UNIVERSITY
OF WOLLONGONG
AUSTRALIA

Australian Centre for
Health Engagement,
Evidence & Values

Community Jury on Artificial Intelligence in Health

INFORMATION BOOKLET

ACKNOWLEDGMENTS

Our thanks to the organisations supporting this community jury process: the Royal Australian and New Zealand College of Radiologists, Monash Partners Academic Health Science Centre, Maridulu Budyari Gumal, the Sydney Partnership for Health, Education, Research and Enterprise (SPHERE), and the Western Australian Health Translation Network.

Our thanks to the experts: Professor Farah Magrabi, Associate Professor Katy Bell, Professor Ian Scott and Distinguished Professor Wendy Rogers, who reviewed the contents of this booklet and will act as witnesses for the jury.

Thanks also to Professor Mike Burgess, Professor Annette Braunack-Mayer and Belinda Fabrianesi, who generously shared materials that have informed the design of this booklet, and MosaicLab, whose leadership in deliberative methods has informed our process.

This document was prepared by Lucy Carolan, Emma Frost, Dr Yves Saint James Aquino and Professor Stacy Carter from the Australian Centre for Health Engagement, Evidence and Values. Professor Stacy Carter is the guarantor and takes final responsibility for the contents.

FOREWORD

Welcome to the Australian Community Jury on Artificial Intelligence in Health. We are grateful that you have accepted our invitation to be part of this national event. To help you prepare for the event, we have put together this information booklet. It contains an overview of what to expect in a community jury and a brief introduction to some of the basics of artificial intelligence in health, to help you prepare for the discussions you will have with other participants about this important topic. You can use the booklet before, during and after the event.

You don't need any prior knowledge to take part in the jury. Just read the contents and start to think about what we are asking you to consider. You or your fellow participants are not expected to be experts on this topic, and you will most likely have further questions after reading this booklet. We encourage you to bring these questions to the community jury process, along with your insights and perspectives. These are all critical to the deliberation. A list of key terms can be found on the last pages of this booklet.

The booklet also includes information about our COVID-Safe plan and information you will need during your stay in Sydney. Please take some time to familiarise yourself with this information.

We look forward to welcoming you online on March 16th, and in person on March 31st, 2023.

CONTENTS

1. THE COMMUNITY JURY

1.1. WHAT IS A COMMUNITY JURY?

A community jury is an innovative democratic process used all over the world. It brings together a randomly selected group of people who broadly represent the entire community. The people who attend learn about issues, discuss them with one another, and then make recommendations about what should happen and how things should change. The group's conclusions are reported to people and organizations that can make decisions about the topic, and publicised to the wider community.

1.2. COMMUNITY JURY KEY TERMS

A list of key terms can be found on the last pages of this booklet.

1.3. YOUR ROLE AS A JUROR

This project is an opportunity for members of the community to be directly involved in democratic decision-making. Potential outcomes include providing evidence about community acceptability of healthcare tools that use artificial intelligence, and ways of implementing these tools.

Your role as a juror is to represent your fellow Australians, and work with your fellow jurors, to provide recommendations to decision-makers about the use of artificial intelligence in health services. You and your fellow participants each bring different life experiences and perspectives. Understanding these differences will ensure that the recommendations you make together are sensitive to the range of views in the Australian population. It is also important that your discussion and recommendations are well-informed. This booklet and the

experts you will hear from online and at the event will provide you with the information you need to understand the issues and make decisions. The recommendations that you make as a group will provide advice to people who design, implement and use artificial intelligence in health systems.

1.4.OUR QUESTION FOR YOU

Artificial Intelligence (AI) refers to a set of computer-based technologies that can do things that previously required human thinking and action. Artificial Intelligence is widely used in everyday life.

Artificial intelligence systems are being developed to detect or diagnose diseases. Artificial intelligence systems can help healthcare workers to find disease, or in some cases, can find disease automatically, without help from healthcare workers.

In this jury, you will be asked to make recommendations on the following question:

Under what circumstances, if any, should artificial intelligence be used in Australian health systems to detect or diagnose disease?

In making your recommendations, please consider:

1) What are the most important issues that you have heard about during the expert sessions and your discussions?
2) How important are potential benefits of these artificial intelligence systems in our reasoning, and which potential benefits seem most important?

3) How important are potential harms or dangers of these artificial intelligence systems in our reasoning, and which harms or dangers seem most important?
4) What should be done about the potential for algorithmic bias and unfair outcomes from these artificial intelligence systems?

1.5. THE PROCESS: A ROADMAP

This jury process is in two parts. Part 1 is online, Part 2 is in person in Sydney.

Part 1 A total of 8 hours spread over 2 weeks, from Thursday 16th March to Thursday 30th March. You will participate in three online sessions with other jurors (evening Thursday March 16th, afternoon Sunday March 19th and afternoon Sunday March 26th). In between you will access online information provided by experts, and you can interact with your fellow jurors on a message board.

Part 2 A weekend session, approximately 14½ hours, from Friday 31st March to Sunday 2nd April, held at the Mercure Hotel, next to Central Station in Sydney. Travel time to and from Sydney will be extra time and could take between 7-17 hours return depending on where you live. If you cannot fly back to your home state on Sunday afternoon, you will receive an extra night's accommodation and fly home on Monday morning.

PART 1: ONLINE

START HERE

Zoom Session 1
Thursday March 16th
5:30pm – 7:30pm AEST

Opening whole group session
(3/4 hour)
Welcome and introductions: why are you here, and why is the jury process important?

Relationship and skill building
(1 ¼hr)
Meeting one another, and building critical thinking skills

Thurs 16th March → Sunday 19th March
Bulletin board 1 activated

During these 3 days, look at the evidence videos online & read the information provided – feel free to interact with other participants and ask questions

Zoom Session 2
Sunday March 19th
3pm – 4:30pm AEST

Small group discussions: what did you think of the evidence, and what questions should we ask the experts?

Thurs 23rd March → Sunday 26th March
Bulletin board 2 activated

During these 3 days, look at the evidence videos online & read the information provided – feel free to interact with other participants and ask questions

Zoom Session 3
Sunday March 26th
3pm – 4:30pm AEST

Small group discussions: what did you think of the evidence, and what questions should we ask the experts?

Thurs 30th March
Bulletin board 3 activated

Final feedback from the experts uploaded online Let us know if you have any more questions and we will go looking for answers!

NEXT UP: SYDNEY!

PART 2: FACE-TO-FACE

DAY 1: Friday 31st March
3pm – 6pm

3pm –Welcome
Welcome and getting started

4pm – Experts
Check in with the experts: reviewing what we've learned, and any questions

5pm – Introduction
Get to know each other and the process

DAY 2: Saturday April 1st
9am – 5pm

9am – Discussion 1
(1½ hrs)
What matters to us?

10:30am – Break
(1/2 hr)

11am – Discussion 2
(1½ hrs)
Understanding the range of perspectives in the room

12:30pm – Break
(1 hr)

1:30pm – Deliberation 1
(1½ hrs)
What needs attention? Narrowing our focus to key areas

3pm – Break
(1/2hr)

3:30pm – Deliberation 2
(1 ½ hrs)
Documenting agreement and talking about areas of disagreement

DAY 3: Sunday April 2nd
9am – 3pm

9am – Deliberation 3
(1 ½ hrs)
Producing our final list of recommendations and clarifying reasons

10:30am – Break
(1/2 hr)

11am – Deliberation 4
(1 ½ hrs)
Final drafting and preparing to present

12:30pm – Break
(1 hr)

1:30pm – Final session
(1 ½ hrs)
Presentation to supporting organisations
Feedback on the jury process and we say goodbye

1.6. ABOUT THE EVENT

ONLINE SPACES FOR PART 1

For Part 1 you will need to access **'Zoom'**, a video conferencing platform that can be used through a computer desktop or a tablet, and allows users to participate in group discussions and live chat. There are short videos on the Zoom website which show you how to join a Zoom meeting and how to use the functions in Zoom (https://support.zoom.us/hc). Please let the research team know in advance if you haven't used Zoom before, so we can make time to talk you through it if needed. Please see the separate 'How to Zoom guide' enclosed in the information booklet pack.

For Part 1 you will also need to use **'VisionsLive'**, an online research platform. On VisionsLive you can watch videos, read information, post your reactions, comments and questions, and interact with other participants. To access VisionsLive you will need a computer or a tablet. You will receive email messages and links to access the Bulletin Board activities. You will simply need to clink on this link to join – there is no need to download any programs or apps – the links will take will take you straight to VisionsLive.

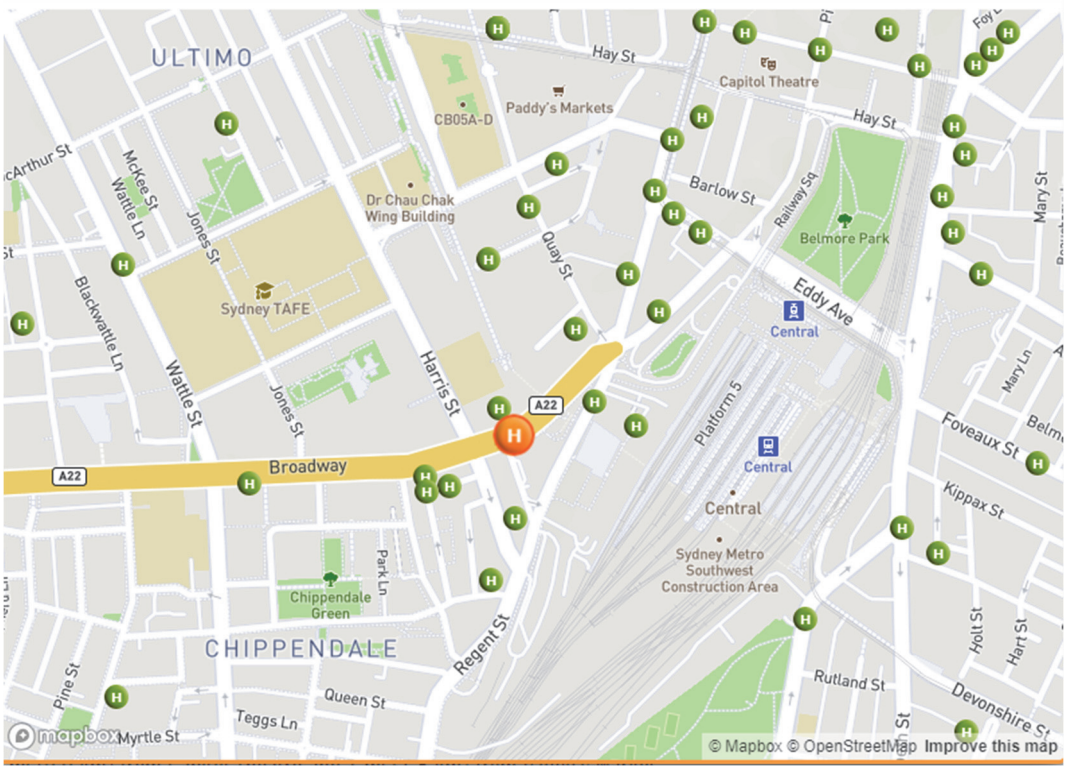
VENUE FOR PART 2

For Part 2, the face to face meeting, you will travel to Sydney to meet with the other jurors, the researchers, the experts and representatives of the organisations supporting the process.

ACCOMMODATION

All participants will stay at the Mercure Sydney Hotel, which is located at 818-820 George Street, Sydney, NSW, 2000. (See the map below). There is 24-hour reception which may be reached

by phone on (02) 9217 6666. Mercure Sydney Hotel is an eight-minute walk from Sydney Central Railway Station, and one-minute walk to Sydney Central Bus stop. All the participants will have their own queen room with a private bathroom.



At the hotel you should check in to your room and acquaint yourself with the hotel before our event starts. The jury starts at 3.00pm in the afternoon of Friday 31st March in the Town Hall Room on Level 2. A member of the UOW research team will be at the hotel reception to greet you from 2:30pm.

A buffet breakfast is provided to all hotel guests with no need for vouchers. Breakfast is available from 6.30am. On the Friday an afternoon tea will be served on arrival, with a light supper served at the end. Morning tea, lunch and afternoon teas will be provided on Saturday and Sunday. When you arrive at the hotel, you will receive a VISA gift card with funds to cover dinner for Friday and Saturday nights ($80 in total, $40 per night).

When you arrive at the first jury meeting on Friday afternoon, we will provide you with another VISA gift card. This will contain payment for your participation in the online process ($415). If you have any questions about how to use the VISA gift cards just ask someone from the research team.

COVID SAFETY

In this booklet pack, we have included a Rapid Antigen Test (RAT). Please use this RAT on the day you plan to travel (before you travel). If the test is positive, please do not travel. Contact us and we will discuss options with you.

We will supply Rapid Antigen Tests each day of the jury and will ask you to do the test in your room before you attend each day. If you need help to do the test, or if you test positive, or if you develop symptoms while you are in Sydney, please let someone from the research team know immediately.
You must not travel to the event if you are unwell, or if you have been a close contact with a known active case of COVID-19 in the 7 days before. If you are unsure, please call the research team to discuss.

The room for the event is large and well-ventilated. Hand sanitiser will be available. You can ask a member of the research team for a mask if you need one. We support and welcome anyone who wants to wear a mask. You do not have to wear a mask to participate.

If you are unable to travel or experience delays, please notify the project coordinator, Lucy Carolan M: 0448 746 163 or email lengland@uow.edu.au

1.7. TRANSPORT TO THE MERCURE SYDNEY HOTEL

BY PLANE

When you arrive in Sydney Airport, you will need to make your own way to the venue (once you have collected your luggage). The best way to get to the Mercure Sydney Hotel is by a direct train from Sydney Domestic Airport Station to Central Station. Trains leave approximately every 10 minutes and take approximately 10 minutes to get to Central Station. Exit Central Station towards Railway Square. From Central Station there will be an eight-minute walk to the Hotel (600 metres).

This booklet pack contains a $100 VISA gift card to cover any taxi fares or other travel between your home and the airport, and train travel between the airport and the hotel on Friday and Sunday. If you think your travel will cost more than $100 in total, please keep your receipts and show them to the research team so we can organise reimbursement.

BY TRAIN

When you arrive in Central Station, Sydney, you will need to make your own way to the venue. Exit Central Station towards Railway Square. From Central Station there will be an eight-minute walk to the Hotel (600 metres). This booklet pack contains a $100 VISA gift card to cover any taxi fares or other travel between your home and the train, and train travel between home and the hotel on Friday and Sunday. If you think your travel will cost more than $100 in total, please keep your receipts and show them to the research team so we can organise reimbursement.

BY BUS/COACH

When you arrive in the Bus Terminal Central Station, Sydney, you will need to make your own way to the venue. Exit Central Station towards Railway Square. From Central Station there will be an eight-minute walk to the Hotel (600 metres). This booklet pack contains a $100 VISA gift card to cover your bus fare (e.g. Sydney buses or long distance bus / coach). If you think your travel will cost more than $100 in total, please keep your receipts and show them to the research team so we can organise reimbursement.

2. SUPPORTING ORGANISATIONS, EXPERT WITNESSES AND RESEARCH TEAM

2.1. ORGANISATIONS SUPPORTING THE PROCESS

THE ROYAL AUSTRALIAN AND NEW ZEALAND COLLEGE OF RADIOLOGISTS

*The Royal Australian and New Zealand College of Radiologists, or RANZCR, is supporting the community jury. RANZCR is one of 25 specialist medical colleges accredited by the Australian Medical Council. These colleges train and certify medical specialists, set standards, and support and promote research in their fields. RANZCR is the college for radiologists: the specialists who i*nterpret and analyse images produced by diagnostic imaging technologies (like CT-scans or MRI scans). *RANZCR has provided the statement below.*

RANZCR is committed to improving health outcomes for all, by educating and supporting clinical radiologists and radiation oncologists. RANZCR is dedicated to setting standards, professional training, assessment and accreditation, and advocating access to quality care in both professions to create healthier communities. Our members are critical to health services: clinical radiology is central to the diagnosis and treatment of disease and injury and radiation oncology is a vital component in the treatment of cancer. RANZCR creates a positive impact by driving change, focusing on the professional development of its members and advancing best practice health policy and advocacy, to enable better patient outcomes.

RANZCR has been at the forefront of policy on medical artificial intelligence in the region, and is committed to engaging with members of the public and understanding their perspective on using AI for diagnosis and screening. RANZCR will make an opening statement at the meeting of the jury in Sydney, will join the final day of the meeting to hear the jury's recommendations, will consider the recommendations made by the jury, and will provide a public response to the recommendations which will be forwarded to all members of the jury.

MONASH PARTNERS ACADEMIC HEALTH SCIENCE CENTRE
MARIDULU BUDYARI GUMAL, THE SYDNEY PARTNERSHIP FOR HEALTH, EDUCATION, RESEARCH AND ENTERPRISE (SPHERE)
WESTERN AUSTRALIAN HEALTH TRANSLATION NETWORK

Three Australian Health Research Translation Centres from Victoria, New South Wales and Western Australia respectively, are jointly supporting the community jury. The three Centres have provided the statement below.

monashpartners.org.au thesphere.com.au wahtn.org

Monash Partners Academic Health Science Centre; Maridulu Budyari Gumal, the Sydney Partnership for Health, Education, Research and Enterprise (SPHERE); and the Western Australian Health Translation Network are delighted to be non-financial sponsors and observers of the "Community Jury on Artificial Intelligence" in Health, to be held in Sydney, 31st March to the 2nd April, 2023.

Our three Research Translation Centres consist of partnerships between leading health service, research and teaching organisations focused on innovating for better health and wellbeing. Each are accredited by the National Health and Medical Research Council (NHMRC).

These centres, along with seven others, make up the Australian Health Research Alliance (AHRA) whose priorities are the systematic embedding of research in Australian health care; better alignment of research capacity with clinical priorities and more, better and faster research translation to deliver patient, public and economic benefit.

While we recognise the uptake of Artificial intelligence (AI) in the world is moving rapidly, the use of AI in Australian healthcare is still in its infancy.

The use of AI in healthcare for disease detection and diagnosis aligns closely with two of AHRA's top priorities: consumer and community involvement and data driven healthcare improvement.

AI has the potential to change the health landscape – to be able to recognise symptoms and provide the ability to access healthcare sooner than is humanly possible within current systems.

It presents an exciting opportunity in the future of healthcare and community input into its application is crucial.

Your contribution, thoughts and recommendations presented during this community jury will aid in the introduction and use

of AI in healthcare for disease detection and diagnosis when being presented to and considered by health organisations.

2.2. THE EXPERT WITNESSES

In the online process, you will hear important background information from a range of experts. This will include experts with different talents and training, including in medical informatics and data science, medical ethics, and healthcare practice. If you have questions for the experts at any time let us know and we will do our best to get you an answer! Four experts will be presenting evidence to you.

WHO ARE THE EXPERTS FOR THIS COMMUNITY JURY?

PROFESSOR FARAH MAGRABI

Farah is a Professor of Biomedical and Health Informatics at the Australian Institute of Health Innovation, Macquarie University. She has a background in Electrical and Biomedical Engineering and is an expert in the design and evaluation of digital health and Artificial Intelligence (AI) technologies for clinicians and consumers. She leads the NHMRC Centre of Research Excellence in Digital Health's Safety research stream and is co-chair of the Australian AI Alliance's Working Group on safety, quality and ethics. **Farah will provide expert evidence on the question "What is Artificial Intelligence and how does it work in healthcare?".** Farah will also be our 'Expert in the room' for the Community Jury.

ASSOCIATE PROFESSOR KATY BELL

Associate Professor Katy Bell is a clinical epidemiologist in the University of Sydney's School of Public Health, specialising in the evaluation of medical tests used for screening, diagnosis, and monitoring. She is a member of the Evaluation Subcommittee for the Australian Government's Medical Services Advisory Committee (MSAC) which considers funding for new tests on the Medicare Benefits Scheme (MBS). She holds an NHMRC Investigator Grant supporting research into how early detection tests can be used to benefit health and not cause harm, and is a Chief Investigator for the NHMRC funded Wiser Healthcare collaboration that aims to support better value care for all Australians. **Katy will provide expert information on the questions "How do screening and diagnosis work now? What is evidence-based medicine?"**

PROFESSOR IAN SCOTT

Ian Scott is the Director of Internal Medicine and Clinical Epidemiology and a Professor with the Faculty of Medicine, University of Queensland. He is a consultant general physician with research interests in healthcare Artificial Intelligence,

clinical decision making, and quality and safety improvement issues in clinical practice, among others. He currently chairs the Queensland Clinical Networks Executive, is the inaugural chair of the Australian Deprescribing Network, Metro South Clinical AI Working Group, and Queensland Health Sepsis AI Working Group and is a founding member of the Australian and New Zealand Affiliate of the US Society to Improve Diagnosis in Medicine. **Ian will provide expert evidence on the potential and proven benefits of healthcare AI**

DISTINGUISHED PROFESSOR WENDY ROGERS

Wendy is a Distinguished Professor in the Philosophy Department and the School of Medicine at Macquarie University. She has wide ranging research interests including the ethics of AI and other new technologies in healthcare, the ethics of synthetic biology, organ transplant abuse and feminist bioethics. She is Co-Director of the Macquarie University Research Centre for Agency, Values and Ethics and a chief investigator on a number of ARC and NHMRC grants. Her recent publications include the co-edited 2023 Routledge Handbook of Feminist Bioethics. **Wendy will provide expert evidence on the potential risks or harms of healthcare Artificial Intelligence.**

2.3. WHO IS RUNNING THE EVENT?

The Australian Centre for Health Engagement, Evidence and Values (ACHEEV) specialises in connecting health decision-makers to the Australian public via processes like community juries. Our mission is to make health systems more inclusive and democratic. We identify real-world problems faced by health systems, and support Australians to learn about these problems and provide advice to decision-makers.

WHO WE ARE (THE RESEARCH TEAM)

PROFESSOR STACY CARTER

Professor Stacy Carter is the Director at ACHEEV. Stacy's training is in public health, and her expertise is in qualitative and deliberative methodologies, public health ethics, feminist bioethics and empirical ethics. Her research program focuses on artificial intelligence and big data in health, reducing harm and waste in healthcare, screening and diagnosis, and including consumers and citizens in healthcare decision making.

DR YVES SAINT JAMES AQUNO

Yves is a clinician and philosopher working as a research fellow at the Australian Centre for Health Engagement, Evidence and Values at the University of Wollongong. His research expertise

includes medical ethics, ethics of cosmetic surgery and ethics of artificial intelligence in healthcare.

ASSOCIATE PROFESSOR CHRIS DEGELING

Chris Degeling is an Associate Professor at ACHEEV. As a social scientist with a background in veterinary medicine, Chris' research focuses on the intersection of public health ethics, public health policy and emerging issues at the human-animal-ecosystem interface. Chris is a specialist in qualitative research and deliberative methodologies like community juries.

EMMA FROST

Emma is doing her PhD at the Australian Centre for Health Engagement, Evidence and Values at the University of Wollongong. She is from Jervis Bay (Yuin Country). Emma's research focuses on Australians' views on the use of Artificial Intelligence in healthcare.

LUCY CAROLAN

Lucy is a research assistant at ACHEEV working on a range of health-related projects. Her current research focuses on understanding the values of the Australian public regarding the implementation of Artificial Intelligence in diagnosis and screening.

3. THE BASICS OF ARTIFICIAL INTELLIGENCE IN HEALTH

3.1. WHAT IS ARTIFICIAL INTELLIGENCE

"Artificial Intelligence" (AI) refers to **widely used computer-based systems that can assist or replace humans.** Artificial intelligence systems do everyday things: they can automatically suggest what TV show to watch next on a streaming service, alert your bank to unusual transactions in your account, or automatically touch up a photo you've taken with your phone.

We will focus on applications of artificial intelligence that are designed to check for diseases. Artificial intelligence can help healthcare workers to find disease, or in some cases, can find disease without help from healthcare workers. Artificial Intelligence systems already exist to identify conditions like cancers, eye problems, mental health conditions and dementia. Artificial Intelligence systems can work in health services like hospitals, or at home on your devices. There are many kinds of health-related artificial intelligence systems, but we will focus on systems for disease detection and diagnosis.

3.2. HOW IS ARTIFICIAL INTELLIGENCE BEING USED TO DETECT AND DIAGNOSE DISEASES?

In healthcare, artificial intelligence is already being used for some tasks. Most applications of artificial intelligence for detecting and diagnosing diseases are in a sub-category of artificial intelligence called Machine Learning. **Machine learning technologies use large amounts of data to learn patterns, and the patterns can then be applied to predict an outcome in real life.** For example, researchers could use a

dataset to train a machine learning algorithm to “learn” how factors like age, sex, and family history influence a person’s likelihood of developing a cancer. Then, healthcare workers could use the patterns that the machine learning algorithm found to help them decide whether patients were at-risk of developing cancer.

Some examples of how Artificial Intelligence is currently being used to detect and diagnose diseases include:

- Assisting healthcare workers in analysing x-rays and other images used to diagnose medical conditions
- Using patients’ health records to determine whether they are at risk of developing a disease
- Analysing images of people’s retinas to look for diseases of the eye
- Collecting and analysing people’s health data from wearable devices such as Fitbit

Artificial Intelligence technologies are progressing quickly, and new Artificial Intelligence research is happening all the time. There are many new healthcare Artificial Intelligence technologies that are in development, being tested, or waiting to be approved for use by patients or healthcare workers in hospitals and clinics.

3.3. FAQS ABOUT ARTIFICIAL INTELLIGENCE

(FAQ = Frequently Asked Question)

DO ARTIFICIAL INTELLIGENCE TECHNOLOGIES HAVE A 'BRAIN' OR A 'MIND'?

No, artificial intelligence technologies do not have a brain or a mind. Artificial intelligence algorithms are far less complex than brains or minds. They can only use maths and statistics methods to find patterns in data. Most artificial intelligence systems can only do a small number of specific tasks.

DO ARTIFICIAL INTELLIGENCE TECHNOLOGIES MAKE MISTAKES?

Yes. Artificial intelligence technologies learn from health data, and health data can be biased, inaccurate and sometimes incomplete. The performance of artificial intelligence systems also relies on the way they are developed by human coders. **As a result of problems in data or problems with coding, artificial intelligence technologies will sometimes make mistakes.**

IS ARTIFICIAL INTELLIGENCE AS GOOD AS HUMAN DOCTORS AT DETECTING AND DIAGNOSING DISEASES?

At the moment, artificial intelligence systems mainly help healthcare workers who can combine AI advice with information about patients to make diagnoses.

There is a lot of variation in the accuracy of artificial intelligence technologies. **The accuracy of an artificial intelligence technology depends on many things, such as the data used for developing and training the technology and the disease that the technology is supposed to detect.** Research studies have found that some artificial intelligence technologies are about as accurate as human doctors when detecting or

diagnosing diseases. But these technologies might not be as accurate as human doctors when they are used in real life settings. Sometimes research shows that they work less well in the real world.

As researchers develop new ways to use artificial intelligence in healthcare, the hope is that technologies may become more accurate and begin to make fewer mistakes than human doctors.

IS ARTIFICIAL INTELLIGENCE ALREADY BEING USED IN AUSTRALIA FOR DETECTING AND DIAGNOSING DISEASES?

Artificial intelligence that is built into medical devices needs to be checked and approved by the Therapeutic Goods Administration, which is the regulatory agency for medical products such as drugs and medical devices.

You may use artificial intelligence-enabled apps on your smartphone, such as the HealthDirect app[1] for checking symptoms, or you may use an AI-enabled wearable device such as a Fitbit or Apple Watch to track your health. In some cases, artificial intelligence technologies might be used to assist your doctor in making a decision about your symptoms or analysing a scan, but **they cannot be used on their own to make decisions about your health.** At least in Australia, in 2023, your health care worker still needs to make the final decision.

3.4. DIAGNOSIS AND SCREENING

During the jury process you will hear a lot about diagnosis and screening. **Diagnosis is the process of identifying the disease or condition a patient has**. Diagnosis can involve taking a

[1] https://www.healthdirect.gov.au/health-app

medical history, examination of the patient, and doing tests. The diagnostic process starts when a person seeks healthcare because something is wrong – usually because they have symptoms. For example, you might go to a doctor with pain. Through the diagnostic process, the doctor tries to work out what condition is causing the pain.

Screening is different. **Screening is checking to see whether disease *might* be present, in people who don't have symptoms of that condition**. Usually a screening test is offered to those people who are at higher risk of a condition than the general population. For example, women 50-74 years old are offered breast cancer screening because they are at higher risk of developing breast cancer. Or people who have diabetes are offered regular eye examinations because they are at higher risk of eye disease than people without diabetes. The screening process might not deliver a definitive diagnosis: people with a positive screening result are often advised to have more tests to find out whether they actually have the disease. **You will hear more about diagnosis and screening from the expert witnesses.**

3.5. THINKING ABOUT EVIDENCE

In healthcare, there are strict rules about what counts as evidence. This is important, because health workers need to know whether a test or treatment works. Rules about what studies provide good evidence for tests or treatments make it possible to combine research from all over the world to ask, for example, 'is this a reliable test to detect this disease, and will it improve patients' health (for example, directing appropriate treatment)?'

But it's not that simple. **Generating evidence is time consuming and expensive, and the evidence doesn't always provide the answers health workers need**. Often research is from rich countries in the northern hemisphere, with members of marginalised groups being underrepresented. Not all evidence is published, and sometimes when studies are critically analysed, they aren't quite as good as their authors suggest. While the question of whether tests work is critically important, there are other important questions that have to be answered with different kinds of methods – for example, questions about the patient experience.

The health and medical research community continues to build knowledge about the effectiveness of tests and treatments. At the same time, there are always uncertainties and gaps. In the expert presentations and our activities, you will be invited to think critically about the evidence for AI in healthcare and to take that evidence seriously in your decision-making.

3.6. WHY ARE WE TALKING ABOUT THIS TOPIC?

Using Artificial Intelligence for detecting and diagnosing diseases has the potential to improve aspects of healthcare. However, it also introduces some risks, including risks of harm. Experts in artificial intelligence are debating whether the benefits are greater than the risks, and how we should decide.

POTENTIAL BENEFITS OF AI IN HEALTHCARE

AI may make speed up the process of detecting diseases by helping healthcare workers make faster decisions about a diagnosis for their patients.

AI may free up time for healthcare workers. Artificial intelligence may be able to complete some tasks that healthcare workers previously had to do. This could mean that health care workers have more time to spend with patients.

AI diagnosis may become more accurate than human diagnosis. As the technology develops, artificial intelligence may become a more accurate way to detect some diseases in patients.

AI may reduce the cost of healthcare. If artificial intelligence is faster or more accurate than human health care workers, and if the cost of implementing AI is not too high, it might reduce the cost of health care for the government and even for patients.

AI may be helpful in remote areas. Artificial Intelligence may allow people in remote areas to access health care in their GP's office that would normally need a specialist.

POTENTIAL HARMS OR DANGERS OF AI IN HEALTHCARE

AI may work better for some patients than others. Artificial intelligence technologies can be biased, meaning they work better for some types of people compared to others. AI has been found to sometimes copy human biases, meaning that AI might make more mistakes for people in already-disadvantaged groups.

AI may cause health care workers to lose skills. If Artificial Intelligence does things that human healthcare workers used to do, the healthcare workers may begin to lose skills they used to have.

AI may be less accurate than human healthcare workers at detecting diseases. Artificial Intelligence technologies may be less accurate than human doctors at detecting a disease. Early claims that AI is highly accurate are not always verified in real world studies. The accuracy of artificial intelligence technologies may vary depending on the place where it is used (e.g., a technology developed in the US may not work as well in Australia)

Healthcare workers may rely on AI over their expert knowledge. Even when Artificial Intelligence technologies are supposed to assist human healthcare workers rather than replace them, some healthcare workers may put trust AI technologies over their expert knowledge and not question the decisions made by AI, even when they disagree.

Some health AI technologies might not have human healthcare workers to check for mistakes. Some health AI technologies are designed to be used at home, where there is no healthcare worker to make sure that the technology is accurate.

4. EXAMPLES OF ARTIFICIAL INTELLIGENCE DESIGNED TO BE USED IN HEALTH

4.1. CASE 1: SYBIL, ARTIFICIAL INTELLIGENCE FOR LUNG CANCER SCREENING

WHY THIS CASE?

Lung cancer is an abnormal growth (tumour) in the tissue of one or both lungs.[2] Over time, lung cancer can progressively increase in size and affect breathing, causing pain and symptoms. Without intervention, the tumour could spread throughout the body.

Doctors can check for lung cancer, or the risk that someone has lung cancer, by taking images of the chest with x-rays or CT scans. A specific type of CT scan can be used to screen healthy people for lung cancer. The specialist doctors who read these images are called radiologists. Radiologists can interpret or "read" images to look for signs of lung cancer.

Sybil™ is an Artificial Intelligence algorithm designed to analyse images from CT scans. Sybil™ works without help from a radiologist. **Sybil™ predicts the risk of a patient developing lung cancer within six years.**

[2] https://lungfoundation.com.au/patients-carers/conditions/lung-cancer/overview/

WHAT IS IT?

Sybil™ is a software product that uses an advanced type of Artificial Intelligence called deep learning.[3] **Sybil™ was developed in the US and is not yet approved for use in Australia**. Developers of the software claim that it can predict lung cancer risk up for to 6 years. The software can work automatically as soon as the CT scan image is available. The software's prediction of risk is based on the analysis of a single CT scan image without the need for other patient information, and without input from a radiologist.

The software was developed by researchers from the Massachusetts General Cancer Center and the Massachusetts Institute of Technology. The researchers used lung CT scans of participants from the US National Lung Cancer Screening Trial.[4]

HOW MIGHT IT CHANGE HEALTHCARE FOR AUSTRALIANS?

Cancer Australia is actively looking into developing a nationwide Lung Cancer Screening program that will leverage the use of Artificial Intelligence and computer-assisted diagnostics.[5] A 2021-22 Federal Budget Measure tasked the Department of Health and Cancer Australia to work together to establish the feasibility of implementing a national program.[6]

In Australia, lung cancer is the leading cause of cancer death, and is **often detected at such an advanced stage that treatment options are already very limited**. A screening

[3] https://ascopubs.org/doi/full/10.1200/JCO.22.01345

[4] https://ascopubs.org/doi/full/10.1200/JCO.22.01345

[5] https://www.canceraustralia.gov.au/about-us/lung-cancer-screening

[6] http://www.msac.gov.au/internet/msac/publishing.nsf/Content/1699-public

program to detect high-risk people or early-stage cancer could save lives and reduce lung cancer mortality. It is estimated that in 10 years, a screening program in Australia could prevent over 12,000 deaths.

The proposed national screening program aims to incorporate Artificial Intelligence technologies similar to Sybil™. Nationwide screening programs entail a high number of images that must be read by radiologists, so require large workforces. Technologies like Sybil™ could work independently and provide support to radiologists.

WHAT IS PROMISING ABOUT IT?

- The system promises to **improve accuracy in identifying signs of potential lung cancer nodules** in CT scans even if these signs are too small for human eyes to see.[7]
- For patients and health consumers, **increased accuracy would mean that doctors could intervene early** and provide appropriate management to improve survival.
- Increased accuracy would also **decrease errors**, such as saying there is cancer present when there is none. This would prevent unnecessary use of extra diagnostic tests or treatment.

WHAT MIGHT BE PROBLEMATIC ABOUT IT?

- Like any technology that helps with decision making, when artificial intelligence systems are used, **clinicians tend to favour or rely too much on the recommendations or interpretations generated by the AI**. At times, this tendency

[7] https://news.mit.edu/2023/ai-model-can-detect-future-lung-cancer-0120

to favour or rely on the technology means that clinicians become less critical, which could then lead to errors.

- Many artificial intelligence systems are developed overseas using data from overseas populations that are different from the Australian population. There are currently **no clinical trials that demonstrate that Artificial Intelligence technologies developed overseas will perform properly on patients and health consumers in Australia.**
- As with other screening programs, using artificial intelligence may **increase risk of people being diagnosed who may not benefit from the diagnosis** (for example, because they cannot be treated), and may experience harm (for example, increased anxiety).[8]

[8] https://doi.org/10.17061/phrp2731722

4.2. CASE 2: CANARY™, A MOBILE APP FOR MENTAL HEALTH SCREENING

Image from https://canaryspeech.com/blog/canary-speech-launches-on-microsoft-azure-marketplace/

WHY THIS CASE?

Mental health conditions such as anxiety or depression can affect the way a person feels, thinks or behaves. In some cases, these symptoms lead to emotional and physical problems that are hard to cope with.[9] Screening and diagnosis of mental health conditions involve an appointment with a healthcare professional, who gathers detailed information about a person's thoughts, moods, behaviours, and medical history.

Canary™ mobile app offers a mental health service directly to consumers who have mobile phones and access to the internet.[10] The screening is fully automated, with the AI system processing information and providing evaluation without the help of a professional.

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[9] https://www.healthdirect.gov.au/mental-illness

[10] https://doi.org/10.48550/arXiv.1910.10082

WHAT IS IT?

Developed by US-based company Canary Speech, Inc., Canary™ is a free mobile application with Artificial Intelligence capabilities. **The app is designed to screen for mental health conditions, including mood and anxiety disorders**. It does this based on analysing a person's speech. The app can be downloaded via Google App or Apple App stores.

How the app works:

- The Canary app instructs the user to speak freely for 20 seconds.
- The 20-second recording is processed by an Artificial Intelligence algorithm, which analyses features in the speech, such as volume, tone of voice, and presence of pauses.
- The app then provides a Vocal score, with higher scores indicating increased risk of the presence of a mental health condition.

The mobile app manufacturer claims that the app *"provides only information, is not medical or treatment advice and may not be treated as such by the user. As such, this App may not be relied upon for the purposes of medical diagnosis or as a recommendation for medical care or treatment. The information on this App is not a substitute for professional medical advice, diagnosis or treatment."*[11]

[11] https://canaryspeech.com/

HOW MIGHT IT CHANGE HEALTHCARE FOR AUSTRALIANS?

A 2022 survey showed that over 2 in 5 Australians aged 16 to 85 have experienced a mental health disorder during their lifetime, and 1 in 10 Australians reported having been diagnosed with a mental health condition.[12]

Despite the high number of Australians experiencing a mental health disorder, mental health services in Australia are not meeting the needs of patients.[13] The majority of Australians access mental health care through private service providers, with Medicare partly subsidising fees. Recently, the Australian government has decreased the number of subsidised Medicare sessions.[14] Those who cannot afford private services must rely on the public health system, which is also under-resourced.

As a free mobile app, Canary promises to provide a form of mental health screening for people who cannot access services in the public or private healthcare system.

WHAT IS PROMISING ABOUT IT?

- The company behind the mobile app claims that its technology is **more accurate than existing mental health screening methods,** and that it could detect mental health problems even before onset of observable symptoms.
- If it is accurate, the technology has the potential to **fill gaps in mental health assessment services**.

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[12] https://www.aihw.gov.au/reports/mental-health-services/mental-health

[13] https://napp.org.au/2021/04/the-australian-mental-health-crisis-a-system-failure-in-need-of-treatment/

[14] https://www.news.com.au/lifestyle/health/mental-health/medicare-subsidies-for-mental-health-care-to-be-reduced-to-10-sessions/news-story/88779e899756f2b4bb7099fec1d325a5

WHAT MIGHT BE PROBLEMATIC ABOUT IT?

- The app is subject to Australia's National Safety and Quality Digital Mental Health Standards,[15] which ensures the quality of digital mental health service provision. However, there is **no evidence that the mobile app has applied the recommended quality and safety standards**.
- Artificial Intelligence systems designed to analyse voice and speech tend to be **less accurate for people with accents** or dialects that are not well-represented in the data used to develop the technology.[16]
- Studies have shown that most mobile phone apps have **not been scientifically evaluated for their effectiveness in improving care or patient outcomes**.[17] Apps can lead to harm when they offer incorrect or misleading information.[18] For example, an app might offer advice not to consult a health worker when a user actually requires professional help.
- The app is designed for screening, but not treatment. **It may be unhelpful for a person to learn that they are at a higher risk of having a mental health condition if they cannot access mental health treatment services**.

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[15] https://www.safetyandquality.gov.au/standards/national-safety-and-quality-digital-mental-health-standards

[16] https://facctconference.org/static/pdfs_2022/facct22-43.pdf

[17] https://doi.org/10.1371/journal.pdig.0000002

[18] https://www.smh.com.au/lifestyle/health-and-wellness/wellness-and-mental-health-apps-are-they-worth-it-20190312-p513if.html

4.3. CASE 3: IDX-DR, ARTIFICIAL INTELLIGENCE TO SCREEN FOR DIABETES COMPLICATIONS

WHY THIS CASE?

About 1.3m Australians have diabetes.[19] **Diabetic retinopathy is a common complication of diabetes**. It is a condition of the retina, which is on the inside back surface of the eye. Diabetic retinopathy can cause blindness in people with diabetes.

About 4 in 10 adults with diabetes have retinopathy, and about 1 in 10 have reduced vision.[20] People can start to develop diabetic retinopathy without realising it, so it is recommended that people with diabetes have eye checks at least every two years.[21] These checks traditionally happen at the ophthalmologist (eye specialist). **Early treatment can slow down or stop people with diabetes losing their vision.**

IDx-DR is an AI-enabled medical device for checking the health of the retina in people with diabetes. IDx-DR tells the operator whether a person with diabetes has signs of diabetic retinopathy, so they can seek early treatment. Previously, only human doctors could look for diabetic retinopathy in images of the retina. This is skilled work, but can be very repetitive, which can lead to mistakes. In some cases, the person with diabetes is given eye drops to dilate their pupils, which take hours to wear off. Some specialists examine people's eyes directly, which means being in close proximity and feeling uncomfortable while the specialist examines the eye**. IDx-DR automates this**

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[19] https://www.aihw.gov.au/reports/diabetes/diabetes/contents/how-common-is-diabetes/all-diabetes

[20] https://pubmed.ncbi.nlm.nih.gov/28318640/

[21] https://www.healthdirect.gov.au/diabetic-retinopathy

process, and does not require eye drops or direct examination of the eye by a health worker.

WHAT IS THIS CASE?

IDx-DR is an autonomous AI system inside a purpose-built machine. You can see pictures of IDx-DR here:

https://www.digitaldiagnostics.com/products/eye-disease/idx-dr/

There are two algorithms in IDx-DR. One is for quality control. IDx-DR takes pictures of the patient's retina, and the quality control algorithm checks that those pictures are good enough. If they are, a second machine learning algorithm analyses those pictures to check for signs of 'more than mild' diabetic retinopathy. **IDx-DR tells the operator within a minute whether the patient has 'more than mild' changes in their retina.**

HOW MIGHT IT CHANGE HEALTHCARE FOR AUSTRALIANS?

IDx-DR is designed to be used by GPs, optometrists and other healthcare workers in the community. The hope is that if IDx-DR can be used by trained GPs or optometrists, **people with diabetes can have their eyes checked more easily and regularly, with less cost and inconvenience**.

People whose eyes are fine could then avoid unnecessary specialist appointments. And people who are developing retinopathy might be detected earlier, so they can be referred for specialist eye care. The Australian and New Zealand College of Ophthalmology has supported using AI to screen for

retinopathy in New Zealand communities where there are low levels of screening and treatment.[22]

WHAT IS PROMISING ABOUT IT?

- The company behind the system claims that a **clinician can be trained to operate the machine in 4 hours.**
- IDx-DR was **trained to look for the same changes that a human specialist would look for**, so specialists can understand how the system works.
- The early studies supporting IDx-DR were independently managed.
- These studies suggest that when a human specialist says an image *does not* show retinopathy, IDx-DR agrees 91% of the time. When a human specialist says an image *does* show retinopathy, IDx-DR agrees 87% of the time.
- The company claims that the system works for **people from all ancestries.**
- **IDx-DR has regulatory approval in the US and EU**,[23] and was the first medical device to receive regulatory approval in the US that is considered ”autonomous”, which means it can work on its own without a health worker present.
- IDx-DR is being used in the US.
- **The company takes legal responsibility** for the accuracy of the system.

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[22] https://ranzco.edu/wp-content/uploads/2022/08/RANZCO-Position-Statement-Diabetic-Retinopathy-and-diabetic-retinal-screening-in-NZ_2022.pdf

[23] In Australia, the TGA has approved several software products for automated analysis of pictures of the retina, but IDx-DR has not yet been approved.

WHAT MIGHT BE PROBLEMATIC ABOUT IT?

- **IDx-DR only looks for diabetic retinopathy**, so it won't pick up other changes or eye diseases that a human eye specialist would identify.
- **The system is commercially protected**: the source codes are not publicly available and are patented.
- **The research about IDx-DR is mostly funded and/or authored by the company** or people with an interest in the company.
- **It's not clear what happens to the data collected by the system.**
- Evidence shows that IDx-DR can detect retinopathy in real-world settings, but **there is no evidence yet whether this will prevent vision loss**, save costs or improve access to care.

4.4. CASE 4: COGSTACK AND NATURAL LANGUAGE PROCESSING TO SCREEN FOR UNDIAGNOSED DEMENTIA IN MEDICAL RECORDS

WHY THIS CASE?

'Dementia' is used to describe a group of conditions where brain function gradually gets worse. This can lead to changes in people's memory, speech, thinking, personality, behaviour, and ability to walk and move.[24] There are between 400,000 and 500,000 people in Australia with dementia, and this number is going up.[20] As a person's dementia gets worse, they need more and more help to do things. Dementia can seriously affect the person's health and quality of life, and that of their family and friends. People with dementia usually need healthcare and

[24] Australian Institute of Health and Welfare. Dementia in Australia. Canberra: AIHW; 2022.

aged care services for care and support. There is currently no cure: the goal is to help the person maintain independence and quality of life for as long as possible.[20]

Dementia diagnosis requires face-to-face assessment by a specialist doctor.[25] Australians with dementia are often diagnosed late, so may miss out on relevant support. **If dementia could be detected earlier and more accurately, people with dementia might get services and support at an earlier stage** of their illness, and live a better life for longer.

WHAT IS THIS CASE?

This case uses a platform called CogStack to look for dementia based on the digital data in people's existing medical records.[26] It uses a machine learning technique called Natural Language Processing (NLP). **Natural language processing systems can process large amounts of text**. Think, for example, of all of the words written in all of the records in a hospital. A human couldn't think about all of that text at once, but a natural language processing system can process it quickly. It can catalogue and sort the information and look for patterns. This means natural language processing systems are particularly useful for dealing with large amounts of text data.

CogStack can find and extract information from any kind of digital record. It can use structured information (for example, a form that only allows people to tick boxes) or unstructured

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[25] Diagnostic and statistical manual of mental disorders : DSM-5. American Psychiatric Association, editor. Arlington, VA: American Psychiatric Association; 2013.
[26] Enticott J, Johnson A, Teede H. Learning health systems using data to drive healthcare improvement and impact: a systematic review. BMC Health Services Research. 2021;21(1):200.

information (for example, freehand notes). It can use a scanned document or image. It can use notes typed by a healthcare worker. It can analyse for patterns across all of these different types of data. It can also display patterns in a visual form that people can understand.[27,28]

Monash Partners Academic Health Science Centre (MP) received a grant from the Medical Research Future Fund (MRFF). The funds were used to **adapt CogStack for the Australian context and deploy this across health service partners**. One of three case studies occurred at the National Centre for Healthy Ageing (NCHA),[29] a partnership between Peninsula Health and Monash University, and complemented an existing NHMRC dementia grant. The aim of the study was to develop algorithms, using electronic medical record data, to detect the probability of a person having diagnosed or undiagnosed dementia.

HOW MIGHT IT CHANGE HEALTHCARE FOR AUSTRALIANS?

The project is focused on the Mornington Peninsula in Victoria. The National Centre for Healthy Ageing hope, through this project, to estimate how many people actually have dementia on the Mornington Peninsula. They also want to identify which suburbs people with dementia are living in, to improve services and supports available to those people, closer to where they live.

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[27] Jackson R, Kartoglu I, Stringer C, Gorrell G, Roberts A, Song X, et al. CogStack - experiences of deploying integrated information retrieval and extraction services in a large National Health Service Foundation Trust hospital. BMC Med Inform Decis Mak. 2018;18(1):47.

[28] Noor K, Roguski L, Bai X, Handy A, Klapaukh R, Folarin A, et al. Deployment of a Free-Text Analytics Platform at a UK National Health Service Research Hospital: CogStack at University College London Hospitals. JMIR Med Inform. 2022;10(8):e38122.

[29] https://www.monash.edu/medicine/national-centre-for-healthy-ageing

Results will also be used to provide State and National estimates of how many people are living with diagnosed and undiagnosed dementia.

WHAT IS PROMISING ABOUT IT?

- Right now, this system is **only being used to estimate how many cases of dementia there are** in specific areas or populations. But in future, algorithms supported by CogStack might be used **in the clinic** to find individuals with a high chance of undiagnosed dementia.
- If the system could be used to screen for dementia in individual patients, they could be **referred to a memory clinic for a formal specialist diagnosis**, or their General Practitioner (GP) could be notified.
- **Early detection could facilitate early tests and diagnosis** (or getting an all clear).
- If people were diagnosed through a screening process, **they could receive support and treatment earlier** than occurs now.
- The team involved in this project are observing our Community Jury and are keen to **include your views**—and the views of the broader community—to guide future uses of AI in this field.

WHAT MIGHT BE PROBLEMATIC ABOUT IT?

- It is not always clear how these types of AI fit into Australian **regulation** requirements
- There are no proven treatments to cure or delay progression of dementia. So **early identification can't stop the disease, it can only provide earlier support.**
- Algorithms are never 100% accurate, and screening tests always result in some false positives. This would mean **people**

being told they might have dementia, and then, after diagnostic tests, being told they don't have dementia. This could be very confronting for the person and their family.

- Because there is no cure, and because screening tests are sometimes wrong, **some people may not want to be told that they have a high chance of having dementia**.
- Deciding whether or not someone has early/mild dementia is not clear cut. **Some cases of 'mild dementia' may not progress to more severe disease**. People labelled with dementia may experience stigma and negative psychosocial effects from the disease label.

5. Key Terms

Adaptive algorithm	Algorithms designed to create models that develop and change continuously based on new data. Opposite of locked algorithm.
Algorithm	A set of rules, equations or instructions to solve a problem, perform calculations, process data or automate reasoning.
Algorithmic bias	Systematic errors in AI systems that result in unfair or unequal outcomes that privilege a group or an individual over others.
Artificial Intelligence	A set of computer-based technologies that can do things that previously required human thinking and action.
Assistive AI	AI systems that assist humans to make decisions, but use human inputs as well as existing data to provide the answers
Augmentative AI	AI systems that support humans to do tasks – for example by providing information when it is needed
Autonomous AI	AI systems that can complete tasks independent of human decision-making and action
Bias	See algorithmic bias
Big data	Large and often complex data sets that can be used to develop AI technologies.
Clinical data	Detailed information about specific aspects of people, or health conditions (e.g., blood pressure, weight, lab results).
Computer vision	A subset of AI applications that enable computers to analyse images.
Consent	Permission for something to happen or agreement to do something.

Deep learning	A type of machine learning approach that uses very complex algorithms called *multi-layered neural networks*. These algorithms require large amounts of data and create models that are too complex for humans to interpret.
Deliberation	Long and careful consideration or discussion. A citizens' jury aims for informed deliberation i.e. the participants have enough information and time to consider all the relevant issues in the case under discussion.
Diagnosis	The process of determining whether or not a person has a particular medical condition through taking a patient history, examination, and testing.
Direct-to-consumer healthcare	Healthcare and medical functions that are marketed to consumers (the public) rather than healthcare workers.
Expert	A person who is knowledgeable in a certain area. In a community jury, the experts are the ones who give information to the jurors.
Facilitator	A person who helps to guide a group through a process of discussion or deliberation.
Generalisability	When an AI technology is generalisable, that means that it can detect health conditions accurately when used in a different context or population to where the AI technology was developed.
Locked algorithm	Algorithm that produces a model that does not change over the course of its use. Opposite of adaptive algorithm.
Machine learning	A series of techniques that enable computers to learn from data without explicit instructions from a human.
Model	The output of a machine learning algorithm after the algorithm is run on data.

Natural language processing	A subset of AI applications that enable computers to analyse written and spoken language.
Observer	Observers are not part of the research team, but are interested in the jury process. Observers attend some jury sessions, but are not active participants.
Public interest	The public interest is the well-being and welfare of the general public and society.
Screening	Screening involves actively offering a test to a defined group in the population who do not have signs or symptoms to see whether they might be at risk of having a disease.
Supervised learning	A machine learning approach which uses data associated with a known outcome to create an algorithm that can then be used. For example, an AI technology that uses your symptoms to tell you if you have a disease or not (the expected outcome) is based on supervised learning.
Wearables	Any technology designed to be worn, such as smart watch.

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