Kheiron Medical Technologies
AI in Health & Care Award
2nd Patient and Public Involvement Report

July 2023

1. Foreword

Patient and Public Involvement (PPI) has always been at the heart of what we do at Kheiron. Understanding the needs of patients and what the wider public cares about has informed everything, from the development of Mia to the way we communicate about AI. Our commitment to genuine engagement with patients and the public played an integral role in us winning the AI in Health and Care Award and gave us a strong foundation to build on. Our first PPI report published in 2021 summarised our activities leading up to that point and set a clear plan for how we wanted to work with patients and the public going forward. It also included the findings of a patient literature review that has guided some of the topics we have discussed at PPI Advisory Board meetings and our patient acceptability workshops.

In this, our second PPI report published in July 2023, we review our progress against the deliverables set out in our previous report and reflect on how our conversations with patients and the public since then have deepened our understanding of public perceptions of AI.

It is also a chance to evaluate not just *what* we have done, but *how* we have done it. We have collected regular feedback from everyone that we have engaged with and we want to use that to ensure that the experience of working with us is easy, enjoyable and fulfilling.

Lastly, this report is a celebration of wonderful people that have shared their insight, knowledge and experiences with us over the past two years. Their contributions really are shaping the way we implement AI into the breast screening service and we could not do this without them. We learn something new from every interaction with them and they have been a huge source of inspiration and motivation to the Kheiron Team over a challenging period.

With very special thanks to Maura Buchanan, Ali Baron, Hasina Zuberi, Louise Chandler, Rosemarie Wilson, Michael Prior, Tracy Calleran, Mary Barton, Colleen Chandler, Danielle Hargeaves, Valerie Howard, Jan Arkle, Karen Brannan, Leah Jeffries, Anna Dejaegher-Joseph, and Florina Moldovanu.

Sarah Kerruish
Chief Strategy Officer

2. Introduction

Kheiron develops cutting-edge deep learning solutions that support radiologists to improve cancer detection. By combining machine learning, data science, clinical rigour, and human expertise, our solutions are designed to help radiology departments become more effective and efficient, overcome resource challenges, and improve the experience of patients. Mia® (Mammography Intelligent Assessment) is our breakthrough AI platform for breast screening. Mia is designed to empower radiologists and screening services to deliver confident, accurate and timely results to every woman, everywhere.


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How Artificial Intelligence Is Being Used to Detect Breast Cancer That Doctors Miss

Hungary has become a major testing ground for artificial intelligence software to spot cancer, as doctors debate whether it would replace them in medical jobs.

6 MIN READ

Akos Stiller for The New York Times

Nicolás Ortega

Why Do So Many Men Avoid Doctor's Visits?

Experts shared tips for getting over the resistance.

6 MIN READ

As reported in the New York Times and by the BBC, Mia is already helping doctors find breast cancers earlier in Scotland and Hungary.

In September 2020, Kheiron was announced as one of the Phase 4 winners of the first UK Government AI in Health and Care Awards. Phase 4 projects aim to gather the final-stage evidence needed to merit large-scale commissioning and deployment across the NHS.

Since then, we have successfully deployed Mia into 8 NHS breast screening units with 8 more in the pipeline. This means that clinicians are using the AI tool and understanding how it performs.

We are already seeing the real-world impact of what Mia can do and where it is helping doctors detect breast cancers earlier. This was featured on BBC Click and BBC News. A patient named June had her mammogram read by Mia at NHS Grampian in Aberdeen and it successfully detected her breast cancer at an early stage, meaning a better prognosis for her.

We have almost completed our large-scale retrospective study (ARIES) looking at historical mammogram data across 3 different and geographically-dispersed sites, ensuring that Mia can perform and generalise across different groups of women from varying ethnic backgrounds, as well as in different breast screening units using different mammogram machines and software versions.

We are well underway with our (GEMINI) project to use Mia as an 'Extra Reader'. This is taking place in Scotland where we are able to use Mia in real-time as part of the clinical review.

Our first prospective trial (LIBRA), which has taken many years of planning, designing and obtaining national approvals is just about to commence. This will provide valuable data on arbitration behaviour of clinicians using the Mia AI tool for part of the workflow.

3. Progress against our work plan

Deliverable 1: Grow the PPI Advisory Board

At the time of writing our previous report, we had established a PPI Advisory Board with its first two members. We aimed to have a full Board with at least five external PPI Advisers that were representative of women from a range of socio-economic and ethnic backgrounds, as well as bringing different experiences of breast cancer and breast cancer screening.

To do this, we advertised the opportunity to get involved with our PPI work in various channels and forums including Sista Talk, run by the National Black Women's Network, and the Muslim Women Network. We had some initial informal conversations with those that responded to our adverts to tell them more about Kheiron and to find out about their background and interests.

We invited those interested in participating to join our upcoming co-production workshops to develop our PPI Strategy. This was a good opportunity for them to experience how we deliver engagement activities, and to establish whether this was a good fit for both us and them. The group worked brilliantly together, being respectful of others opinions and with each person contributing something different from their own beliefs and experiences.

We followed up, making it clear that we would be led by their preferences in terms of how involved they would like to be in future. We were delighted that everyone who took part in the co-production workshops decided to continue as full-time members of the PPI Advisory Board and feel this is a reflection of how positive these first interactions were. These women believed in our mission and felt that they could add value, which was really important to both them and us.

We gained four new members back at the start of 2022, exceeding our goal and bringing our total to six. Since then, one PPI Adviser stepped down due to other work commitments and we recruited one new Adviser.

The Board is made up of cancer survivors, women of breast screening age, people with a family history of breast cancer and people with loved ones that have been affected by cancer. In January 2023, we recruited our first male Adviser. He brings to the Board his experience as a cancer survivor, his background working on the National Police DNA Database and his insight from contributing to previous AI in breast screening projects.

Our PPI Advisers are from different parts of the UK; Scotland, Bristol, Nottingham, Berkshire and London. They have different ethnic, socio-economic, and educational backgrounds.

Together they have combined experience in nursing, marketing, communications, campaigning, change management, journalism and radio.

Back in 2021, we aimed to hold eight quarterly meetings between October 2021 and October 2023. Our PPI Advisory Board has already met nine times since then, with a tenth meeting planned for September 2023.

They have met for a mixture of formal Board meetings and other engagement activities such as workshops, the majority of which have been online. This has allowed us to meet frequently and hear from people all over the UK.

In January 2023, we held our first in-person meeting in London. After a year of meeting online, it was lovely to meet face-to-face and enjoy lunch together. We used the opportunity to demonstrate how Mia works to our PPI Advisers, to introduce them to different members of the Kheiron Team and to film new content that could be used on our website and social media to show the real people behind our PPI work.
Some quotes that we received from the group include:

"I think it's been a really refreshing experience, I've never done anything like this before and when I first heard about it and wanted to get involved I thought - this is new and I was curious. For me it's been a really satisfying and fulfilling opportunity and what I find exciting is being involved in it very early on."
Louise Chandler, PPI Adviser

"I really enjoy being involved in developing the PPI Strategy, there's a mixture of formal and informal voices and meetings."
Rosemarie Wilson, PPI Adviser

"I'm very excited about the prospect of AI that Kheiron is developing."
Maura Buchanan, PPI Adviser

"I think the impact for women attending breast screening that Mia will have, is giving them more confidence."
Ali Baron, PPI Adviser

Metrics and evaluation

Number of Board meetings delivered: 10
Average attendance at Board meetings: 89%
After individual PPI meetings, we send out anonymous surveys via SurveyMonkey. We ask the same questions each time, and across all of our meetings this year we found that:

- 89% agreed or strongly agreed that the meeting purpose and its objectives were clear
- 94% agreed or strongly agreed that we used our meeting time effectively
- 94% agreed or strongly agreed that they were given enough information to understand the topics discussed
- 94% agreed or strongly agreed that they felt comfortable asking questions
- 100% agreed or strongly agreed that attendees were were given enough opportunity to express their views and ideas

We also ask what is working well and what could be improved for future meetings.

Some of the answers for what has worked well included:

- *Breakout rooms - It is easier to discuss specific questions in a smaller group**
- *There was a good balance of information and time for discussion.*
- *It was good to do introductions at the beginning of the meeting.*
- *Good preparation with slides and breakout room. Allowing people to talk and give their opinions.*
- *Great mix of experiences and interests of people included*
- *Really well facilitated with the opportunity for all to be open and transparent. Great session and discussion.*
- *That we were able to spend time together.*
- *The right mix of people to have a constructive debate*
- *I felt welcome and able/given opportunities to express my opinion*
- *Open conversations, all suggestions and questions were welcome. It was well managed for different personality types and understanding of the topic.*
- *Asking to hear more from the newer PPI voices and how they felt about AI was a great idea, so we could hear these perspectives, as I think these attendees felt more confident to share their views and ask questions.*

- *Good mix of attendees with varied experience*
- *The intro to the session was great as a recap to give context*
- *Hearing other perspectives*

*We received this feedback 7 times throughout the year and continued to use breakout rooms to enable richer discussion.

Suggestions for what we could improve, included:

- *It would have been good to have had a bit more background from all the participants who met for the first time*
- *Comfort break a tiny bit longer*
- *The technology, to try an alternative to Teams **
- *More time in the group discussion*
- *I'm struggling to find something that could be improved, perhaps (if noticeable) there's anyone who is quieter, making sure there's space for them to share/ask questions.*
- *A summary email at the end of each session would be useful as a recap - before the next one - to help us with the journey. Perhaps it might be useful to include some information as prep/context to help us come to the session ready to be informed.*
- *Maybe short introductions for anyone new.*
- *More breakout room time*
- *It worked well for this session, somehow keeping attendees on track to answer the questions posed, which can sometimes be difficult to navigate. More of this going forward would be good so we keep hearing all the voices and views.*
- *Occasional face to face meetings*
- *Understanding next steps*
- *Only a small thing, but continuing to make sure the new people to the group were heard first.*

* We received this feedback multiple times about one of our meetings hosted on Teams where technology impacted our ability to meet in breakout rooms. We switched back to Google Meet for subsequent meetings.

We have also just sent our PPI Advisers a survey to capture their thoughts on what is working well and what we could improve. We will be discussing this in person at our meeting in September 2023 so we can decide how best to take the Board forward and continue its great work.

As part of the AI in Health and Care Award, KiTEC, King's College London and ResPeo Research Leads have been observing many of our PPI Advisory Board meetings and other engagement activities. We very much look forward to receiving their independent evaluation of our PPI efforts and any suggestions to improve the work that we do.

Lessons learned

In future, we would like to expand the Board to include somebody from an Asian background and a Muslim member. We know from the findings of the Independent Review of Adult Screening Programmes in England that there are existing barriers for Muslim women attending breast screening. We also know from our own interviews with women of screening age that Muslim women may have some further resistance to AI being introduced in breast screening.

We have previously tried to advertise the opportunity to be involved on Muslim-specific forums but have been unsuccessful. We may need to enlist the help of a specialist recruiter with reach into this community in order to generate initial interest and awareness. We are then confident in our previously successful approach to onboarding; we will hold informal introductory conversations to answer any questions and build rapport.

before offering some taster engagement activities without any obligation to continue longer-term. We found that once women knew more about Kheiron's values and mission, they were much more motivated to continue working with us. They could also experience for themselves how we go about engaging; we are friendly and warm, and all opinions are valued.

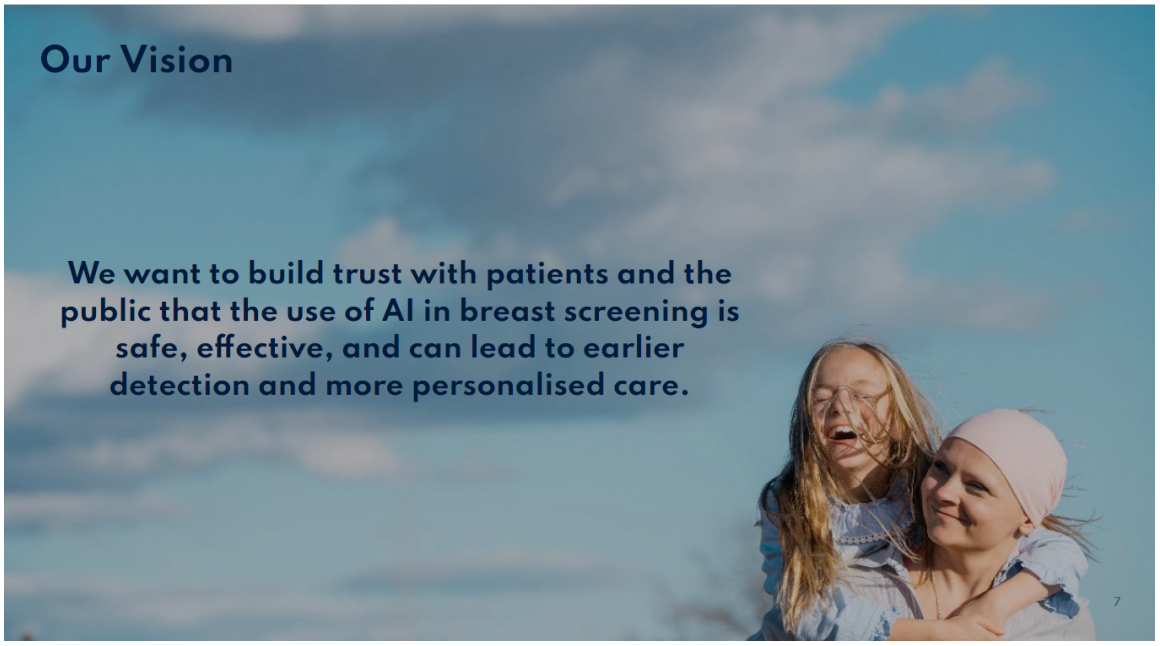
Deliverable 2: Develop our PPI Strategy

One of the key deliverables in our 2021 report was to develop a PPI strategy setting out our vision, how we aim to achieve it and how we will measure success. We wanted to co-produce this with our PPI Advisory Board.

We worked alongside the Co-Production Collective, a community working to support the authentic co-production of research, service and policy development. They planned and facilitated three workshops between May and July 2022. Their independence and expertise ensured that all parties were communicating on a level playing field, and sharing power and decision making.

You can find our PPI Strategy on our website, alongside a recording of the webinar where our PPI Advisers presented the strategy and shared their experience of developing it together with several of our AI in Health and Care Award stakeholders. The strategy was born entirely from their ideas and input so it was really important that they had the opportunity to share it in their own words.

The strategy includes our shared vision (where we want to be in the future), our mission (what we need to do to get there) and our action plan (how we will do it, broken down into specific activities).



Our mission is formed of two parts:

- To raise awareness among patients and the public about the potential benefits of Mia.
- We will consult and engage with patients and the public so we can better understand concerns about Mia and AI in general, and how best to reassure them.

We identified the smaller actions that need to be taken in order to achieve our mission. These broadly fell into four categories:

1. Gaining knowledge and insight; listening to the public's views; monitoring attitudes
2. Creating public-facing information
3. Sharing our patient and public involvement work with the world
4. Influencing key stakeholders and decision-makers

Metrics and evaluation

We discussed at length with the PPI Board how to track our progress against the actions in the strategy and decided to create a dynamic action plan. This would give us goals to work towards and keep us focussed whilst giving us flexibility to adapt our plans based on the regulatory landscape, resources, changing priorities and new opportunities. We will review the action plan at each quarterly PPI Advisory Board meeting.

Our focus for Q2 2023 was to deliver the workshops set out in the first section of our strategy - Gaining knowledge and insight; listening to the public's views; and monitoring attitudes. Our focus for Q3 2023 was to produce this PPI report. We will be reflecting on both at our next meeting in September 2023 and deciding which actions to prioritise for Q4.

Lessons learned

We are obviously delighted to have been successful in producing this PPI strategy, but we are most proud of the way in which it was produced. The process of co-production was very rewarding for everyone involved and has resulted in a strategy that feels authentic, personal to 'us' collectively, and very closely aligned with what matters most to patients and the public.

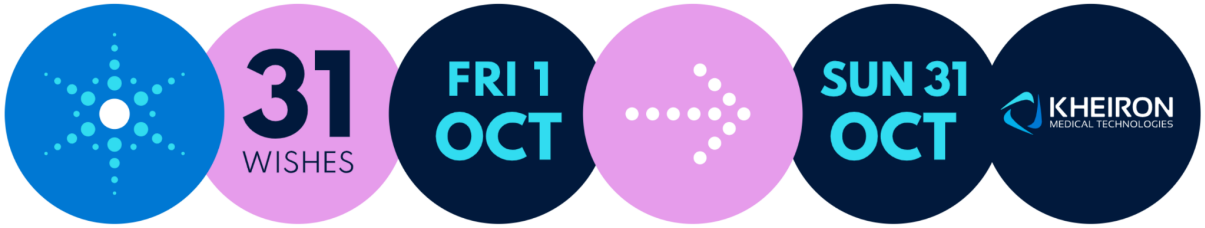
We also feel we gained a lot from the Co-Production Collective's input. They ensured that we were working in equal partnership and for equal benefit, and really living and breathing the values of co-production throughout.

Deliverable 3: Amplify the patient voice

In order to effectively communicate our mission, we have to put the most important voice - that of women, breast cancer patients and their loved ones - at the forefront of what we do. We recognised the need to share our PPI work with the world and ensure the voice of patients and the public could be heard clearly on our website and channels.

We successfully delivered our 31 wishes campaign in October 2021, for Breast Cancer Awareness Month. We were honoured to share the stories of 31 people who have been affected by breast cancer. Our storytellers include patients and survivors, their spouses, children, parents and daughters, plus radiologists and oncologists. Collectively, these 31 stories convey our wish for the future of breast cancer awareness: That, working together, we can give every woman, everywhere a better fighting chance against breast cancer. The

videos are unscripted, told in the participant's own words, and filmed using their own smartphones, computer screens or video conferencing.



We also launched a new 'engage' section of our website focussed entirely on sharing our PPI work and amplifying the patient voice in different formats such as blogs and videos.

Lastly, we have created a central repository of content for the Kheiron Team to use in their daily work. This includes:

- Public-facing materials such as our PPI reports and strategies
- Recordings of webinars led by our PPI Advisers
- Photo and video content captured at our in-person PPI Advisory Board meeting in January 2023
- 31 wishes campaign content

Metrics and evaluation

In our previous report, we committed to measuring the performance of our 31 wishes campaign based on a few key metrics. Across Breast Cancer Awareness Month we reached:

- Videos from 38 real people affected by cancer
- 1125 people viewing Kheiron's emails about the campaign
- 528 views of the campaign web page
- 33,385 impressions on LinkedIn
- 42 retweets and 116 likes on Twitter

We also received extremely positive anecdotal feedback from participants and viewers of the campaign

Anxiously awaiting each day's story… thank you & your team for asking me to participate!
Donna, breast cancer survivor

This is such a positive statement for the benefit of many. Thank you.
Stephen Bromhall, CIO NHS Trust

I want to send a HUGE congratulations for Kheiron's 31 Wishes campaign. It is moving, effective, and SO well-done. I am honoured to be a part of this effort. Kudos!
Andrea, CEO Brem Foundation

Congratulations on the beautiful 31 wishes campaign. It is really magnificent. Of course I love Andreas' wish most! Sincere gratitude for your hard work on this campaign, and congratulations on a job very well done!
Dr Rachel Brem, Director of the Breast Imaging and Intervention Center at George Washington University & Cancer Center

Thank you for including me. It's nice to think I've done something "significant" to highlight awareness for others in my 10th year post breast cancer diagnosis. I hope it's a very successful media campaign.
Sharon, breast cancer survivor

Lessons learned

We have reflected this year on maintaining the right balance between delivering high-quality engagement activities such as our Board meetings and workshops, and sharing our PPI work on our website and social media. During busy periods, we have prioritised engagement activities. At our September 2023 meeting, we will work with PPI Advisory Board members to create a timeline for the 'engage' section of our website to ensure that there is a steady stream of content over the coming months.

Deliverable 4: Engage with PPI Leads at NHS sites

Back in 2021, we set out to engage with PPI Leads at the various NHS sites that we were working with as part of the AI in Health and Care Award. The purpose of this was to understand:

- The demographics of their local screening population
- Data on screening uptake
- Any existing patient groups that may wish to take part in our PPI activities
- Any other barriers or opportunities.

This deliverable was initially delayed whilst contracts with NHS sites were being finalised but since then we have struggled to make any progress building meaningful relationships with PPI Leads at sites. Despite reaching out to contacts suggested by the project teams at partner sites with a facilitated introduction, we were met with resistance as a commercial company.

We tried to explain that we would be implementing our AI in their local screening service as part of study funded by the NHS, and that it was in everyone's interest for us to gather the views of local women of screening age. We also made it clear that no resources were required of them when it came to delivering any engagement activities, nor were we seeking their public endorsement; this was a scoping exercise and we needed information about the local landscape in order to make this a success.

In April 2023, we decided to reach out again to PPI contacts at each of the NHS sites working with us to ask for their help to advertise the opportunity to take part in some online workshops. Our aim was to have representation from patients or members of the public from each of our partner sites. Despite having some interest from NHS staff, only one PPI representative was referred to take part in our workshop.

Lessons learned

Despite significant effort, we have been unable to build a collaborative working relationship with PPI Leads within the NHS. Our aim has always been to continue delivering an industry-leading patient and public involvement programme, with minimal effort required from NHS colleagues. However, their input and cooperation would significantly improve the quality of our engagement and enormously benefit both patients and the NHS AI Lab. We would very much welcome support from the PPI Team within the NHS AI Lab to facilitate introductions to relevant colleagues and help broker relationships where there is mistrust or confusion around working with tech companies on NHS funded projects. It would also be beneficial to share learnings

with other AI companies on this topic; we are all working towards the same goal of better understanding public perceptions of AI.

Deliverable 5: PPI activities at sites

As mentioned above, we aimed to work alongside patients and the public at each of the NHS sites participating in the award, to build on our previous research into the attitudes and beliefs of AI being used for mammography. We planned for this to take the form of workshops focussed on the areas of concern highlighted by our literature review and specifically the findings outlined in the paper by Pouyan Esmaeilzadeh[1]; technological concerns, regulatory concerns and ethical concerns.

Without the necessary input from local PPI Leads we were unable to deliver a PPI activity at each individual partner site. Instead, we delivered two online workshops covering the three areas of concern and sent an invitation to all of our sites asking for them to advertise the opportunity to be involved locally. Unfortunately, we did not get representatives from each site.

The two workshops were delivered between May and June 2023 with support from the Co-Production Collective. Eleven patients and public representatives attended. Having a smaller group led to rich discussions and allowed us to get deeper into some of the issues than we would have been able to with a larger group.

Workshop findings

Our first workshop focussed on technological concerns. Participants were split into two groups to discuss either safety or human involvement, thinking about questions that members of the public might have including:

[1] *Use of AI-based tools for healthcare purposes: a survey study from consumers' perspectives - BMC Medical Informatics and Decision Making*

- Is AI safe?
- What happens if the AI fails?
- Will a human be involved? How?
- Will I lose out on face-to-face interaction with a clinician?

They were asked to discuss their own thoughts and beliefs, and whether these issues were something that they personally would be concerned about and why.

There were a broad range of views but it was interesting how perceptions of safety were so heavily influenced by the level of human involvement. Some expressed that they would not be concerned about safety at all if they knew that there was 'still an expert human involved' or that the use of AI alone made them feel 'uneasy.' Many participants felt that a combination of human and AI involvement felt safest, as the AI could potentially 'reduce human error'. One pointed out that the current process is not perfect and can miss cancers, so AI could improve accuracy.

One participant expressed that AI currently feels like 'the unknown' and said that we need to develop the public's confidence in what they called 'non-human tech.'

There was a strong feeling that AI should not be used to replace human interactions. This is in line with our focus on providing AI solutions to support radiologists, not replace them.

Interestingly, the group took a broad view of the term safety. They didn't just focus on the AI missing cancers but also discussed other aspects of safety including:

- the impact of recalling women back unnecessarily
- keeping people's data safe
- the impact of AI on screening uptake - 'there is no point it being safe if it isn't used'
- whether we have enough data to show that it works for different ethnicities.

The group also discussed the potential positive impact of being able to reassure patients about safety, theorising that if the data could say that AI works better than humans on particular women (based on their ethnicity or breast density) then this could increase screening uptake.

We asked participants what information might help to alleviate concerns about safety and human involvement. Answers included information, particularly 'facts and figures' about:

- which regulatory bodies are assessing the AI
- whether it has been independently tested
- who is involved and who the ultimate decision makers are
- data on how Mia performs for different ethnicities and breast densities
- how healthcare professionals feel about using Mia (positive testimonials).

They said that it wasn't important to know exactly how Mia works in order to feel it is safe.

We asked about the right level of information to provide and the unanimous response was that a basic level of information should be provided to everyone but that we should link to further information for those that want it e.g. on our website. They felt this struck a balance between materials being clear, concise and suitable for everyone whilst allowing those that needed further information to feel reassured to seek this out.

Other advice included offering information in different formats to suit different learning styles: visual, auditory, reading and writing, and kinaesthetic. Many felt videos would be effective especially using real people and their stories. We were also encouraged to learn from other high-quality information materials such as those provided by national charities like Macmillan and Breast Cancer Now.

When it came to language, we were told to avoid 'confusing jargon'.Several participants felt the term 'AI' could be 'problematic' and 'fear mongering' especially as the experience of going for a mammogram wouldn't be changing and humans would always be involved. We were told to make this very clear in all communications. The group favoured terminology such as 'assisting' and 'working alongside' radiologists.

When it came to timings, we were guided that earlier information in screening invite letters would 'reduce anxiety and fear', and that radiographers could play a role in signposting to further information.

Our second workshop covered regulatory concerns and ethical concerns. Participants were split into breakout rooms to discuss the following concerns:

- **Data privacy:** What happens to my data? Who has access to it? What happens if there is a data breach?
- **Perceived social bias:** Does AI work for everyone, or will it exhibit some level of discrimination?
- **Regulation and evaluation:** Who assesses the performance of the AI? How is this regulated? How is performance audited?
- **The future of AI:** How will this AI be used in future? Will it take over and replace humans? What are the limits to what it can do?

Data privacy

The group discussed heightened awareness of data privacy concerns in general since the introduction of the GDPR regulations.

They pointed out that the breast screening service already processes and stores their health data, and they know very little about how they store it or how long for. It made some people feel ok that 'it is collected through the NHS' whilst others felt that the introduction of AI would create 'an extra layer of data' that must be kept safe and secure. One person also expressed that 'recognising the brand' of the companies involved in processing their data could help them feel more comfortable.

Some were unsure what a data breach would mean for them, and felt that their feelings about this really depended on what sort of data would be leaked.

Information required to help their understanding of the issue included:

- what exactly would happen if there were a data breach
- if there are any third parties with access to data
- whether they would be informed of any data breaches.

Advice on how to communicate about data breaches with the public included:

- being honest and transparent - 'they don't want to find out about it in the news'
- sharing the 'next steps'
- setting out what have put in place to prevent it happening, or will put in place in future
- including details for where to find more information
- ensuring we don't exclude people who don't have access to a computer or telephone
- offering support particularly to people who may be newly diagnosed with cancer and struggling.

Perceived social bias

The group discussed the fact that bias is inherent in AI because it relies on the data that it is built from and that it can 'only use the information it is given.'

They were interested in many forms of bias including for different ethnicities, different socio-economic backgrounds (based on who is more likely to attend breast screening), different ages, different genders (transgender and non-binary patients), different breast densities and different clinical needs e.g. symptomatic or patients with high familial risk.

They felt there could be a role for Kheiron in encouraging uptake in certain ethnic groups in order to improve the data the AI is trained from, and also in trying to use the AI in other countries with poorer access to breast screening.

One interesting question that arose was whether the AI itself could use an image to identify differences in patient demographics.

Lastly, the group discussed when we would know that we have had 'enough data' for the AI to be 'good enough.'

Regulation and evaluation

The group understood the importance of regulation and acknowledged that all NHS work is governed by regulations; one example that was given was that NICE regulates drug treatments. One participant said 'as a patient I want to know there isn't a cowboy doing things' and another said 'it's good to have regulation to mitigate against bad actors.' However, most participants were unsure exactly who regulates AI or how they could easily find this out.

The group was also interested in the balance between regulation and freedom to innovate. One participant expressed that they 'want the customer to be in the driving seat, not the regulations' and another said 'I find that there are lots of barriers with regulations when developing a product, but it needs to be able to develop.' A third participant said that 'sometimes you have barriers from legal teams that don't understand the tech or the user.'

It was also pointed out that 'not everyone trusts the NHS, nor knows the details or wants to.' This was an important reminder for us to be mindful that whilst including logos and other details of NHS partners or 'trusted' organisations may increase acceptance for some, it could do the opposite for others.

The group encouraged us to focus on sharing the benefits of Mia. They said it's important to make it clear that this is a legitimate use of AI and 'Mia is designed to improve services, not to blow up the world.'

In terms of sharing information on how we're regulated, they said that frequently asked questions were a good format and that we should make the information engaging because 'not everyone reads the details on hospital letters, they just take the date for their diary.'

The future of AI

This topic was not one of the three concerns highlighted by our literature review in 2021 but was instead inspired by conversations with our PPI Advisory Board about fear-mongering in the news about the dangers of AI. A lot of these stem from the fear that technology is developing too fast for regulators to keep up.

There were very mixed views about whether this is something that would personally concern participants. However, the group felt it was important to directly address the concerns in the media, for example spelling out that Mia is not going to take away people's jobs but instead fix existing and worsening workforce shortages.

One participant said that in a situation where there were not enough radiologists for the screening programme to continue operating at the same capacity, the use of AI with no human involvement might be necessary and better than no screening at all.

Another asked 'If AI becomes more intelligent than humans, will we become more reliant on it?'

Other concerns were around continuing to audit, update and improve Mia's performance particularly as tumour morphology could evolve over time. One participant wanted this to be done 'with the same rigour that is allowing Mia to be introduced into the breast screening service initially.'

Overall, the assurance that Mia will always be used alongside humans helped alleviate concerns.

Metrics and evaluation

We used our tried and tested questions on SurveyMonkey to collect feedback from attendees. We found that:

- 100% agreed or strongly agreed that the meeting purpose and its objectives were clear
- 90% agreed or strongly agreed that we used our meeting time effectively
- 100% agreed or strongly agreed that they were given enough information to understand the topics discussed
- 90% agreed or strongly agreed that they felt comfortable asking questions
- 100% agreed or strongly agreed that attendees were were given enough opportunity to express their views and ideas

Lessons learned

We planned the workshops at a PPI Advisory Board meeting in March 2023 and decided that long-standing Board members should attend so that they could hear discussions first-hand. We collected feedback anonymously after the first workshop and found that some newer PPI representatives felt unsure about their own contributions to the session because it was clear that there were others with more specific knowledge of AI and Mia.

We addressed this by re-briefing PPI Advisory Board members before the second workshop. We also re-emphasised at the start of the meeting that all opinions were valued. In fact, those with little prior knowledge about AI were more representative of ordinary people attending their breast screening appointment and therefore could tell us a lot about public perceptions.

These workshops were very valuable and we would love to repeat similar sessions on a wider scale with women from across the UK, with the help of the AI Lab and PPI Leads at NHS sites.

Deliverable 6: Design study patient information materials

We want to ensure women have access to high quality information materials about the prospective study. At the time of our last report, we had already begun conducting one-to-one interviews with women of screening

age. The purpose of the interviews was to understand their information needs and preferences. The interviews were a mix of virtual and face-to-face and lasted around 90 minutes each. Example materials from other similar studies were used as a prompt for discussion. The interviews gave us valuable feedback on the best format, layout, content, and style of various information materials including a revised screening invite letter, patient leaflet, poster, information video and trial webpage.

For our LIBRA study (our first prospective trial) we used this feedback to produce a:

- Patient information sheet
- Frequently Asked Questions
- Poster (see Figure 1.)
- A leaflet that will be included in screening invite letters
- Public-facing web page with links to all of the above, as well as a patient video.

These materials were all tested with a larger group of women for further iterations and refinements.

We also produced a poster for our GEMINI project in Scotland (see Figure 2).

Figure 1: LIBRA study poster

Metrics and evaluation

We planned to include metrics such as the number of page views on the LIBRA study webpage, views of the information video, and any anecdotal feedback from women and clinical staff at study sites. Once the LIBRA study has commenced, we will monitor these metrics and carefully review them once the study is over. This will inform how we produce future information materials.

Lessons learned

The initial one-to-one interviews with women helped us to establish their preferences on how they receive information. By developing the materials with their input from the very beginning, we were then able to produce first drafts for their review that required very little tweaking.

We found their input useful, particularly around the level of information included in different materials and the language we use. For example, they fed back that the term 'Artificial Intelligence' is not well understood and could cause more confusion. Many of them preferred explaining Mia as a 'new technology' that we are evaluating. They also steered us to include a basic level of information in posters and leaflets, whilst offering more detailed information for those that required it in the form of frequently asked questions.

We will continue seeking input from patients and the public for all public-facing information materials we produce in future.

Figure 2: GEMINI project poster

Deliverable 7: Internal training for Kheiron staff

We wanted PPI to become part of the organisational culture at Kheiron and for everyone to be clear about the benefits to their area of work. To do this, we delivered a series of training sessions and set up ways to share learning including:

- Delivering our first PPI introductory session at our all-staff meeting in January 2022. This gave an overview of what PPI is and how it can benefit an organisation like Kheiron. We also reflected on the success of our 31 wishes campaign a few months earlier.
- Holding a Lunch and Learn for staff with the Co-Production Collective exploring the values of co-production and how to know you're 'doing it right.'
- Unveiling our new PPI Strategy by inviting our PPI Advisers to present it at our all-staff meeting and allowing questions.
- Actively using our PPI channel on Slack to share interesting articles and ideas, many of which are recommended by our PPI Advisory Board members.
- Setting up a folder of PPI resources including webinar recordings and copies of our PPI materials, to be shared with new staff as part of their induction.

Metrics and evaluation

We did not have any specific metrics associated with this deliverable but have had fantastic feedback from staff, particularly when they have been able to hear directly from our PPI Advisers. The Kheiron Team finds hearing about our PPI work a great source of motivation and a reminder of their reasons for working here.

Lessons learned

This deliverable should remain as a long-term commitment to continual learning for the organisation. We will continue trying to build in opportunities for the Kheiron Team to hear directly from our PPI Advisers, and to share what we are working on.

Deliverable 8: Building relationships with other trusted stakeholders

Trust was a key theme in our literature review, and we felt it was important that we understand other organisations, people and sources of information that are trusted by women.

We reached out to several patient-facing breast cancer charities back in early 2022, hoping to work on a mutually beneficial project to understand more about public perceptions of using AI in breast cancer screening or to understand more about barriers to participating in screening more broadly. We learnt that corporate policies prevent larger charities from working with organisations that have a financial interest in breast cancer such as tech and pharma companies, and this would therefore not be possible.

Lessons learned

As AI becomes more widely implemented into breast screening services, we would like to reconnect with national charities to feed into updated patient materials. This information would be vendor-agnostic but would include basic information about how AI may be used when they attend their breast screening appointment and how to find out more.

Deliverable 9: Second PPI report

This report is a contractual deliverable for the AI in Health and Care Award and was originally planned for September 2022. With agreement from the NHS AI Lab, we changed this to July 2023 in line with other changing milestones.

Metrics and evaluation

Dr. Maria Kordowicz is the NHS AI Lab qualitative lead based at ResPeo (sub-contractors of KiTEC) and is researching the organisational implementation and clinical user acceptability of AI. Dr Kordowicz has observed many of our PPI Advisory Board meetings and other engagement activities, and this report will be reviewed in her evaluation of how we as an organisation deliver PPI as part of implementation.

Lessons learned and conclusion

The process of writing this report and looking back on our PPI work over the last two years has been incredibly useful. We are very pleased to have delivered almost everything we set out to achieve and feel this reflects a wise choice of deliverables. In particular, we are proud of the way the PPI Advisory Board has grown and developed, and of the PPI strategy that we have co-produced together.

Despite challenges engaging with PPI Leads at sites, we still managed to deliver the patient acceptability workshops and now have a blueprint to hopefully repeat them on a wider scale.

Outside of the AI in Health and Care Award, we would like to continue producing regular updates of our PPI work. It's important to review progress and celebrate successes, and reflect on what we could do differently. Our next update will focus on progress against the actions set out in our PPI Strategy.