UNIVERSITY
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AUSTRALIA

Australian Centre for
Health Engagement,
Evidence & Values

Community Jury on Artificial Intelligence in Health

QUESTIONS FROM THE JURY

Contents

1. Jury questions for Prof Farah Magrabi

1.1. EXAMPLES, COMPARISONS, STRENGTHS, WEAKNESSES

1. Are some countries already using AI for diagnosis and screening? What can we learn from them? Is AI currently being used in diagnosis and screening (here or overseas)? If so, for what tasks? Are there any diagnostic AI systems that we can see in use in real time?
2. The jury is very interested in the differences between assistive and autonomous AI. Could you provide key positive and negative (or beneficial and harmful) examples of assistive and autonomous AI? What evidence do we have for their impact (here or in other countries)?
3. Is AI always a product? (like Canary or IDx-DR) Diagnosis is a process: is AI sometimes implemented as a process? Are there any key examples of AI as a process rather than a product in diagnosis and screening? Is it incorporated into a system? The jury has seen examples of AI as products with names/brands.

1.2. DIAGNOSTIC AND SCREENING AI IN PRACTICE

4. Has diagnostic AI been used with diverse populations (not just one ethnicity, but the possibility of mixed ethnicity), or Populations or groups that are historically underserved? Does AI learn the variety of differences in a population and account for this as a factor? Should we be concerned that AI will consolidate or 'average out' what health is and what health ought to be. Will humanity lose health diversity?
5. When AI is used to diagnose or screen someone, would they be told? Are there currently people who know that AI has been used in their care
6. How do assistive systems affect expert attention and decision making? Could they become de facto autonomous if an operator comes to trust the system?
7. Might value judgements by clinicians distort valid AI results?

1.3. AI LEARNING AND DEVELOPMENT

8. The jury is very interested in what it means to say that AI learns? How does it 'learn'? How does it become more accurate? Are there limits to its ability to learn? How long does it take to train an AI to do something as complex as medical diagnosis?
9. How is healthcare AI developed? Do developers (or others) influence how AI systems learn, or their outcomes? Can humans fix errors made by AI systems?
10. Is it correct to say that AI *cannot* make the kinds of judgements that humans might make based on experience or intuition (e.g. recognising that something is not important)?

11. Are neural networks a reliable analogue for brain activity?
12. Especially for autonomous AI systems, what is the risk of establishing a feedback loop within or between AI systems that will lead to an "average-bias"? Once a neural network has been established, with the rules that are guiding it, does have the capacity to become autonomous?

1.4. PERFORMANCE

13. Can AI keep becoming more accurate after it is released, or do some systems not need any more training?
14. If an AI system made decisions based on probabilities, and there were two possible diagnoses with similar probabilities, how would it handle this?
15. If AI is only looking for a specific thing, what happens if it doesn't find another condition so doesn't alert healthcare workers? What kinds of backup systems would be in place for when AI makes an error?
16. Can algorithms predict uncertainty? And can AI predict uncertainty, especially in populations? Does it apply or work in different ethnicities or social groups? Can it make decisions differently in different populations?
17. What is the unit of analysis for diagnostic AI --) e.g. the molecular level of disease? Some other aggregate?

1.5. OVERSIGHT AND INTERESTS

18. Who makes the decision to implement a particular AI product in healthcare?
19. How is oversight, regulation, control and security of healthcare AI systems managed in Australia? Are there any lessons from other countries for how we oversee AI in Australia? How is the potential risk for bias overseen?
20. Who would be responsible for errors or misuse if AI is implemented?
21. What companies are behind healthcare AI? Are they trustworthy? (Especially with our data). Where is the investment coming from?

1.6. ACCESS

22. Could AI increase access to healthcare e.g. in rural and remote Australia? Can everyone access AI in healthcare? If not, why not?

1.7. DATA

23. How do we know that the data being used to develop health AI are good quality? (How are they validated, checked, who signs off, is there a governance panel that reviews the data?) Are health data like MyHealthRecord, vaccination records, myGov data and data from health apps currently being used to develop AI?

24. How safe are the personal data used to develop AI systems? Are there controls on its use? Could increased use of AI reduce our privacy (e.g. increase on-selling of data, data breaches, access by health insurance companies with effects on individuals' premiums)
25. Is medical imaging data of high enough quality for AI to provide a diagnosis? Could AI misunderstand an image? If so, how would misdiagnosis be prevented? Could a good AI machine learning system make mistakes because it is working with poor quality data? (if so, what would happen then?)

1.8. COST

26. How expensive will it be to rollout AI systems for diagnosis and screening? What are the costs? (Is it just the equipment – or also healthcare workers?) Could screening using an autonomous AI be cheaper than the status quo?

2. Jury questions for Prof Katy Bell

2.1. SCREENING AND DIAGNOSIS IN PRACTICE

1. Could you explain what is meant by disease detection?
2. Can you say a little more about 'doing nothing' or 'doing little' as an alternative to screening in populations?
3. We hear on a daily basis of patients going undiagnosed due to medical practitioners not listening to their patients and not undertaking necessary testing to identify the cause of the signs and symptoms. Does research suggest screening might decrease mortality due to missed disease? Is there potential for AI-based screening process to miss more signs of a medical condition?

2.2. EVALUATING SCREENING

4. What criteria are used to evaluate screening programs and diagnostic tests? How consistent are these between countries? Will they also apply for screening using AI?
5. How are benefits, harms and cost-effectiveness defined and measured in evaluation? (would this be similar for AI-based systems?)
6. Can we trust research about screening and diagnosis (e.g. is the interpretation independent and unbiased)?
7. There is a lot of variation in screening and diagnosis practices in the real world – how do researchers remove this variation to create good quality evidence?
8. There is pressure to make tests available quickly. But generating evidence about screening programs seems to require a long time. How can these be reconciled?

9. How do screening researchers make sure their findings are used in practice?

2.3. PATIENT CENTRED SCREENING AND DIAGNOSIS

10. Do you think patient values and circumstances are considered in the application of evidence-based practice? Do you think using AI could change this?
11. Does current screening/diagnostic research apply to patients from all geographical locations, ages, sex, financial backgrounds etc? Does the evaluation of screening consider intersectionality and marginalised populations? Would research about AI in screening/diagnosis include marginalised populations? How would we make sure that all kinds of patients and all kinds of settings and all kinds of clinical practice are represented in data and in decision making?
12. Some people may have all the indicators for a diagnosis but do not want to have a label. Can this 'not knowingness' be honoured?

3. Jury questions for Distinguished Professor Rogers

1.1. TRANSPARENCY, PATIENT INFORMATION AND PRIVACY

1. Is there an existing policy informing patients that AI will be utilised in detecting their diagnosis? Is there any information given to patients in relation to the privacy/confidentiality of any data collected? Is there going to be a detailed information package developed to allow patients to agree to or disagree to AI being used in their case? Can patients have the right to choose whether AI will be used? Do you think patients should be able to opt out of having their data used for AI analysis? Why or why not?
2. If AI was being used on someone within the scope of the people that the AI correctly analysed the data, do patients need to be made aware that it may not be as effective on someone else with a different skin colour or ethnicity?

3.1. GOVERNANCE, REGULATION, LEGAL IMPLICATIONS AND EVALUATION

3. Should the claims of developers of software/algorithms be accepted and adopted or should they be subject to rigorous appraisal, if so who/what should be responsible to conduct this?
4. What do you think about human oversight, to quality check AI, do you think there is a need/no need or varying degrees depending on various factors: previous/no past experience of algorithm/s? That oversight is reduced/removed only after problem free observation period, or never removed?

5. Is there any studies undertaken to understand and protect doctors and clinicians from any ethical or legal consequences of using AI

3.2. RISKS AND HARMS FROM USING AI AND PREVENTING HARM

6. Are you confident that the potential risks or harms of healthcare Artificial Intelligence can eventually be eliminated or at least diminished to a degree that is acceptable to all stakeholders or do you believe that attainment of a very high standard across all areas of health screening, diagnostics and care/treatment is not on the horizon yet? How likely is it that the harms will be addressed?
7. If an AI application is causing bias due to not having sufficient dataset for minority populations, is it a matter of inputting in more or have equal datasets across all population groups? If there was a requirement in place for AI companies and programmers to have the same amount of data for groups based on gender, age, race and ethnicity etc., would this eliminate or reduce the under-representation or equality in the datasets that are used to train AI systems?
8. Is there any further evidence about the performance of AI trained in diverse data sets on terms of the outcomes for patient satisfaction, as well as accuracy and efficiency?
9. Could you provide (if available) the demographics of those that build the AI? Is this predominately cishet white, able bodied men?
10. You have mentioned the problems that can result from bad algorithms, (Robo-debt), what can be done to prevent these seeing the light of day, can they be identified before being released/unleashed on the public, (lab rats)? Should there be a system of reviewing new algorithms before implementation and before ongoing development/modifications?
11. Is there a decision making framework for patients and clinicians about minimising the harm or risk of the use of AI?
12. What are some of the factors underpinning common and specific risks in the use of AI for health diagnosis and detection?
13. We have heard discussions of both potential benefit and potential harms. How are these being weighed? A potential harm to a patient is likely to be considered to the patient as far more heavily weighted than a potential benefit to a field of research by a researcher.

3.3. IMPLEMENTING AI FOR DIAGNOSIS AND SCREENING

14. Do you consider that some health domains are less suitable to AI involvement and are probably best left to be Natural Intelligence, at least in the short term, if so elaborate please?
15. What do you believe needs to happen to ensure best practice in the delivery of health services, AI v Natural Intelligence?

16. If you could design your ideal healthcare Artificial Intelligence system, what things would you consider essential requirements?

4. Questions for Professor Ian Scott

4.1. EVIDENCE FOR AI, BENEFITS AND COSTS

1. Why have there been so few studies undertaken and does that mean we are relying on the developers for accuracy of their AI? Are there enough Australian studies – or are we relying on international evidence that might be less relevant to our setting? Is there a plan to increase the Australian evidence base?
2. Are there any plans to undertake a rigorous set of studies on the benefits of using AI, the potential for cost saving, and greater efficiency from using AI? Do you think there will be randomised control trial evidence generated? Who would do this? Would they compare human performance with AI performance? Would this be on the same patients?
3. What is/will be the process of engaging a necessarily large cohort of clinicians and consumers required for the design, testing and implementation of AI?
4. How would data quality and inclusion of data from diverse participants be managed for such studies?
5. What about diagnosis where different clinicians have different views on what is 'right' and what is 'wrong'. Who will decide the programmers for AI? Will they provide a balanced input into diagnosing conditions or will they be from only 'one camp' so to speak. I see this as a different kind of bias other than just race and gender. In short, who decides the input data?
6. The jury are interested in the benefits and costs of implementing AI, including different types of AI:
   - A lot of AI developments are quite expensive to use – won't AI in healthcare be exposed to the same costs?
   - Are the benefits and costs of AI used to screen for disease different to those for AI used for diagnosis?
   - Are the benefits and costs of assistive AI different to those for autonomous AI?
   - How long would it take for AI products to break even on costs?
7. We have heard discussions of both potential benefit and potential harms. How are these being weighed? A potential harm to a patient is likely to be considered to the patient as far more heavily weighted than a potential benefit to a field of research by a researcher.

4.2. REGULATION AND GOVERNANCE

8. What stage is AI at in regard to a "Regulatory Framework"? Is there a blueprint or roadmap or trajectory for such a framework? How is it being approached? I am interested in the level of involvement of government, clinicians, consumer advocates. Would regulation include investigative powers and punitive powers? Would regulation include a process to handle complaints from injured members of the public? Are there any other features you deem necessary?
9. Are there any alternatives to regulation such as training healthcare professionals towards self-regulation and providing the necessary checks and balances within the practice of medicine itself?
10. What are the current AI regulatory bodies in other countries and how do they operate and give feedback about potential harm done by the use of AI in disease detection and diagnosis, as well as the accuracy of AI? What is happening at international levels through for example UN, EU etc to set international benchmarks and regulatory approaches for AI?

4.3. QUALITY ASSURANCE AND PERFORMANCE

11. Could the performance of an AI that analyses medical record data be affected by the quality of clinical notes? Who will be held responsible for undertaking updates and maintaining the AI functionality?
12. Is there potential for greater error and bias due to AI implementation compared to the status quo? Who would check that an AI-informed diagnosis was correct? Who would be liable if it was incorrect?
13. What measures do you think should be taken to ensure that AI is used in a fair and unbiased way in healthcare?
14. What might happen if the technology does not function or breaks down for a period of time, is there back up support readily available or contingency plans in place for remote clinics? Would there be staff to take over this role if the AI technology breaks down?

4.4. IMPLEMENTATION AND APPLICATIONS OF AI

15. We have been given four examples of AI in use – would AI be used to check only for those diseases (anxiety/depression, lung cancer, dementia, diabetic retinopathy) or could it be used in a wide range of diseases?
16. How are clinicians and consumers engaged in the early stages of implementation. You have discussed functionality on a busy clinical environment and I am wondering how engagement might impact on clinical performance. To me, I can foresee clinician time constraints and busy work environments hindering this process of engagement.

17. How might there be more engagement of clinicians and consumers right from the start with designing, testing and implementing AI application? It seems like the big overseas companies create these AI technologies privately, and it is being taken up in Australia after it is already in use in other countries, so how might consumer engagement occur here?
18. Will AI implementation change the skill requirements of health workers?
19. How has AI been implemented for diagnosis so far. For example, have there been new Medicare numbers introduced? Have there been any other change management strategies in place for this implementation?
20. They promote that this will improve access for rural/remote patients. However, services such as CT/MRI type scans are not always available in rural/remote locations so how is access improved for them? They still need to travel hundreds of kms to get to the scanning centres at which time they are located with the relevant clinicians in that area. The devices still need to be purchased, operated, and interpreted- who is referring these patients and who is assisting them after diagnosis? The issue in rural areas is about access to healthcare, not the quality of the few existing professionals.

4.5. PATIENT/CONSUMER PROTECTION AND ADVOCACY

21. Do you think patients will benefit from the use of AI? Is the use of AI better than current best practice for patient's experience of care?
22. Do you think patients should be able to opt out of having their data used for AI analysis? Why or why not?
23. The jury are very interested in the idea of a patient checklist or patient charter. Are there currently any advocacy organisations in Australia (or internationally) who could assist with making the AI consumer checklist more accessible? Are patient advocates dedicated health consumer not for profit advocacy groups – and how are they funded to ensure they can compete with the multinationals involved in marketing these tests and tools?
24. How have other countries increased the digital health literacy of patients and clinicians? In particular who is responsible and accountable for the digital health information provided (the patient, the clinician and/or the AI specialist?) How accessible is this information? How can digital health literacy be supported for a range of demographics and, in particular, a range of patient needs? Will this be the responsibility of clinicians? If we are discussing health literacy for any informed consent considerations, does this

include considerations of child participation in decision-making of health outcomes? How would this be addressed for those lacking capacity for autonomous decision-making of health outcomes?

5. Extra questions

5.1. UPGRADES, UPDATES, MAINTENANCE, INFRASTRUCTURE

1. Issue around the development of systems. We replace iphones etc. once every three years. The AI systems will need to be upgraded constantly. How will this impact on the AI. Given how much effort goes into approving the AI in the first place. System will need to cope with the updates and upgrades.
2. Post implementation phase, more neglected than the ideation, marketing phase. Needs to be a bit of balance. Few experts suggest more needs to be done more quickly or sooner post implementation to ensure things are working as intended. And not waiting too long for a review to identify that the AI is not working
3. If AI is not reliable/high performance, should it ever be autonomous?
4. Do we have the IT infrastructure to support implementation?

5.2. IMPACTS

5. Problem of loss of clinical skills – more about deskilling?

5.3. REGULATION AND OVERSIGHT

6. Are we really clear where the oversight is at a regulatory level. What organisations, establishments are we taking lead from. Who is policing. Who makes decision to pull an AI from the market.
7. Governance and regulation – is there anything in the regulatory frameworks that could overcome the challenges?
8. The group is seeking information about regulation of AI in Australia, what kind of regulation is needed in Australia, international organisation or cooperation ongoing? Use of AI and protection and safety of health data. What oversight is mandatory or voluntary?
9. Who should roll out these systems? The grand plan does not need to be 'Big Brother' – just need to ensure the investment going in drives home the needs of the community at a public health level. Ensure the benefits are available to everyone. Government supported by many organisations?
10. What control mechanisms will be placed around it to ensure it is development effective? Decentralisations of all AI – AI systems for specific tasks.

11. Still greyness around the governance – e.g. in finance you have a finance governing board that is responsible – e.g. to review data quality, if we're using third party is it safe and credible
12. Software legality – touches access, quality, whether a system helps or not
13. Would it be possible to make all diagnostic and screening AI open source with a public license? Would this address current problems with diagnostic and screening AI?
14. Who decides to implement in a given setting? Will this be based on developer data only?

5.4. SECURITY, PRIVACY, ETHICS

15. Cyber security systems may be an important area which as not been discussed as yet. What are the data security issues.
16. What are the major privacy and ethics issues?

5.5. MARKETS AND INTERESTS

17. Initial implementation. Appears technology is driven by big overseas companies. Will adopting overseas AI further bias use in Australia. Will there be any rules or regulations using data sets from other countries which may not be applicable to Australia
18. Who decides what we prioritise, what we should focus on, how we should proceed. Companies work on things that suit them. Creating solutions that suit their company needs. Where is the umbrella addressing of need – underserved groups, remote communities. In Australia we are adopters – just reacting, we should be proactive. Hopefully in the regulatory space there is a 'grand plan' for Australia's approach to AI.
19. Who is going to be benefited from all of these dollars?
20. The group is seeking information about whether there is one AI system being used by everyone, or each country or each company will be developing their own AI system.

5.6. ACCESS AND FAIRNESS

21. What part of the population will the AI be available too. Will the majority be able to afford, have access too. Is everyone going to have the chance to use these systems. Biggest concern about all AI systems.
22. Is there any research to suggest that AI has actually benefited marginalised groups?
23. Will recommendations be relevant to private healthcare or only public healthcare? How would public vs private work?
24. Performance – insight from someone who might have experienced AI directly

5.7. PATIENT INTERESTS

25. Is there a patient charter of rights?

5.8. RESEARCH

26. More information about the studies. Were they carried out in Australia. Who will be conducting them. Who will be in the studies. Will we have more studies conducted in Australia.
27. Barney – wants to know more about data – who decides what data exists and who decides what data is used?
28. Is the research all developers or is it independent and how is it being disseminated – how can an app be used if its performance is poor?
29. The group is seeking information about the presence of international bodies or standards that could collect data from all cultures or backgrounds; or any databank that contains information from different parts of the world that can be shared to AI developers to avoid bias.

5.9. RELEVANCE AND LOCAL APPLICABILITY

30. Can we have Australian technology for Australians.
31. What work is being done to ensure Australian AI research, development, implementation. And how can we support that.

5.10. PERSPECTIVES & COMPARISONS

32. Is there an example of end to end development and implementation in Australia that is documented and available?
33. Would like to see a SWOT analysis on AI, ranking risks – how to weigh up different risks and opportunities
34. What are the trade offs – who decides the trade offs – when are they dealt with – does the jury have to decide what trade offs are important? – to whom are these trade-offs put up? Will be a problem for performing the task in the jury without understanding the tradeoffs. Structure, conduct and performance of AI. Trade offs different at different levels/for different actors: patient, clinicians, health process, health management.
35. The group is seeking information about perspectives of clinicians and how they feel about the use or implementation of AI.
36. The group is seeking information about whether AI development and implementation takes into account the rural versus metropolitan context of population and health priorities.

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