UK-US Cancer Summit
Final Report

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Foreword

There has never been a better opportunity to harness research and innovation and international partnerships to speed our ability to prevent, detect and treat cancer for all. Through scientific advances and public health lessons, including during the COVID-19 pandemic, we have learned about the power of our research and innovation communities to deliver progress at a pace and scale previously unimaginable. We must now direct this energy to other health challenges and expand its impact and reach.

The United Kingdom and the United States are world leaders in cancer research. In advance of the G7 Summit in June 2021, Prime Minister Boris Johnson and President Joe Biden challenged the cancer research community to identify the most important areas for collaboration between our two countries.

Cancer is a high priority on the domestic health agendas in each of our countries. The Cancer Moonshot in the United States sets out ambitious goals to reduce the death rate from cancer by at least 50 percent over the next 25 years and to improve the experience of people and their families living with and surviving cancer. The Life Sciences Vision, published by the UK Government in 2021, sets out an ambition to drive the development and commercialisation of new cancer medicines, diagnostics, and genomic and predictive technologies, acting as a testbed for oncology innovation. An expanded partnership between our two countries holds the potential to make greater progress on cancer.

There is already a rich history of successful partnership in the life sciences and cancer between our two countries. Collaborative work between our scientists has resulted in Nobel prize-winning discoveries, from solving the structure of DNA to technology that can improve the production of human antibodies to treat metastatic cancer and other diseases.

We thank the National Cancer Institute, Medical Research Council and Cancer Research UK for bringing the scientific community together and identifying opportunities for further collaboration. We endorse the opportunities identified in this report, which place improvements in cancer outcomes and experiences for all patients at the core of their ambition.

Delivering against these opportunities will require contributions and commitments from government, regulatory bodies, industry, academia, funders and patients. We appreciate the enthusiasm from individuals and organizations to address the challenges we face and to work together to overcome them. Through sustained commitment to this partnership, we can develop concrete cancer solutions that will benefit patients from all places and backgrounds.

Arati Prabhakar
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UK Government Chief Scientific Adviser

Introduction

As strong science nations, the UK and US have a long history of working together to address cancer, a leading cause of death worldwide that accounted for nearly 10 million deaths in 2020[1]. While survival in both countries has been steadily improving, the COVID-19 pandemic has interrupted progress and amplified the need for coordinated international action.

Whilst both countries acknowledge there are significant efforts being made by key partners elsewhere, such as the EU Cancer Mission, the UK-US Cancer Summit and following activities had the overall ambition of identifying collaborative opportunities where partnership between the two countries could lead to transformative impact and accelerate progress to change the experience of cancer as we know it today, leading to health, social and economic impact.

A Scientific Summit was held virtually on 13-14 November 2021 and brought together a group of approximately sixty world-leading UK and US researchers, clinicians, patient advocates, and industry representatives. Objectives for the meeting included the identification of transformative research ideas and ways to resolve barriers to progress, such that we might fundamentally change our understanding of cancer, our approach to it, and improve the experience of patients and their families.

Discussions were anchored around six pre-identified challenge areas:

1. We have too few methods to prevent cancer.
2. Cancer detection is often too late, too slow, and too expensive.
3. We face racial and socio-economic disparities in diagnosis and outcomes.
4. We fail to learn as much as we can from every patient in our health systems and those on a trial.
5. Too many of our new treatments are based on paradigms that are not driving overall survival improvements.
6. We don't understand tumorigenesis in the absence of clear mutational processes.

The Scientific Summit generated 30 defined ideas and opportunities (see **Annex 1**). Subsequently, targeted engagement was carried out with representatives from policy-making bodies, industry, academia, patient advocacy groups, and other key stakeholders[2]. This critical step allowed these stakeholders to provide input on prioritisation, consolidation of ideas, delivery and next steps to collaboratively address the challenge of 'ending cancer as we know it'. The results of this iterative consultation process have informed this Report, produced jointly by the UK Medical Research Council (MRC), Cancer Research UK (CRUK) and the NIH National Cancer Institute (NCI).

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1. The Global Cancer Observatory Fact Sheet, International Agency for Research on Cancer, December 2020 (Accessed 10 August 2022). https://gco.iarc.fr/today/data/factsheets/cancers/39-All-cancers-fact-sheet.pdf

2. Some specifics on the delivery of outputs relevant to the described opportunities (e.g., support for Small and Medium-sized Enterprises (SMEs) or facilitating access to market for novel therapeutics) were not directly in scope. Whilst such areas would benefit from enhancement, complementary actions should be led by the appropriate bodies and institutions to develop the most suitable approaches.

Priority Opportunities

The depth and range of existing ambitious initiatives, dedicated specialists, and long-standing support from public, industry and charity funders in both nations is clear. There is robust infrastructure and an experienced workforce already tackling substantial challenges in cancer research, prevention, diagnosis, treatment and survivorship. The Scientific Summit highlighted that UK-US partnership should prioritise areas where capitalising on these existing strengths will accelerate progress.

Through the 30 individual recommendations identified at the Scientific Summit, several common themes were emphasised, where joint government action would have a major impact:

- The need to prioritize new and innovative approaches to prevention and interception.

- Opportunities for better coordinated data usage, from the population level through to molecular data (including access, sharing, standardisation, integration and analysis).

- The critical need to address health inequities (greater diversity in data collections; equity of access for all communities to diagnostics, trials and treatments; and the importance of tackling social determinants of health that are linked to increased cancer risk).

- The potential impact for more streamlined, flexible and efficient regulations that allow novel trial designs to more rapidly generate new treatment paradigms and for trial data to inform subsequent research.

- Opportunities to enhance coordination and cooperation within and between stakeholders, including academia/clinic, industry (across start-ups, SMEs, large multinationals), public bodies and patient groups.

This report presents five proposed priority opportunities for development and action through transatlantic collaboration. All would have significant value for cancer research and patients, and there is potential for wider impact across additional disease areas. Other priorities identified within the full list of Summit recommendations (**Annex 1**), some with longer-term ambitions, inform and support the ones prioritised below.

1. **Identify new cancer treatments and interventions faster for all patients**

2. **Leverage all cancer data to help revolutionise cancer diagnosis and treatment**

3. **Deliver equitable cancer care for everyone in all our communities**

4. **Identify transformative ways to prevent and intercept cancer**

5. **Develop the workforce needed for the future of cancer research**

1. Identify new cancer treatments and interventions faster for all patients

1.1. Commit to coordinated transatlantic regulatory processes that accelerate outputs from clinical trials

The pace of scientific innovation, commercialisation and health system adoption could be substantially accelerated by an even more supportive, flexible regulatory environment with international interoperable approaches, avoiding duplication of effort and delays to deliver cutting edge diagnostics and treatments to patients. An agile regulatory environment that helps streamline multinational trials, working in partnership with patients, academics, clinicians and industry can further accelerate the development and implementation of novel diagnostics, ambitious prevention strategies and optimised therapeutic approaches for patients, including those with cancer and pre-cancer.

The response to the SARS-CoV-2 pandemic has demonstrated that both countries have the flexibility and capacity to coordinate large-scale clinical research efforts in response to an urgent public health challenge. This has resulted in innovative platform trials such as RECOVERY which completed accrual and generated results in record time. However, further harmonisation of regulations is needed to ensure this continues for other diseases including cancer. In 2021, the UK MHRA became a full participant of Project Orbis, an FDA-led programme that facilitates coordinated assessment of novel cancer treatments by regulators from different countries, coalescing scientific expertise and expediting the approval of much needed treatments. While there are specific challenging considerations for absolute harmonisation of regulations in the cancer space (e.g. orphan drug classification), building on this disease exemplar and facilitating early engagement between researchers and industry with regulators can facilitate responsive approaches and bolster transparency around the regulatory decision-making process. It also ensures that regulators have early knowledge of products coming into the pipeline which informs their preparation of the required, relevant regulations, and interactions with product developers so they can work towards meeting those regulatory standards.

After trial delivery, bilateral regulatory coordination would also enable faster approvals and adoption of successful new interventions. An alignment of regulatory processes will make transatlantic trial set up and approval as efficient as possible, for both academia and industry. An agile, proportionate and interoperable regulatory environment would be particularly impactful to speed methodologic innovations for clinical trial conduct. Given momentum across the clinical research landscape towards remote consent and monitoring, decentralised trials incorporating digital or telehealth applications, and the use of novel technologies in remote data capture, modernized regulatory approaches are increasingly needed.

We must also aggressively strive to increase clinical trial accrual particularly for historically underrepresented groups so population diversity is adequately represented in every study, and all groups have equal access to ground-breaking new interventions as soon as possible. Transatlantic efforts are needed to enlarge the patient pool, especially for rare cancers and molecularly defined subsets of common cancers. Coordinated efforts are required for public engagement to stimulate participation in trials but also to incorporate patient and public involvement to inform study design and methods to improve access to enrolment. The Future of UK Clinical Research Delivery 2022-2025 Implementation Plan commits the UK to people-centred research, which will make it easier for patients, service users and members of the public to access research, be involved in the design of research, and to have the opportunity to participate. Shared standardised guidelines for the involvement of patients and the public would ensure their input is integrated into transatlantic studies, building an effective framework that would improve individual protocols and more broadly increase trust and cooperation between patients, their representatives and the research community.

1.2 Create a UK-US framework to support the routine development and delivery of flexible and agile platform trials

Most cancer clinical trials currently test a single new therapy in a single cancer type, a slow, inefficient, costly, and unsustainable process. Given the leading roles UK and US academia and industry have played in developing new cancer interventions globally, enabling more transatlantic trials could potentiate synergistic improvements in speed, efficiency, and cost for translation to patient benefit. Transatlantic studies could for example have a significant impact in studies on rare cancers. UK-US collaboration could also provide a unique platform for large-scale, high-impact platform trials across the cancer control continuum. These studies would rapidly evaluate multiple therapies, detection approaches or preventive interventions in parallel, through multi-arm, multi-stage adaptive methods. The studies should link and capitalise on the existing large-scale trial infrastructure and platform trial delivery expertise in both nations, with early involvement of regulators and industry, under a coordinated framework. The trials would recruit cohorts of participants that reflect population diversity and maximize patient participation; an added benefit would be the ability to potentially identify differences in response rates to treatments between sub-groups. The framework would be designed to deliver significant changes in intervention evaluation but also inform discovery research into disease biology. An immediate opportunity to tackle is that of studies focusing on rare cancers, which are an unmet clinical need and for which bilateral trials would facilitate adequate sample sizes to yield scientifically informative results for patients.

Along with regulatory bodies, the proposed framework would be developed in partnership with industry and academic/clinical communities and working cross-nationally would ensure outputs are designed for multiple regulatory settings. Studies supported by the proposed framework would offer an opportunity to determine standardised collection of outcome measures across the US, UK and beyond.
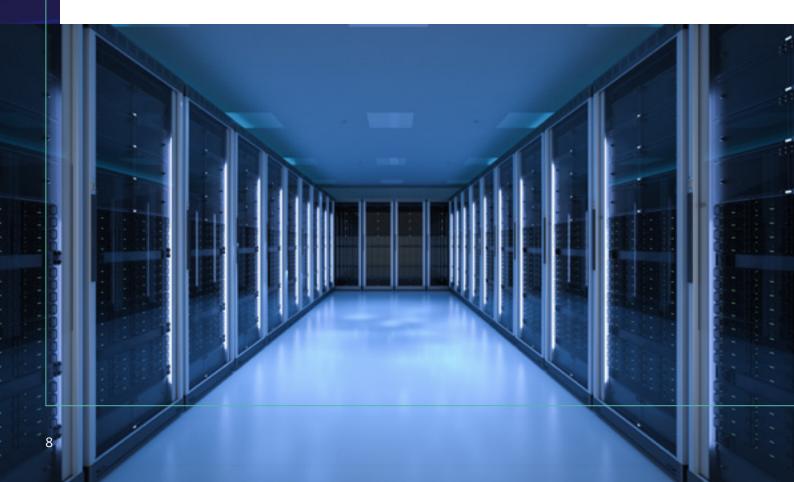
2. Leverage all cancer data to help revolutionise cancer diagnosis and treatment

A wealth of biological and clinical data is being collected at an unprecedented pace, volume and variety. This is already redefining our understanding of disease, treatment development and innovative therapeutic approaches. The transformative potential of such data cannot be overestimated, but there are significant access and data integration challenges to maximising the potential benefits. To harness this potential, the pathway from data gathering and storage to its analysis and use should be enhanced, building on the experience and skills already available in both countries, and a culture of sharing and re-using data should be consolidated. The challenges of data integration, interrogation and management, given the ever-increasing pace and volume of multidimensional data resources have been well documented and are applicable across disease areas. However, a trans-national focus with cancer as an exemplar could drive the field forward.

With tumour molecular characterization increasingly common in clinical practice and novel diagnostics such as multi-cancer early detection assays increasingly likely to be adopted,

we need an arsenal of new treatments designed for different targets, using different treatment paradigms, and novel molecular approaches, that can be tailored to individual patients. In this context, with the agile and forward-looking regulatory environment described above, appropriately integrated data pipelines and infrastructure need to be in place and working efficiently to ensure the pace of development can meet the increased need for improved interventions.

There has often been apprehension from the public about making health-related data available for research, either by providing tissue samples or clinical data. The data revolution can only take place with active involvement from all parties, and by keeping the patients' needs and privacy safeguards at its heart. UK and US cancer communities (across research, patients and industry) are well placed to coordinate and lead efforts to prioritise and deliver on the added value that advanced data integration and interrogation can provide for cancer patients, toward a vision of learning from every patient's unique cancer journey.

2.1 Deliver innovative analytical approaches to maximise value from all data types

A significant proportion of existing cancer data is underutilised and the challenge of standardising, curating and integrating disparate datasets is substantial. Data is held by numerous providers and navigating different information governance requirements can be time consuming. Furthermore, timeliness of cancer data can be challenging, with data often only accessible years after it was collected. The UK and US are well placed to lead efforts to optimise and innovate data usage. This should include advanced analytical approaches, including incorporating machine learning and artificial intelligence. Cancer research is a natural exemplar area for such development given large existing multidimensional datasets, including digital imaging and pathology, genomics and multi-omics data, and treatment and outcome data. To tackle the complex challenges a consortium approach will be needed to bring together data management expertise from technology companies at the forefront of their field, clinical settings, academics and the public, to first address the issue of well curated, accessible and timely national data. With improved robust datasets, collaboration of researchers (across cancer and other disciplines) and the private sector to advance the state of mathematical models and state-of-the-art statistical methods designed to comprehensively analyse and manage cancer data could be transformative.

Underpinned by the unique National Health Service (NHS) and its health-related data, the UK offers strengths through its experience with world-class cancer registries, and has invested in world-leading organisations and infrastructure such as UK Biobank, Genomics England, and Our Future Health, a programme which will recruit a diverse group of 5 million volunteers, supporting data driven research into early detection and early-stage treatments. The US NIH All of Us research programme has a complementary ambition to collect and study data from 1 million or more people to improve precision medicine, treating each patient in a more personalised way. The NHS Genomic Medicine Service in England is aiming to be the first national healthcare system to offer whole genome sequencing routinely and at scale to specific groups of patients. This Service has already started rolling out whole genome sequencing for seriously ill children and those who are likely to have a rare genetic disorder, children with cancer, and adults with certain rare conditions or specific cancers. Identifying ways to further enable UK-US data partnerships would allow more researchers to collaborate to maximise these health-related population-scale datasets and should include partnership with industry to drive new analytical innovations.

2.2 Establish common processes to protect data and to facilitate access, integration and shared custodianship of data

Several major examples of data banks that collect and make available large amounts of health-related data have been established in both countries (e.g., UK Biobank, All of Us) and there is a demonstrable interest in and recognised potential of such large-scale resources. Exemplars of secure software platforms have also emerged, such as OpenSAFELY, which encodes a set of best practices that can be deployed to create Trusted Research Environments for managing health data records, and DARE UK, which aims to provide research data infrastructure at a national level.

Cancer has been well represented in research outputs from such resources to date and continues to be an area well suited for prioritization. Substantial benefits could be reaped from increasing interoperability and enabling common approaches to storage, access and analysis of data in alignment with the FAIR data principles; e.g with agreements on minimal metadata or common formats. These approaches could be facilitated by standard regulatory agreements and trusted custodianship frameworks that have strong public support and respond to researchers' needs, accelerate access and enhance collaborations between the UK and the US.

For both large and smaller-scale data collections, more robust common data infrastructure is required to rapidly and safely capitalize on this

opportunity between both countries. A useful example is the federated approach of the [FDA Sentinel Initiative](#) in the US for monitoring safety of medical products. The system is accessible by international partners including the UK MHRA Clinical Practice Research Database, for executable queries on UK data, with the ability to then combine analyses to expand total datasets.

A more immediate need that can be tackled within existing infrastructure is to establish generic processes that help researchers easily navigate various data types, as well as centralising data processing through established custodians which can be contacted by interested researchers. In addition, ensuring there is a standardised format of data outputs would increase interoperability and accelerate processing and analysis by the research community. Joint government commitment is required to both retain important legal and data

privacy expectations whilst also simplifying and optimising data sharing to facilitate enhanced collaborations, from basic research to clinical applications. This could be delivered through data sharing and/or policy agreements.

Engagement between researchers, industry, regulators and the public would ensure that data quality thresholds are agreed, and data usage is transparent, effective and trusted. Some initiatives for improved data sharing are already in existence, such as the [Transcelerate](#) biopharma initiative, which facilitates sharing of preclinical and clinical data, and the [Accumulus Synergy](#) project, which aims to improve communications between pharmaceutical companies and regulatory authorities (including MHRA and the FDA) to optimise regulatory submissions. Industry is willing and keen to expand such existing projects' visibility and access.

3. Delivering equitable cancer care for everyone in all our communities

It is clear both in the UK and US that urgent action is required to overcome the long-standing health inequities that impact cancer outcomes. Health disparities have been identified as a shared critical challenge across the health and wellbeing spectrum that both countries are committed to addressing. With disparate disease outcomes, uneven access to standard care as well as trials, and insufficient representation of the diversity of our populations in research data, there are major opportunities to increase equity across the scientific enterprise. In the UK, Genomics England has a Diverse Data initiative to improve understanding of genomic diversity, increase available data from under-represented groups, and develop new tools to change research and care practices.

3.1 Strengthen culturally competent research through transatlantic engagement, empowered community participation and shared learning

Community engagement and empowerment are essential, and all parts of the cancer research ecosystem must establish strong community support infrastructure to foster greater engagement, mobilization, and co-production of community-centred research and improved health literacy.

This challenge can be tackled more effectively by developing a transatlantic patient and public engagement effort to ensure that every patient and member of the public is aware of and provided with the opportunity to participate in trials, with a focus on engaging with underserved populations and removing any barriers to participation. This will increase diversity of trial participants, improve understanding of interventions in different populations and more equitably deliver benefits from cancer research to all. Transatlantic partnership has the potential to expand how good practice is developed and deployed to best effect. A more harmonised UK-US regulation effort described above would be advantageous, taking into account the need to modernise consent for more inclusive and impactful patient participation

(such that collected samples and data are usable and re-usable, not just for the trial for which they were collected, but for future research). Such efforts should extend beyond cancer patients to the general population of both nations to facilitate advances in prevention and early detection research that target asymptomatic individuals.

In addition, to advance knowledge and insights on health inequity and to evaluate impact of interventions, research is needed on the structural and social determinants that can drive population health improvements. This approach will not only lead to interventions for cancer but can have broader impacts on a range of health outcomes. For example, research to inform efforts to tackle obesity (a major modifiable cause of many common cancers and non-communicable diseases) could lead to new structural interventions at the population level and individualised approaches within the healthcare pathway. In order to achieve these objectives, it is essential to ensure that population and research data are fit for purpose, accessible and harmonized.

3.2. Improve cancer outcomes across the population by addressing both biological and social determinants of health inequities between populations

Both the UK and US have established activities that aim to address existing population disparities impacting health outcomes, such as the use of Patient and Community Navigators who engage with members of underserved communities, inform them and help them overcome barriers in healthcare. In the UK, the Genes and Health studies are an example that specifically focuses on populations of South Asian origin, to identify genetic variants associated with heart disease, diabetes and other health issues that disproportionately affect these populations. There is an opportunity to consolidate learning from such experiences in both countries to more effectively address the disparities in cancer incidence and outcomes between different populations as well as generate new insights,
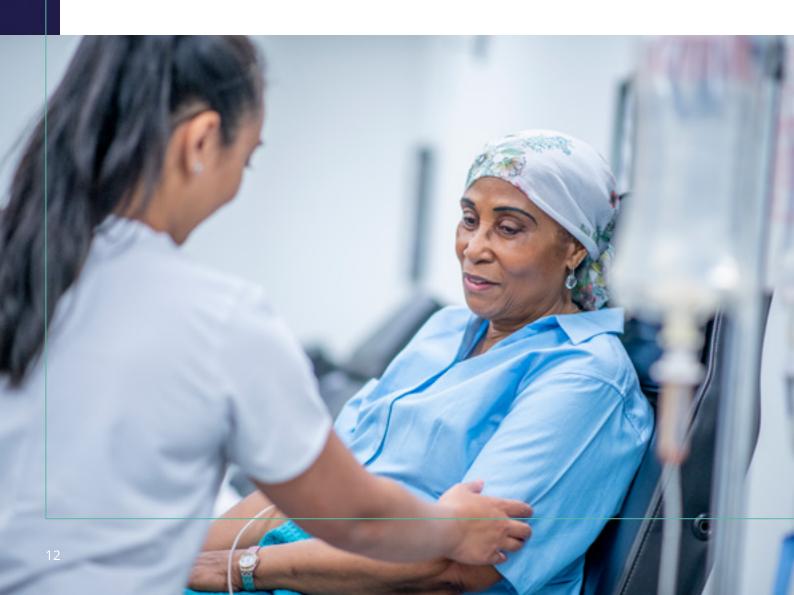
particularly given that inequities for specific groups may manifest differently in the UK and US. This may be well addressed with the establishment of a bilateral research consortium to collate relevant existing data, identify knowledge gaps across the entire research spectrum (biological, clinical, epidemiological, socio-behavioural, implementation and health policy research), and to develop shared objectives to improve equitable access to healthcare, research participation and representation.

In addition to equity of access considerations, work to ensure experimental design and models of cancer adequately reflect diversity would need to be explored, to ensure a full understanding of the impact of diversity in population and lifestyle factors on biological processes, and to characterise this across different groups to better evaluate differences.

Taking a transatlantic approach to addressing health disparities in cancer will enable a broader investigation into wider and more varied population groups. This issue should be explored at a researcher-led experimental design level as well as a regulatory and policy-maker level to ensure these biological differences are considered when developing pre-clinical and clinical models and interventions. Engagement with patient and community representatives throughout will be vital.

In addition, a transatlantic approach to collaboratively understanding social determinants of health would be valuable both in terms of understanding shared challenges and intervention opportunities in the respective healthcare systems, and also in terms of successfully engaging specific communities in cancer research. Further and more diverse patient recruitment to trials and research studies, and changes in consent processes (such as with more digital tools), would facilitate increased learning from each patient, improved understanding of cancer in different populations, and lead to more effective prevention, detection and treatment.

4. Identify transformative ways to prevent and intercept cancer

4.1 Establish a UK-US Cancer Interception and Precision-Prevention Collaborative

A robust response to the increasing global cancer burden requires concerted efforts to stop cancer before it develops/progresses, particularly given that approximately 40% of cancers may be preventable. Both nations have supported world-leading efforts to improve the prevention, early detection and diagnosis of cancers, including the NCI Pre-Cancer Atlas and the UK's significant cohort resources. Substantial progress has been made towards understanding the biological mechanisms that promote cancer, including the context of the tumour microenvironment, as well as the identification of drug targets and the development of interventions to prevent disease. Additional developments in immunology have helped progress personalised therapies. A coordinated collaborative approach between the UK and US would allow greater joint focus on these challenges, underpinned by harmonised and optimised experimental model systems, joint access to tissue samples and representative populations of human participants, to accelerate progress substantially. The more rapid translation of fundamental cancer biology research into clinical benefits could be enabled through shared UK-US research platforms (including the platform trials framework described above). This application of our understanding of tumour biology and the tumour microenvironment will help increase the number of known preventable cancers and help develop interventions to prevent and treat cancers earlier. A joint collaborative would aim to rapidly develop and evaluate precision prevention interventions such as prophylactic vaccines or other targeted immunological or pharmacological interventions.

5. Develop the workforce needed for the future of cancer research

Increasingly in cancer, researchers need relevant collaborations and experience across a broad range of areas such as molecular biology, epidemiology, genomics, technology development, clinical settings, population and health system science, as well as literacy or specialised expertise in data science. Common skills shortages in informatics, computational, mathematical and statistical skills have been recently reported[3], and this also applies to cancer research, where research teams would benefit from being more multidisciplinary, to appropriately formulate ambitious and creative approaches to solve the key biological and clinical questions, to address existing gaps in research, and to facilitate translation to the clinic. This includes increasing opportunities in basic/discovery science, an essential work stream which opens up new avenues for translational and applied research, as well as identifying and deploying the most appropriate data analysis approaches (e.g., artificial intelligence, machine learning, advanced modelling). Ensuring cutting-edge analytical expertise and capacity will be critical to deliver the data revolution in health, including in cancer. This remains a challenge across the research pipeline and is emphasised in industry where it is further acknowledged that drug development specialists benefit from hybrid experiences of both academic and commercial drug development research to be effective; such opportunities continue to be rare.

A further research, clinical and industry workforce challenge is with respect to health equity. There are many disparities in the cancer pathway and health outcomes, influenced by social, race/ethnicity, geographic, and economic inequalities; these have been recognised by both Governments, including through the UK's Call for Evidence for a Major Conditions Strategy and the US Cancer Moonshot, and efforts at the regional and national levels have been previously undertaken to address these, including by industry. The UK and US need to build on past experiences and harness efforts to ensure a workforce that is aware of and sensitive to such differences. To achieve this, current and future health care workers and researchers must be further trained on the importance of social determinants of health and systemic racism, health inequalities, and cultural humility; this should be done in partnership with patients and their advocates. In addition, investment in the workforce pipeline from more diverse backgrounds (e.g., black and other ethnic minorities) is needed to improve representation and aid trust from patients with different backgrounds. This requires a long-term approach including at the earliest stages, such as engaging a diverse range of students in science and biomedicine and evolving how such early career professionals are trained.

A transatlantic training programme is proposed where co-mentoring is provided in varied environments both in the UK and the US to promote the reduction of silos of expertise, to facilitate more streamlined expertise sharing across different disciplines, underpinned by health equity objectives. Training such a cadre of transatlantic researchers would support the various opportunities listed above, would enable synergistic learning from the UK and US research environments and health systems, and would pave the way for a future of more seamless transatlantic collaboration in cancer research.

3. Better, broader, safer: using health data for research and analysis: A review commissioned by the Secretary of State for Health and Social Care (2022); accessed on 1 August 2022. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1067053/goldacre-review-using-health-data-for-research-and-analysis.pdf

Conclusion

The UK-US Cancer Summit brought forward a compelling case for consolidation of both local and international efforts in cancer research. There is clear agreement on major themes where UK-US partnership would lead to transformative impact, specific to cancer, as well as potentially impacting across other disease areas. The themes laid out in this report are a subset of areas of opportunity where future action in cancer research would ensure the best interventions reach more people faster, by:

- Committing to greater regulatory streamlining and agility across the Atlantic

- Establishing a clear framework for joint platform trials

- Committing to better curating, standardizing and integrating data, safely and quickly, and sharing effectively across borders

- Delivering innovative analytical approaches for interrogating big cancer data of all types

- Better understanding and addressing biological and social determinants of health inequities

- Establishing a bilateral strategy to improve equitable access to cancer care, research participation and representation

- Establishing a UK-US cancer interception and precision-prevention collaborative

- Developing opportunities for transatlantic training for cancer research

The outputs from this activity take advantage of UK and US strengths, are ambitious, and would remove barriers to progress. The priority opportunities above lay the foundation for change and would require future commitment and investment over time from many different parts of the cancer ecosystem.

Further strong ideas put forward through the broader list developed at the Scientific Summit (**Annex 1**) expand areas of need and opportunity, for pursuit by the research community, policy makers and industry.

The means to deliver against the priority opportunities need to be further shaped. Some of these mechanisms, when established, could be extended to other partnerships beyond the UK-US or beyond cancer, for further and wider mutual benefits and impact.

At a moment when our two countries are intensifying our commitment to change the experience of cancer as we know it, the UK and US cancer research communities similarly commit to working in partnership towards targeted actions to this end.

Annex 1. Initial recommendations and common challenges for collaboration identified during the UK-US Scientific Cancer Summit

Theme	Recommendations	Common challenges
1. We have too few methods to prevent cancer.	1.1 Develop comprehensive risk models for cancer. 1.2 Establish precancer registries. 1.3 Define new targets for cancer prevention and interception. 1.4 Coordinate large-scale prevention trials. 1.5 Establish programs for immune-based prevention and disease interception. 1.6 Develop cancer prevention programs rooted in implementation science.	**Research and training** • Attracting diverse scientists • Applying new analytic approaches • Assembling multidisciplinary teams • Implementing large-scale population studies • Developing and sharing models
2. Cancer detection is often too late, too slow, and too expensive	2.1 Develop a shared sample and data bank. 2.2 Improve risk assessment, screening, and early detection through data science and non-invasive technologies. 2.3 Understand the biology of progression from normal cells to precancer to cancer and translate this insight to the clinic. 2.4 Develop consistent, systematic validation and clinical evaluation of early detection biomarkers and technologies. 2.5 Address barriers to public uptake of screening and related inequities.	**Regulations and policies** • Harmonizing regulatory frameworks • Changing research culture to maximize data sharing
3. We face racial and socio-economic disparities in diagnosis and outcomes.	3.1 Create a UK-US initiative to address cancer disparities. 3.2 Develop a workforce for the future. 3.3 Strengthen culturally competent research and access to data. 3.4 Ensure community involvement, participation, and empowerment. 3.5 Harness partnerships to drive novel health equity-informed approaches.	**Community engagement** • Including patients and advocates at all stages • Considering patient and population diversity in all cancer research
4. We fail to learn as much as we can from every patient in our health systems and those on a trial.	4.1 Modernize consent for participation in cancer research. 4.2 Create incentives for healthcare systems to collect and store samples. 4.3 Build infrastructure for rapid data sharing and learning. 4.4 Create incentives to increase collaboration with industry.	• Increasing collaboration among industry, academia, and government • Involving communities in policies and initiatives to improve uptake of interventions
5. Too many of our new treatments are based on paradigms that are not driving overall survival improvements.	5.1 Centralise creation and sharing of preclinical cancer models. 5.2 Harmonise the regulatory framework for clinical trials. 5.3 Create a researcher-led biorepository facilitating specimen and data sharing. 5.4 Foster the AI revolution for therapeutic innovation. 5.5 Create a think tank and funding mechanism to accelerate high-risk discovery.	
6. We don't understand how tumorigenesis in the absence of clear mutational processes occurs.	6.1 Develop population scale, comprehensive, longitudinal epidemiological and molecular phenotyping studies. 6.2 Initiate large, prospective, multi-tissue sample collections across age ranges. 6.3 Develop new animal and human, cell and tissue models to understand mutagenic and non-mutagenic carcinogens. 6.4 Identify and characterise mutagenic and non-mutagenic cancer-causing agents. 6.5 Conduct interventional trials in humans informed by new insights.	