Improving Equity of Access to Cancer Clinical Trials in Scotland

February 2023

Scottish Government
Riaghaltas na h-Alba

Executive Summary

The Scottish Government is committed to tackling health inequalities and providing access to the highest quality of care for all. This includes providing equitable access to care in clinical trials, which is an integral part of NHS cancer care.

The CMO Annual Report published in March 2021 stressed that *'We urgently need to address our health inequalities here in Scotland, which are the worst in western and central Europe'.* It also acknowledged the 'sobering' report of Professor Sir Michael Marmot, Build Back Fairer, December 2020. A key finding of the latter was that *'to reduce health inequalities and build back fairer from the pandemic, multi-sector action from all levels of government is needed and we must create long-term policies which support equity'.*

This finding equally applies to cancer clinical research, which is by far the biggest area of research in NHS Scotland, representing over 30% of the entire national portfolio. The size of the cancer portfolio reflects the overall prevalence of cancer, with citizens having a 1 in 2 chance of developing cancer during their lifetime[1], and the fast pace of product development and innovation. It also reflects the clinical community's commitment to delivering high-quality patient care through cancer research, as **all** patients benefit from being treated in research active hospitals [2] [3] [4]. Clinical trials also provide access to potentially lifesaving or life extending cancer treatments that are not yet available in standard of care. This can provide hope when standard treatment options have been exhausted.

Furthermore, clinical research plays a vital role in supporting the move towards precision medicine. Where our understanding of human biology, and the biology of cancer in the laboratory, is then translated into the development of new highly targeted therapies, which are then taken into clinical trials. These 'personalised' therapies are more likely to be effective as they are tailored to the individual characteristics of the patient and their specific cancer. Personalisation can also improve treatment outcomes and quality of life by sparing the patient the potentially harmful side effects of therapies which may be of limited value. Many personalised therapies developed in clinical trials ultimately become licensed products made available for standard use in the NHS ('standard of care').

Indeed, in cancer services, **realistic medicine** often relies on the ability to provide access to **precision medicine**. Precision Medicine uses the genetic profile of an individual and/or their disease to guide decisions about the prevention, diagnosis,

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[1] Ahmad A.S., Ormiston-Smith N. & Sasieni P.D. (2015). *Trends in the lifetime risk of developing cancer in Great Britain: comparison of risk for those born from 1930 to 1960.*, British Journal of Cancer.

[2] Downing A, Morris EJA, Corrigan N, et al. (2016) *High hospital research participation and improved colorectal cancer survival outcomes: a population-based study.* Gut Published Online First:2016 doi:10.1136/ gutjnl-2015-311308. https://gut.bmj.com/content/66/1/89.short

[3] Jonker L, Fisher SJ, Dagnan D. *Patients admitted to more research-active hospitals have more confidence in staff and are better informed about their condition and medication: Results from a retrospective cross-sectional study.* J Eval Clin Pract. 2020;26:203–208. https:// doi.org/10.1111/jep.13118

[4] Jonker, L. Fisher, S.J. (2018) *The correlation between National Health Service trusts' clinical trial activity and both mortality rates and care quality commission ratings: a retrospective cross-sectional study,* Public Health, Volume 157, 2018, Pages 1-6, ISSN 0033-3506, https://doi.org/10.1016/j.puhe.2017.12.022. (https://www.sciencedirect.com/science/article/pii/S0033350618300015)

and treatment of disease. Clinicians can then better understand individualised risks and benefits of treatment, and have well informed discussions with the patient about *what matters to them* (i.e. realistic medicine). This helps to improve quality of care for individuals, and by minimising interventions of limited individual value, capacity is optimised for all NHS patients who need time critical care. We will however see that lack of access to complex genomic testing is a key constraint. Equity of access to some treatments, in trials and standard of care, is affected as a consequence.

In the context of a continuing pandemic, in which large waiting lists have grown, this report notes there are several ways in which clinical research benefits overall NHS capacity. In addition to the benefits described above, we will see that a vibrant trials portfolio allows Scotland to better compete for talent by offering more attractive and rewarding careers. Increasing the overall proportion of cancer patients treated in trials also alleviates pressure on standard of care services by providing 'per patient', externally funded, treatment capacity. Optimising use of NHS funded capacity is especially important in services with rapidly growing demand, such as Systemic Anti-Cancer Therapy (SACT), with an underlying average growth rate of circa 10% per annum. Or radiotherapy, where novel hypo-fractionated techniques, developed and delivered in trials, reduce attendances, and provide highly cost-effective potential alternatives to SACT and surgery.

It follows that the more thinly stretched NHS capacity becomes, the more vital clinical research activities become for all cancer patients. Nevertheless, this report demonstrates that the clinical research community generally perceives a lack of engagement from NHS senior management, with clinical research often treated as 'an optional extra'. This experience was exacerbated during the COVID-19 pandemic when cancer and other non-COVID trials were in many cases paused or deprioritised.

When considering the pandemic's impact on Scotland's cancer portfolio, it quickly became clear to the NRS Cancer Resilience Group that continuity and speed of trials restarting varied considerably. If left unchecked this could potentially exacerbate pre-existing health inequalities in cancer care. Equally, it was recognised that the pandemic had caused rapid changes in the way organisations worked in partnership and used technology to provide remote access to care, thus providing a useful platform upon which to build.

An Equity of Access Short Life Working Group (EoA Group*) was therefore established to explore these issues. The group was asked to advise on how to mitigate these risks and realise opportunities for more equitable access to cutting edge therapies in clinical trials for the people of Scotland.

The following report summarises the findings and recommendations of the group. This is provided as a compilation of work package reports focusing on domains which impact on equity of access, including:

- Opportunities and Challenges for Recovery of Scottish Cancer Research
- Cancer Clinical Trials Data
- Cancer Trials Staffing and Management

- Key Performance Indicators
- Financial Models
- Use of Digital Technology
- Access to Enhanced Genomic Testing
- Partnership Working

The reports have been written by subject experts, designated as 'Work Package Leads', contributed to by the EoA Group, and then edited and compiled into a single document by the EoA Group Chair. **Membership of the EoA Group is provided in appendix 1*

Recommendations are detailed within work package sections and summarized in section 2 of this report. If these recommendations are acted upon, there would be wide ranging benefits for the people of Scotland, for NHS and academic institutions, and for the Scottish economy.

Taken together, this would form a significant body of work. Accordingly, the key recommendation of this report is that the contents be used to inform the development of a new **Scottish Cancer Research Strategy.**

NHS standard of care, diagnostics, and clinical trials services are intrinsically intertwined and co-dependent. Success will therefore hinge on **close strategic alignment between Scottish research, service, and genomics strategies**. The time is right to achieve this aim as the latter two strategies are also currently being refreshed and developed.

The Scottish Cancer Research Strategy should be co-designed by the various stakeholders in health, academia, government departments, industry, patient and public involvement (PPI) and the third sector. There should also be dedicated leadership of the development and delivery of this strategy, and highly coordinated partnerships, through which Scotland can fulfil its potential as a provider of world-class cancer care

Denise Calder, Equity of Access Group Chair
May 2022

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1. Section 1: Work Package Reports

1.1 Work Package 1

Title
Opportunities and Challenges for Recovery of Scottish Cancer Research

Scope
- Provide an analysis of the strengths, weaknesses, opportunities and threats relating to recovery of Scottish Cancer Research
- Provide recommendations to help address the findings of this analysis

Lead
Kirsty Shearer, Network Manager (N&E Scotland), NRS Research Scotland Cancer Research Network

1.1.1 Background
In May 2021, NRS Trials Resilience Group noted that the cancer clinical research portfolio had not recovered evenly across Scotland. NRS Network Managers were therefore asked to provide their assessment of strengths, weaknesses, opportunities and threats (SWOT) based on their understanding of the landscape. It was decided that this analysis would be relevant to overall recovery across a range of parameters, including equity of access, and should be included in this report. The following SWOT analysis provides an introductory snapshot of themes explored later in this document.

1.1.2 Assessment
Trials are a core component of NHS cancer services and depend on many of the same staff and service infrastructure. Similarly, NHS standard of care services depend on research staff, including clinical academics, to support clinical service provision. Although these services are intimately intertwined, there are separate approaches to strategic planning in academia, NHS cancer services, diagnostics/genomics, strategic partnerships with industry and third sector, etc. Silo working results in duplication, a slower rate of progress, and missed opportunities for patients in standard of care and trials.

The strengths, weaknesses, opportunities and threats revealed in the analysis below are wide ranging and require a more cohesive partnership approach. A Scottish Cancer Research Strategy is therefore required, which aligns with the refreshed national Cancer Strategy, and a national genomics strategy. The recent publication of the first national Cancer Research Strategy for Wales[5] indicates that this is an opportune time to develop and publish a national cancer research strategy for Scotland. The Scottish strategy should address the key themes summarized below and explored in later sections of this report.

[5] Link to the Moving Forward: A Cancer Research Strategy for Wales 2022 Document

Strengths

- Strong 'Once for Scotland' ethos at strategic level (i.e. governments / policy makers)
- Calibre of academic institutions and NHS/academic researchers, includes world leaders in their fields.
- Creation of CRUK Scotland Centre will combine strengths and should benefit all of Scotland, if there is close partnership working across all institutions.
- A government that has recognised the importance of research to core service delivery, sustainability and innovation and works closely with providers.
- High degree of national systems integration (e.g. Chemocare / Varian / EDGE)
- Rich data assets spanning almost 5 decades, and entire patient pathways
- Robust cost recovery and cost avoidance tracking software and methodology available

Weaknesses

- No cohesive Scottish Cancer Research Strategy. Strategies for research, service, diagnostics, data and digital, are all planned separately.
- Lack of coordination in balancing trials and academic portfolios across Scotland
- Inconsistent attitude toward research - not routinely seen as core business / no trials KPIs
- NHS services are planned without giving due consideration to headroom capacity requirements for care delivered in trials
- Single centre services and trials provides insufficient choice, flexibility, and resilience
- Barriers to access exist due to long distance travel and lack of local infrastructure for trials
- Dependent on NHS England for parts of the trials portfolio (e.g. IECT and Protons), and those requiring enhanced molecular testing
- Lack of visibility of trials open and available
- Unsustainable funding model that is dependent on patient recruitment (see finance section)
- Over reliance on charitable funds for trials staff and equipment. Centres with access to large charitable funds have an advantage in what they can offer patients.
- Lack of consistency in versions and use of shared systems, including cost recovery and cost avoidance tracking software.
- Bottlenecks are created in many NHS functions that support both clinical and corporate service e.g. information governance.
- Consultant capacity is severely compromised. Consultants must therefore sacrifice research time to support clinical service and provide mutual aid
- Insufficient number of dedicated research sessions available for Oncologists and Haematologists

Opportunities

- Operational and strategic partnerships have been forged and strengthened during the pandemic. This could be used as platform on which to develop a Scottish Cancer Research Strategy. This would help deliver a cohesive approach between academia, NHS (Cancer and Diagnostic), industry and the 3rd Sector so that Scotland can fulfil its potential as a leading nation for world-class cancer care
- Cancer Services Strategy / Workforce strategy / Genomics strategy are all about to be rewritten. These would be strengthened by a closely aligned Cancer Research Strategy which harnesses high calibre research opportunities and world leading expertise
- A coordinated Senior Clinical Research Fellowship Programme (50:50 service:trials) would harness Scotland's research excellence and help to rapidly build Oncology consultant capacity in Scotland.
- The creation of the new CRUK Scotland Centre provides an opportunity to balance and coordinate research activity with a stronger interface between ALL Scotland's academic and NHS institutions to improve discovery, treatment options, outcomes, and training.
- NHS Leaders could be educated on the importance of access to care in trials, helped to manage performance against KPIs, and to build trials requirements into national planning processes.
- Clinical systems could be harmonized to build resilience, inter-operability, and ability to leverage rich data assets to drive research and innovation
- The closer working relationships developed during the pandemic could be leveraged to develop a more balanced trial portfolio inc Radiotherapy and Cellular Therapies
- The Early Diagnostic Centres initiative could provide greater access to end to end treatment pathway data and opportunity for early detection trials
- Care and viability of health services could be improved by routinely informing all patients that hospitals are research active, and there could be an opportunity to participate in a trial as standard
- Capacity of health services could be optimised by developing a national approach to optimisation studies. This would support realistic medicine and improve patient outcomes and experience
- Use development of Lung Health Checks and expanded access to SABR Lung to develop world leading portfolio of lung cancer trials
- Harness digital tools to improve awareness and facilitate access to trials closer to home
- Leverage internationally leading expertise in genetics, cellular therapies, product manufacture to ensure Scotland leads in this field
- State of the art research facilities could be designed into all new cancer facilities.
- Scotland can offer a platform for continuation of a trial from phase I in the ECMC units to phase II/III across the different cancer centres throughout Scotland.

Threats

- CRUK Scotland Centre must deliver for all of Scotland or risks losing funding.
- Academic institutions do not routinely cooperate closely, and if this doesn't happen it could exacerbate geographical barriers to access, further concentrating activity in the central belt.
- Severe senior medical workforce deficits are likely to further deteriorate without urgent action
- Continuing financial dependency on recruitment may result in a deteriorating mismatch between funded capacity and demand requirements due to increasing stratification
- Reliance on NHS England for access to some trials and specialist services. We have seen during the pandemic that this can disadvantage patients from Scotland (Protons/JiT/CAR-T)'.
- National service reviews are underway which explicitly exclude any planning for trials capacity. This will result in insufficient capacity for service and clinical research if left unaddressed.
- Separate management and planning of cancer trials, cancer services, and support services may result in de-prioritisation of trials in favour of waiting list backlogs grown during COVID
- Scotland misses out on early diagnostic trials and any trials which require access to complex genomic testing. This impairs equity of access to trials for patients in Scotland and this inequity will grow over time if left unaddressed.

Clinical research is an integral part of NHS cancer services. It provides access to potentially lifesaving or life extending cancer treatments that are not yet available in standard of care. It also plays a key part in the delivery of safe, high quality, and cost-effective cancer care and generates experience in delivery of the most innovative cancer therapies.

To mitigate future risks to trials and standard of care, and to optimise strengths and opportunities, there must be a more integrated approach to management and planning between the two aspects of care provision.

1.1.3 Recommendation

It is thus recommended that a Scottish Cancer Research Strategy is produced which closely aligns with the refreshed national Cancer Strategy, and the developing national Genomics Strategy. This should be co-designed by the various stakeholders in academia, government, health, industry, patient and public involvement (PPI) and the third sector.

1.2 Work Package 2

Title
Cancer Clinical Trials Data

Scope

- Identify key areas of inequality and recommend areas of focus for new sites/expansion.
- Provide an initial assessment of access to trials by ethnicity and recommendations regarding further work required in this area
- Provide an assessment of data support requirements / tools to monitor equity of access to trials on an ongoing basis

Leads
Dorothy Boyle, Network Manager (SE Scotland), NRS Research Scotland Cancer Research Network
Ian Anderson, Information and Quality Manager, NRS Central Management Team

1.2.1 Background

The EoA Group agreed that to determine the pandemic's impact on equity of access to trials, access to data would be required. This should capture the number of cancer patients across Scotland in the various tumour groups, postcode areas, socio-economic groups, ethnicity, and minority groups; and whether there was proportional representation of these groups recruited into trials both before and during the pandemic.

If this baseline could be established it would help to identify key areas of inequality to focus on, and help measure the efficacy of interventions designed to improve equity of access. It was not however possible to get a complete data set from the sources available to the group. The Scottish census data were 10 years old and did not reflect significant demographic changes over the last decade. Moreover, data systems used by NHS Research Scotland (NRS) and Public Health Scotland (PHS) do not capture the depth of trials data contained in the EDGE database (EDGE). *
EDGE is the standard software tool used across Scotland's Cancer Research Network.

These challenges were compounded by the fact that EDGE is not used in the same way across the three Scottish Cancer Research Network areas. The combined affect rendered it unlikely that a clear baseline assessment could be provided. Work package 5 explores the use of digital tools such as EDGE in more detail.

1.2.2 Assessment

In view of these challenges, two sample domains were selected to see if meaningful conclusions could be drawn. These were 1) access to trials by ethnicity and 2) access by postcode. This sample focused on the following high volume groups of cancer patients: Lung, Breast, Colorectal and Urology. This work is described below.

Assessing equity of access by ethnicity
The following question was asked: *What is the ethnic composition of Scotland's population and how is this reflected in the number of patients entering clinical trials (or 'studies')?*

Ethnicity data from the 2011 Scotland Census were compared with 2020 data from the EDGE Database as illustrated in the table below.

Category	2011 Census	2022 Census	2020 EDGE
Asian, Asian Scottish or Asian British.	2.7% of population	?	3.05% of patients
African Caribbean or Black.	1% of population	?	0.76% of patients

The findings of this analysis are inconclusive and provide limited assurance due to the difference in the age of these data sets. This also assumes that all ethnic groups have the same incidence of cancer, which is not likely to be true. A greater degree of granularity from other data sources would therefore be required to have a more conclusive analysis.

Assessing equity of access to trials by postcode
The following question was asked:
What is access to cancer clinical trials in Scotland in relation to patients' postcodes, and how does this compare with cancer incidence by postcode?

Postcodes for the South East and North and East nodes were used for this analysis. From this data it can be seen that patients are travelling across Scotland to cancer centres outside their local areas to take part in a clinical trial. From this data, it is clear that patients from every region in Scotland are participating in clinical trials either within their nearest Network node or by travelling to another one of the other Network nodes. It was however impossible to establish whether access rates were equitable.

A much more robust collation and examination of the data is required to accurately report on such findings as the number of patients in high deprivation areas or patients within large multicultural areas with a cancer diagnosis entering trials. This would require additional support to produce this work.

It is important to note that the most specialist trials, particularly early phase trials, will always be concentrated in the specialist regional cancer centres to maintain safety. Consequently, data on *availability* of trials will never be geographically dispersed to match centres of population. However, access rates should not be adversely impacted if carefully designed support strategies are put in place to minimize travel and the impact of travel where this is necessary. This will be explored further in later sections.

1.2.3 Recommendations

1. Equity of Access is one of a range of important cancer research performance measures. A standardised suite of performance measures for the Clinical Research Community, and simple key performance indicators (KPIs) for boards, should be agreed as part of a wider Scottish Cancer Research Strategy.

2. Key stakeholders in the Clinical Research Community need to be able to readily access performance information, to enable well informed decisions about improvement actions. The current infrastructure does not allow for this. An assessment is therefore required of staffing, systems and system integration requirements to allow efficient monitoring of equity of access and other key performance metrics on an ongoing basis.

3. A baseline assessment of performance should be undertaken when Scotland's 2022 Census data are available.

4. Consider use of performance benchmarking tools to provide visibility of how regional and national performance compares with other areas. This would help to identify best practice, learning opportunities, and improvements delivered as part of a nation strategy. Options to consider include the National Institute for Health Research's (NIHR) INCLUDE Tool: Better Healthcare Through More Inclusive Research.

1.3 Work Package 3

Title
Cancer Trials Staffing and Management

Scope

- Complete a baseline assessment of research staffing levels across Scotland, highlighting areas of significant variation
- Make recommendations on staffing requirements to improve access at regional and local centres, and new models of trials delivery
- Review management arrangements and senior support requirements and make recommendations for how this can be improved

Lead
Joy Dawson, Research Governance Manager, NHS Borders

1.3.1 Background

Many of the traditional means of delivering clinical trials have been challenged during the COVID-19 pandemic and there is an opportunity to reinvigorate research delivery to ensure it can deliver more equitable access across Scotland. The Equity of Access Group therefore wanted to understand baseline staffing levels for delivery of NHS clinical research, and what it would take to make this more equitable as a key enabler of improved trials provision.

It should however be noted that clinical trials do not operate in isolation. They rely on NHS support services (e.g. pharmacy and diagnostics) and cancer facilities which serve both trials and standard of care. Accordingly, it was not possible to assess the whole NHS workforce involved in clinical research. This assessment instead focused on:

1) Inequalities in specialist Oncology and Haematology trials staff, particularly in the specialist regional centres; and
2) Staffing requirements to open up more low risk / later stage trials in local centres, expanding provision of care closer to home.

Finally, it was noted that the Cancer Clinical Research Community often report a lack of management engagement, and that this impedes ability to maintain and grow access to trials. This report includes recommendations for how this can be improved.

1.3.2 Assessment

Clinical research staffing gaps have been identified across many health boards, and in all parts of the multidisciplinary team (see appendix 2) A number of factors have however rendered it impossible to accurately establish workforce and funding gaps in any centre relative to others, as described below.

- The data in appendix 2 were provided by the various health boards. The Work Package Lead relied on board R&D departments to check and verify accuracy before publishing.
- These data are not complete as not all data requested from boards were provided.
- Some of the sessions funded by the 4 larger health boards provide regional support and there may be double counting in the returns provided by smaller boards.
- The table provides a snapshot in time in Q4 2021/22. Consultant workforce gaps subsequently deteriorated across Scotland and are particularly acute at present. All specialist centres have been impacted, and a number of boards are relying on mutual aid to maintain service. These pressures limit the time of oncologists for research. The importance of consultants time for research was highlighted by the CRUK report: https://www.cancerresearchuk.org/sites/default/files/creating_time_for_research_february_2021_-_full_report-v2.pdf
- Insufficient information was available on academic posts and how many boards and universities rely on honorary contracts. A future exercise is required to assess how much clinical research depends on universities and their ability to fund posts.
- It was impossible to determine the exact proportion of funding for staff which is reliant on commercial income, one board reported that all their data manager posts rely on commercial income generation.

Charitable Funding

Notwithstanding the above caveats, the data collected for this report provided clear evidence of a reliance on charity and endowment funding to support clinical research capacity in the NHS. Centres with greater access to charitable funds thus have an important advantage for the patients they serve, and this leads to geographical inequalities.

For example, The Beatson has dedicated Clinical Trials Radiographers. These posts have been part funded by the Beatson Cancer Charity since 2017 and have facilitated an increase in the number of Radiotherapy trials opening whilst reducing length of time to set up trials for patients of WOSCAN health boards. The charity has also funded state of the art equipment to facilitate research, e.g. MR Simulator, which allows for more diverse access to trials for patients within this health board.

These roles and equipment are not in place in all Scottish radiotherapy centres.

Recruitment and retention

All boards reported that they have essential research nurses and data manager staff on fixed term contracts due to income being non-recurring. Nurses are nationally hard to recruit staff and the inability to offer permanent posts renders it difficult to recruit and retain staff.

As highlighted above, it is also vitally important that Consultant capacity is rapidly built to avoid a deterioration in research productivity and access to treatment in trials. A proposal has been submitted to Scottish Government for a Senior Clinical Research Fellowship Programme to provide immediate support for standard of care

and trials services, and quickly increase the number of individuals in Scotland ready to take up consultant posts.

Most oncologists provide outreach services to smaller boards. The ability of the smaller boards to undertake cancer research trials is largely dependent on the tertiary centres for recruitment of patients to clinical trials. This in turn is dependent on the number of oncologists who conduct clinics within these boards, the tumour types they specialize in, and their time and ability to be research active. This also limits which tumour groups can access care in trials at their local hospital. It follows that board performance against Cancer QPI standards, which record recruitment to cancer research by board, are not always within the control of the smaller health boards.

Support service vacancies have an adverse impact on research delivery. It was impossible to quantify the impact as part of this work but a number of important examples were provided. These include a national shortage of staff in aseptic pharmacy roles which are key to the delivery of cancer clinical trials. Fife and Borders also cited dedicated research pharmacy posts that have been vacant for several months.

A further example was provided in relation to colonoscopy and endoscopy. Waiting times are high nationally; a situation which has deteriorated during the pandemic. As a result many boards struggle to support research in oseophageal and colorectal cancer as they cannot deliver the required diagnostics within protocol timeframes.

Developing new models of working

In assessing how clinical trials are delivered and how these might be improved, meetings were held with cancer patients and relatives (PPI) and ABPI representatives. The PPI group had a mixed experience of research as part of their care ranging from no experience to participant in trial and active member of protocol steering group. There was clear willingness to identify barriers to research participation and how they could be overcome.

Travel was generally seen as a barrier to treatment and research accessibility. Most trials are non-surgical anti-cancer therapies which require multiple attendances. Multiple long-distance journeys to access care have a significant impact on patients' lives when on active systemic anti-cancer therapy (SACT) or radiotherapy. At the same time many specialist treatments further afield can exacerbate inequalities by being accessible only to more affluent patients with greater ability to access support and fund travel or temporary accommodation for themselves and their families. Accordingly, all boards can report examples of patients who have opted for standard of care treatments available locally, rather than travel long distances to participate in specialist trials; even when trials provided an opportunity of improved clinical outcome.

During the pandemic, there has been examples of severely immune compromised patients refusing to access trials due to the need to travel from tier 1 to tier 4 areas due to fear of exposure to COVID-19. In the context of a continuing pandemic, it is more important than ever that the clinical research community critically challenges

itself about which aspects of trials could be provided locally, or in at least one more specialist centre, if supported by the necessary staffing and technology.

Sponsors and clinical research organisations tend to undertake clinical research with centres they have previously worked with and who have delivered trials recruitment to target in the past, thus potentially creating longer term inequities in access to research across Scotland.
Sponsors understandable want assurances about sites' trial experience, or how significant the training needs would be for a research naive site. Industry partners also report a reluctance to open too many centres per country due to the cost and logistics of setting up trial centres. For example, assessment of relevant laboratory QA certification; scanners and other specialist equipment and staffing arrangements.

Only regional specialist centres have the expertise and facilities to safely undertake early phase cancer trials. However, not all cancer trials provide highly specialist care that needs to be delivered in a tertiary centre. Indeed, many that do include components that could be delivered locally. With the necessary staffing models in place, and optimal use of digital technology between partner centres, it is possible to greatly expand local access, particularly for investigations and treatments that can be safely provided in standard of care.

A hub and spoke delivery of staff training and research activity could be developed to facilitate this. Local centres being accredited to perform some of the procedures of a main centre would be useful to ensure patient care closer to home is achieved. This would also provide new sites with valuable trials experience, building confidence amongst sponsors.

Many aspects of remote specialist care have been introduced during the pandemic in standard care that could be adopted in trials. Interaction with oncologists is very important when considering trial delivery, and specialist centres already provide outreach hub and spoke models in standard of care. Local trials recruitment should be built into these outreach sessions as standard. Equally, components of trials which are non-specialist might be delivered locally through tumour site specific clinical nurse specialists.

The new NIHR Associate PI scheme could be adopted and used in conjunction with schemes such as NRS fellowships to build portfolios that encompass large multi-site studies and smaller locally developed research programmes.

Extending hub and spoke models for delivery of trials beyond the current regional arrangements does not come without challenges. It can generate more work for R&D departments and can be difficult to navigate contractual complexities. Accordingly, there is a need for a more detailed scoping exercise to determine how a hub and spoke training and delivery model could be effectively delivered in practice.

Scoping activity should include mapping services which are already delivered locally by clinical teams in partnership with tertiary centres as part of standard care pathways. This would identify potential activities that can be undertaken locally for research.

Network Management Arrangements
There is strong evidence of the Cancer Research Network working well with health boards through the regional managers. However, in view of the dependence of trials on standard of care, and vice versa, it is important that the network works more strategically and has a higher overarching view of cancer research and standard cancer services.

Crucially, any future research strategy should develop a more integrated approach with standard of care service planning and delivery. Only by doing so will there be a robust model that effectively maintains standard of care and optimises equity of access to treatment in trials across Scotland.

Network clinical leads in each region should have dedicated time for the role as their input is vital in assessing new trials, capability to deliver and oversight of the regional portfolio. The structure of the network should provide not only dedicated time and funding for the cancer research champion, but equivalent non-clinical senior management sessions dedicated to the support of the national cancer portfolio lead.

There should be clinical and managerial time for regular network meetings to review the regional portfolios and better share information. Increased formal engagement and partnership working with health boards will allow better communication and shared learning, particularly in exploring the potential benefits and risks of a hub and spoke model.

There should be regular communication and where required attendance at meetings at a UK level to raise the profile of cancer research activity in Scotland. This should be considered as part of a review to ensure that NRS has the necessary dedicated focus on cancer, given the proportion of national research activity delivered by cancer services.

Senior Management Support
To create this infrastructure, service management and executive support is vital. It has been repeatedly noted by the research community that their lack of support can be a major barrier for research delivery, as this often depends on NHS service staff and facilities. For example, if managers are unable or unwilling to accommodate externally funded research time in job plans then opportunities to optimize research activity are lost.

More needs to be done to ensure that NHS senior managers recognise the value of research as part of core service provision. Managers should be required to support and manage the performance of their teams to ensure that patient access to trials is optimized and delivered locally wherever clinically appropriate. A number of actions could be taken to address this.

- Training

  Scotland offers a wide range of training opportunities for NHS managers. However, managers do not receive training about how clinical research activity supports improvements in the safety, quality, and efficiency of care for all patients. Nor indeed that by supporting clinicians to be research active, they improve their ability to offer more attractive and rewarding careers in which staff

can pursue interests. This in turn improves the service's ability to attract and retain high calibre staff in an extremely competitive employment market.

- Workforce planning

The 2021 CRUK report, Creating Time for Research[6], explained that to optimize access to trials services must build in headroom capacity to allow clinicians the extra time necessary to be 'research active'. The aforementioned national workforce and deteriorating operational pressures render this more difficult than ever to achieve this in practice. It is important that managers are given support to develop 5-year workforce plans for their services which build in headroom capacity over time.

- Service Planning

NHS service planning focuses on requirements to provide access to high quality care (facilities, staffing, consumables); but only to meet demand for standard therapies approved for use. There is no requirement to design in headroom capacity to accommodate clinical research activity from the outset. This leads to capacity pressures in both standard of care and trials, as both arms require access to the same staff and facilities. Proposals to deliver new services should be routinely required to demonstrate ability to provide equitable access to trials alongside other service requirements. This would reinforce the message that trials are an integral part of NHS cancer care.

- Leadership

Job descriptions of NHS leaders (clinical and non-clinical) usually include a statement on the need to demonstrate commitment to delivering education, in addition to delivering against KPIs. There is no standard requirement to demonstrate a commitment to research and innovation in service delivery. Adding this standard requirement to job descriptions would be a powerful statement of intent.

- Introduce Key Performance Indicators (KPIs)

Delivery of equitable access to care in trials is not a KPI against which Health Boards are managed. Provision of 'access to care' should be measured and proactively managed in both the standard of care and trials setting. This will be explored in the next section.

1.3.3 Recommendations

1. Scope the number of academic honorary contracts that support clinical cancer research delivery to ensure that this dependency is visible and understood

2. Centrally fund essential radiotherapy clinical trials capacity. Resource requirements should be confirmed separately by the national Radiotherapy Management Group.

[6] Link to Identifying and Improving the Capacity of Healthcare Staff to Conduct Research – Cancer Research 2021 document

3. All oncologists and haemato-oncologists should be allocated at least one dedicated research DCC session within a standard 10 PA job plan.

4. Consider national infrastructure support for diagnostics and aseptic pharmacy

5. Fund sessions for the 3 regional clinical leads to support each node, and matched senior management sessions to support the national cancer research champion.

6. Develop a national Senior Clinical Research Fellowship to rapidly build essential senior medical capacity for standard of care and cancer trials.

7. Review how standard care pathways can be effectively established to map new hub and spoke staff training and service model to support cancer trial delivery

8. Ensure the national NRS service structure has a proportionate focus on cancer given the size of the national trials portfolio that this represents. This should include consideration of a dedicated cancer fund for the NRS Fellowship Programme

9. Provide a package of training and support for NHS managers and ensure the requirement to support trials is built into job descriptions and service planning.

10. Introduce Key Performance Indicators for access to care in trials (See next section)

1.4 Work Package 4

Title
Key Performance Indicators

Scope
Explore the potential to introduce national key performance indicators for clinical research and provide recommendations

Lead
Denise Calder, Strategic Partnership Manager for Cancer Research, CRUK Scotland Centre, University of Edinburgh, General Manager, Edinburgh Cancer Centre, NHS Lothian

1.4.1 Background

As discussed in the previous section, NHS management support is considered essential to the recovery of clinical research, and improved access to care delivered in trials. It is important to address this issue in the context of a continuing pandemic and deteriorating capacity and demand pressures across Scotland.

Cancer Trials Resilience Group (CTRG) noted that NHS executives and senior managers were unlikely to prioritise trials in the current context unless they could easily see and understand the benefits of a vibrant trials portfolio.

Indeed, it is generally understood that clinical research offers patients a wider range of treatment options which can in some cases offer superior treatment outcomes. However, delivering care in trials also has significant *service* benefits which remain invisible. These benefits are derived from provision of externally funded new cancer medicines and treatment capacity for patients, most of whom would otherwise receive NHS funded cancer therapies delivered in standard of care. Clinical research thus alleviates capacity pressures in standard of care, which improves safety, quality, and efficiency of care for all.

Furthermore, there was concern that access to care in trials is not a KPI against which Health Boards are managed. This is in contrast with other access KPIs such as Treatment Time Guarantee and 31/62 day Cancer Waiting Times Targets. Whilst there are several QPIs at tumour group level, there is no aggregated performance measure by board.

To address these concerns, CTRG requested that a focus group explore these issues and provide recommendations. The focus group met on 11th April 2022, and included representatives from CSO, NRS CMT, and Research Network Managers. The assessment and recommendations of this group are provided below.

1.4.2 Assessment

The KPI focus group was tasked with identifying KPIs which would be simple to generate and meaningful in content for the *agreed target audience.* It was acknowledged that a variety of stakeholders would be interested in published KPIs, and each would have their own data interests. However, to be most impactful, KPIs should be specifically aimed at:

- NHS Senior Managers / Executives – to demonstrate overall performance trends in Health Boards across Scotland, the wider value of providing treatment in trials, and to serve as a guide to further action or enquiry

- The Clinical Research Community – to demonstrate overall performance trends, to help measure efficacy of interventions designed to improve access, and to understand the impact of changes in the research environment

The group explored a wide range of options, some of which would be difficult to generate due to the numerous IT systems and bodies involved in collecting and processing data. The KPIs presented in the dashboard below were therefore considered most suitable.

Access to care in trials is:

1. Equitable	% Cancer patients given an opportunity to participate in a trial, by Board (consented)
2. Efficient - Optimises treatment capacity	% Cancer patients treated in externally funded trials, by Board (recruited)
3. Cost effective	% Cancer medicines spend externally funded in trials, by Board
4. Drives innovation	Number of studies open, by phase, by Board, by tumor type **A growing proportion of early phase trials demonstrates a vibrant portfolio, which provides access to novel therapies.*

1.4.3 Recommendations

1. Provision of 'access to care' should be measured and proactively managed in both the standard of care and trials setting. It is therefore recommended that the above KPIs are adopted for use across NHS Scotland and reported at regular intervals by NHS Research Scotland Central Management Team.

2. This dashboard of KPIs should be reviewed at the end of year one to ensure it meets the information requirements of the recommended Scottish Cancer Research Strategy. This review should also take account of similar metrics developed in other nations which support international benchmarking.

1.5 Work Package 5

Title
Finance

Scope
- Provide a baseline assessment of issues to be addressed in order to provide more equitable funding of trials capacity
- Make recommendations to address the issues identified. This should particularly address regional trials for which there is not standard exchequer funding arrangement

Lead
Charles Weller, General Manager, NRS Central Management Team

1.5.1 Background

Work package 3 emphasised the importance of having essential funded capacity to safely deliver trials. Consistent financial models, which include a robust approach to cost recovery and disbursement of funds, are key enablers to expanding access to clinical trials activities. As we have seen, this also drives improved capacity utilisation and cost effectiveness in standard of care services.

However, this is a complex landscape which can be hard for members of the Clinical Research Community to navigate due to multiple funding sources and contractual arrangements. This report will explore key issues to be addressed in order to provide greater clarity and fairness, and provide recommendations with regard to:

- Consistent and robust costing and recovery models
- Effective and transparent recovery and disbursement of funds to the appropriate location to ensure that NHS services can provide support to reseach activity, and to develop additional capacity where needed.
- Consistent and predictable costing to support rapid study agreement and setup and to promote repeated projects with sponsors.
- Fair and transparent attribution of costs to help clarify study responsibilities and roles.
- Efficient models for distributing and using funding resources to support more equitable models of delivery, closer to home where clinically appropriate.

1.5.2 Assessment

CSO provides funding both as core infrastructure allocations to Boards and Research Networks, and also through grants and other routes. In principle, study-specific costs should be fully identified and recovered as set out in ACoRD (Attributing the Costs of health and social care Research & Development), and PICTF (Pharmaceutical Industry Competitiveness Taskforce), without the need for core allocation support. A reliance on core allocations to offset the shortfall in poorly costed or improperly disbursed projects prevents the development of sustainable and scalable research infrastructure.

A short paper summarising the current position on costing for both commercial and non-commercial studies is provided in appendix 3.

While the process operates broadly as intended, there are ongoing differences of interpretation and practice. The topic is wide, and while not all the issues identified are directly relevant to equity of access, all are likely to have a wider impact on the ability of NHS Scotland and NRS to support and deliver research in a sustainable way.

The position in England on **commercial costing** is still developing. The Scottish approach is to enable UK-wide consistency in costing through common training and competency frameworks. **Non-commercial costing** remains unstandardized- although there has been moves to develop a process based on use of modified standard commercial rates.

The use of the SOECAT (Schedule of Events Cost Attribution Template) to enable correct attribution of costs may also help to support better identification and recovery of funds by R&D Departments.

Several problems were highlighted in processes for handling costs after the initial review:

- Study extensions were identified as an issue.
- Costs for study amendments are not always fully identified or fed back to cost recovery/finance.
- There are concerns over costings for site initiation, consent, and follow-up. The feasibility process is becoming increasingly time consuming as commercial sponsors are more frequently asking for several different feasibilities to be complete, pre-selection visits, and screening log. It is not clear that sites are routinely and consisting costing for this additional administrative burden.

Other points to note include:

- Cancer studies are complex and can often be hard to cost. Details of the patient pathway can be crucial in developing an accurate costing but may not be well understood by administrative staff who often generate costings.
- Larger centres are often more dependent on charitable funding to support core activity. This creates a vulnerability in regional service provision. It also means that boards with greater access to charitable funds are better able to offer access to a wider range of trials.
- Developing models for flexible working, including shared site models across multiple Boards may challenge the current model, and have a direct impact on availability of trials in smaller or more rural Boards.
- There is significant financial value to the NHS in the form of high-cost cancer drugs which is often overlooked. Approximately 50% of NHS Oncology expenditure is on high-cost cancer medicines. Edinburgh Cancer Centre now routinely uses the EDGE database to capture these savings and draw attention to the wide range of benefits related to the research portfolio.
- CSO allocation models are based on a single site paradigm and may be challenged by the development of split site models.

- The pandemic has reduced commercial income, particularly in smaller Boards
- The pandemic has also impacted non-commercial funders, particularly charities, through both a loss in available income, as well as an increase in costs due to extended trial timelines. This is estimated to be as much as £368m UK-wide: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32397-7/fulltext
- Development of better systems to track research activity, link to financing and invoicing models could be effective in improving cashflow and enabling support for split site models which could widen the geographic engagement of trials.
- Experience at several sites suggests resource to support use of EDGE could have wider benefits in both financial processing as well as gathering information on benefits such as resource utilisation, released clinical capacity due to trial activity, and drug cost savings. This in turn provides another strong incentive for senior decision makers to support the continuity and expansion of access to trials.
- Low volume, highly specialized services (e.g. CAR-T cell therapy) tend to be delivered in single centres in Scotland, with NHS England providing additional capacity where necessary. Alternatively, centres in England may have been commissioned to provide the service entirely (e.g. Proton Beam Therapy).

  These services are funded by a risk share arrangement to which all boards contribute, and patient access is then managed by National Services Division (NSD). These risk share arrangements do not include access to clinical trials, which provide access to essential care. In both these examples, the costs of care are high. NHS organisations are currently expected to meet an initial component of Excess Treatment Costs (ETCs), which can affect consistent access to treatment in trials in some places. NSD is proactively working with key stakeholders to address this.

1.5.2 Recommendations

Detailed recommendations to address the issues described above can be found in appendix 4 and are summarised below.

1. As part of the development of a Scottish Cancer Research Strategy, create a focus group to address the recommendations of this work package.

2. Review and improve study costing processes

3. Develop standard Scotland-wide approaches to capture drug savings and other non-financial benefits of clinical research

4. Identify and address areas where reliance on charitable funding may affect resilience and continuity of research services.

5. Facilitate mechanisms to enable local reinvestment of trial income, savings and core funding to feed into service design.

6. Further develop the “One Scotland” model to reduce the cost of additional site setup, and enable equitable study placement, including development of “split-site” models.

7. Develop better models for transferring funds between NHS bodies

Work Package 5

Title
Digital Technology

Scope
- Link the EoA and Data & Digital working groups so there is two way communication.
- Lead on development of digital tools as opportunities and needs arise.
- Raise awareness and support implementation of existing digital tools.

Lead
Kirsty Shearer, Network Manager (N&E Scotland), NRS Research Scotland Cancer Research Network

1.6.1 Background

The report from the Data and Digital short life working group has been produced and reported to NHS Research Scotland Restart Strategic Oversight Group as a separate piece of work that sits alongside the EoA report as a complimentary document. It consists of 6 work packages throughout the trial life cycle and recommendations for interventions that would have the greatest potential impact which have been mapped against current resource. The EoA group endorse all the recommends made by the Data & Digital group.

In addition to the recommendations in the Data and Digital paper, a key digital tool used in cancer research is the EDGE software. This section will therefore focus on how EDGE can be better utilised to benefit cancer research. EDGE is a dedicated web based software that manages clinical research to provide research professionals with rapid access to real-time data to improve the efficiency of running research. This allows the tracking and management for studies from start to finish with complete oversight. EDGE has become an embedded part of the clinical research infrastructure across the UK and internationally. The Cancer Research Network has been using EDGE since 2007.

1.6.2 Assessment

Minimum Scottish data set for EDGE
Most researchers conducting cancer research are using EDGE to record recruitment to the cancer studies. EDGE data fields can be set as mandatory, currently the only field across Scotland that is mandatory is CHI number. The Network nodes have also set postcode as a mandatory field to provide information to report on the clinical trials QPI. The use of the postcode field has not only been useful for QPI reporting but has been used to allocate research resource to additional centres. Additionally, from an R&D function it is difficult to manage information from different research software sources as information is often not consistent, hence one minimum dataset across Scotland would be beneficial.

National reporting
EDGE has the ability to allow information to be pulled nationally for reporting across all Cancer Centres. Currently this can be used to report generically on things such as recruitment and trial status. However, there is the facility to form closer working partnerships and collaborations between a defined group of organisations i.e. all the cancer Network nodes. This would allow national badging of trials into defined groups such as radiotherapy, paediatric, oncology, and haematology, allowing robust reporting across the portfolio.

Finance
EDGE provides finance functionality for organisations to track all trial costs related to their trials. This finance functionality can be used to enable the creation of invoices with other financial systems. EDGE allows the creation of costing templates for recording the costs as set out by the trial contract. The ability to run specifically filtered finance reports allows flexibility for oversight and invoicing. Currently in Scotland NHS Lothian, NHS Greater Glasgow and Clyde and NHS Highland cancer research teams and R&Ds are using the finance tools in EDGE. By using the finance tool in real time the financial reporting from a trial is likely to be more accurate and income maximised, minimise risk and show transparency.

By using the finance tool, the amount of saving an NHS health board is generating by taking part in trials and avoiding drug costs can be calculated. Other ways to capture additional trials associated costs would be to track excess treatment costs and research support costs as well as de-escalation trial cost savings. Capacity savings to the standard of care clinical service provided can be made by taking part in research as research provides resource in the form of staff, tests and treatments that ease the pressure on the clinical service, this saving can be collected used EDGE. EDGE finance could also facilitate running trials in a shared care format to increase geographical equity and reimburse the correct hospital for work done.

A time saving tool has been developed by a dedicated EDGE member of staff in NHS Lothian to assist with completion of adding the finance information to EDGE by the users. Also bespoke finance trackers have been developed in Lothian to pull out information from the finance function to assist with activity oversight and finance reporting.

System use by other departments
Within cancer clinical trials it is not only the direct research teams that are using EDGE to manage the research, it is also used by departments that support research. This has particularly been the case in NHS Greater Glasgow and Clyde where it is used by pharmacy, pathology, nuclear medicine and the transplant team.

Support for EDGE
EDGE have a good central support team that can be contacting for specific EDGE questions. Currently in Scotland it is only NHS Lothian who has a dedicated staff member employed to support the development of EDGE finance tool, so it works well for research and finance staff. In the other Health Boards support is offered ad hoc by Network staff. A national role could support national training, putting on cost templates, pulling finance reports, running a peer support group, implementing sharing learning for different teams and facilitating national discussion groups

Recruitment – LPMS – CPMS
In the UK research recruitment is recorded in the Central Portfolio Management System (CPMS) for all 4 nations. There are then Local Portfolio Management Systems (LPMS) that can feed in the recruitment numbers for each site that will then be checked for accuracy by the Sponsors. EDGE is a LPMS and in England the recruitment data recorded in EDGE is directly fed into CPMS. However, in Scotland a recruitment report from EDGE is downloaded and manually manipulated then uploaded onto ReDA (clinical trial management system used to manage research governance in Scotland) before being transferred into CPMS. This is a potential source of data error as well as unnecessary work.

ReDA in Scotland is the primary research governance system that is used for receiving study documentation from IRAS and signing off R&D approvals. However ReDA does not provide a good research site management tool. Ultimately one system to manage both processes would be the ideal solution for research staff and R&D staff.

1.6.3 Recommendations

1. Additional fields in EDGE should be set as mandatory fields by all cancer EDGE administrators across Scotland. This minimum dataset should be definite through stakeholder discussions. These requirements should be set out as SOPs.

2. Define a minimum dataset and definitions of use for key items of trial information such as dates and status that should be populated across Scotland, this will facilitate use by NRS, the Networks and R&Ds.

3. The Cancer Network Managers work together with EDGE to set up the background work needed to achieve this partnership level reporting access.

4. The users then need to be advised as to the fields they need to be completing to keep this information in real-time.

5. Evaluation of using EDGE as a finance tool between research staff and R&D staff across cancer trials in Scotland to ascertain if it should be implemented by all Health Board R&Ds and how it should best be implemented to achieve full benefit and reduce human error.

6. Drug cost avoidance needs to be calculated across all CTIMP trials for cancer at each Health Board as a powerful tool to demonstrate the benefit of trials to health board budgets.

7. The drug avoidance cost recording should be expanded to capture other trial avoidance costs that are demonstrable benefits of trials.

8. The timesaving tools developed by Lothian need to be rolled out to all EDGE users to increase efficiency. Even with these timesaving tools extra resource in

the form of local research staff should be assessed to determine if it is adequate to provide full support of this extra work.

9. Learning from support departments that have successfully used EDGE should be shared nationally to explore developing beneficial likewise solutions across the country.

10. The use of EDGE across the 5 cancer centres warrants a role for national service support.

11. Reduce manual manipulation to process recruitment data for ReDA and CPMS, either by the direct LPMS upload from EDGE to CPMS or have a way to auto-manipulating the data from EDGE to feed into ReDA which then uploads to CPMS.

12. A wider review of the LPMS/research governance management systems needs to be undertaken in Scotland to evaluate the value of having one or multiple systems.

1.7 Work Package 7

Title
Access to Enhanced Genomic Testing

Scope
- Articulate role of genomic testing in providing equitable access to cancer trials
- Provide recommended actions and support requirements to improve access to genomic testing

Lead
Dr P Roxburgh
Senior Clinical Lecturer in Medical Oncology and Precision lead for Glasgow ECMC

1.7.1 Background

In situations where standard therapies are suboptimal, patients across Scotland require access to clinical trials of novel agents. The Experimental Cancer Medicine Centres (ECMCs) in Edinburgh and Glasgow are responsible for providing access to these novel therapies at the earliest phase development, and all specialist centres provide access to later phase trials.

A substantial number of early-phase studies now require molecular selection using complex molecular testing, even in this initial phase of drug development. As a consequence, later phase evaluation of novel therapies also increasingly rely on molecular selection which in turn leads to an increased portion of ‘precision oncology’ medicines being licensed and reimbursed by the Scottish Medicines Consortium (SMC). Importantly, the focus to develop molecularly targeted therapy has come from demonstration this ‘precision oncology’ approach leads to better patient outcomes [1-13] (table 1).

Table 1: Summary of precision oncology programmes.

Study title	No. pts	Sample type	% pts matched	Headline outcome	Outcomes measured
PREDICT (MD Anderson) Tsinberidou et al, 2012	1,144	FFPE	18%	Patients on matched treatment had a *longer overall survival* (OS), *better response rates* and *longer time-to-treatment failure* (TTF)	TTF, OS
IMPACT (MD Anderson) Tsimberidou et al, 2015	1,436	FFPE	27%	Patients on matched therapy had *better response rates*, *failure free survival* (FFS) and *longer OS*	Response rates, FFS, OS
SHIVA Le Tourneau et al, 2015	716	FF	13%	No significant benefit for patients treated with a matched therapy compared to unmatched	PFS
NEXT-1 Kim et al, 2015	428	FF and FFPE	24%	*Response rates improved* for matched patients in the gastrointestinal/ hepatobiliary/rare tumours group & lung group.	Feasibility of molecular testing, response rates
IMPACT/ COMPACT (Princess Margaret Cancer Centre) Stockley et al, 2016	1640	FFPE	5%	Patients on matched treatment had *better response* to treatment. No observed benefit for OS or time on treatment.	Frequency of genomic alteration and actionable mutations, outcome of profiling
MOSCATO-01 Massard et al, 2017	948	FF	21%	Patients on matched therapy had *better progression free survival* (PFS) in comparison to their last treatment	PFS for matched patients vs. their PFS interval on their last line of treatment
WINTHER Rodon et al, 2019	303	Dual biopsy-met & histo matched tissue	35%	Use of RNA profiling, on top of DNA mutation profiling, increased the proportion of patients being matched to a targeted therapy. *Higher matching score correlated with longer PFS*.	PFS on current treatment vs. previous treatment.
TARGET- part A Rothwell et al, 2019	100	ctDNA, FFPE, FF	11%	ctDNA data showed good concordance with matched tumour and results were turned around within a clinically acceptable timeframe.	Feasibility of utilising ctDNA sequencing data for clinical decision making.
NCI-MATCH Flaherty et al, 2020	5954	FF and FFPE	18%	Demonstrated feasibility of large-scale screening, at numerous accruing sites, for moderately frequent molecular targets.	OR to targeted agents

FFPE: formalin fixed paraffin embedded FF: fresh frozen PFS: Progression Free Survival OR: Objective Response ctDNA: Circulating Tumour DNA TTF: Time to treatment failure FFS: Failure Free Survival. Rows shaded blue highlight studies where patient benefit was demonstrated.

These precision medicine programmes have demonstrated the feasibility of delivering comprehensive and complex genomic testing and that patients benefit from this approach.

1.7.2 Assessment

At the current time, the NHS genetics laboratories in Scotland provide high quality somatic genetic testing via single gene or small panel sequencing for some selected cancer patients. This means that when a clinical team are considering a patient for a clinical trial, they have only limited molecular information available (e.g. KRAS status in colorectal cancer patients and BRCA1/2 status in ovarian cancer). In the past, many trials incorporated 'pre-screening' procedures, where after the patient gives consent, their tumour sample can be sent for testing for the molecular marker of interest at a Sponsor funded vendor. Due to the availability of complex and comprehensive molecular testing in most trials-active countries, trial Sponsors are now moving away from the Sponsor funded 'pre-screening' model, expecting that the required molecular information pre-exists through standard of care genomic testing. As a consequence, some molecularly guided trials cannot open in Scotland.

In NHS England, testing for a comprehensive panel of genomic markers is now available through a network of Genomic Laboratory Hubs (GLHs). Furthermore, the scope of testing provided by the GLHs has recently broadened further to also include access to whole genome sequencing for patients with selected tumour types (high grade serous tubo-ovarian cancer and carcinoma or unknown primary). Due to this programme of comprehensive genomic testing, cancer patients in England will be able to access a portfolio of precision oncology trials that are not possible to open in Scotland.

There is a realisation among leaders in genomics laboratories in Scotland that a new genomic strategy for cancer is an urgent need. This has been highlighted by SMC approvals for tumour agnostic therapies, where a molecular characteristic determines suitability for a medicine regardless of tumour site, and other 'precision oncology' therapies for which we currently have no available testing in NHS Scotland (table 2).

Table 2. Examples of novel therapies that cannot be accessed in Scotland as the required complex molecular test is not available

Therapy/Indication	Molecular Test	Comments
Olaparib in combination with bevacizumab for high grade ovarian cancer (SMC approved)	Homologous recombination deficiency (HRD) test	HRD or genomic test is a complex assay that requires extensive sequence data
Entrectinib for patients over 12 years with a solid tumour harbouring an NTRK fusion (SMC approved)	NTRK fusion assay	This is an example of a tumour site agnostic therapy. If all patients are not screened for the presence of the TRK fusion then patients cannot benefit from the therapy.
Pembrolizumab for MMR deficient or MSI-H cancer (access through IPTR)	Microsatellite instability assay and/or mismatch repair gene sequencing	Another example of a tumour site agnostic therapy.
Selpercatinib for advanced RET fusion-positive thyroid cancer and RET-mutant medullary thyroid cancer (SMC approved)	RET fusion and RET mutation testing	An example of requirement to detect both mutation and fusion.

While the new NHS Scotland genomic strategy for cancer may, understandably, address the requirement to identify patients suitable for treatment with SMC approved therapies, it is of paramount importance that the need for visibility of targets which are being explored in clinical trials is also considered to allow Scottish patients access to clinical trials of novel therapies locally. Presently, patients who have sufficient means, self-fund commercially available genomic testing however this is not an option for the vast majority of cancer patients.

1.7.3 Recommendation

A new genomic strategy for cancer in recognised as an urgent need. This strategy should be developed by all stakeholders (genomics laboratory leaders, pathology, cancer clinicians, clinical genetics, clinician scientists, scientists, eHealth, patients) and provide access to testing which is accessible to all patients across Scotland at the point and time of clinical need. The strategy should also consider the following requirements:

1. Cover a broad panel of genes required for SMC approved medicines and including targets currently under exploration in early-phase trials and targets with promising pre-clinical data.

2. Consider the need for more complex tests in certain circumstances (HRD testing, fusions, structural variation, whole genome sequencing).

3. Build capacity, such that resource is available for research and development within the genomics labs, to allow evolution of testing in line with new emerging targets for cancer therapies.

4. Develop an attractive training pathway for genomics-focussed clinical scientists and offer multiple career progression options after qualification.

5. Build capacity in services required to support tissue testing including pathology, biorepository, tissue transportation.

6. Consider the impact of expanded somatic genomic testing on clinical genetic services.

7. Develop IT systems and governance systems that provide sufficient and secure storage of genomic data and that can provide controlled access to genomics data and associated clinical outcome data to facilitate translational research projects.

8. Establish the National Molecular Tumour Board to allow discussion of complex molecular testing results and consideration of clinical implications.

9. Align a programme of education to the new strategy to improve genomic literacy across the health service but particularly within oncology, radiology (understanding tissue requirements for molecular testing), surgery, medical specialities.

1.8 Work Package

Title

Partnership Working

Scope

- Identify key obstacles to partnership working between boards
- Provide recommended actions and support requirements to improve partnership working across the research community

Lead

Dr Stephen Harrow, Consultant Clinical Oncologist, NHS Lothian

1.8.1 Background

It was agreed at the outset of the EOA group that collaborative working and partnerships across Scotland would be key to delivering the shared ambition of increasing access to clinical trials for Scottish patients. A questionnaire comprising 5 questions, detailed below, was therefore developed with the aim of interrogating what collaborations were already established and working well, what collaborations were established but not working optimally and where new partnership development should be focused to achieve our aim.

This questionnaire was sent to the clinical, nursing and administrative leads at each of the 5 cancer centres. Each of the leads were asked to forward the questionnaire to anyone within their department who they considered appropriate to provide additional comment. Patient representation, industry partners and government associates who formed part of the EOA committee were also invited to comment. Feedback was received from all 5 cancer centres and collated. The initial findings were discussed within the EOA group and further information sought from individuals where required. The main points raised against each of the questions is detailed below. These points formed the subsequent recommendations.

Before further elaborating on the outputs of this work, it should be noted that it focused on NHS partnerships. However, the importance of building partnerships across the *whole research community,* including academia, NHS, industry and third sector cannot be understated. Only by developing close cross sector strategic partnerships will Scotland deliver a truly world leading cancer research portfolio which optimizes benefits to patients, and equity of access to innovative therapies in trials. Although this wider context fell outside the scope of this report, it requires a focus as part of a cohesive Scottish Cancer Research Strategy.

1.8.2 Assessment

Clinical Researchers across Scotland were asked a series of questions to help identify issues and opportunities to support better partnership working between boards. These questions and a summary of their responses are provided below.

1.Are you aware of tumour group networks that coordinate the clinical trial landscape across Scotland on a regular basis?
Although clinicians have access to Portfolio Maps - NCRI, there appears to be no coordinated formal network detailing the research landscape across cancer care for any tumour group. The Breast team, Paediatrics and CNS teams seem to have a semi-formal way of discussing ongoing trials across the 5 centres. There are only 2 Phase 1 teams in Scotland and there are links established to discuss trials.

There was interest from nearly all respondents to have a tumour specific national process to highlight trial activity across Scotland. This would need to be maintained regularly with adequate administrative support. The resource should have links to Principle and Chief investigators and details of trial and access to patient information sheets. There was some discussion that this should be available for patients to access.

2. Are you aware of collaboration between cancer centres as to what trials to open and where, in order to perhaps maximise recruitment or minimise duplication of effort?
There is no formal collaboration between centres regarding what trials to open and consideration as to competing trials within the existing portfolio of trials across Scotland. The smaller cancer centres are not part of the discussions regarding opening trials in larger centres which they feel is missed opportunity as they have expertise to contribute. The smaller centres felt that if they were involved at the start of trials opening, they could build in processes to do some of the screening and follow up work locally and reduce patient travel to larger 'central belt centres' which would increase national recruitment.

3. Are you aware of cross referral of patients to other cancer centres to enter specific trials? Is this a well co-ordinated straight forward process?
There are no formal referral processes within Scotland to transfer patients between centres for entry into clinical trials. There have been informal referrals made for trials by certain teams. These referrals can often be time consuming to organise and risk being rejected, causing uncertainty and anxiety for patients.

There is often a lack of knowledge as to what trials are open and where in order to consider trials for patients. There is no one source for patients to access if interested in trials.
If there was to be active movement of patients between centres for clinical trials, then this would need to be supported with increased resource to support the recruiting centre delivering the trials.

There would need to be a supported process to ensure clear communication and coordination of the patient journey as this is often time consuming to coordinate. There was a strong feeling that inter-centre transfer of patients to access clinical trials should be improved.

4. Do you think national, tumour specific groups with oversight of trial activity at a national level would be advantageous for Scotland and Scottish Patients? If 'yes' then what barriers would you fore see in developing that model, and if 'no' then why?

The general feeling was that another layer of national bureaucracy would hamper trial development rather than improve it.

It was suggested that the NCRI Groups (no longer CSGs) should provide this function but that representatives who attend NCRI Group meetings do not feed back to the Scottish community. It was felt that to do this well out with the NCRI would be time consuming.
For smaller, niche studies perhaps within Radiotherapy/SABR a national level approach could be considered but this was not supported by the majority of respondents.

5. Do you believe in a once for Scotland approach would improve equity of access for patients then how would you like to see that realised?
There was general scepticism as to what this really means.
All respondents felt that we should address the administrative work and bureaucracy around trial set up. Due to differences in capacity and resource it was felt that individual centres still need to have individual sign off for studies.

It was noted that health boards legal requirements would prevent a national adoption process for studies. This has been explored in the past and proved time consuming with little benefit realised in the end. There was lack of interest in having single sites opening studies and asking patients to travel. Smaller centres did not want to be excluded or prevented from opening studies locally.

There was interest in trying to ensure that there is a Scotland wide approval process for laboratory work, radiology and radiotherapy.

An increase in research active personnel in each centre (particularly consultants with protected time for research) was considered by many the best mechanism to increase trial activity and equity across Scotland.

1.8.3 Recommendations

1. **Scottish Cancer Trials Register.** National register of trials that has administrative support to maintain its integrity. It should be easily searchable across a range of parameters such as tumour type and be clearly set out in terms of patient clinical pathway. Should be able to easily link to the relevant information for each study and the PIS. Should be available for patients. Regular out puts circulated to encourage or expand recruitment circulated nationwide.

2. **Transfer of patients between Cancer Centres.** Patients should have access to trials across Scotland, and beyond where no appropriate trial option is available in Scotland. As much effort should be made as possible to support discussion, PIS hand out, consent and investigations locally. Smaller centres should be included in the larger trials by allowing as much as possible to be done in local centres. Smaller centres should be involved in the process of setting up trials in order to develop local solutions to reduce patient travel. More use of the ‘near me’ interface for patients should be explored. If patients

do travel then they should be provided with travel expenses. Consideration should be made to increasing the QPIs around clinical trial activity within tumour specific networks. We need to resource centres to be able to support this movement of patients, provide dedicated personnel to coordinate the patient pathway, develop ways to ensure as much can be done at a local level and expand and utilise new technologies such as NearMe, ProKnow and other Radiotherapy picture/patient archiving and communication systems (RT-PACS).

3. **NCRI.** The NCRI has launched new networks NCRI Networks - NCRI to provide a central hub to get involved with the work of the NCRI Groups (formerly CSG's). Representatives on NCRI Groups should feedback regularly and formally to the wider Scottish community on NCRI activity and plans. We should ensure that on each NCRI Group there is at least one Scottish representative who has a mandate to inform Scottish clinicians. As well as application to the Groups, sign up to the networks could be actively promoted, which would help facilitate feedback to Scottish clinicians.

4. **Accreditation Process.** Radiology, Radiotherapy and laboratories should be nationally accredited. Patients would therefore be able to engage in trials in larger centres and be able to get screening and follow-up investigations locally.

5. **Research and Development.** Scotland operates a generic review process that aims to streamline and reduce duplication of work. The generic reviewers are currently overwhelmed due to restart and recovery pressures therefore a review is required to identify additional resource. Education is required to inform investigators of the processes required to optimise the current system.

6. **Research Programme Activities.** Increase the number of research sessions across the country in all cancer centres to build a network of clinicians to coordinate research.

7. **Develop Closer Partnerships Across the Research Community.** Building strong well supported strategic partnerships across the *whole research community,* including academia, NHS, industry and third sector requires dedicated support and focus as part of a cohesive Scottish Cancer Research Strategy.

2. Section 2: Summary of Recommendations

WP-1 Opportunities and challenges for recovery of Scottish cancer research

1. Produce and implement a Scottish Cancer Research Strategy which closely aligns with the refreshed national Cancer Strategy, and the developing national Genomics Strategy. This should be co-designed by the various stakeholders in academia, government, health, industry, patient and public involvement (PPI) and the third sector.

WP-2 Cancer Clinical Trials Data

1. Develop a standardised suite of performance measures for the Clinical Research Community, and simple key performance indicators (KPIs) for boards, should be agreed as part of a wider Scottish Cancer Research Strategy.
2. Articulate the infrastructure requirements (staffing, systems and system integration) to provide the clinical research community with data necessary for monitoring of equity of access and other key performance metrics on an ongoing basis.
3. Provide a baseline assessment of performance should be undertaken when Scotland's 2022 Census data are available
4. Consider use of performance benchmarking tools to provide visibility of how regional and national performance compares with other areas. Options to consider include the National Institute for Health Research's (NIHR) INCLUDE Tool: Better Healthcare Through More Inclusive Research.

WP-3 Cancer Trials Staffing and Management

1. Scope the number of academic honorary contracts that support cancer research to ensure that this dependency is visible and understood
2. Centrally fund essential radiotherapy clinical trials capacity. Resource requirements should be confirmed separately by the national Radiotherapy Management Group.
3. All oncologists and haemato-oncologists should be allocated at least one dedicated research DCC session within a standard 10 PA job plan.
4. Consider national infrastructure support for diagnostics and aseptic pharmacy
5. Fund sessions for the 3 regional clinical leads to support each node, and matched senior management sessions to support the national cancer research champion.
6. Develop a national Senior Clinical Research Fellowship to rapidly build essential senior medical capacity for standard of care and cancer trials.
7. Review how standard care pathways can be effectively established to map new hub and spoke staff training and service model to support cancer trial delivery
8. Ensure the national NRS service structure has a proportionate focus on cancer given the size of the national trials portfolio that this represents. This should include consideration of a dedicated cancer fund for the NRS Fellowship Programme
9. Provide a package of training and support for NHS managers and ensure the requirement to support trials is built into job descriptions and service planning.
10. Introduce Key Performance Indicators for access to care in trials

WP-4 Key Performance Indicators

1. Monitor performance in provision of care in both standard of care and trials settings.
2. Adopt KPIs for use across NHS Scotland, and NHS Research Scotland Central Management Team to report board level performance at regular intervals.

WP-5 Finance

1. As part of the development of a Scottish Cancer Research Strategy, create a focus group to address the recommendations of this work package.
2. Review and improve study costing processes
3. Develop standard Scotland-wide approaches to capture drug savings and other non-financial benefits of clinical research
4. Identify and address areas where reliance on charitable funding may affect resilience and continuity of research services.
5. Facilitate mechanisms to enable local reinvestment of trial income, savings and core funding to feed into service design.
6. Further develop the “One Scotland” model to reduce the cost of additional site setup, and enable equitable study placement, including development of “split-site” models
7. Develop better models for transferring funds between NHS bodies.

WP-6 Digital technology

1. Additional fields in EDGE should be set as mandatory fields by all cancer EDGE administrators across Scotland. This minimum dataset should be defined through stakeholder discussions.
2. Define a minimum dataset and definitions of use for key items of trial information such as dates and status that should be populated across Scotland, this will facilitate use by NRS, the Networks and R&Ds.
3. The Cancer Network Managers work together with EDGE to set up the background work needed to achieve this partnership level reporting access.
4. The users then need to be advised as to the fields they need to be completing to keep this information in real-time.
5. Evaluation of using EDGE as a finance tool between research staff and R&D staff across cancer trials in Scotland to ascertain if it should be implemented by all Health Board R&Ds and how it should best be implemented to achieve full benefit and reduce human error.
6. Drug cost avoidance needs to be calculated across all CTIMP trials for cancer at each Health Board as a powerful tool to demonstrate the benefit of trials to health board budgets.
7. The timesaving tools developed by Lothian need to be rolled out to all EDGE users to increase efficiency. Even with these timesaving tools extra resource in the form of local research staff should be assessed to determine to provide full support of this extra work.
8. Learning from support departments that have successfully used EDGE should be shared nationally to explore developing beneficial likewise solutions across the country.
9. The use of EDGE across the 5 cancer centres warrants a role for national service support.

10. Reduce manual manipulation to process recruitment data for ReDA and CPMS, either by the direct LPMS upload from EDGE to CPMS or have a way to auto-manipulating the data from EDGE to feed into ReDA which then uploads to CPMS.
11. A wider review of the LPMS/research governance management systems needs to be undertaken in Scotland to evaluate the value of having one or multiple systems.

WP-7 Access to Enhanced Genomic Testing

1. Cover a broad panel of genes required for SMC approved medicines and including targets currently under exploration in early-phase trials and targets with promising pre-clinical data.
2. Consider the need for more complex tests in certain circumstances (HRD testing, fusions, structural variation, whole genome sequencing).
3. Build capacity, such that resource is available for research and development within the genomics labs, to allow evolution of testing in line with new targets for cancer therapies.
4. Develop an attractive training pathway for genomics-focussed clinical scientists and offer multiple career progression options after qualification.
5. Build capacity in services required to support tissue testing including pathology, biorepository, tissue transportation.
6. Consider the impact of expanded somatic genomic testing on clinical genetic services.
7. Develop IT systems and governance systems that provide sufficient and secure storage of genomic data and that can provide controlled access to genomics data and associated clinical outcome data to facilitate translational research projects.
8. Establish the National Molecular Tumour Board to allow discussion of complex molecular testing results and consideration of clinical implications.
9. Align a programme of education to the new strategy to improve genomic literacy across the health service but particularly within oncology, radiology (understanding tissue requirements for molecular testing), surgery, medical specialities.

WP-8 Partnership Working

1. Develop national trials register with regular out puts circulated to encourage or expand recruitment circulated nationwide.
2. Develop a plan to provide vas much care as possible in local centres, through coordinated and resourced multicentre collaborations, and use of technologies such as NearMe, ProKnow and other Radiotherapy picture/patient archiving and communication systems.
3. Use NCRI Networks - NCRI to provide a central hub to get involved with the work of the NCRI Groups (formerly CSG's) with regular two way feedback between NCRI and wider clinical research community
4. Radiology, Radiotherapy and laboratories should be nationally accredited. Patients would therefore be able to engage in trials in larger centres and be able to get screening and follow-up investigations locally.
5. Scotland operates a generic review process that aims to streamline and reduce duplication of work. The generic reviewers are currently overwhelmed due to restart and recovery pressures therefore a review is required to identify

additional resource. Education is required to inform investigators of processes to optimise the current system.

6. Increase the number of research sessions across the country in all cancer centres to build a network of clinicians to coordinate research. Clinicians, nurses, physicists, radiographers and allied health care professionals who are funded to engage in research should also develop and support national networks to ensure equity of trials.
7. Build strong highly coordinated strategic partnerships across the *whole research community,* including academia, NHS, industry and third sector requires dedicated support and focus as part of a cohesive Scottish Cancer Research Strategy.

3. Appendices

Appendix 1: NRS Equity of Access to Cancer Clinical Trials - Short-Life Working Group Members

- Denise Calder (Chair)
  Strategic Partnership Manager for Cancer Research, CRUK Scotland Centre, University of Edinburgh, General Manager, Edinburgh Cancer Centre, NHS Lothian

- Alan McNair
  Senior Research Manager CSO

- Gregor McNie
  Unit Head, Cancer Policy, Scottish Government

- Charles Weller
  General Manager, NRS Central Management Team

- Ian Anderson
  Information and Quality Manager, NRS Central Management Team

- Dorothy Boyle
  Network Manager (SE Scotland), NHS Scotland Cancer Research Network

- Karen Bell
  Network Manager (West of Scotland), NHS Scotland Cancer Research Network

- Kirsty Shearer
  Network Manager (North and East Scotland), NHS Research Scotland Cancer Research Network

- Martin Coombes
  Director, Policy Advocacy and Government Affairs, Bristol Myers Squibb

- Tracy McEleney
  Clinical Trial Service Manager Public Health Scotland, Deputy Director, CaCTUS Cancer Clinical Trials Unit

- Joy Dawson
  Research Governance Manager, NHS Borders

- Prof Anthony Chalmers
  Professor of Clinical Oncology, University of Glasgow

- Dr Stephen Harrow
  Consultant Clinical Oncologist, Edinburgh Cancer Centre, NHS Lothian

- Dr Leslie Samuel,
  Consultant Clinical Oncologist, NHS Grampian,

- Sheuli Porkess
  ABPI

- Emma Kinloch
  NCRI Consumer Lead

- Dr Patricia Roxburgh
  Senior Clinical Lecturer in Medical Oncology and Precision lead for Glasgow ECMC

- Chloe Wilkinson
  Clinical Trials Radiographer, The Beatson, West of Scotland Cancer Centre

- Donna Caldwell
  Clinical Trials Radiographer, The Beatson, West of Scotland Cancer Centre

Appendix 2: Baseline clinical trials staffing data

Ayrshire & Arran, WosCRN
Number of Staff

- Oncologists are visiting clinicians from Beatson
- 2.42wte band 6 nurses
- 0.1wte 8A Pharmacist for CEPA (Regional Chemotherapy Electronic Prescribing and Administration Service) and
- 1.2wte band 5 pharmacists

Funding Source

- 60k from cancer research network- R&D fund the rest

Vacancies/Gaps

- Not able to cover RN annual leave.
- Gaps- band 5 and band 6 nurse gap but no resource
- no resource for data manager

Forth Valley, WosCRN
Number of Staff

- 5 oncology sessions- breast, haematology, Urology, Lung and Colorectal
  2 wte research nurses

Funding Source

- some funding from WosCRN, CSO allocation

Vacancies/Gaps

- 1 wte band 7

Greater Glasgow and Clyde, WOsCRN
Number of Staff

- 36 research PAs- oncology consultants
- 2 PA Pathologists
- 3 research fellows
- 0.4 wte Macmillan funded late effect post
- 22.7wte nurses
- 3wte HCSW/sample handlers
- 31.2wte data managers and admin support
- 1.6 wte clinical trial radiographers
- 2.3wte oncology research pharmacists
- 2PAs Beatson Clinical Research Facilities Director

Funding Source

- data manager posts rely on commercial income
- clinical trial radiographers are charity funded -£106884
- R&D fund oncology PAs,50% of research fellows, part of radiographer and radiotherapist posts, band 7 nurse for ATIMPS, oncology research pharmacists and the 2 PAs for Beatson CRF Director

Vacancies

- 1.8wte clinical oncologist vacancies and 1wte medical oncologist vacancy. Plan for further 1.wte medical oncologist post late 2022
- Beatson CRF Quality Manager

Lanarkshire, WosCRN

Number of Staff

- No research-specific funded Oncology sessions - Oncologists are visiting clinicians from NHS GG&C (Beatson). Service scope – including service levels and services provided - fall under a Service Level Agreement.
- Solid tumours:2.50 WTE Band 6 RN,
- Haematological cancer:1.6 WTE Band 6 RN

Funding Source

- 45% of nurse post funding is from WosCRN, rest R&D

Vacancies/Gaps

- No Research Nurse gaps for Cancer Clinical Trials at the present level of recruitment / activity.
- Gap identifed that would require funding- band 5 clinical trials aseptic pharmacy technician 0.5wte £21645 and band 7 clinical trials aseptic pharmacist 0.5 wte £31775

Grampian, NOSCRN

Number of Staff

- 2 NRS fellowships for breast cancer surgeons and 1 NRS fellowship for GP in cancer - as well as 8.9 sessions for oncologists and 3.7 sessions for haematologists
- 11.2wte nurses, 1.2 wte HCSW
- 7.8 wte data managers

Funding Source

- Funding from NOSCRN support 3.63wte nurses.
- Other posts are funded by R&D and endowments.
- PA sessions for clinicians are a mixture of funding sources including grant, commercial, NHS, academic and research

Vacancies/Gaps

- Consultant vacancies in oncology

Highland, NOSCRN

Number of Staff

- No information on number of oncology sessions
- 4.29wte nurses
- 3.8wte data managers

Funding Source

- Funding from NOSCRN supports
- 0.8wte nurse and 2.2wte data managers.
- Other posts are funded by R&D

Vacancies/Gaps

- Consultant vacancies in oncology

Tayside, NOSCRN

Number of Staff

- NRS researcher support for 9 consultants comprising 18 PAs- 2 Oncologists, 2 Radiologists, 3 Surgeons, 1 Pathologist and 1 Haematologist
- 4.4 FTE nurses
- 2.7 FTE data managers

Funding Source

- Consultant PAs funded through R&D, and academic grants
- Research Nurses: 1.6FTE SCRN, 1.8 R&D 1.0 endowments/Trial income/academic grants/commercial trial income
- Data Mangers: 0.99 FTE SCRN 0.9 FTE R&D, 0.81 FTE endowments/Trial income/ grants

Vacancies/Gaps

- 5.0FTE Oncology consultant vacancies

Borders, SECRN

Number of Staff

- Oncologists are visiting clinicians from Lothian-2 clinical oncologist sessions - breast and lung
- 1.2 wte nursing (0.4 wte supports other areas as well)
- 0.4wte data manager and 0.4wte admin (admin supports other areas)

Funding Source

- 20k from SECRN and CSO allocation total cost of nurse posts for 2022/23 is £83209

Vacancies/Gap

- Band 6 1wte research pharmacy post remains unfilled - currently funding band 5 resource to cover
- Lung oncologist is not research active in NHS Borders
- Haematology vacancies- difficulty recruiting to not able to cover RN annual leave

Dumfies & Galloway, SECRN

Number of Staff

- No information on number of oncology sessions
- 0.6wtenurse,
- 1wte data manager
- 1 wte admin support

Funding Source

- Nurse funded by SECRN

Vacancies/Gaps

- No R&D manager
- No current breast oncologist cover

Fife, SECRN

Number of Staff

- No information on number of oncology sessions
- 3.4 wte nurse and support staff
- 0.5wte pharmacist and 0.6wte pharmacy technicians

Funding Source

- 0.8wte haematology and oncology research nurse funding from SECRN, R&D funds remaining 2.6wte
- R&D fund pharmacy posts

Vacancies/Gaps

- pharmacist post vacant for long period- due to be filled in March 2022 0.5 wte but supports all research

Lothian, SECRN

Number of Staff

- 2 NRS fellowships for cancer, plus haematologist and urological surgeon whose research programmes focus on cancer. 8 oncologists with ring-fenced research time (most are ex-NRS fellows)
- 23.2 wte nurses
- 19.0wte data managers
- 1.0wte EDGE manager
- 6.0wte Tissue consenter/processors
- 1.0wte Pharmacy technician

Funding Source

- Funding from SECRN, CRUK, ECMC, commercial and non-commercial income and R&D, drugs saving reinvested by service into trials pharmacy support

Vacancies/Gaps

- 3.0wte nurse vacancies + supporting SACT Standard of care service due to vacancies there
- 2.0wte data manager vacancies, consultant vacancies in Oncology and Haematology

Appendix 3: Summary of costing, contracting, and financing arrangements for clinical research in Scotland.

June 2021 C Weller

Study costing
Costing in the UK is delivered through NHS R&D, based on a dialogue with sponsors and funders. NRS Central Management Team figures suggest a total Scottish commercial portfolio value of ~ £15-20m in new studies signed per year, although as realisation of this value is dependent on full recruitment to all studies, the actual income will be around £10-12m. Non-commercial income is not collated, but commercial studies (pre-COVID) comprised ~ 25% of the total portfolio.

Commercial studies
The basis for engaging with the pharmaceutical industry was agreed in the early 2000s, as part of the Pharmaceutical Industry Competitiveness Taskforce (PICTF) Commercial funders are expected to meet all costs over and above standard of care, and are normally expected to provide IMP for free.
Costs are derived using a standard tariff, comprising staff rates and procedures. Staff rates are based on Agenda for Change rates for nominal staff grades expected to carry out a given activity. Rates for standard procedures use rates derived on a survey of average rates, which are uplifted annually using the NHS England inflator value. There is a mechanism to add additional procedures not yet on the list.
This base cost is then increased by:

- An indirect cost multiplier (1.7) (staff costs only)
- A capacity building multiplier (1.2)
- A multiplier to take into account different organisational costs; England uses the regional Market Forces Factor (MFF), although this is technically only defined for English sites, Scotland uses a fixed figure of 1.2 for MFF to apply for all Scottish sites.

This gives:

- Staff costs: base cost + 70% indirect costs + 20% capacity build +20% MFF for Scotland.
- Investigations: base cost (considered to already include any indirect costs) + 20% capacity build + 20% MFF.

Costs are captured using the Industry Costing Template (ICT). The sponsor is expected to complete the ICT. In Scotland, the agreed model is that a Generic Reviewer (GR) is identified who is expected to negotiate and agree a cost once for Scotland (subject to unavoidable local variation – however this should be very rare).

Negotiation should use the agreed rates, however there is often a need for discussion about the precise set of procedures and required staff time as specified in the protocol.

Non-Commercial studies
The UK wide ACoRD (Attributing the costs of health research) framework sets out the basis for identifying and attributing costs for non-commercial studies.

Under AcoRD study costs are classified as either “Research”, “Support” or “Treatment” costs:

Research costs

Funders should meet all research costs (with some limited exceptions for AMRC funders).

Support Costs

In Scotland, CSO meet SSCs (Study Support Costs), which are recorded by the lead Scottish R&D onto the NRS Finance System (NRS Finance Administration (scot.nhs.uk)), matched to study recruitment on ReDA, and returned to Boards annually in arrears as part of the CSO allocation model. Rates are set by CSO.

Excess/Treatment Costs

NHS organisations are expected to meet Treatment costs, which include the anticipated costs of delivering the intervention ***if the study intervention were to be adopted*.**

CSO operate a process to meet additional costs (netted against standard care costs) when they exceed certain thresholds – and similar systems operate in other UK nations. These are normally referred to as Excess Treatment Costs, or ETCs.

In practical terms, this applies to studies funded by organisations on the CSO funder list, NIHR list or which are eligible for extended review (this is a process that allows Investigator initiated research or projects funded by overseas charities or overseas governments to be added to the portfolio and thus be eligible for support and inclusion in activity metrics.)

The SOECAT (Schedule of Events Cost Attribution Template) was introduced UK wide in October 2018 to support collation of ETCs in England. Sponsors are expected to complete the SOECAT for each study as part of the funder application, and to then seek R&D signoff.

This is intended to help to ensure that all costs on studies are identified and properly attributed – particularly Research costs. It is *not* intended as a costing tool. Rates are included in the SOECAT, but these are intended solely for estimation of standard of care and Treatment Costs to enable estimation and central distribution of ETCs. Although payment of ETCs in Scotland does not follow the same model as England, the SOECAT can be used in an application.

There is no recognised standard tariff for non-commercial activities, but the CSO recommendation has been to use the standard Commercial rates (see above), less overhead and capacity building components.

Contracting

Standard commercial contracts are negotiated and agreed UK-wide, by a group chaired by HRA, and including NHS and industry representation.
Trusts in England are contractually obliged to use the standard templates, but this is not the case in Scotland.
A number of variants are available to cover different options (CROs, Primary Care, etc).
Standard non-commercial contracts are also available, although there is more flexibility in their use. Simple contractual models are also provided to cover data protection issues when actively searching for patients in PICs (Patient Identification Centres).

Invoicing and disbursement

Invoicing and disbursement are largely matters internal to Boards, and the responsibility of Board Finance Directors.
Non-commercial income should be clearly identifiable and usable for the identified activity. While invoicing and appropriate disbursement can be problematic on multiple year studies, existing financial models are expected to be able to accommodate this.
For Commercial income, there are a number of issues:

- How to gather reliable information to invoice?
- How to ensure invoicing within defined timescales without loss of income?
- How to use overhead and capacity building components? Must these be used for the noted purpose, or can Boards be more flexible?
- How to handle income over multiple years?

Solutions are largely devolved to individual Boards, however the recent IFRS15 accounting regulations apply. These require income to be spent in the financial year in which it has been incurred, which potentially prevented saving and use of surplus funds, however current advice is for Boards to develop spending plans for saved capacity building funds, which is intended to reassure auditors.

Appendix 4: Detailed Recommendations of the Finance Work Package

Rigorous, transparent, and consistent study costing

Issues	Notes	Recommendations and actions
a) Issues with consistency and completeness in costings.	• Sites can take inconsistent positions on study activity • Not all items included • Issues with amendments, setup, follow-ups • Current cost model is expected to capture all trial costs. • Models are agreed at UK level • Consistency is a key part of ongoing development of the Scottish system	• Review current arrangements for capturing and recording trials costs vs standard of care and address any variability in approach. • Develop standard costing models for non-commercial studies • Review processes for robust and rigorous costing of amendments • Review standard rates for setup and follow-ups, then forward for UK wide agreement • Consistent use of EDGE or equivalent
b) Split site models may not be reflected in current costing models	• Details of the operation of split sites are still being developed	• Review models for capturing different costs at different site types; develop new models as needed

c) Lack of awareness within NHS of clinical and indirect benefits of research	• NHS Clinical trials can deliver significant benefits beyond direct financial returns.
	• These include drug savings due to provision of drugs from study sponsors
	• Other benefits to service, both direct and indirect, include staff development and better patient outcomes.
		• Develop standard approaches which can be implemented Scotland-wide to capture drug savings.
		• Consult with the research community to identify associated non-financial benefits, and ways to quantify and capture that information
		• Provide information on drug cost savings and other benefits to service to relevant NHS executive staff.
		• Consider development of simple organisational KPIs, to support wider awareness of research deliverables. These could include:
		  ○ Number of studies
		  ○ Complexity or study type
		  ○ Number of patients consented and recruited
		  ○ Gross value/savings to service

Operation of standard funding model

a) Loss of commercial income due to fewer studies delivering during pandemic	• Early indications are that commercial activity is recovering. • Loss of income offset by vaccine trials, but benefit was limited to specific departments, and impact will be greater on smaller Boards	• Process development is ongoing at UK/Scottish level issue • Issues can be raised as part of discussions with industry at the CSO Industry Partnership Forum (IPF).
b) Impact of suspended studies and extended timelines in non-commercial studies	• Delays impacted timelines and staff funding flows	• Consult network leads to identify and articulate issues, processes and improvements required • Engage with UK managed Recovery programme to support delivery and income
c) Impact of pandemic on charitable funding	• Ability to affect this is limited, but pragmatic approaches can be considered	• Consult network leads to assess extent of issues and identify ways any improvements required
d) Reliance of cancer research centres on charitable funding	• Cancer research activity is supported by a variety of charitable sources of varying sizes and operational remits. • Key posts required for delivery are often dependent on raising funds through charitable sources. • Access to these funds is often restricted to groups or regions.	• Explore options for Scotland wide collaboration to support coordinated and efficient use of charitable resources. • Identify areas where reliance on charitable funding may affect resilience and continuity of research service.
e) Not all activity is captured within a per patient funding model	• Standard funding model is based on patient contact and income. Different study models and increased stratification may impact this model.	• Consult with stakeholders on longer term impact and possible solutions to feed into future discussions on network and trial core funding models.
f) Patients do not routinely have access to trials for clinical services which rely on Out of Scotland Service Provision	• Current arrangements do not provide a standardized model for funding excess treatment costs for clinical trials • National services are planned without including a plan to provide equitable access to cancer trials	• Review these arrangements for CAR-T cell therapy and Proton Beam therapy, and ensure there is a consistent approach which can be applied to other highly specialist trials • Ensure that planning processes for national cancer services address equitable access to clinical trials from the outset. This should be a standard field in service applications and scoring criteria

Internal disbursement and use of funds

a) Drugs cost avoidance & EAMS	• Cost of drugs provided by sponsors, particularly commercial, is not routinely available, or considered. There is scope to engage with NHS management in identifying of opportunities for savings and reinvestment • EAMS offers opportunities for managed transitions from trials to practice	• Review current activity, and agree Scotland-wide models, to routinely collect data on drug avoidance costs. (See also item [2] above) • Explore opportunities around EAMS. Engage with management teams on those decisions where there could be a financial benefit to service.
b) Board to Board transfers	• Models are dependent on development of flexible working models, driven by MHRA recommendations. • Service level agreements are preferred model, but are not standardised • Split site models require transfer of funds between sites, but this may not be well understood, and there is no standard model.	• Review use of inter-board financial SLAs for access to cancer trials • Review process for Board-to-Board transfer of funds for split site studies, and agree standard templates or guidance if necessary

c) Internal disbursements	• Effective use of funds is vital for developing integrated research and clinical models. By capturing savings and using income systematically Boards can build capacity in equitable ways. The impact of this will be magnified in smaller Boards, which may receive less central funding.
	• Models vary widely across Scotland.
	• Systems allowing patient and activity tracking, notably EDGE, have proved extremely useful for financial tracking
	• Limitations in the use of income across budget years limits the ability to use income effectively to develop capacity.
	• NIHR have produced guidance
		• Facilitate mechanisms to enable local reinvestment of trial income, savings and core funding to feed into service design allowing joined up service and trial management activity.
		• Engage with Board finance departments, to note existing NIHR guidance, and seek high level agreement to share information on models
		• Research network managers should be provided with transparent information on income within their remit and have a role in managing use of funds.
		• Review wider accounting issues with planning across financial years to clarify obstacles and identify potential solutions.
		• Support wider use of applicable electronic tracking systems. This would allow:
		  ○ Closer links between trial activity and finance
		  ○ Better identification of benefits of trial activity
		  ○ Improved split site invoicing and disbursement

Funding for regional and split-level studies

a) Contracting and SLAs	• *Issues noted above in 3(b)*	
b) Regional Boards access to commercial studies	• There are several barriers to placement of studies at smaller Boards: cost of setup for additional sites, larger geographic spread, and lack of specialist services.	• Gather evidence on placement of commercial studies • Further develop the existing "One Scotland" model to leverage opportunities in reducing the cost of additional site setup • Review Central Feasibility data to identify bottlenecks and resource limitations
c) Regional access to specialist services may affect study placement	• Key examples include radiotherapy	• Gather evidence of lack of placement of studies in regional sites, and any reasons • Explore options to develop split site models, and address lack of regional specialist services.

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Any enquiries regarding this publication should be sent to us at

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