BCS, The Chartered Institute for IT's response to National Screening Committee's 'Use of artificial intelligence for image analysis in breast cancer screening' Consultation

Prepared by Arnoldis Nyamande, Policy Manager, BCS - The Chartered Institute for IT

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BCS, The Chartered Institute for IT

The purpose of BCS as defined by its Royal Charter is to promote and advance the education and practice of computing for the benefit of the public. We bring together industry, academics, practitioners, and government to share knowledge, promote new thinking, inform the design of new curricula, shape public policy and inform the public. As the professional membership and accreditation body for IT, we serve nearly 60,000 members including practitioners, businesses, academics, and students, in UK and internationally. We accredit the computing degree courses in ninety-eight universities around the UK. As a leading IT qualification body, we offer a range of widely recognised professional and end-user qualifications.

BCS is the largest professional body in the Federation for Informatics Professionals (FEDIP), the awarding body for the only UK professional register dedicated to health and social care. In this sector we collaborate with the UK Government and devolved administrations, over 40 NHS

Trusts and health organisations and thousands of members to support the development of IT, digital and information professionals; driving professional-development and lifelong learning to improve professional skills, competence and public trust.

Summary of the BCS position

BCS is supportive of the role AI has to play in improving the health and care of the population and supports the NSC's position outlined in the consultation document: 'Use of artificial intelligence for image analysis in breast cancer screening – Rapid review and evidence map[1]' not to endorse the implementation of AI for Breast Cancer Screening in the UK at present.

Taking an iterative approach where we walk before we can run in such critically important areas of public health is vital. There are a number of critical questions which need to be explored before a full roll out of AI in the screening of breast cancer; such as how we inform the public and maintain public trust, how we minimise and watch for bias, how we establish a mainstreamed culture of data ethics amongst those governing, collecting and using the data that will inform the AI, and vitally, establish clear evidence on AI's impact in increasing accurate diagnosis.

BCS is keen to support the initiative in the future once it is evident that more research has been done to ensure that AI Breast Screening will be safe for all who use it.

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[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/987021/AI_in_BSP_Rapid_review_consultation_2021.pdf

UK National Screening Committee

Use of artificial intelligence for image analysis in breast cancer screening

Consultation comments pro-forma

Name:	Arnoldis Nyamande		Email address:	Arnoldis.nyamande@bcs.uk
Organisation (if appropriate):		BCS, The Chartered Institute for IT		
Role:	**Policy Manager**			

Section and / or page number	Text or issue to which comments relate	Comment *Please use a new row for each comment and add extra rows as required.*
p.11	A range of risk factors for breast cancer have been identified, including sex, age, breast density, family history of breast cancer, genetic mutations, reproductive history, BMI, inactivity, and the use of hormone replacement therapy.	The comment identifies sex as being a risk factor for breast cancer development, but the study appears to exclusively target women. If AI breast screening is going to be the future of breast cancer screening, there needs to be a diverse and inclusive sample size. This must include transgender men, cisgender men and broad samples of people within the categories mentioned.

		Including a diverse range of people and ensuring categories are inclusive of this diversity will ensure the AI is enabled to aid in the treatment of all people without discrimination. This will help it avoid the 'poor generalisation' mentioned on page 16. A comprehensive equality impact assessment should be undertaken and published with provision for periodic iteration.
18	The primary drivers for AI in medical imaging have been cited as the desire for greater efficacy and efficiency in clinical care.	While we appreciate the need for efficacy and efficiency, we must ensure that AI in medical imaging doesn't come at the expense of high calibre service. This includes ensuring high professional standards are met at all stages of the development and implementation of the AI. An accelerated adoption of AI must be led by tried, tested, and verified data. To ensure that there aren't barriers to access, we strongly encourage uploading the data to an open source website.
19	Secondly, an algorithm is unaffected by fatigue or subjective diagnosis.	We champion any effort that seeks to ease the strain on NHS workers. In helping NHS workers, however, we must be sure not to harm the environment. There should be efforts to ensure that energy efficiency and environmental considerations should be factors in the development of screening algorithms.

| 19 | Biases may develop through features of the mammogram, or different demographics of the women screened. This speaks to the importance of understanding the validity of studies involving AI and algorithms' transferability to other settings, but also the crucial problem of interpretability…Carter et al. argue that AI systems will inevitably encode values, and that those values may be in turn difficult to discern. | The probability of this happening can be lowered by implementing the suggestions covered in page 11 around ensuring diversity.

A rigorous equality impact assessment would cover most of the concerns here, however a further safeguard to avoid coder bias would be to identify and use a diverse cohort of coders to design and work with the data and the algorithms.

Data samples used must also represent the diversity of the population so the AI can learn with less risk of bias. By making diversity and inclusion an integral part of the AI from the beginning, the risk of it inheriting biases with the potential to cost lives or provide suboptimal care is reduced. |
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| 20 | The sharing of data has significant monetary implications, and governmental release of data to private providers without consent raises significant ethical questions. | Failing to be clear with the public about what patient health data will be used, and what it will be used for, has negative implications for public perception, trust and willingness to provide vital information to clinicians and healthcare professionals.

Patients need clear communication about the nature of the AI programme, in as much detail as they require, to preserve and protect public trust. Failure to do so risks eroding public trust in the NHS Breast Screening Programme and wider NHS programmes. A lack of effective communication and an erosion of public trust may have serious implications for |

		public health as people pause for thought before engaging with the Programme. Trust can be gained as the public become increasingly aware of the positive benefits of technology such as AI on their lives. To ensure this increase in trust continues to develop, we must support the professional training and development of the analysts and data scientists working with this data. We must also establish clear ethical and professional standards for use across sensitive public data. This is something BCS, The Chartered Institute for IT, champions as one of its core values – as highlighted in the recent 'Priorities for the National AI Strategy - policy discussion document'. BCS is also working with The Royal Statistical Society, the Operational Research Society, the Royal Academy of Engineering, the National Physical Laboratory, the Royal Society and the Institute of Mathematics and its Applications, to collaboratively shape and develop the data science profession. As part of this programme, industry-wide professional standards are to be established for data science to ensure an ethical and well-governed approach so the public can have confidence in how their data is being used[2].

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[2] https://www.bcs.org/more/about-us/press-office/press-releases/professional-standards-to-be-set-for-data-science/

20	The possibility of AI replacing radiologists is already leading to a significant proportion of medical students discounting the speciality as a career choice	Automation shouldn't necessarily lead to unemployment or make a profession obsolete. This decline in medical students choosing radiology could be the result of a lack of clear communication between prospective radiologists, the NHS and software manufacturers about the role of the AI; it needs to be made clear that it is there to assist, not replace, them.