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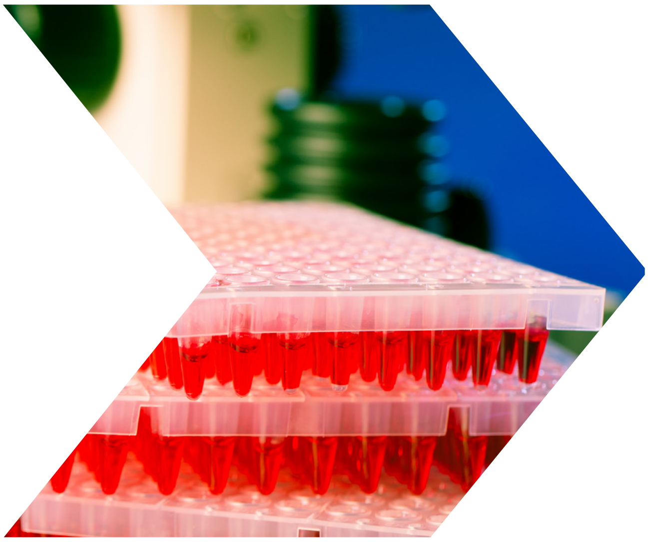
Blood-based cancer screening (BBCS)

Exploring the potential to transform population-based cancer screening in the United Kingdom with one simple blood test

THINK TANK

Introduction

Detecting more cancers in the earliest stages of development when patients' chances of being cured are higher has the potential to reduce the burden of disease in Europe, making cancer screening a fundamental pillar of Europe's Beating Cancer Plan and a high priority for both the European Commission and its Member States in a context where incidence is rising and expected to reach 5.5 million annual new diagnoses by 2045.[1] In the United Kingdom, too, a national cancer plan is being developed as part of the government's 10 Year Health Plan for National Health Service (NHS) reform, with cancer prevention and early diagnosis expected to feature prominently as levers for improving survival rates that currently remain lower than in other comparable countries.[2] In the coming years, national and European policy will evolve against a backdrop of ongoing technological innovation in the field of cancer screening, with the potential to modernise approaches to primary and secondary prevention at population level.



Blood-based cancer screening tests, which include both single-site tests to identify specific cancers and multi-cancer early detection (MCED) tests designed to detect multiple types of cancer using a simple blood sample, are among the innovations that could profoundly transform the landscape in the future. Indeed, the majority of cancer deaths in the UK are caused by tumour types for which no screening test is currently available.[3] Due to their comparatively less invasive nature, these tests could eventually become accessible, cost-effective options for cancer detection allowing for earlier intervention and better clinical outcomes. However, significant challenges remain before they can be considered for population-level screening, including uncertainty surrounding the clinical and health economic evidence required to support their use, the capacity of existing diagnostic infrastructure and their integration into current care pathways.

The EIT Health Think Tank has designed a pan-European, multi-stakeholder initiative to shed light on the oncology diagnostic environment and to identify the evidence requirements, barriers and opportunities for the potential adoption of blood-based cancer screening in population screening programmes across Europe. A series of roundtable discussions are being held in various countries in 2025 to engage with relevant opinion leaders and subject matter experts, the first of which took place on 28th January 2025 in London, UK. The event brought together 12 participants from England and Scotland representing the fields of academia, research, public health, as well as clinical and medical oncology, to provide insights into the current cancer screening landscape in Britain, emerging knowledge about blood-based cancer screening and possible paths towards its widespread implementation. The discussions focused on MCEDs more specifically, as one such technology is currently being evaluated on a large scale in England. This report summarises the key findings and points of debate.

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[1] **Source:** Globocan

[2] https://www.gov.uk/government/calls-for-evidence/shaping-the-national-cancer-plan/shaping-the-national-cancer-plan

[3] https://www.cancerresearchuk.org/health-professional/cancer-statistics/mortality/common-cancers-compared#heading-Zero

Part 1: Cancer screening in the UK – current landscape, opportunities and challenges

1.1 Current landscape

A defining feature of population health screening in the UK is that candidates for new screening programmes are centrally evaluated by a dedicated public body, the UK National Screening Committee (UK NSC), which makes recommendations to the national government and public healthcare payer. Once accepted, screening programmes are planned, organised and overseen by the NHS in England, Scotland, Wales and Northern Ireland, healthcare being devolved to the individual nations.

There are currently three established population-wide cancer screening programmes: for breast, cervical and colorectal cancer. The UK NSC's recommendations for their implementation are, respectively, that women should be offered a mammography scan every three years between the ages of 50 and 70 and an HPV test every five years from the age of 25 to 64, and that all individuals aged 50 to 74 should be invited to take a faecal immunochemical test (FIT) every two years. However, regional variation exists for example in the secondary prevention of colorectal cancer, which only begins at age 60 in Northern Ireland and for which some nations currently apply higher thresholds for test positivity to mitigate endoscopy capacity constraints while they work to meet the recommended standards.[4] Annual participation rates also vary regionally and by programme, ranging from less than two thirds (58%) of those eligible for bowel cancer screening in Northern Ireland, to more than three quarters of the target population for breast cancer screening in Scotland (76%) and Northern Ireland (74%). A significant decline in participation in breast and cervical cancer screening was recorded across the UK in the wake of the COVID-19 pandemic.[5]

A new programme for targeted lung cancer screening based on computerised tomography scans, targeting individuals aged between 55 and 74 with a history of smoking that places them at heightened risk, was accepted in 2022 and is currently in the rollout phase in England.

The path from diagnostic test to national screening programme

An established pathway to acceptance and implementation of population-level health screening interventions exists under the auspices of the UK NSC. In a first step, potential candidates are identified in an annual open call for proposals, which can be submitted by any entity. The UK NSC then prioritises submissions by mapping the evidence in support of different interventions. Formal assessment of thus selected candidates includes reviews, evidence summaries and cost-effectiveness modelling. To be accepted as a population screening technology, a test must be validated, demonstrably safe, supported by an agreed policy on diagnostic investigation and treatment, and acceptable to the public. Clinical evidence is also required to support the proposed screening programme using a given test, including high-quality data from randomised clinical trials (RCTs) that the programme reduces mortality or morbidity while minimising other risks. Importantly, the UK NSC examines, not only the benefits, but also the potential harms of introducing a screening intervention at population level. From a health economic perspective, it is generally admitted that cancer screening will represent an increased cost to the system, however this should be offset by the expected benefits for population health as measured by quality-adjusted life years (QALYs) gained.

A new intervention under consideration is typically piloted by the NHS before the UK NSC makes an official recommendation to the governments of the devolved nations. This allows the feasibility of implementation to be tested according to social and organisational criteria as well as by gauging the public's motivation to participate. Although application to and acceptance by the UK NSC can be considered the obligatory route for any test to become a fully-fledged screening programme in the UK, a new precedent was set when a pilot run by the NHS following a negative initial assessment of targeted lung cancer screening moved the UK NSC to change its position and issue a positive recommendation.

1.2 Barriers to optimal screening use

Inequalities in screening uptake: Participation in the UK's national screening programmes needs to be improved in several ways. First, although screening tests are available through the NHS to all those who fall within the relevant age groups, lower rates of participation among socioeconomically disadvantaged groups are a potential source of health inequalities. Geographic disparities were also highlighted between the devolved nations due to different paces and approaches in implementing the programmes. A sharp drop in screening coverage in England in the wake of the pandemic was a particular cause for concern and it was noted that Scotland, which did not follow suit when England moved to a system of open invitations whereby people now need to actively book their screening appointments, was slower to absorb its backlog from the pandemic but maintained higher uptake levels overall. It was also suggested that participation tends to be skewed towards individuals who are already health-conscious, with higher-risk subjects being more likely to skip their appointments. Some believed that community outreach through

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[4] *https://www.cancerresearchuk.org/health-professional/cancer-screening/bowel-cancer-screening*

[5] **Source:** OECD

the people working in screening at local level could be better harnessed to convey the importance of screening and boost uptake. Blood-based testing could conceivably overcome some of these disparities in the future as blood draws could be carried out in the community setting, by local pharmacies and possibly also by mobile units such as those utilised across the UK in the course of an ongoing trial of the Grail Galleri MCED test.[6]

Insufficient diagnostic and treatment capacity: Overloaded diagnostic and cancer care services currently keep people waiting months for follow-up after receiving a positive screening test, running counter to the very purpose of detecting cancer early to allow more effective treatment and better outcomes. Although waiting lists have been shortened since a peak in the backlog was reached in September 2022, the NHS England's Management Information on Cancer shows that at the end of December 2024, over 17,000 people had been waiting more than two months (62 days) for treatment after an urgent GP referral with suspected cancer.[7] As MCEDs do not visualise the cancer itself, with some tests at best predicting its likely organ of origin based on characteristics of the circulating tumour DNA (ctDNA) shed into the bloodstream while others rely on whole body magnetic resonance imaging (MRI) to confirm the cancer site, concern was expressed that introducing them as a population screening tool could further compound the pressure on the system by requiring patients to undergo multiple additional diagnostic procedures. Participants also highlighted the existence of geographical disparities in time to diagnosis across the UK, centres' performance in this area being closely correlated with their resource and staffing levels. It was suggested that making better use of community diagnostic centres to complement hospital capabilities could improve the situation and reduce inequalities.

Delayed implementation of innovation: With the average delay from the reporting of a pivotal clinical trial – expected in 2026 for the NHS-Galleri trial – to the complete rollout of a nationwide programme typically seen to be between 10 and 15 years, the possibility to streamline this process and expedite the introduction of valuable interventions was generally considered a desirable goal. An example of this could have been the launch of a pilot of the Galleri test within the NHS England in parallel to the ongoing trial, however the data from the trial's first year was ultimately considered insufficient for this to go ahead.[8] Meanwhile, some cautioned that speed should not come at the expense of evidence-based decision-making, recognising that it takes time to generate the kind of high-quality evidence required for public health policymaking such as the launch of a population screening programme.

1.3 Facilitators of effective cancer screening

A structured approach to progress through the UK NSC: The existence since 1996 of a structured National Screening Committee, made up of experts dedicated to the topic of population screening, was considered one of the key strengths of the UK's system having led to high standards in quality management, providing infrastructure and opportunities to prospectively collect data, monitor performance as well as assessing applications to test new features or changes to existing programmes. Although it was recognised that this body has historically proven reluctant to adopt innovations in screening more rapidly than in comparable neighbouring countries, with one participant criticising an excess of negativism in the recent evaluation of the lung cancer screening programme, the UK NSC's increasing willingness to consider the application of new technologies was commended. One notable example of this is its support of the ongoing EDITH (Early Detection using Information Technology in Health) trial to test the potential role of artificial intelligence (AI) in breast cancer screening.[9]

Strong infrastructure for screening research and implementation: The coordinated delivery of healthcare services through the NHS and well-developed data collection systems across the country were seen to facilitate research in the screening domain, allowing for example the launch of the NHS-Galleri trial, the only randomised controlled trial of an MCED to date. However, it was noted that an excess of bureaucracy within the NHS and restrictive privacy regulations occasionally stifle research by limiting the linkage of data from different sources, such as screening data with cancer registry data, which among other things is essential to monitoring the real-world effectiveness of screening programmes following their implementation. Scotland's efforts to establish a screening intelligence platform as a single point of access to linkable data from all the national screening programmes, building on a successful initial implementation of its cancer intelligence platform in late 2019,[10] were highlighted as a positive development in this area. The national public healthcare and health data infrastructure also permit population-wide, comprehensive approaches to quality-assured screening and the piloting of new interventions, contrary to countries with more fragmented healthcare systems.

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[6] (Neal, et al., 2022)

[7] https://www.england.nhs.uk/statistics/statistical-work-areas/cancer-waiting-times/management-information-on-cancer/

[8] https://www.england.nhs.uk/blog/an-update-on-the-ongoing-nhs-galleri-trial/

[9] https://www.gov.uk/government/news/world-leading-ai-trial-to-tackle-breast-cancer-launched

[10] https://www.gov.scot/publications/major-review-scottish-breast-screening-programme/pages/11/

Part 2: Potential and evidence requirements for MCEDs

MCED tests available today search for fragments of DNA, proteins and other circulating molecular biomarkers shed into the bloodstream, but also in breath or urine, by a developing cancer. Some MCEDs have entered clinical testing, but none have received regulatory approval from either the United States Food and Drug Administration (FDA) or the European Medicines Agency (EMA) to date. At European level the SAPEA (Science Advice for Policy by European Academies) consortium, a part of the European Commission's Scientific Advice Mechanism that provides independent scientific evidence and policy recommendations to EU policymakers, published an Evidence Review Report on cancer screening in 2022.[11] Despite the evident appeal of detecting multiple cancer types with a single, potentially simple and cost-effective blood test, also known as a liquid biopsy test, a positive recommendation for the use of MCEDs at population level could not be made as further evaluation of these technologies was deemed necessary. In particular, the ability of currently available tests to detect cancer early remained in doubt after initial studies found sensitivity rates for Stage I cancers as low as 24% for the Galleri test[12] used in a diagnostic (symptomatic) setting and 43% for the CancerSEEK test.[13]

While most clinical studies of MCEDs so far have used samples from people with a known cancer diagnosis, several blood-based tests have begun to be studied for their potential as cancer screening tools in healthy trial populations:

- **The CancerSEEK** test analyses a panel of specific mutations in circulating tumour DNA (ctDNA) and protein biomarkers that are indicative of different cancer types. The DETECT-A study prospectively evaluated the test combined with whole-body imaging in over 10,000 women aged 65 to 75 with no history of cancer.[14]

- **The SPOT-MAS (Screening for the Presence Of Tumour by Methylation And Size) test** analyses multiple signatures of ctDNA typically found in five main tumour types: liver, lung, breast, colorectal and gastric cancer. These are the most common cancers in Vietnam, where the K-DETEK prospective cohort study of close to 3,000 participants is seeking to validate the test's performance for screening in an asymptomatic population.[15]

- **The CanScan test** uses whole-genome sequencing (WGS) to analyse various features of fragmentation and genetic alterations in circulating cell-free DNA (cfDNA), targeting 13 different tumour types. Its clinical validity for the detection of multiple cancer types in a population at average risk is currently being evaluated in the JINLING Cohort study enrolling individuals aged 45–75 without cancer-related symptoms in China.[16]

- **The Grail Galleri test** analyses DNA methylation in cfDNA, a chemical modification of DNA that is involved in controlling patterns of gene activity and which has distinct profiles in different cell types according to the specific set of genes they express. It can thereby reveal not only the presence of around 50 different cancer types, but also predict the likely tissue of origin, differentiating 18 potential tumour sites. The Pathfinder study was the first to assess the Galleri test in apparently healthy men and women over the age of 50.[17] Several prospective studies are currently ongoing to further evaluate the Galleri test, and England is host to the largest of these, which is also the only trial investigating the test's suitability for population screening as opposed to more limited diagnostic applications in symptomatic care and treatment follow-up.

The NHS-Galleri trial

The NHS-Galleri randomised controlled trial aims to evaluate whether the Galleri assay can detect cancer early and thereby prevent advanced stage cancers. Enrolment was completed in July 2022, with 140,000 adults aged 50–77 participating in the study. Blood was collected at up to three visits, reflecting annual screening appointments. Following collection of the first blood sample, participants were randomised 1:1 to the intervention arm (blood tested with Galleri) or to the control arm (blood stored). Only participants in the intervention arm with a cancer signal detected had results returned and were referred for follow-up investigations and potential treatment within the NHS. Remaining participants in both arms stayed blinded and were invited to return for their next visit. Participants were encouraged to continue other NHS cancer screening programmes and seek help for new or unusual symptoms. The trial's primary objective is to demonstrate a statistically significant reduction in the incidence rate of Stage III and IV cancers diagnosed in the intervention arm compared to the control arm in the three to four years after the first blood test. The results, expected in 2026, will help determine the clinical utility of population screening with an MCED test.[6] Health information, such as whether someone developed cancer and how it was treated as well as mortality, are being collected from centrally held NHS records for up to 10 years after participants' first appointment.

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[6] (Neal, et al., 2022)
[11] *https://cci4eu.aws-lcb.iarc.who.int/wp-content/uploads/2025/01/SAPEA-report-on-cancer-screening-in-EU.pdf*
[12] (Nicholson, et al., 2023)
[13] (Cohen, et al., 2018)
[14] (Lennon, et al., 2020)
[15] (Nguyen, et al., 2023)
[16] (Yang S, et al., 2024)
[17] (Schrag, et al., 2023)

MCEDs as an additional tool, not a replacement

At the roundtable, several participants argued that low sensitivity of a multi-cancer test is not necessarily incompatible with a population screening approach because more patients would still be detected overall compared with single-cancer tests and compared to the overall performance of cancer screening today: as the majority of tumour types have no screening tests available, only 5–6 percent of all cancers in the UK are currently detected through existing programmes. It was generally expected that should they be accepted for population screening, MCEDs would be implemented alongside rather than in replacement of current programmes. In the field of colorectal cancer screening, for example, they would not be capable of detecting the precancerous lesions that develop over as much as a decade, likely without shedding any DNA into the bloodstream. The removal of these adenomas, in over half of cases directly during the diagnostic colonoscopy procedure, prevents colorectal cancer from developing, thus reducing morbidity and saving the cost of cancer treatment. Any modelling to assess the cost-effectiveness of screening with MCEDs would therefore need to consider both the detection and prevention elements of current colorectal cancer screening.

Early detection may not always lead to better outcomes

Disagreement arose as to whether screening with MCEDs could truly support better outcomes considering that a high rate of DNA shedding leading to detectable ctDNA is increasingly recognised as a marker of more aggressive disease and poorer prognosis, being significantly associated with shorter progression or recurrence-free survival and overall survival across various tumour types including colorectal[18] and head and neck cancers.[19] Though the association appears to be stronger in advanced disease,[20] systematic reviews in breast[21] and pancreatic[22] cancer have shown it exists even for localised tumours, leading some to question whether a cancer detectable in the blood should be considered early-stage at all. If MCEDs are predominantly detecting high-risk and advanced cancers, though they do have the potential to accelerate diagnosis and treatment of early symptomatic or late presymptomatic disease, they may not yield the benefits expected from population screening, which reduces cancer mortality by detecting curable, less aggressive forms of disease. In the absence of evidence showing that giving treatment sooner to patients with detectable ctDNA improves outcomes, it was argued therefore that using MCEDs as a screening tool could not only fail to make a meaningful public health impact but also potentially cause harm to people with incurable disease by increasing their time as patients and the amount of treatment they undergo without deriving any significant benefit from earlier intervention.

Other participants countered that disease stage remains the dominant prognostic marker even among cfDNA positive cancers, warranting the view that estimated survival chances with Stage I and II cancers shedding DNA, though lower than those without detectable ctDNA, are nonetheless sufficient to expect a benefit from early diagnosis and treatment.[23] This would be especially applicable to fatal diseases such as pancreatic and gastric cancer, for which no screening exists and which are usually diagnosed in the advanced stages.[24] Moreover, from a clinician's perspective, early detection can be considered beneficial even if it does not increase the overall chance of cure because it may give patients more or better treatment options: for example, systemic anti-cancer therapy, which is known to be more effective in individuals with a high performance status.

No consensus on evidence generation for MCEDs

Diverging views on the link between early detection by liquid biopsy and improved patient outcomes were also central to the ensuing discussion around the type of evidence required to support the use of MCEDs for population screening. From the perspective holding that the biology of disease plays a bigger role in prognosis than stage at diagnosis, a new population screening programme should demonstrate that it reduces mortality, not just the proportion of late-stage diagnoses – particularly as the latter outcome measure would be impacted by the test itself if the presence of ctDNA ultimately leads to a redefinition of disease staging. Unless a test is proven not to be independently associated with prognosis, it was argued that using surrogate endpoints carries a risk of leading to wrong conclusions.

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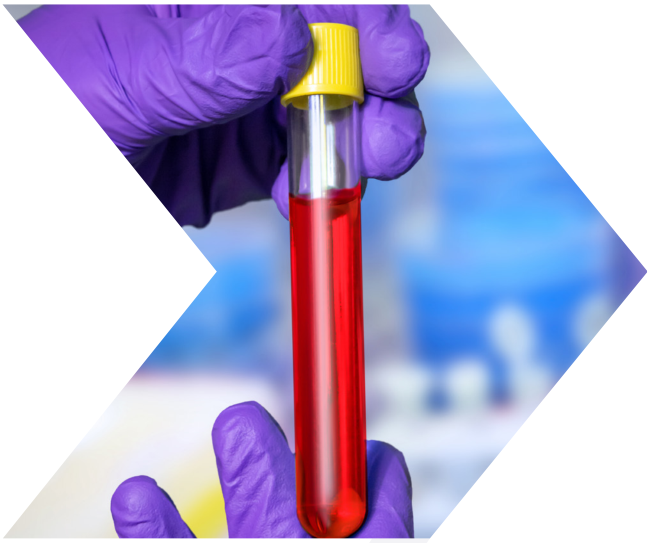
[18] (Fan, et al., 2017)
[19] (Yang R, et al., 2024)
[20] (Sogbe, et al., 2025)
[21] (Cullinane, et al., 2020)
[22] (Guven, et al., 2021)
[23] (Sasieni, et al., 2023)
[24] *https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/pancreatic-cancer/incidence#heading-Four*

Of the opposing view that prognosis of all types of cancer depends heavily on stage, with cancers that shed cfDNA seemingly still having a better prognosis than cancers at the same site that are one stage more advanced, others believed reduction in late-stage diagnoses to be the more judicious trial endpoint for obtaining evidence of screening efficacy in a shorter timespan than mortality. This is especially relevant for treatable cancers diagnosed in early stages, where mortality endpoints would take a long time to reach in clinical trials and confront test manufacturers with 15-year development timelines that would disincentivise commercial activity in an area which already attracts much less investment than medicines as it is. In this context, it was proposed to demonstrate the impact of screening on stage at diagnosis through RCTs like the NHS-Galleri trial and to separately quantify the impact of detectable cfDNA on stage-specific survival through prospective observational studies. The results of these two types of study could then be combined to estimate the impact of screening on cancer mortality. In the case of the NHS-Galleri trial, retrospective testing of stored samples from participants in the control arm who later develop cancer is planned for a secondary analysis and expected to provide additional insight into the screening intervention's effect on cancer-related mortality.[25] A further consideration was that separating the effects of screening on stage shift versus mortality would be important to account for future developments in treatment of cancer, which could render mortality data from screening research irrelevant in the space of a few years.

In addition to evidence of a reduction in mortality or morbidity, health economic analysis of cost-effectiveness measured by gains in quality-adjusted life years was thought to be among the UK NSC's most important decision-making elements for accepting a new screening programme. Evaluating changes in stage at diagnosis, together with the associated stage-specific survival data for different cancers, would arguably allow this type of cost-effectiveness modelling, though it was highlighted that the cost-effectiveness of a screening programme should be measured independently of the evaluation of the test itself. With the Galleri test currently listed at 949 US dollars, it was also noted that the price of MCEDs would need to be substantially reduced to meet cost-effectiveness criteria in the UK. It was hoped that this would be facilitated by new sequencing technologies and by the potential for mass testing within a nationwide screening programme to yield reasonable profits for manufacturers at a lower revenue per test.

With agreement reached on the importance of offering clear guidance to companies developing screening tests as to what evidence needs to be generated and on what timeline, the UK NSC's Research and Methodology Group (RMG) established in 2023 to provide guidance on the committee's research requirements was heralded as an important milestone. Made up of eight screening research experts who meet four times a year to review new research proposals, the RMG provided first advice on multi-cancer detection tests in 2024. However, one participant proposed that contentious questions with significant public health and economic implications, such as those surrounding evidence generation for MCEDs, should be debated in larger public consultations and arbitrated by elected officials.



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[25] (Wan, et al., 2025)

Part 3: Considerations for implementation

In the event that blood-based tests are accepted for population cancer screening in the future, four dimensions were identified as decisive for implementation in the UK: the diagnostic infrastructure to follow up on positive tests, the approach to integrating the tests into care pathways by defining who can be tested and in which conditions, the affordability and equity of access both to the tests themselves and to follow-up testing, and potential knock-on effects on other screening programmes.

Investment in diagnostic infrastructure

Preparing the NHS, and especially the diagnostic infrastructure throughout the country, for a future implementation of blood-based cancer screening was considered a critical success factor in light of current personnel shortages and funding constraints. While it was reported that diagnostic capacity is in the process of being expanded, the strains on the system remain, as the number of patients being referred is growing and pathways are becoming more complex. Although one attendee noted that currently coverage for a new service generally takes away from the budget allocated elsewhere in the system, it was hoped that funding could increase for a significant enough expected benefit, as has been the case for the reimbursement of chemotherapy over the years.

Management of 'false positives'

Although current versions of MCEDs are being commercially developed with high specificity of over 99%, the Galleri test giving rise to only 0.5% of false positives[26] and CancerSEEK to 0.86%,[13] important questions remain regarding the follow-up of people with positive screening tests in whom no cancer is detected by subsequent diagnostic procedures. In terms of healthcare service utilisation this would hypothetically amount to 150,000 annual referrals for the 1 in 200 false positives occurring through population screening with the Galleri test in the UK – not a major burden on capacity compared with, for example, the 3 million patients going through the urgent referral pathway each year. However, uncertainty as to whether these false positives really are erroneous results or whether the site of a developing cancer was just not found or not yet visible in medical imaging, will need to be resolved as the long-term outcomes of participants in ongoing trials become known. This will be key to determining how far investigations should be taken following a positive screening test, which will also have an impact on the overall cost-effectiveness of a future screening programme. The potential psychological impact on people who are not yet patients of having a positive screening that fails to be confirmed as a cancer diagnosis in a subsequent limited panel of tests was also highlighted, including not only anxiety but also possible changes in future help-seeking behaviour and participation in other cancer screening programmes. The feasibility of offering advanced testing such as whole-body MRI and the multidisciplinary expertise needed to interpret it to every individual concerned was also a cause for concern, although the introduction of AI-based image analysis and triage could conceivably support this in the future.

Integration into care pathways

Regarding the integration of blood-based cancer screening into care pathways, it was highlighted that the benefits of the tests will almost certainly not be equal across all tumour types. More work is needed to understand how liquid biopsies should best be utilised, as a substitute or as a complement to existing screening tests, and possibly also in symptomatic services for individuals with unspecific symptoms. It was therefore recommended that efforts should begin early to identify questions that will not be addressed by ongoing clinical trials and plan alternative ways to answer them. Among these, there was some agreement that running large pilots while waiting for the final clinical trial results would not only help to better anticipate the capacity and workforce training needs within the healthcare system, but also serve to win the buy-in of healthcare professionals, considered an essential condition for wider implementation.

Impact on overall screening uptake

Participants generally believed that blood-based tests would be well accepted by the public in the UK, likely more so than other screening methods, by virtue of their simplicity and less invasive nature. The potential to ensure broad accessibility of testing was highlighted with reference to the methods employed in the course of the NHS-Galleri trial, which included mobile blood collection units stationed in easy-to-reach locations such as supermarket parking lots and sports stadiums. Nonetheless, it was still considered important to explore views on the subject of liquid biopsies to anticipate potential knock-on effects on screening uptake: For example, would people skip their other screening appointments if their blood test came back negative? Initial research in this area indicates that MCEDs carry intrinsic appeal due to the familiarity and convenience of the testing procedure but raise concerns related to potentially unpleasant and unnecessary follow-up interventions, and suggests that testing might not be as well accepted in addition to rather than in replacement of existing screening.[27] Larger studies, such as the 'sIG(n)al' longitudinal evaluation embedded in the NHS-Galleri trial,[28] will need to quantify the prevalence of different views and their implications for behaviours around cancer screening.

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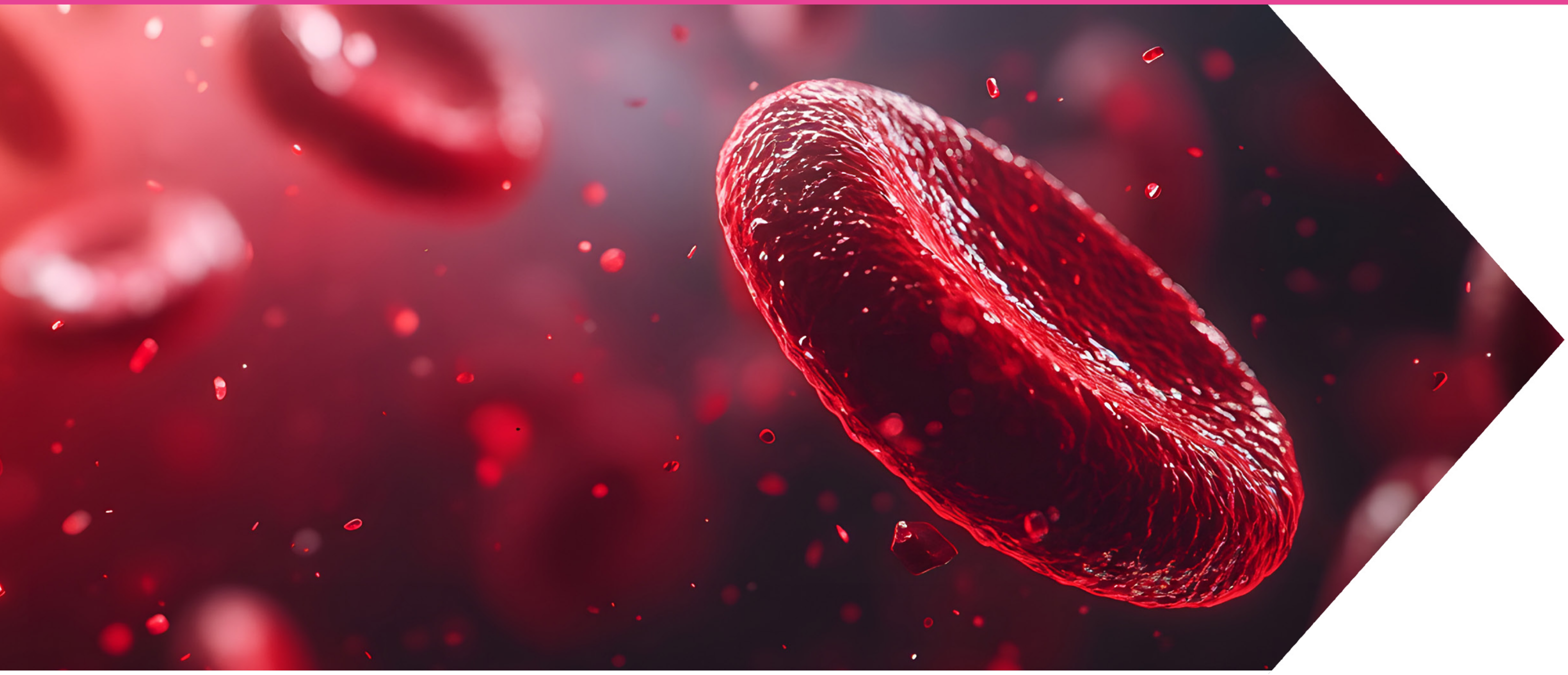
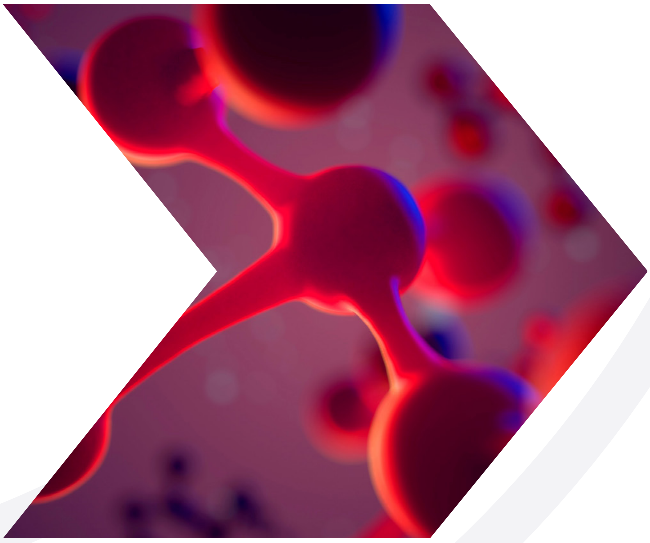
[13] (Cohen, et al., 2018)
[26] (Klein, et al., 2021)
[27] (Schmeising-Barnes, Waller, & Marlow, 2024)
[28] (Marlow, Schmeising-Barnes, Warwick, & Waller, 2023)

Summary



With a structured process and dedicated resources available to evaluate and implement population screening, as well as the largest clinical trial of an MCED to date taking place within the NHS in England, the UK has a strong foundation on which to build a national approach to blood-based cancer screening. If and how this will become a reality depends on the answers to questions such as whether these tests can detect more cancers early (so that fewer cancers are diagnosed late), whether early detection by these methods meaningfully improves outcomes of diseases with the particular biological characteristics that the tests are designed to identify, whether such improvements are substantial enough to offset the cost and harms of testing at population level, and whether the price of MCEDs can be reduced in a mass testing scenario to meet cost-effectiveness standards in the UK. With existing evidence showing that the detection of ctDNA is a poor prognostic marker and thus may run counter to the very principle of screening, to identify diseases where timely treatment leads to better outcomes than usual care, rigorous data will be needed to demonstrate the public health benefits of early intervention in cfDNA-positive cancers.

While these data are still pending, the ability of the NHS to pilot new screening interventions at scale has the potential to provide information on their real-world feasibility beyond the variables measured in clinical trials and could be leveraged in the short term to better understand the impact of blood-based cancer screening on available healthcare resources. Efforts to optimise existing screening programmes and care pathways are considered to have yielded modest improvements in terms of public health in recent years, so in addition to continued work in this field the need for innovation in cancer screening is a point of consensus that arguably justifies the continued development of liquid biopsies as a potentially paradigm-shifting technology. Downstream diagnostic and treatment capabilities may not yet be on a par with the needs that could arise from population screening with blood-based tests but the recent pace of innovation in these areas, too, suggests that this could easily change in years to come.



Participants		
David Baldwin	Honorary Professor of Medicine and Consultant Physician, University Nottingham, Centre for Cancer Sciences	RT Participant
Emma Odowd	Honorary (Consultant) Associate Professor, University Nottingham, Centre for Cancer Sciences, lung cancer expert	RT Participant
Peter Sasieni	Professor of Cancer Epidemiology, Director of the Cancer Research UK Cancer Prevention Trials Unit, Queen Mary University London	RT Participant
Mike Richards	Chair of the UK National Screening Committee	RT Participant
Shinkins, Bethany	Professor, WMS Health Sciences, Warwick University, test expert member of the UK NSC, lung screening expert	RT Participant
Rosa Giuliani	Consultant medical oncologist , Guy's and St Thomas' NHS Foundation Trust	RT Participant/SC/MODERATOR
Tasmin Sommerfield	National Clinical Advisor for Screening, NHS	RT Participant
Shaun Hill	Trustee, Independent Cancer Patients' Voice	RT Participant
Jessica Lloyd	Strategic Evidence Manager, Cancer Research UK	RT Participant
Colin Rees	Professor of Gastroenterology, Newcastle University	RT Participant
Peter Hampson	Medical Manager, Roche Diagnostics	INDUSTRY REP
Elsebeth Lynge	Professor Emerita of Epidemiology, University of Copenhagen	RT Participant/STEERING CO
Sameena Conning	Executive Director of Corporate Affairs, EIT Health	EITH/Support
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Lana Burgess	Communications Manager, EIT Health	EITH/Support
Rianne Ernst	Vintura	EITH/Support
Alison Bouissou	Medical Writer	EITH/Support
Laura Prat	Events Manager, EIT Health	EITH/Support

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3. https://www.cancerresearchuk.org/health-professional/cancer-statistics/mortality/common-cancers-compared#heading-Zero.

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