ANALYSIS

Financial incentives for breast cancer screening undermine informed choice

Theodore Bartholomew, Mirela Colleoni, and **Harald Schmidt** argue that the focus should be on decision making not uptake when the balance of benefit and harm is subjective

Breast cancer is the most common cause of cancer death for women worldwide.[1] Various measures have been explored to reduce breast cancer mortality. One approach is to encourage screening through financial incentives for patients or providers, as recently proposed in France and the UK, respectively.[2-4] Several countries already use some form of incentive, and the extent to which they are being offered, in combination with ambitious screening targets, could suggest that their use is an appropriate way to promote population health.

This, however, is far from clear: there are major concerns about breast cancer screening, the effectiveness of financial incentives is unclear, and there is an urgent need to ensure women have given their valid consent—that is, informed and without undue influence—for screening. Some trans men and women and non-binary people are also eligible for breast cancer screening, and although the data mostly relate to cisgender women, the arguments on informed consent apply to everyone.

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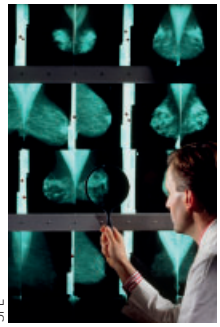
KEY MESSAGES

- Financial incentives tied to screening mammography are being used to increase uptake
- Such incentives risk unduly influencing decisions as the benefits and harms are finely balanced
- Health authorities should instead focus on promoting informed choice by providing evidence based decision aids
- Targets for breast cancer screening should consider informed choice rather than uptake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Lifetime benefits and harms of breast cancer screening (per 10 000 women screened)*

	UK independent review[5]	Cochrane review[6]	US Preventive Services Taskforce[7]	
Screening period (years)	20	10	24	24
Screening frequency (months)	12-24 (aggregate)	12-24 (aggregate)	12	24
No of breast cancer deaths averted	43	5	90	70
No of breast cancers overdiagnosed	129	50	250	190
No of overdiagnoses/deaths averted	3	10	2.8	2.7
No of false positive results	Not measured†	Not measured‡	17 980	9530
No of women experiencing important psychological distress from false positive findings	Not measured¶	>1000	Not measured§	Not measured§

*Differences in estimates reflect the different screening periods, as well as methodological differences (including which trials are deemed sufficiently robust and unbiased).
†Estimated that 3.36% of all women screened each year receive a false positive result.
‡Estimated that the cumulative risk of a false positive result after 10 mammograms is around 20-60%.
¶Concluded that the results are conflicting but that a false positive result can cause breast cancer specific psychological distress for up to three years.
§Acknowledges that false positive results "can lead to psychological harms."

Health effects of breast cancer screening

Breast cancer screening is controversial on several grounds. For every woman who avoids a breast cancer death through screening, 3-10 women will be treated unnecessarily and over 200 will experience psychological distress because of false positive results (table).[5-7]

Although a 2012 UK review stated that screening conferred "significant benefit and should continue," with one breast cancer death averted for every 235 women invited to screening over 20 years,[5] its conclusions have been widely challenged.[8-10] Major concerns include the harms of overdiagnosis (box 1), substantial uncertainty over cost effectiveness,[11] and that most reductions in mortality can be attributed to improved breast cancer awareness and the use of adjuvant hormonal and chemotherapy.[6-13] A Cochrane review concluded that universal mammography screening should be reassessed given the "small at best" chance of benefit.[6]

Targets, rates, and incentives

Recommendations for breast cancer screening attract considerable political and public attention, and there have been calls for more open minded discussion and public education.[14] Breast cancer screening rates vary widely between countries, but many nations with previously high screening rates have seen a decline,[15-17] which has partly been attributed to increased awareness of the harms of screening.[18] Screening rates consistently lag behind targets set by health authorities: few EU countries achieve the bloc's screening target of 70%,[19] and the latest figures in England and the US show that screening rates are below nationally set ("achievable") targets.[20 21] In response, some countries have introduced or proposed financial incentives to increase screening rates.

In England, for example, the Independent Review of Adult Screening Programmes has recommended that NHS England should "urgently" consider using financial incentives for providers to increase cancer screening rates. Suggestions include introducing payment by activity for general practitioners (more money for more people screened) and targeted payments for enhanced services (giving a practice extra funding for providing additional screening services).[15]

In France, the National Institute of Cancer has

adopted various measures to increase screening rates.[22] These include trials of patient incentives and covering screening related expenses such as childcare, transport, and work.[22] Breast cancer screening rates have been included as one of 29 clinical indicators that can provide GPs with additional remuneration since 2011, despite acknowledgment that the policy is controversial because of the known harms of screening.[23] Financial incentives are also used elsewhere in Europe, including Croatia and Portugal.[3]

In the US, private health insurers encourage take up of breast cancer screening with paid time off, items in kind (T shirts, cinema tickets, etc), and financial incentives such as reduced insurance premiums, gift cards, or lotteries.[4] Although lack of reporting requirements means that the frequency of use and size of incentives are unknown, they are typically $10-$200 (£7-£150).[4] Incentives are also offered to women on low incomes in public insurance programmes in the US: four states offer incentives ranging from around $0.50 to $540.[7 24] Breast cancer screening is also one of the most common indicators in pay-for-performance programmes for US physicians.[25]

Box 1 | Overdiagnosis of breast cancer

Overdiagnosis is defined as "the detection of cancers on screening which would not have become clinically apparent in the woman's lifetime in the absence of screening."[5]

Overdiagnosis is problematic because the lethality of screen-detected tumours is not always clear at the time of diagnosis and thus a breast cancer diagnosis almost always leads to treatment.

In the NHS, 99% of women diagnosed with breast cancer through screening have surgery, 72% have radiotherapy, 72% have adjuvant hormone therapy, and 27% have adjuvant chemotherapy.[5]

Effectiveness of financial incentives

Whether and how financial incentives influence patient and physician behaviour remains unclear. Although patient financial incentives can increase uptake of some types of preventive care,[26-28] their effectiveness within cancer screening and, more specifically, in breast cancer screening is mixed.[26-34] Internationally, the evidence for provider incentives is also "mixed," with most studies on breast cancer showing partial or no effects on uptake.[35]

Ethics of financial incentives

The use of incentives requires consideration of ethical issues. The case in favour of incentives rests on behavioural economics. Motivation to act on long term health goals, even if much wanted, may be outweighed by short term needs, desires, or conflicting priorities. Failed New Year's resolutions and abandoned weight loss regimens are familiar examples.

One rationale for offering incentives for health promotion is that they nudge people to act by offering an immediate (financial) reward for a later health benefit.[36] Consider the example of financial incentives for patients to stop smoking. Such incentives may be perceived as paternalistic and possibly exerting undue influence,[24 37] but because most smokers would like to quit,[37] incentives that successfully motivate smoking cessation can be seen as enhancing autonomy. Not smoking also has overwhelming health benefits and little risk of harm.

Provider incentives have been used when policy makers think they can motivate professionals to adapt their behaviour in ways that better align with health system priorities. For example, provider incentives have been implemented to reduce antibiotic overprescribing[38] and improve hand hygiene.[39]

The fundamental ethical concern with incentives is that they may lead people to make choices that they would not have made without the incentive and are harmed by this choice. Smoking cessation, reducing antibiotic overprescribing, and improving hand hygiene differ fundamentally from breast cancer screening because the benefits of these actions are objectively and substantially greater than the possible harms. Although there are, in principle, good reasons for exploring the potential of incentives to promote breast cancer screening, the starting position for breast cancer screening has to be that the decision is preference sensitive[40]—that is, equally well informed women may weigh the trade-off between harms and benefits differently and rationally may or may not decide to have screening.[41]

If incentives become unduly influential, they can undermine the principle and validity of consent.[24 37] Breast cancer incentives could also compromise the extent to which a provider offers unbiased information on harms and benefits when seeking patient consent. For example, financial gains for higher screening rates might lead providers to change, consciously or unconsciously, the time they spend discussing benefits and harms of screening with patients. This can be detrimental to shared decision making and genuine consent.[42] The presence of a target screening rate further exacerbates this problem, with providers likely to feel pressure to meet targets.

Understanding screening and communicating risk

Across society, understanding of breast cancer screening is generally poor. Most women overestimate the mortality benefits of screening (92% of those surveyed in nine European countries overestimated the mortality reduction from screening by a factor of 10-200 or reported that they did not know)[43] and most are unaware that inconsequential disease can be detected by screening.[41] Such findings are perhaps unsurprising given that organisations that promote screening sometimes overstate benefits and underplay harms.[6 44]

The scientific community agrees that people should be given better information about screening.[45] The fact that people with adequate knowledge of the overall benefit, false positive results, and overdiagnosis may be less likely to choose breast cancer screening,[41] and that those with an understanding of overdiagnosis may be more likely to express an intent to discontinue screening, further underlines this need.[46] Additional research, however, is needed to clarify how understanding affects longer term participation.[47]

Doctors can also have inadequate understanding of screening. In a survey of over 400 US primary care doctors in 2011-12, almost half incorrectly answered that detection of more cancers proves that the screening test reduces mortality (more detection could just mean more overdiagnosis).[48] Three quarters also answered that better five year survival among patients with screen detected cancers than their non-screened comparators would prove that the screening test reduces mortality (when it could be the result of lead time bias).[48]

Effective communication is also a concern. Among 151 UK GPs assessed with a hypothetical patient seeking advice on cancer screening, only 44% were deemed to communicate "complete and meaningful" information on risk.[49] Physicians should have a robust understanding of the interventions they offer and be able to communicate this to patients in a way they understand, but this does not seem to be the case.

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Decision aids to support informed choice

Ideally information provided on the harms and benefits of screening should be individualised to a person's specific risk profile.[50] At the very least people should be supported in their screening decisions with evidence based and suitably comprehensive decision aids[41] (figure, see bmj.com) in conjunction with impartial and informed advice from their physician. Given the complexity of the information that needs to be weighed up in breast cancer screening and the fact that the topic requires confronting your mortality, determining whether your preferences align or conflict with screening for breast cancer is a process, rather than something that is easily decided instantaneously. Decision aids can help surface a person's values and preferences.

Decision aids for breast cancer screening have been successfully implemented across various settings.[41 51] Measures include integrating decision aids into routine patient care and allocating physician "champions" to encourage adoption.[51] Decision aids have been shown to increase the proportion of women making informed choices, and can also correct a woman's pre-existing bias on the perceived benefits and harms of breast cancer screening to reflect the evidence more accurately.[41 52]

Correspondingly for providers, the focus should shift from the narrow aim of encouraging screening uptake, towards supporting and educating health professionals to provide better quality information about screening. This is in line with their obligations to provide patients with information based on the best available evidence.[53]

Achieving this shift will also require increased clinical and physician support for routine use of decision aids rather than considering them as optional, improved system support and resources for decision aids, and addressing time constraints for patient education and support.[51] If incentives are considered, a preferable option would be to tie them to the use of decision aids, to overcome barriers to adoption.

We also propose breast cancer screening targets be abolished as they risk raising conflicts of interest for providers in facilitating preference sensitive decisions. An alternative would be to set targets for rates of informed choice, which would not face this challenge and are a meaningful alternative. Evidence based decision aids that enable scoring of different levels of understanding mean that this proposal is readily implementable (as long as decision makers genuinely value promoting women's informed choices).[41 54]

Use of incentives to increase uptake of breast cancer screening requires urgent reconsideration, as they are ethically problematic. A better approach would be to support women with their screening decisions through the provision of evidence based decision aids, as well as ensuring the availability of healthcare professionals who are both adequately trained and have no conflicts of interest in facilitating preference sensitive decisions.

Theodore Bartholomew, GP specialty registrar, Royal Surrey County Hospital NHS Foundation Trust, Guildford tb.public@mailbox.org

Mirela Colleoni, patient, Hauts-de-France, France

Harald Schmidt, assistant professor, University of Pennsylvania

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