

Patient Perceptions and Attitudes Towards the use of Artificial Intelligence in the Symptomatic Breast Unit

ELECTRONIC SUPPLEMENTARY MATERIAL

Questionnaire:

Patient perceptions of the use of Artificial Intelligence (AI) in the symptomatic breast unit

Artificial Intelligence (AI) tools are showing huge promise in assisting doctors who report imaging (radiologists), to improve workflow and reporting, and help doctors to identify areas of concern on mammogram.

This is an anonymous, voluntary questionnaire we are conducting to understand patient's opinions on the use of AI in healthcare, particularly in breast imaging. We currently do not use any AI tools for reporting mammograms in the Beaumont Breast Centre.

1. What age are you?

15 – 29 years

30 – 39 years

40 – 49 years

50 – 59 years

60 – 69 years

>70 years

2. What is your ethnicity?

White Irish

Irish ~~traveller~~

Any other white background

Black, African

Any other black background

Asian, Chinese

Any other Asian background

Other Ethnic background

Prefer not to say

3. What is your highest level of education?

Junior certificate or equivalent

Leaving certificate or equivalent

PLC Course

Bachelor's degree

Masters or higher degree

4. Have you ever been diagnosed with breast cancer?

Yes

No

5. Do you have a have a parent or sibling with breast cancer?

Yes

No

6. Why are you attending the breast clinic today?

Investigation of a breast symptom

Mammogram for history of breast cancer

Mammogram for family history

Breast Biopsy

Clinic Follow-up

Other – Please Specify

7. How would you describe your interest in AI in general?

Strong Interest

Some Interest

No Interest

Don't know

8. The use of AI in healthcare is a good idea.

Strongly agree

Agree

Neither agree or disagree

Disagree

Strongly Disagree

9. In the future would you agree to an AI tool reading your mammogram in addition to a doctor who reports images (radiologist)? (Mammogram is read by AI and a single human reader)

Strongly agree

Agree

Neither agree or disagree

Disagree

Strongly Disagree

10. In the future would you approve for an AI tool to be the only reader of your mammogram? (Only the AI tool reads your mammogram - No human reader)

Strongly agree

Agree

Neither agree or disagree

Disagree

Strongly Disagree

11. How do you feel about the following statement?
I think replacement of breast radiologists by AI could happen in the future.

Strongly agree

Agree

Neither agree or disagree

Disagree

Strongly Disagree

12. How do you feel about the following statement?
Even if AI tools are more efficient and quicker at reading mammograms, I still prefer a human radiologist to read my mammogram.

Strongly agree

Agree

Neither agree or disagree

Disagree

Strongly Disagree

13. Even if AI tools are more accurate at reading mammograms, I still prefer a human radiologist to read my mammogram.

Strongly agree

Agree

Neither agree or disagree

Disagree

Strongly Disagree

14. In your opinion if a mammogram is read by a radiologist AND an AI tool, and an incorrect result is given to the patient, who is at fault?

Developer of AI tool

Human radiologist

Both

Neither

15. How do you feel about the following statement?
If my mammogram images were fully ~~anonymous~~, I would feel comfortable sharing my images with other hospitals or AI companies to help develop and improve AI tools for future detection of breast cancer.

Strongly agree

Agree

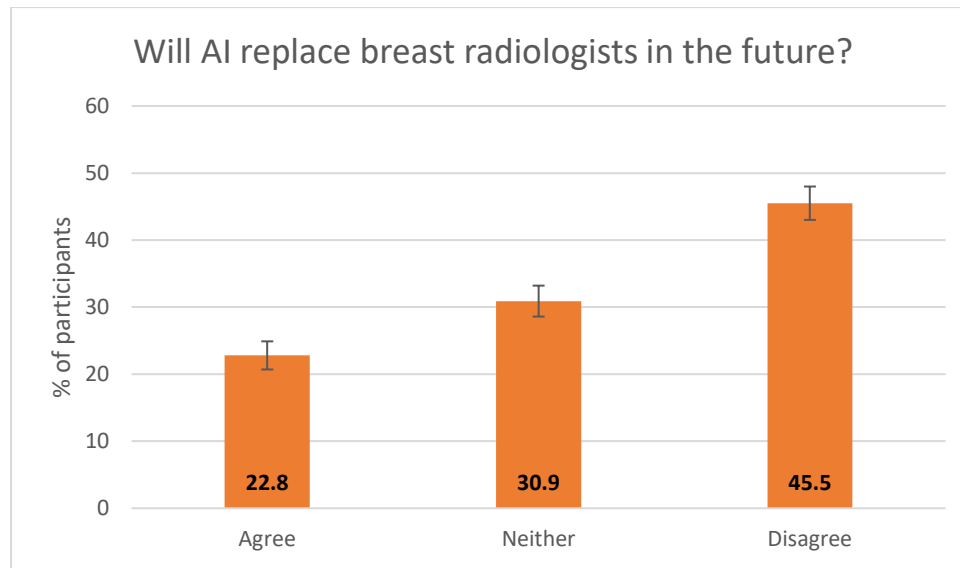
Neither agree or disagree

Disagree

Strongly Disagree

Thank you for taking the time to complete this survey.

Supplementary figure 1 –
Questionnaire on patient
perceptions on the use of AI in
breast clinic



Supplementary Figure 2. Responses to question asking participants whether they feel AI will replace breast radiologists in the future. The y axis represents percentage of participants with the error bars representing 95% confidence intervals.

Supplemental Table 1. Multinomial logistic regression on the question asking participants if they prefer a radiologist even if AI is more accurate

Prefer a radiologist even if AI more accurate – agree	Relative Risk (RRR)	P value	95% confidence interval
Age			
<40 years	1 (base)		
40-49 years	1.25	0.205	0.89-1.75
50-69 years	1.60	0.013	1.12-2.32
>70 years	1.84	0.038	1.03-3.28
Education level			
Leaving certificate & below	1 (base)		
PLC/Bachelors & above	1.02	0.866	0.78-1.35
History of breast cancer			
Family history of breast cancer	0.92	0.608	0.69-1.25

Personal history of breast cancer	1.29	0.127	0.93-1.79
Interest in AI			
No interest	1 (base)		
Some interest	0.86	0.358	0.62-1.19
Strong interest	1.17	0.506	0.74-1.85
Don't know	0.88	0.542	0.58-1.33
Neither agree or disagree	Base outcome		
Prefer a radiologist even if AI more accurate – disagree	Relative risk (RRR)	P value	95% confidence interval
Age			
<40 years	1 (base)		
40 – 49 years	0.84	0.553	0.48 – 1.48
50 – 69 years	1.25	0.464	0.69 – 2.28

>70 years	0.37	0.217	0.08 – 1.78
Education level			
Leaving certificate & below	1 (base)		
PLC/Bachelors & above	3.25	<0.001	1.84 – 5.76
History of breast cancer			
Family history of breast cancer	1.34	0.224	0.84 – 2.15
Personal history of breast cancer	1.18	0.565	0.68 – 2.04
Interest in AI			
No interest	1 (base)		
Some interest	0.91	0.752	0.52 – 1.61
Strong interest	2.14	0.031	1.07 – 4.28
Don't know	0.48	0.124	0.19 – 1.22

Supplemental Table 2. Distribution of all responses to all questions in the questionnaire

Age	<30	30-39	40-49	50-59	60-69	>70	Unknown	
	50 (3%)	233 (15%)	549 (36%)	402 (26%)	163 (11%)	135 (9%)	2 (0.1%)	
Ethnicity	White Irish	Irish traveller	Any other white background	Black, African	Any other black background	Asian, Chinese	Any other Asian background	Other
	1267 (83%)	6 (0.4%)	166 (11%)	26 (2%)	0	27 (2%)	20 (1%)	22 (1.4%)
Education	Junior certificate or below	Leaving certificate or equivalent	PLC course	Bachelor's degree	Master's or higher degree	Unknown		
	184 (12%)	386 (25%)	224 (15%)	411 (27%)	270 (18%)	59 (4%)		
Previous breast cancer diagnosis	Yes	No	Unknown					
	372 (24%)	1154 (75%)	8 (0.5%)					
Family history of breast cancer	Yes	No	Unknown					
	367 (24%)	1145 (75%)	22 (1%)					
Reason for breast clinic attendance	Investigation of a breast symptom	Mammogram for history of breast ca	Mammogram for family history	Breast biopsy	Clinic follow up	Unknown		
	770 (50%)	294 (19%)	201 (13%)	7 (0.5%)	236 (15%)	26 (2%)		
Interest in AI	No interest	Some interest	Strong interest	Don't know				

	331 (22%)	732 (48%)	211 (14%)	235 (15%)		
Use of AI in healthcare is a good idea	Agree	Neither	Disagree	Unknown		
	711 (46%)	673 (44%)	113 (7%)	37 (2%)		
Mammogram read by AI & radiologist	Agree	Neither	Disagree	Unknown		
	935 (61%)	392 (26%)	198 (13%)	9 (1%)		
Mammogram read by AI only	Agree	Neither	Disagree	Unknown		
	160 (10%)	339 (22%)	1026 (67%)	9 (1%)		
AI could replace radiologists	Agree	Neither	Disagree	Unknown		
	350 (23%)	474 (31%)	698 (46%)	12 (1%)		
Even if AI more efficient, still prefer a radiologist	Agree	Neither	Disagree	Unknown		
	1156 (75%)	286 (19%)	72 (5%)	20 (1%)		
Even if AI more accurate, still prefer a radiologist	Agree	Neither	Disagree	Unknown		
	1014 (66%)	364 (24%)	125 (8%)	31 (2%)		
Who is accountable for an incorrect result	AI developer	Radiologist	Both	Neither	Unknown	
	91 (6%)	154 (10%)	1130 (74%)	91 (6%)	68 (4%)	
Willing to share images for AI research	Agree	Neither	Disagree	Unknown		
	1083 (71%)	235 (15%)	154 (10%)	28 (2%)		