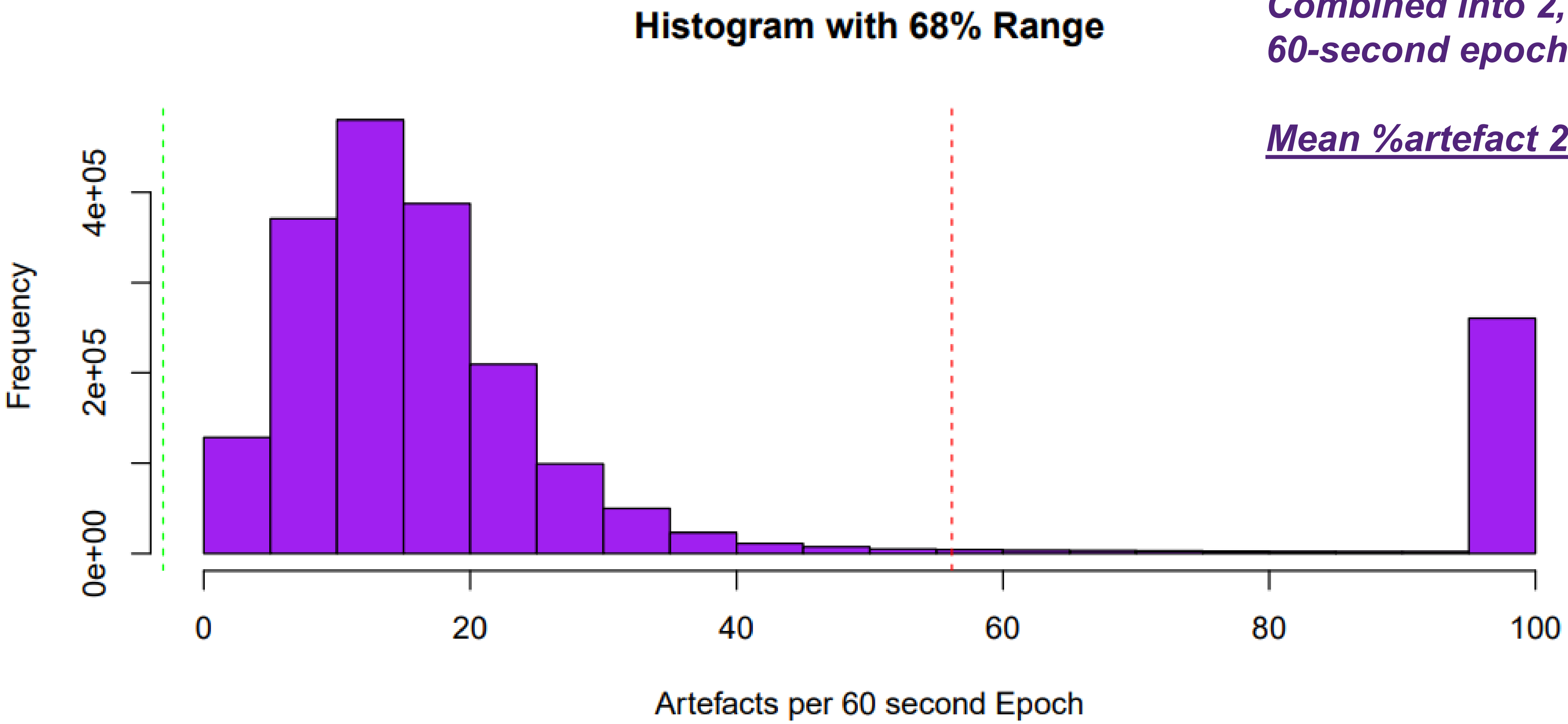


Uncleaned Data Distribution

N = 158,722,558 heart beats

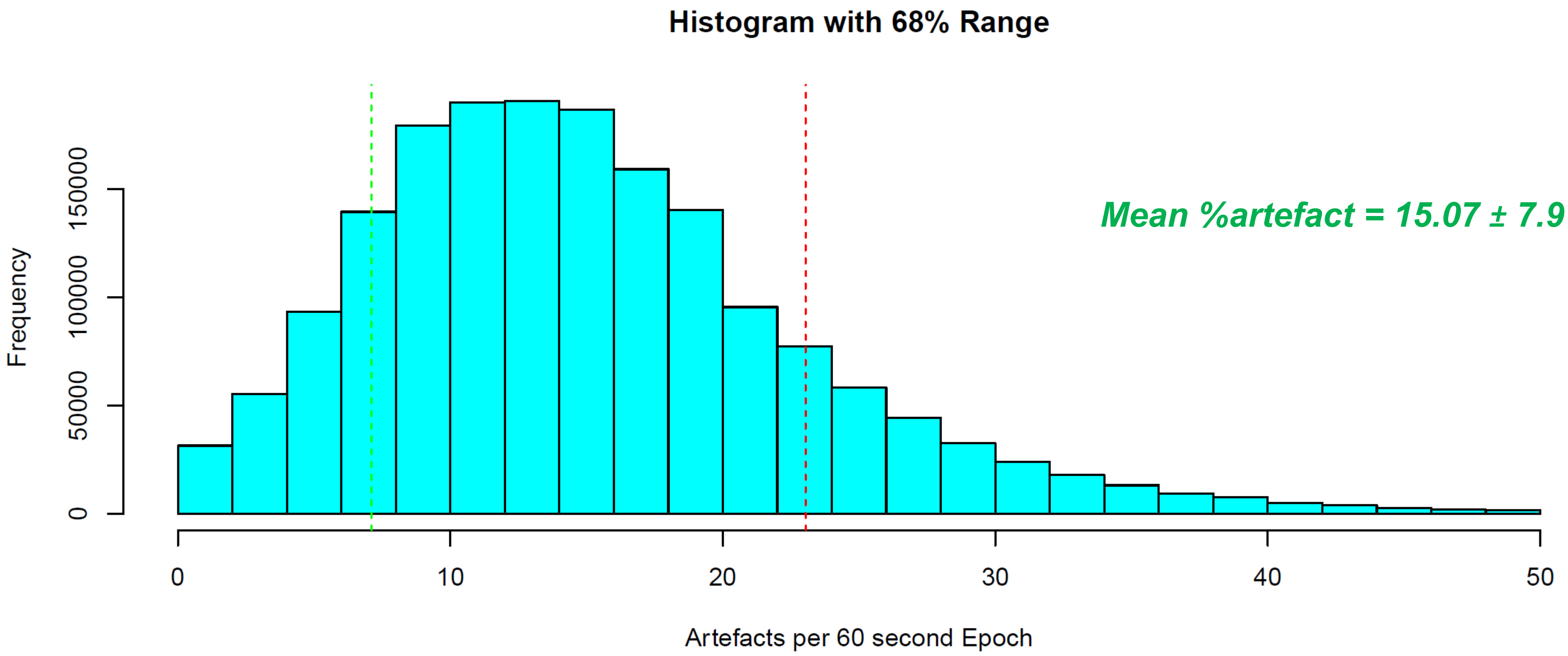
Combined into 2,053,745 60-second epochs

Mean %artefact 29.78 ± 13.58%



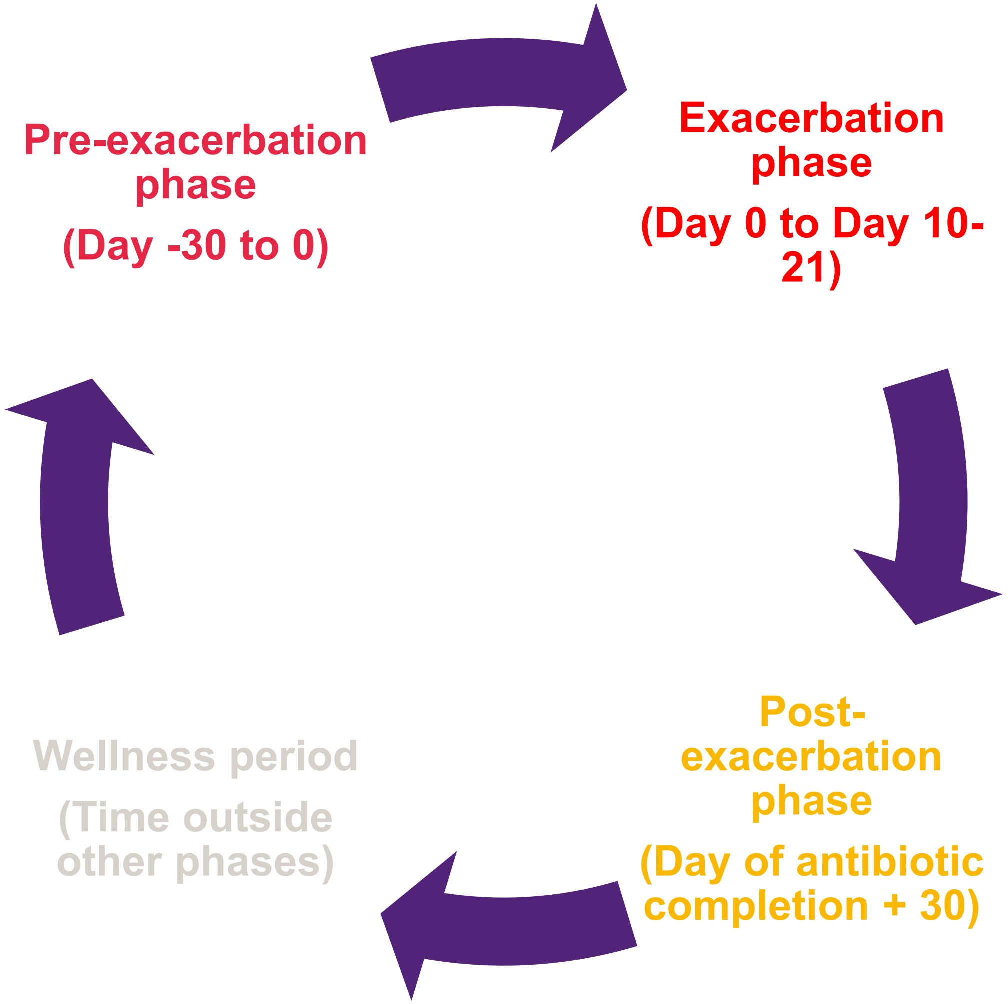
Preprocessed Data Distribution

N = 1,762,937 epochs
(14.2% data rejection)



Mean %artefact = 15.07 ± 7.97%

Labelling to Exacerbation Phase



Heart Rate Variability is reduced *up to 30 days before* diagnosis of pulmonary exacerbation

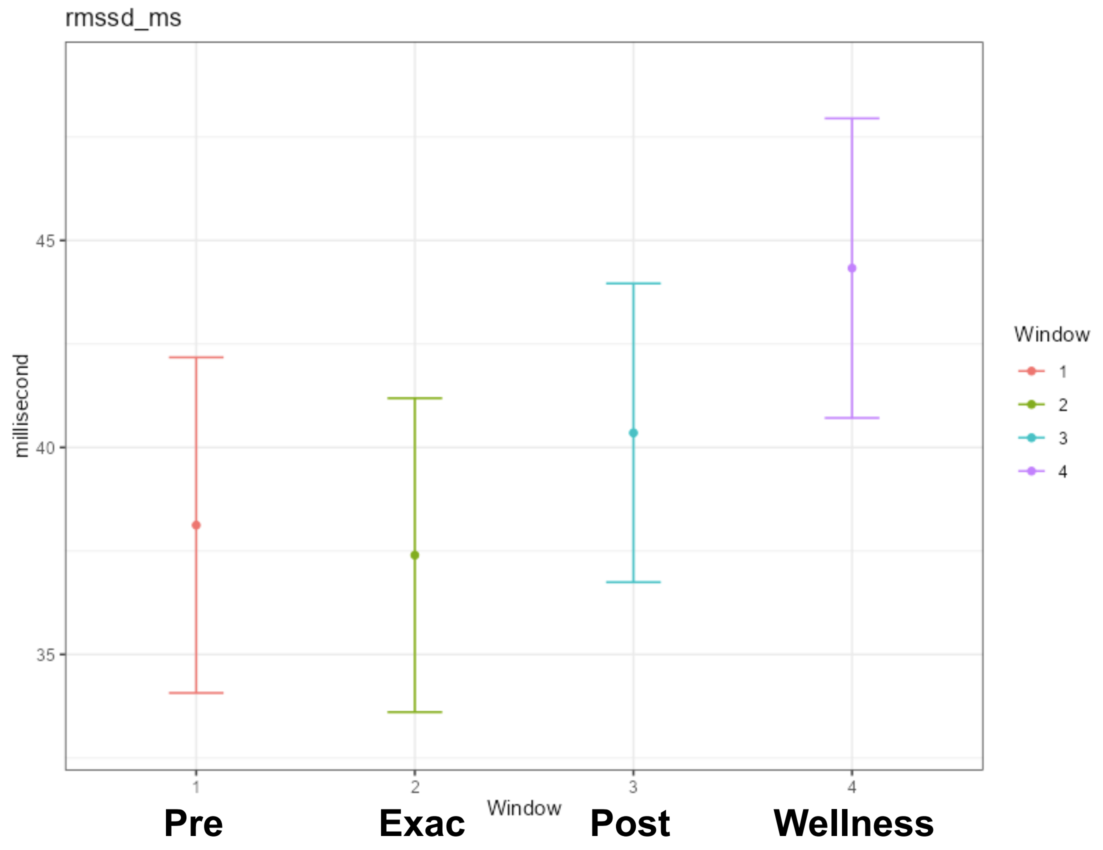


Table 20 HRV measured in this study between phases of pulmonary exacerbation using an LME model. RMSSD = root mean square of successive differences

Phase Comparison to wellness	Estimated mean RMSSD (ms)	Estimated mean difference between phases (ms)	SE	95% CI	p-value
Wellness (Intercept)	44.331	0	1.776	40.713 – 47.949	NA
Pre	38.123	(-6.208)	1.278	(-8.726) – (-3.690)	**<0.001**
Exac	37.399	(-6.932)	1.006	(-8.907) – (-4.958)	**<0.001**
Post	40.352	(-3.979)	0.590	(-5.135) – (-2.823)	**<0.001**

Other positive findings

Awake time during sleep increased during exacerbation compared to wellness (13.4 vs 8.8 mins; p=0.014)

Daily step count reduced during exacerbation compared to wellness (2869 vs 3596 steps/day; p=0.005)

HRV may be an ***early biomarker*** of pulmonary exacerbation*

***Research currently under peer-review (*Eur Resp J*)**

Acknowledgements

Dr Oliver Canfell
@OliverDietitian

Swelling with pride to be at #DHS2022 in Sydney with our "Purple Brigade" – @UQMedicine @UQ_News emerging transdisciplinary research leaders in digital health 🤓📊🔥

Spot the RN, Pharm, BioMed, PhD, Econ, CI, AI, APD & MD! 🤩
@LeannaWoods2016 @SamTRobertson1 @digihealthcrc

Greatest acknowledgement

To the study participants in this PhD thesis living with cystic fibrosis

Other work from Project 0083

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Influence of wearables on healthcare outcomes in chronic disease

– Systematic review, JMIR

Roadmap for smartwatch implementation into preventing chronic disease

– MJA Perspective

Qualitative analysis of the value of wearables in CF care

- Int J Med Inform

Thank you

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PhD Candidate – Queensland Digital Health Centre, The University of Queensland

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Re-analysing existing genomic data to increase the diagnostic yield of genetic tests

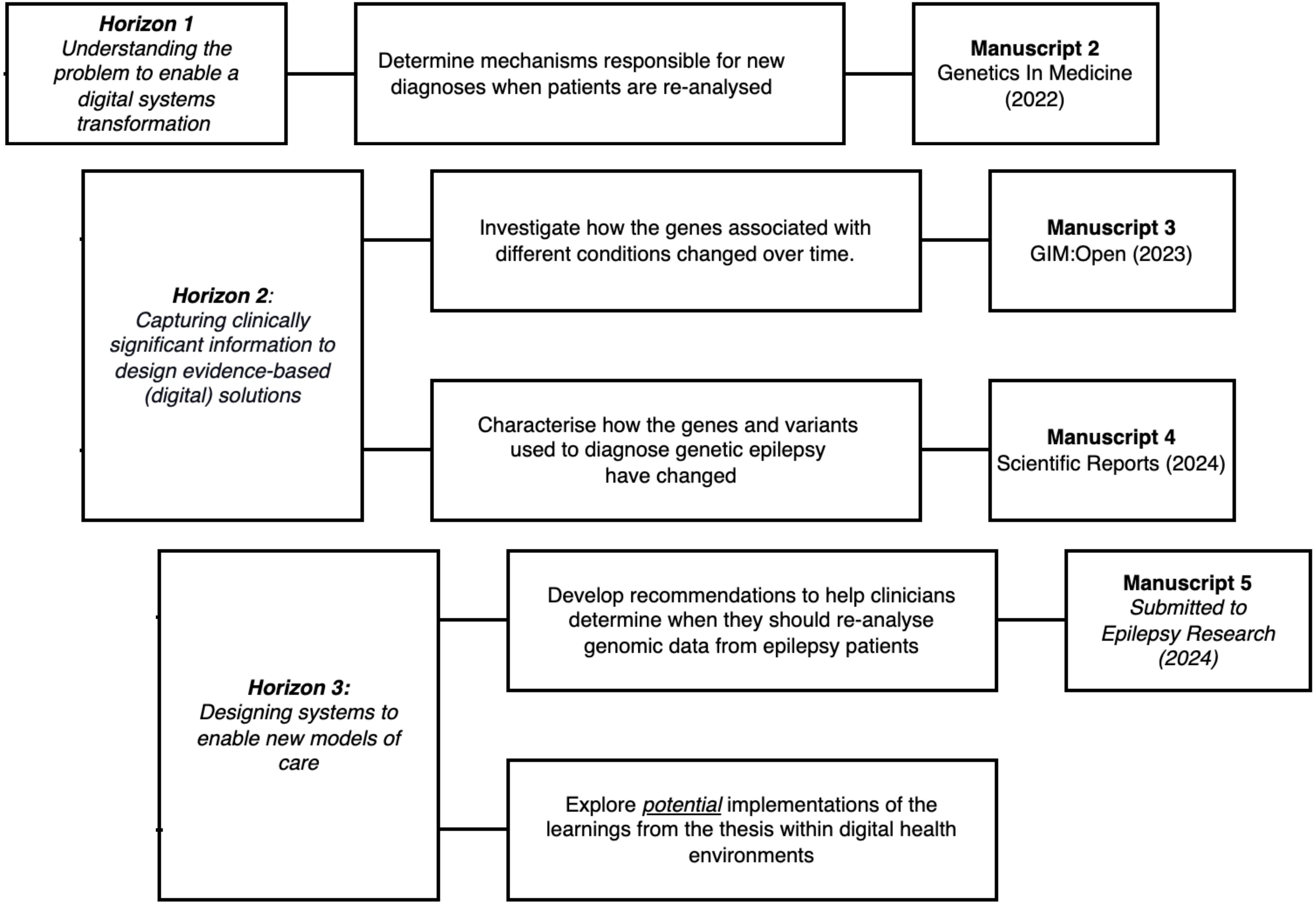
Alan Robertson
PhD Candidate – Queensland Digital Health Centre, The University of Queensland

I acknowledge the Turrbal and Yugara, as the First Nations owners of the lands from which I stand. I pay my respect to their elders, traditions and creation spirits. I recognise that these lands have always been places of teaching, learning, and healing.

Background

Genomics

- Improves
  - Diagnosis + Prognosis
  - Therapeutics
- Genomic data different
  - Remains same, understanding changes
  - Re-analysing existing data
- **How?**



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Project Background

Bringing digital excellence to clinical excellence:
Leading digital excellence in Queensland Health

- Focus on student independence
  - Designing project, winning funding, managing project
- Self-directed approach take throughout
  - Fortunate supervisors, cohort of students

Acknowledgements

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Andrew Burton-Jones
Oliver Canfell
QDHRG Group

University of Queensland
Chelsea Dobbins
Jason Pole

Cohort Effect / Tribe
Graeme Mattison
Sam Robertson

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Research Partner - UQ
MTPConnect – REDI Fellowship
JSPAAA – Travel Grant

Thank you

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DigiHDR Presentations

Presenters:

- Danyang Dai
- Hannah O'Connor
- Jaze Wang
- Monica Noselli
- Quita Olsen
- Teyl Engstrom
- Titus Kirwa
- Tuan Duong

Moderated by Prof Jason Pole
Panel feedback by Prof Clair Sullivan and Dr David Hansen

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Global Geographic and Socio-Economic Disparities in COVID-Associated Acute Kidney Injury (AKI): A Systematic Review and Meta-analysis

Danyang Dai, PhD candidate

Assoc. Prof. Pedro Franca Gois, Digby Simpson, Souhayel Hedfi, Assoc. Prof. Sally Shrapnel, Pro. Jason D Pole

Note: This section has been intentionally omitted at the request of the content owner

Thank you

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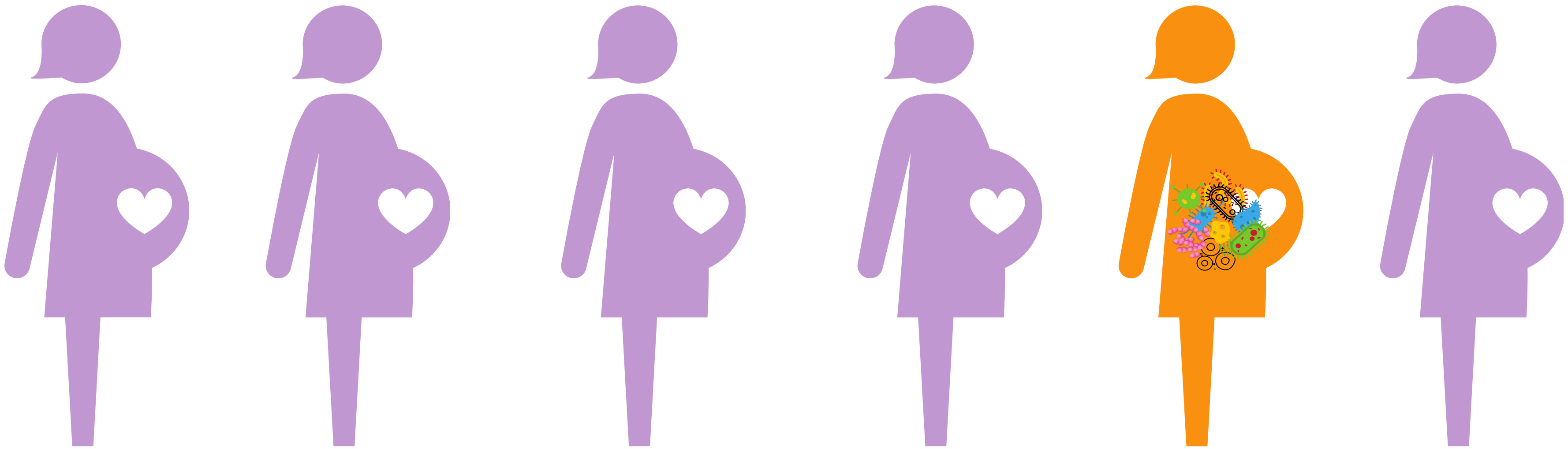
Healthy Gut Diet for preventing gestational diabetes study: A preliminary analysis on participants dietary changes

Hannah O.Connor, PhD candidate

Nina Meloncelli, Shelley Wilkinson, Susan de Jersey

Gestational Diabetes Mellitus (GDM) is the most common condition impacting pregnant woman



No dietary intervention studies have been conducted to investigate the link between the gut microbiota and diet

Randomised Control Trial: The Healthy Gut Diet (HGD)

The aim is to examine if women who adhere to the HGD can avoid GDM

What women receive

ontrol

3 x **Te**
appoir
We
Partici
r

4-minute video on
ealthy eating in
egnancy

No significant differences at baseline in characteristics or dietary intakes

Randomised
(n=129)

Intervention
(n=66)

Control group
(n=64)

Mean age of 33 years

64% had a University degree

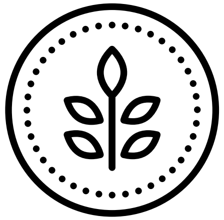
71% were born in Australia

Average ppBMI was 28 kg/m2)

The Healthy Gut Diet
for preventing gestational diabetes
Study

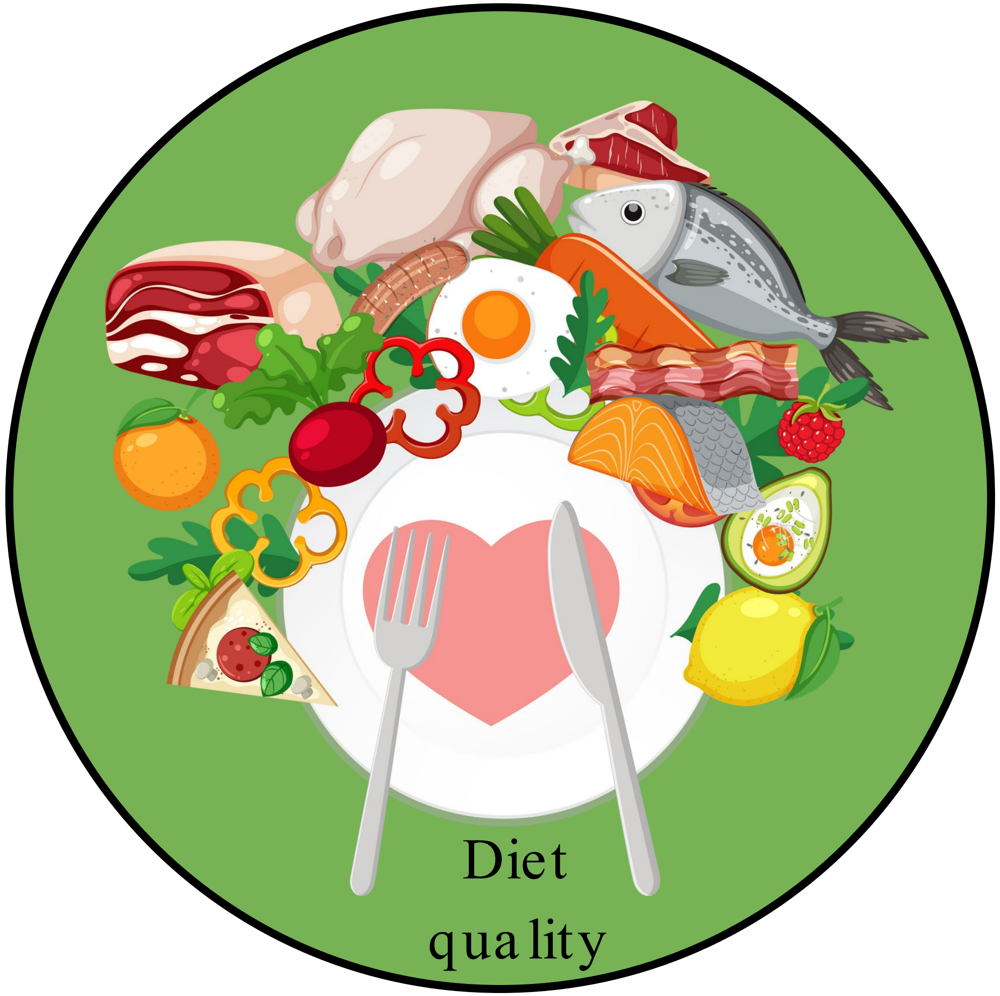
Significant increases in diet quality, prebiotics and fermented foods

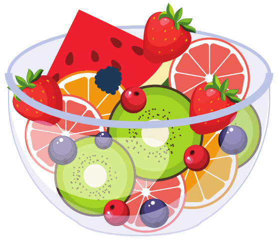
Vegetables



Fiber

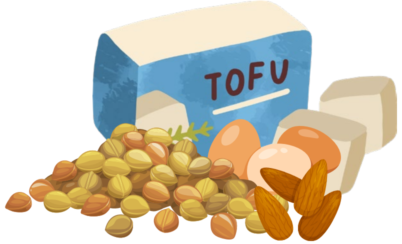
Fermented foods





Fruit

Grains (wholegrains)



Non-meat protein

Thank you

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Digital Health Interventions To Prevent Type 2 Diabetes: A Systematic Review

Wenyang (Jaze) Wang, PhD candidate

Dr Mahnaz Samadbeik, Dr Gaurav Puri. A/Prof Donald McLeod, Dr Elton Lobo, Dr Tuan Duong, Jennifer Nguyen, Mutian Ding, Prof Clair Sullivan

Project 1: Literature Review

Research question: What is the existing evidence regarding digitally-enabled solutions for improving health outcomes related to the Quadruple Aim in outpatient diabetes management?

Hypothesis: There is a diverse range of digitally-enabled solutions in outpatient diabetes management, and these interventions potentially address various aspects of the Quadruple Aim, including enhanced patient experience, improved population health, reduced costs, and improved wellbeing of the healthcare team. The existing literature will likely reveal varied approaches, outcomes, and contexts in the application of these interventions. This scoping review aims to map and characterise this evidence to understand its breadth and depth, identify patterns and gaps, and provide insights for future research.

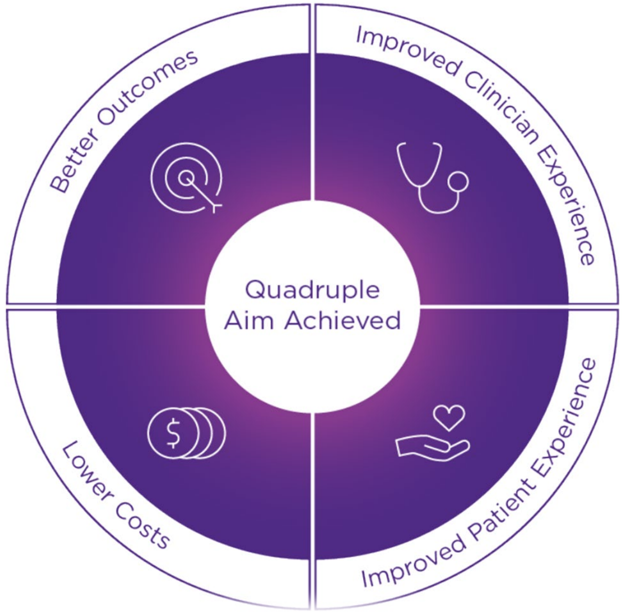
Aim:
To summarise the current evidence and synthesise knowledge on all digital solutions in outpatient diabetes care and their impact on the Quadruple Aim.

Project 2: Comprehensive Evaluation of ieMR Implementation in Queensland Health's Diabetes Outpatient Settings: A Mixed-Methods Case Study on the Quadruple Aims

Research question: What is the impact of the integrated electronic Medical Records (ieMR) implementation on patient experience, clinician experience, population health outcomes, and costs in Queensland Health's diabetes outpatient settings?

Hypothesis: The integration of ieMR in diabetes outpatient care positively affects patient and clinician experience, while also demonstrating improvements in population health and favourable cost-consequences.

Aim: We seek to provide a comprehensive evaluation of the ieMR implementation in the diabetes outpatient settings within Queensland Health. By adopting a mixed-methods case study approach, we will explore the quadruple aim multifaceted impacts of ieMR on various aspects of healthcare delivery including patient experience, clinician experience, population health outcomes, and costs.



Part 01

Evaluate Patient Experience

- Methods: Surveys
- Analysis: Descriptive analysis of patient experience data
- Expected outcomes: improved patient experience

Part 02

Evaluate Clinician Experience

- Methods: Focus groups
- Analysis: Qualitative analysis of staff experience data
- Expected outcomes: enhanced staff wellbeing

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Part 03

Investigate Population Health Effects

- Methods: Collect HbA1c data pre- and post-ieMR implementation
- Analysis: Statistical analysis of HbA1c outcomes
- Expected outcomes: improved HbA1c levels post ieMR implementation

Part 04

Assess Cost-Consequences

- Methods: Collect costs of ieMR in diabetes outpatient clinic
- Analysis: Cost-consequences analysis
- Expected outcomes: favourable cost-consequences

Thank you

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Investigating the presentation of AI information for detecting patient deterioration: ensuring alignment with clinicians’ mental models

Monica Noselli, PhD candidate

Anton H van der Vegt, Maxime Cordeil, Ian Scott, Victoria Campbell, Audrey P. Wang

Note: This section has been intentionally omitted

Thank you

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The public's willingness to share health information for secondary purposes: A systematic review and meta-analysis

Quita Olsen

Dr Leanna Woods, Dr Amalie Dyda, Dr Rebekah Eden, Dr Elton Lobo, Assoc Prof Bernadette Richards, Dr Michelle Krahe, Dr Zahed Lambat, Prof Nalini Pather, Prof Jason Pole, Prof Clair Sullivan

AI-powered retinal scanner

Prof. Angus Turner

- 30% of First Nations population with diabetes
- Diabetes complication blinding disease
- Currently 20% of remote communities receiving eye checks
- 98% of diabetes associated blindness is preventable with eye checks

https://www.abc.net.au/news/2024-10-11/artificial-intelligence-powered-eye-scanner-pilbara/104451718?utm_campaign=abc_news_web&utm_content=link&utm_medium=content_shared&utm_source=abc_news_web

AI retinal scanner wins Lions Eye $5m to diagnose blindness in Pilbara

By Alex Govan | ABC Pilbara | Eyes

Fri 11 Oct

...ssor Turner attends to a patient as part of the AI-powered retinal scanner project. (ABC: Supplied)

Methods

PRISMA guidelines

Databases:

Web of Science, Embase, CINAHL and Medline (Ovid)

Inclusions:

- Primary research articles with all study designs
- Perceptions of data sharing or acceptance
- Data in a healthcare setting with a data custodian
- General public, not healthcare professionals
- Articles from Jan 2020 to Jan 2024

Exclusions:

- Grey literature, theses, conference abstracts or posters
- Articles not in English, full text or peer reviewed

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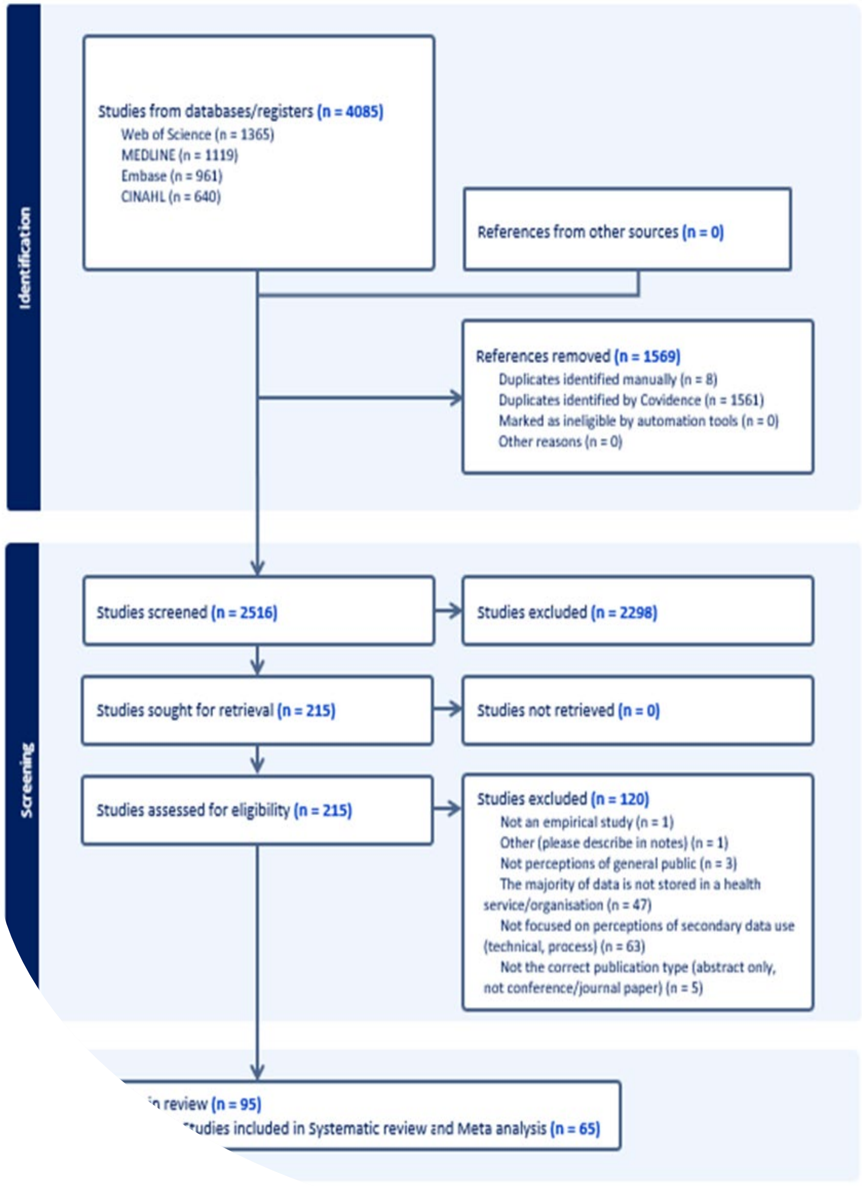
Results

- 95 studies
- 65 quantitative extraction
- 51 meta-analysis for willingness to share



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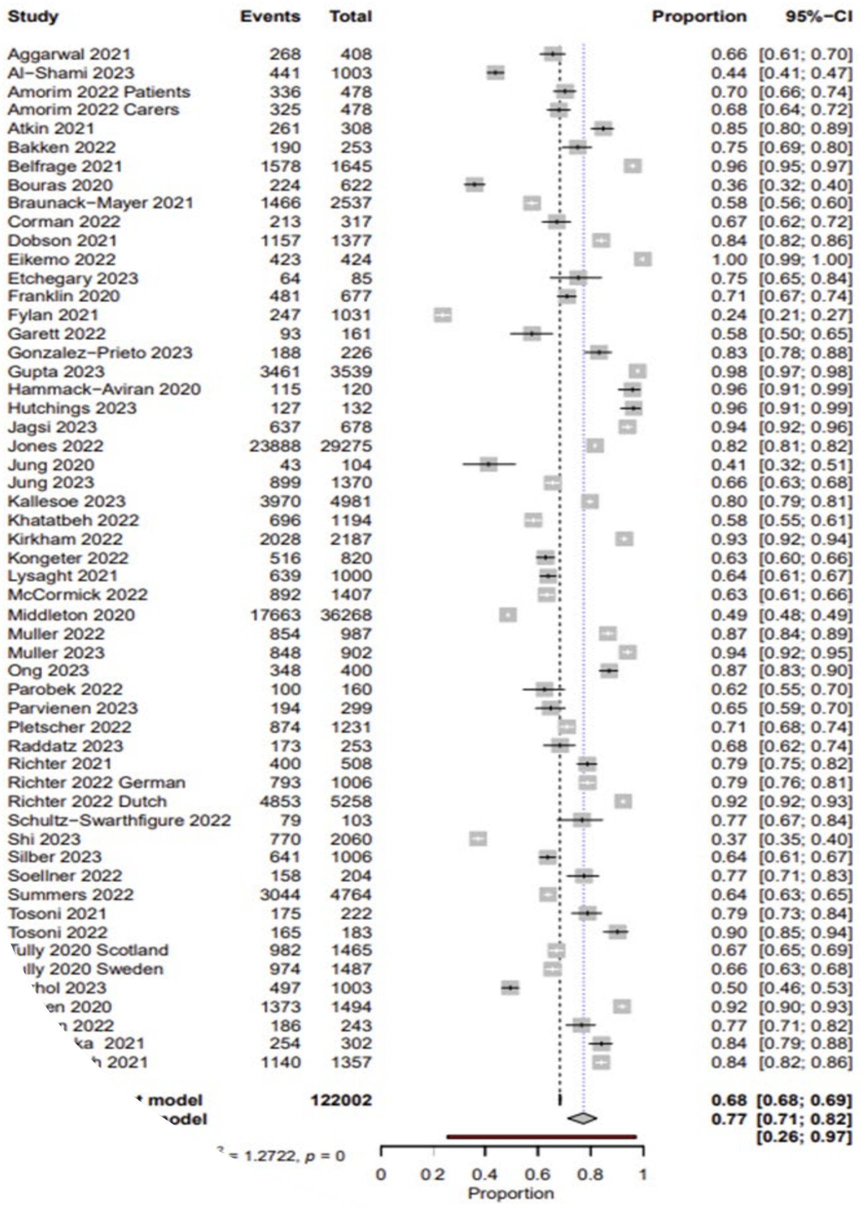
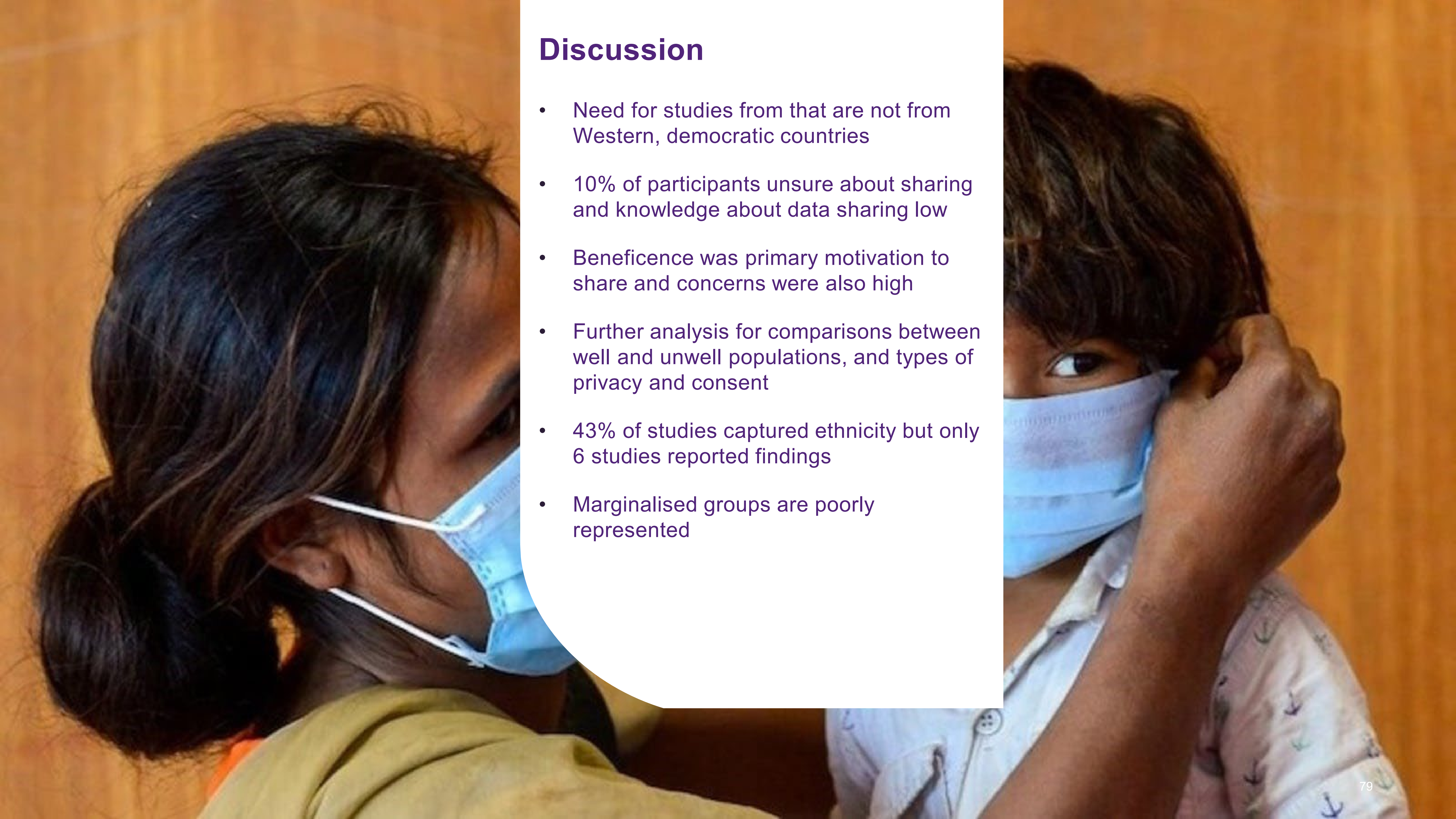
Results

- 95 studies
- 65 quantitative extraction
- 51 meta-analysis for willingness to share

- 34 countries, 95% high income, 51% from USA, UK and Australia, all cross sectional
- Willingness to share 76.59% (95% CI: 71% to 82%)
- Heterogeneity (τ^2 = 1.3, I2 = 99.7%, p<0.001)

- Type of health data
- Willingness to share 76.59% (95% CI: 71% to 82%)
- Heterogeneity (τ^2 = 1.3, I2 = 99.7%, p<0.001)





Discussion

- Need for studies from that are not from Western, democratic countries
- 10% of participants unsure about sharing and knowledge about data sharing low
- Beneficence was primary motivation to share and concerns were also high
- Further analysis for comparisons between well and unwell populations, and types of privacy and consent
- 43% of studies captured ethnicity but only 6 studies reported findings
- Marginalised groups are poorly represented

Discussion

Recommendations

- Develop a validated measure that can be standardised to different jurisdictions
- Undertake a citizen jury with diverse representation to develop a framework and policies for sharing of health data for secondary purposes
- Public education on sharing of health data for secondary purposes

Thank you

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The Impact of Digital Hospitals on Patients: A Secondary Analysis of Patient Reported Experience Measures

The University of Queensland
Australia

Teyl Engstrom, PhD candidate

Clair Sullivan, Jacqueline Daly, Shirle Thompson, Jason Pole

Note: This section has been intentionally omitted

Thank you

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AUSTRALIA

The Impact of Electronic Medical Records on Maternal Healthcare: A Scoping Review

Titus Kirwa, PhD candidate

Dr Elton Lobo, Teyl Engstrom, Terence Felix,

Abhinand Vasudevan, Nicole McDonald, Lindsey Butler, Steven McPhail, Dr Natasha Reid, Dr Lyle Turner, Prof Jason Ferris, Prof Clair Sullivan

The University Of Queensland
AUSTRALIA

Introduction

- $181.9 million benefits related to patient quality and safety, operational service improvement and direct financial savings were realized at the Princess Alexandra, Mackay Base, Cairns, Townsville and Queensland Children's Hospitals (PWC, 2018).

Research question

- What are the enablers and barriers to the implementation of maternal digital workflows and what are the outcomes of implementation?

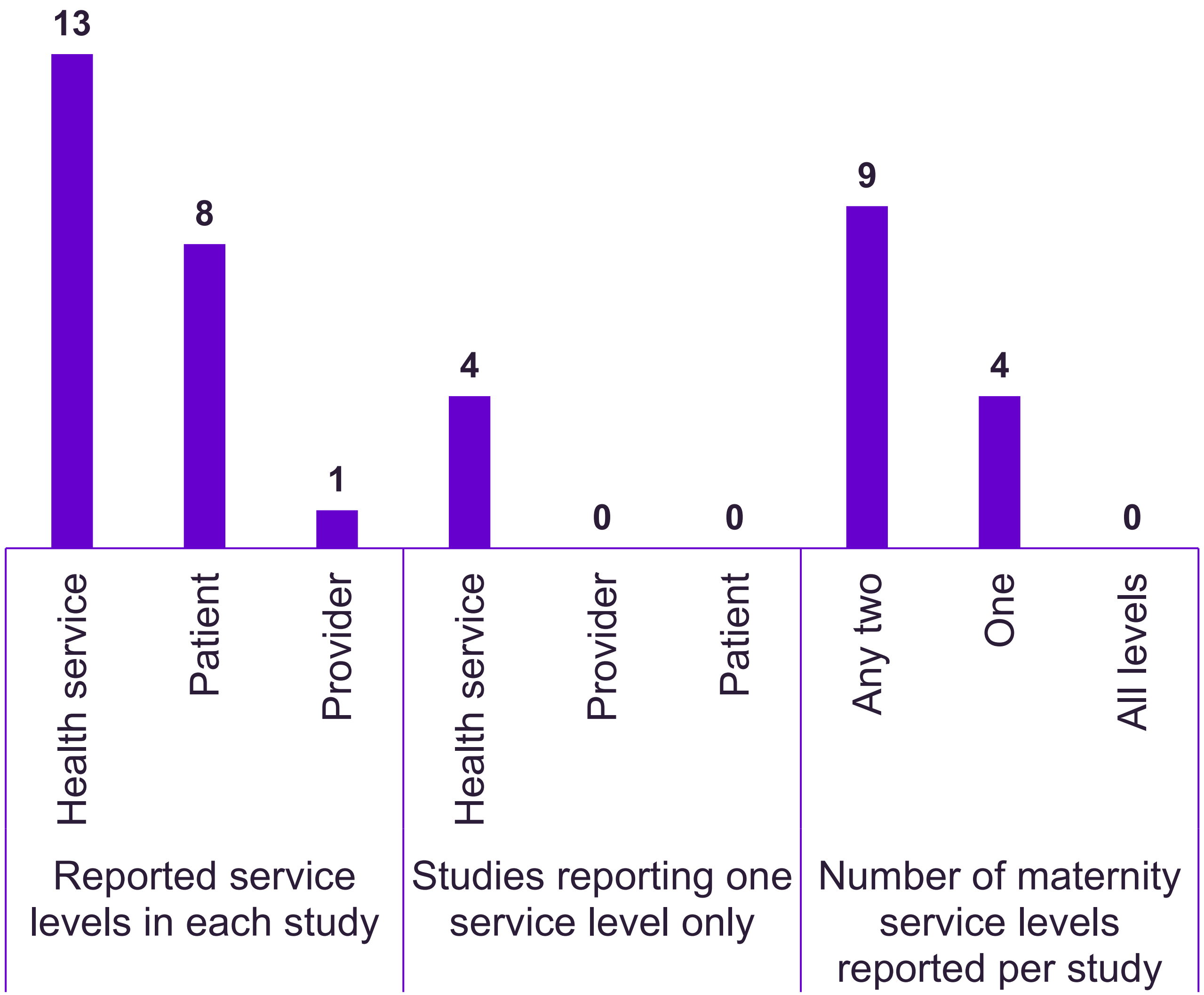
Methods

- Scoping Review mapped to Quintuple & RE-AIM framework

Results (RE-AIM Framework)

The University Of Queensland Australia

Percentage of studies reporting Effectiveness dimensions of RE-AIM per levels of maternity service delivery



Effectiveness Outcomes

- High effectiveness in enhancing health service level outcomes across all studies reporting this level 11 (84.6%).
- 8 (61.5%) reported high efficacy in enhancing patient outcomes.
- Only one study assessed provider experience and reported positive outcomes.

Results (Quintuple Aims)

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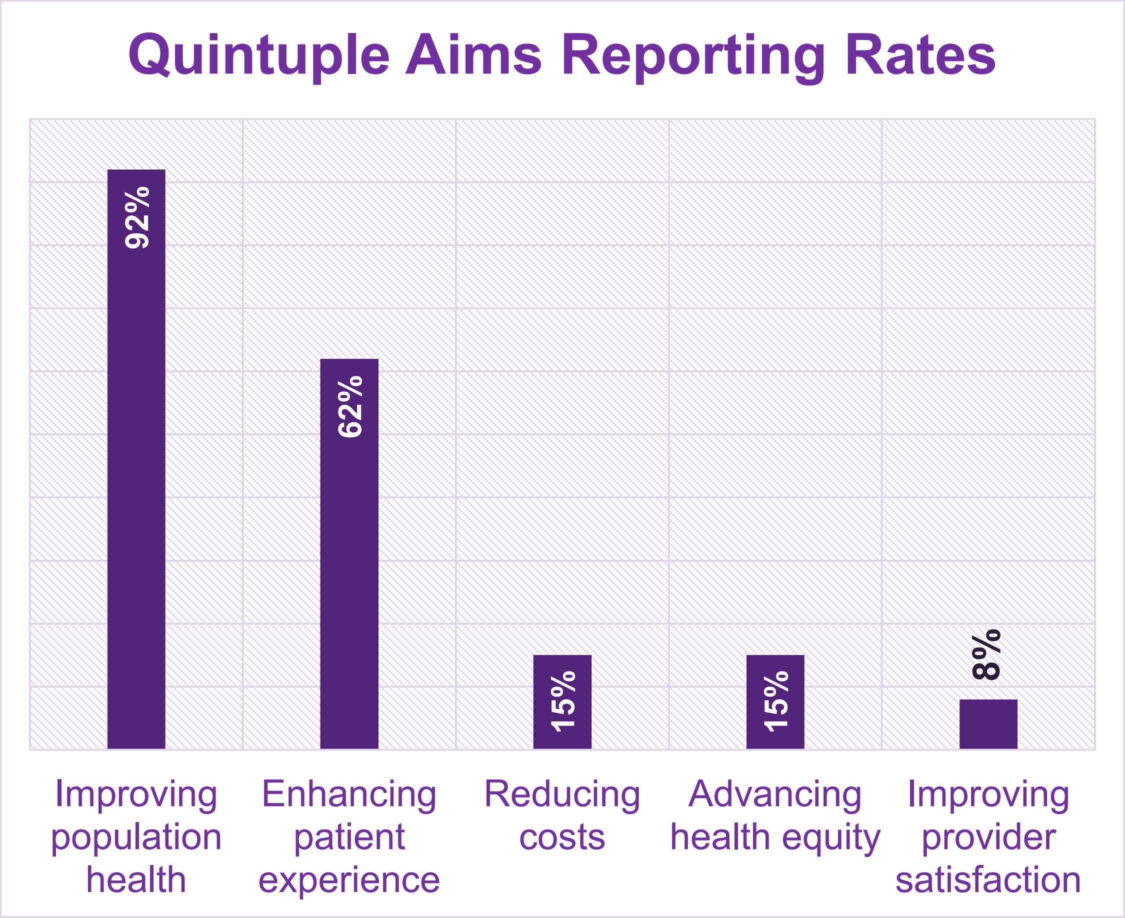
Australia

Impacts of EMRs on Quintuple Aims Outcomes



Less consistently evaluated

- ❖ Cost-effectiveness
- ❖ Provider satisfaction
- ❖ Health equity

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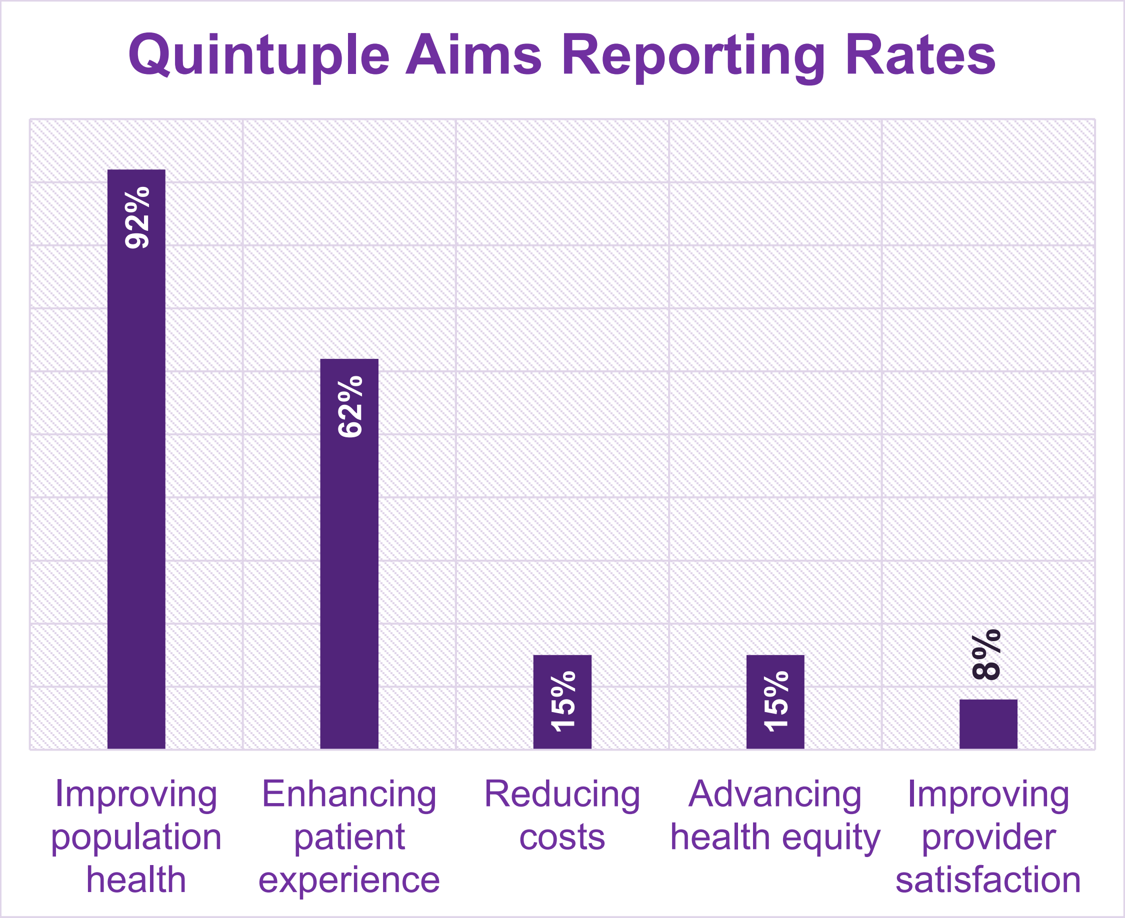
Impacts of EMRs on Quintuple Aims Outcomes



<u>Less consistently evaluated</u>

- Cost-effectiveness
- Provider satisfaction
- Health equity

Thank you

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Digital Health Interventions To Prevent Type 2 Diabetes: A Systematic Review

Tuan Duong, MD, PhD candidate

MSc Quita Olsen, Dr Anish Menon

Dr Leanna Woods, Jaze Wang

Lee Jiang, Dr Marlien Varnfield

Prof Clair Sullivan

Introduction

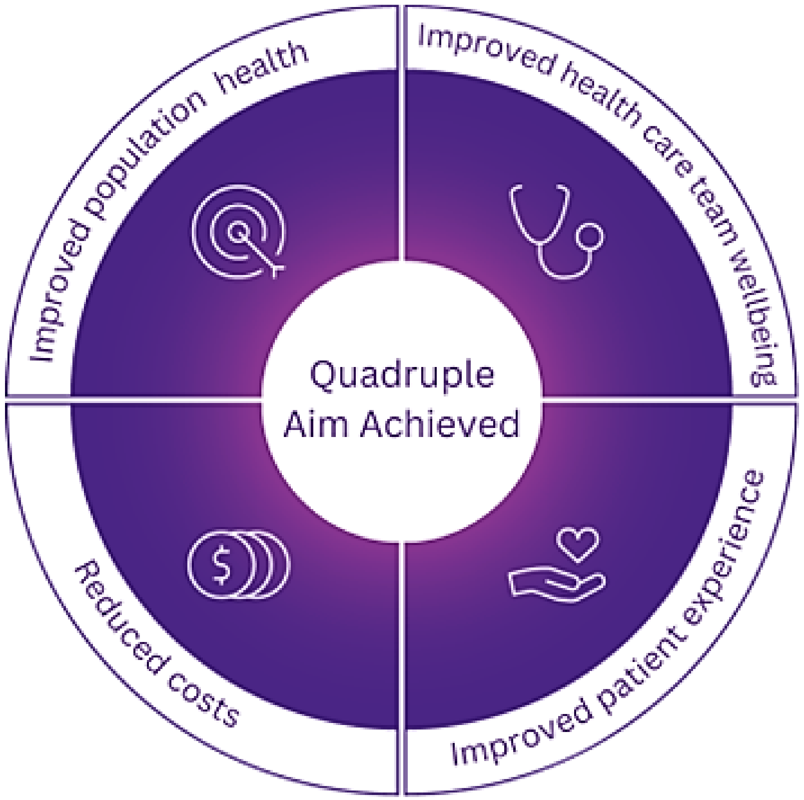
Prevent type 2 diabetes – cost effective

Evidence digital interventions are effective in type 2 diabetes prevention

Quadruple Aims in healthcare

Help guide digital health in prevention, treatment, delivery, planning, decision-making

The impacts of digital interventions on the Quadruple Aims in type 2 diabetes prevention remain largely unknown



Objectives

To systematically review the effectiveness of digital interventions in type 2 diabetes prevention as measured by the Quadruple Aims

Methods

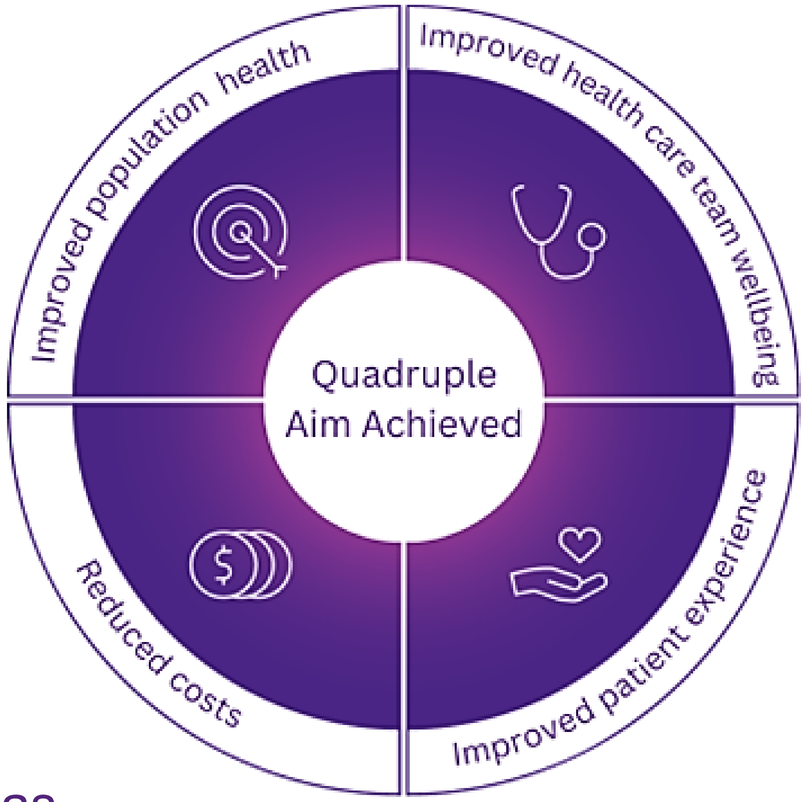
Conducted and reported following PRISMA 2020

Quantitative and qualitative data collected and synthesized narratively

Outcomes mapped to the Quadruple Aims

World's Health Organization Digital health interventions classification

Digital health intervention effects: Positive (+), Negative (-), Neutral (0)



Quality assessment: Version 2 of "Cochrane risk-of-bias tool for randomized trials", "Risk of Bias In Non-randomised Studies - of Interventions"

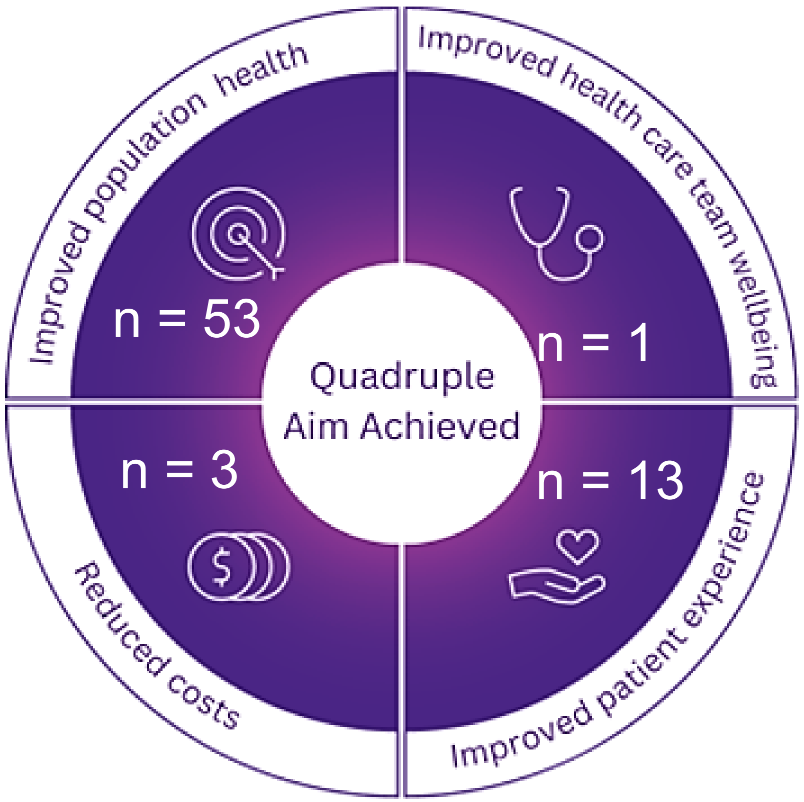
Results

T2DM development (n =14)

One study positive effect
Nine studies neutral effects
NA n=4

Dysglycemia (n = 53)

23 studies positive effect
24 studies neutral effect
NA n=6



Different digital interventions in combination

Targeted communication,
Telemedicine,
Personal health tracking

Conclusions

- Limited evidence supporting the effectiveness of digital interventions in preventing T2DM, clear evidence their effectiveness in improving dysglycemia
- Lack of studies on healthcare provider experience and healthcare cost
- Digital interventions should be integrated with healthcare provider interaction
- Different digital interventions in combination work best
- Combination transmission of information, alert, reminder, telemedicine, tracking device

Thank you

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Thank you

Please join us for networking!