

Health Data Research UK (HDR UK)

Phase 1 Investment

Call for HDR UK Substantive Site proposals

Call timeline:

- **Launch date: Tuesday 1st August 2017**
- **Closing date: Thursday 5th October 2017, 16:00**

This call is open only to applicants who submitted a Statements of Interest for either a Substantive or a Partnership HDR UK site in January 2017 (see section on Eligibility below).

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1. Overview

Health Data Research UK (HDR UK) has been established through an initial £50m partnership investment over the next five years led by the MRC, together with the National Institute for Health Research (England), Chief Scientist Office (Scotland), Health and Care Research Wales; the Engineering and Physical Sciences Research Council (EPSRC); the Economic and Social Research Council (ESRC); the British Heart Foundation; and Wellcome. Harnessing the power of the NHS and associated health and biomedical data in the UK, HDR UK will develop and apply the cutting-edge informatics approaches needed to address the most pressing health research challenges facing patients and the public.

Following the announcement of Professor Andrew Morris FRSE FMedSci as the inaugural HDR UK Director in March this year, the funders, on behalf of HDR UK, are pleased to announce the launch of this competition to identify the initial Substantive Sites of the Institute. These sites will provide the core capacity and capabilities needed to deliver the Institute's mission and strategic vision.

This call expects to identify 5-7 Substantive Sites to address challenging research priorities identified by the HDR UK Director, which would be difficult to fund through traditional funding mechanisms. The Substantive Sites will be supported through long-term awards (10years+), with approximately £25m initially invested by HDR UK over this first five-year award. An emphasis on working in partnership is strongly encouraged, with most Substantive Sites expected to comprise more than one RO. HDR UK Sites will be expected to take a leadership role, not only across local partners, but more significantly across the UK to deliver the research priorities of the Institute at

scale.

Each Substantive Site will be led by a single Site Director, supported by an Associate Director/s. The Site Directors will play an important leadership role in helping the Institute Director and Board shape HDR UK's scientific strategy as part of the Institutes' leadership team.

Participating ROs will be expected to demonstrate strong commitments to HDR UK's core principles, including commitment to work with HDR UK on governance, public engagement, sharing of research data and on developing new career frameworks for interdisciplinary research staff, including technologists/technical specialists. Other direct and in kind leveraged support will be expected in terms of staff time and career development, access to research infrastructure and other health research data-related resources, as well as helping connect HDR UK to partners and stakeholders across the UK.

This is the first of several phases of investment to establish HDR UK, with competitions to follow including to establish the HDR UK Future Leaders Programme and to address strategic research challenges through investing in additional Partnership and/or Substantive Sites.

2. Background and Rationale

Partner funders across the UK have made substantial investments in recent years to provide the necessary infrastructure and capabilities to underpin UK health and biomedical informatics research. Despite these investments, if the UK is to retain its world-leading position in data-driven health and biomedical research and innovation, further strategic, sustainable and long-term investment is necessary. This will enable research that will efficiently transform increasingly large data-sets into information and knowledge that will improve the health and benefit the economy of the nation.

Over the last two years, the MRC has been working with partners including the Engineering and Physical Sciences Research Council (EPSRC), the Economic and Social Research Council (ESRC), the British Heart Foundation and Wellcome, as well as NIHR (England), CSO (Scotland) and Health and Care Research Wales to establish a new national institute for health and biomedical research - Health Data Research UK (HDR UK).

Following an open international search, Professor Andrew Morris FRSE FMedSci was appointed as the HDR UK Director. Professor Morris takes up his new responsibilities on 1st August 2017. Under his leadership, HDR UK's vision is to create a new type of distributed research Institute in the digital age that will be world-leading in the development and application of new mathematical, statistical and computational approaches for biomedical discovery and decision making in health care. This will propel the UK to become: the "largest and best learning health system in the world; the richest data-driven life sciences economy; and a society that improves health and narrows health inequalities through new knowledge from data."

The institute's mission is to improve the health and well-being of patients and populations by harnessing data science to address currently intractable research challenges that need scale, depth, heterogeneous data and the continuum of biomedical research from molecular biology, genomics, biomarkers, to clinical data, electronic health records and pervasive digital technologies i.e. from 'molecule to man'. It will work in partnership to support the development of an "information commons for research" – a fully integrated health research information platform, with access to both deep clinical data and extensive unstructured and large biomolecular data on individual patients and populations. This will act as an exemplar of a trusted and well governed

approach to the sharing of resources and research data for greater scientific impact and reproducibility.

3. Establishing Health Data Research UK

3.1 Structure and Development

Health Data Research UK (HDR UK) will create a thriving, high-energy UK-wide community of inter-disciplinary researchers who will disrupt traditional science and transcend disciplines. It will enable new scientific discovery from large multi-dimensional datasets and the application of new cutting-edge technologies in healthcare. This will require partnership working across the UK with funders, Government, NHS (for example, NHS Digital, National Services Scotland, NHS Wales Informatics Service, Public Health England, Genomics England), third sector bodies, other major research endeavours (for example, the Alan Turing Institute, European Bioinformatics Institute, UK Biobank,) and industry and underpinned by a commitment to good governance and public engagement to ensure the trustworthy use of data for the public good.

To underpin this ambition, the funders have initially committed £50m over the next five years to deliver up to 25 research initiatives, supporting an initial team of over 100 researchers and trainees embedded within a wider HDR UK community that will promote the democratization of health data science.

HDR UK's core research initiatives will be coordinated from an 'institutionally agnostic' head office, with its major research investments delivered by a virtual institute across a number of geographically distributed Substantive and Partnership Sites, working in close partnership with NHS and other partners. The establishment of the Institute will be in two main phases;

Phase 1 – establishment of core HDR UK executive team and initial Substantive Sites.

Phase 2 – establishment of further Substantive Sites, and Partnership Sites and the HDR UK capacity building programme.

Additional partner funder 'growth' programmes and core infrastructural support development (including governance, ethics and public engagement) will run in parallel with Phases 1 and 2

3.1.1 HDR UK Board and Executive Team

HDR UK is being established as a single independent research organisation, with a small corporate head office initially based at the Wellcome, 215 Euston Road, London.

The Institute Board, Chaired by Dr Graham Spittle, CBE, will be responsible for oversight and development of the Institute, setting its major policies and agreeing the strategic direction of the Institute. The HDR UK Director will report directly to the Board.

The HDR UK head office will host a small senior leadership and executive team to coordinate and develop the Institute's strategy, policies, ethics, governance, public engagement and stakeholder relationships, to effectively deliver against HDR UK's research priorities.

Substantive Site Directors will play a critical role within Institute's senior scientific leadership committee. This team will work with the HDR UK Director, Executive and Board (and through them, the funders), to help manage the ongoing research delivery and strategic development of the Institute.

Annex 1 provides an overview of the HDR UK operational structure.

3.1.2 Substantive Sites

Substantive Sites, the focus of this call, will provide leadership across a geography and provide the core capacity and capabilities of the institute, across the breadth of research priorities. It is envisaged that each Substantive Site will:

- comprise single or multiple research organisations (ROs). Where sites are based on a cooperative of ROs, a single coordinating RO and Site Director (based at the coordinating RO) will provide leadership and facilitate working across HDR UK, with external partner organisations and other stakeholders;
- embed computational science expertise alongside health data scientists, with the aim of harnessing complex analytics including machine learning, neural networks and natural language processing to deliver tools that support patient pathways in computable, actionable and much richer ways.
- lead on one to four core research initiatives, underpinned by specific research questions, which will be central to HDR UK's mission, in collaboration with other HDR UK sites and international partners;
- proactively contribute to the training and capacity building ambitions of HDR UK, to advance data science in the context of health and biomedical research;
- cover, and ideally work in close collaboration with NHS and other partners in regional health and social care economies of typically three to six million people;
- where relevant, align with existing NIHR investments and/or regional NHS data hubs as these are being developed by NHS England and the Life Sciences Industrial Strategy, as well as other relevant government health department investments and initiatives;
- where relevant, align with non-health data assets/initiatives, for example investments made by the ESRC such as the Administrative Data Research Centres, or EPSRC investments such as the Alan Turing Institute;
- contribute and subscribe to HDR UK principles covering: capacity building; governance and ethics; public engagement; sharing research data and communications and branding.

3.1.3 Partnership Sites:

Calls for Partnership sites will be made in Phase 2 (not part of this call) and are expected to comprise **single** ROs working in close collaboration with HDR UK directly or through linkage to the Substantive Sites. Partnership sites will typically engage with HDR UK for a fixed-term, focused research initiative, typically requiring a smaller scale of investment

3.1.4 Scaling Across the UK

Through supporting Partnership and Substantive Sites, HDR UK will:

- prioritise strategic research challenges, that can only be delivered by bringing together a unique combination of interdisciplinary skills, expertise, data assets and partnerships, currently distributed across the UK;
- catalyse cross-cutting initiatives, with a range of partners, to address important health research challenges, such as comorbidity and chronic disease, where health data science, can be differentiating in terms of impact and value;
- address for example, initiatives focussed around the implementation of novel quantitative and computational methods that solve challenging problems across the entire spectrum of biology and medicine, or a particular industry's or community's unmet needs;
- work through joint strategy and joint funding in collaboration with other funding bodies

and/or the commercial sector to leverage additional investment.

HDR UK Sites will be expected to take a leadership role, not only within their local partnerships but more significantly **across the UK** to deliver the research priorities of the Institute at scale.

3.2 Building HDR UK's Core Capabilities

In bringing the Institute to fruition, capacity and core capabilities will be built through the establishment of a number of core programmes.

A. Skills and Capacity Building

Capacity building will be a major priority for HDR UK. The Institute will establish a new paradigm for interdisciplinary research training. It will attract and support the brightest research and technical specialists to deliver a new cadre of health data scientists. It will develop flexible training opportunities, working with partners to address unmet skills needs. It will work closely with funders and Research Organisations to establish clear career structures, specific for this interdisciplinary discipline. It will develop appropriate reward and recognition frameworks relevant to the specialist skills, collaborative approaches and outputs of its interdisciplinary trainees; enabling career progression through intellectual leadership and independence.

Substantive Sites will adopt, develop and assist in the delivery of the HDR UK capacity building strategy. Sites will be expected to set-out their commitment to building health data science skills and existing support for interdisciplinary career pathways, within their plans to establish a Substantive Site.

HDR UK Future Leaders Programme (delivered in Phase 2a, so not part of this call)

In addition to the training embedded within each Substantive Site, HDR UK will develop and deliver the HDR UK Future Leaders Programme – a bespoke career development and training programme for researchers and technologists developing and applying novel methodologies, tools and technologies required for data driven health and biomedical research. The Programme will establish a new career model to nurture future talent across the breadth of health and biomedical data science. Collectively, these early career researchers will comprise a cadre of 20-30 “HDR UK Future Leaders” with personal awards, hosted at HDR UK sites.

Under the HDR UK Future Leaders Programme a cadre of HDR UK-funded PhD studentships will also be allocated to Sites.

B. Information Commons for Research

Underpinning HDR UK's research ethos, the institute will work inclusively as part of a consortium of researchers, organisations and publics across the UK to create an Information Commons for Research. This will build upon key developments and best practice from across the UK, including but not limited to: UK Biobank, ALSPAC, NIHR Health Informatics Collaborative, the Farr Institute and Medical Bioinformatics Awards, European Bioinformatics Institute, Genomics England and other NHS England data programmes together with the forthcoming Life Sciences Industrial Strategy led by the Office for Life Sciences. The approach to building this Information Commons for Research would subscribe to the [principles developed by the Global Alliance for Genomics and Health](#).

More specifically, the HDR UK Substantive Sites will work collaboratively to develop and demonstrate the added value of sharing of resources and research data in terms of scientific impact and reproducibility. This will require tools, knowledge, agreed governance and services using, where possible, established standardised terms and conditions that provides access to both

deep clinical data and extensive unstructured and large biomolecular data on individual patients, and populations.

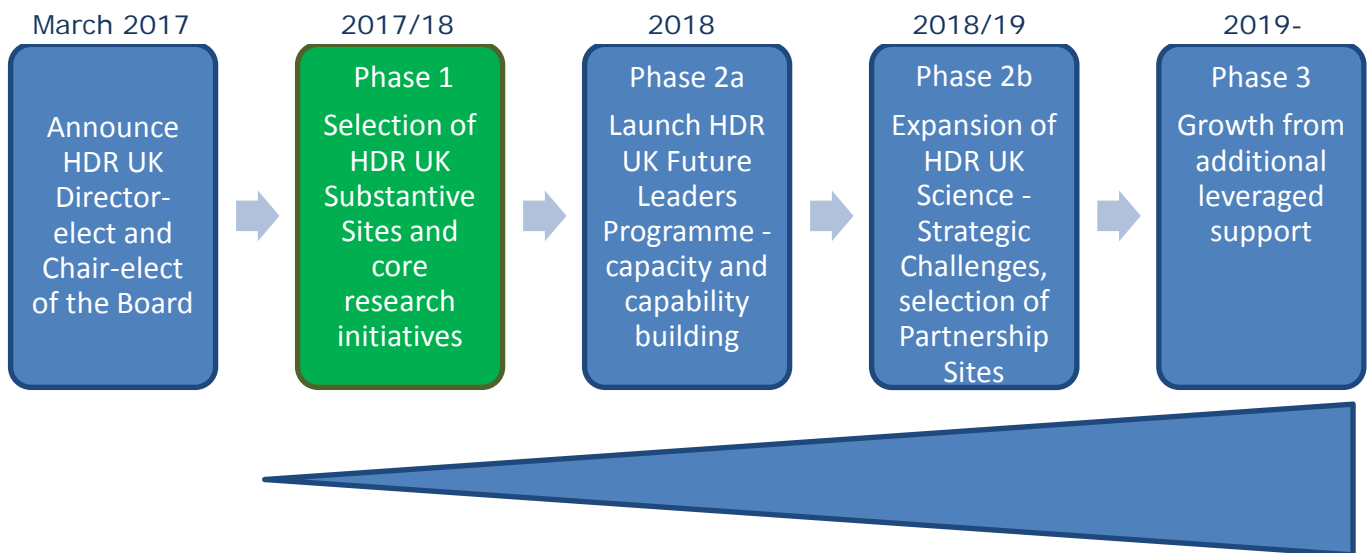
The aim is to ensure that research analyses can be performed across the entire UK health data science ecosystem. This will be possible by creating a federation of trusted research environments that will bring analysis to data through a secure and interoperable data infrastructure. **HDR UK will not host any data**, but will provide expertise and work with partners and data controllers to allow the sharing of analysis and results using built-in analytical and collaboration tools, APIs and data services. Working in partnership, HDR UK will appoint, or second, key opinion leaders with expertise in computing, information governance, ethics and data standards to develop a coordinated technology strategy and a harmonised approach to sharing of research data, information governance, public engagement and analytics across the Substantive Sites.

C. HDR UK Infrastructure

HDR UK will build on the significant existing capital infrastructure investments (for example, MRC Medical Bioinformatics Awards, the Farr Institute, Genomics England, European Bioinformatics Institute), but will also seek additional capital support to build and sustain an appropriate data infrastructure within and across Substantive Sites. This will support provision of; for example: (i) local site-specific processing capabilities; (ii) a distributed compute capability for cross-site working; (iii) a central infrastructure for large dataset processing; (iv) data security and connectivity; (v) software and cloud licenses; and (vi) cross-site communication facilities. Infrastructure investment will be made in Phase 2 once a strategy for research data provision has been agreed with partners.

3.3 HDR UK's phased investment strategy

The timing of the Institute development is shown in the figure below:



INFRASTRUCTURE AND INFORMATION COMMONS FOR RESEARCH DEVELOPMENT

Phase 1	Substantive Sites established through this competition. Incorporating the core health data science research initiatives of the Institute. HDR UK Executive Team, incorporating the Institute Senior Leadership and Executive Team.	Approx £25m Approx £8m
Phase 2a	Launch of the HDR UK Future Leaders Programme in 2018.	Approx £10m
Phase 2b	Selection of further Substantive and/or Partnership Sites in 2018/19 aligned to strategic challenges.	Currently £4m
Phase 3	Over time the Institute is expected to attract a “halo” of additional health data science funding support from other sources, akin to the MRC Centre funding model. It is the ambition of the Institute to attract inward investment over the next five years to at least match the initial financial resource provided by the funders to establish the Institute.	Under development
Director Flexibility Fund	In addition to these expansion phases, the Institute’s Director will retain a flexibility fund to supplement activity across the Institute, to address emerging opportunities and establish additional strategically important partnerships.	Currently £3m

Substantive Sites (Phase 1)

It is projected that once Phase 1-3 investments are complete, a typical Substantive Site will receive an award from HDR UK of between £4-£6m over a five-year period, spanning:

- Up to 4 core research initiatives addressing HDR UK’s initial research priorities;
- ~8-10 core funded staff;
- A cadre of PhDs (typically up to 5 in total over 5 years, to be at least matched by the host ROs);
- Provision of advanced computational and data infrastructure;
- Provision of interdisciplinary space for core researchers (contribution from host ROs).

In addition:

- Sites will benefit from hosting early career researchers and technologists supported through personal awards from the HDR UK Future Leaders Programme (Phase 2a).
- Sites will also benefit from Strategic Challenges and new partnership programmes (Phase 2b)

A number of emerging partnership opportunities are expected to augment the funding available to support Strategic Challenges. For example, as part of the Life Sciences Industrial Strategy, HDR UK will be working in close partnership with Innovate UK, the Industrial Strategy Challenge Fund and the Office for Life Sciences to deliver the Digital Health Catalyst programme, driving new collaborations between business, health services and academic researchers to develop and deliver digital health innovations for patient benefit.

4. Competition to identify HDR UK’s Substantive Sites - Phase 1

The focus of this call for proposals is to identify the initial Substantive Sites that will comprise HDR UK, during the critical early establishment phase. This builds upon the operational structure set out

above, informed by the HDR UK Director's scientific strategy for Phase 1, as set out in (Section 4.2) below.

Attention is drawn to the Framework Heads of Terms (HoT), which sets out the high-level principles of engagement between HDR UK as a corporate body and funder, with ROs seeking to participate as a Substantive Site.

4.1 Eligibility

Statements of Interest were received from ROs interested in becoming a Substantive or Partnership Site of the Institute. This information has been essential in building a robust overview of the diverse health and biomedical data assets and capabilities across the UK. It has shaped the funders' and the Director's thinking around HDR UK's research priorities. They will also be used to inform the independent Expert Review Group's (ERG) recommendations on site selection.

- **This call is only open to applicants who previously submitted a Statement of Interest for either a Substantive or a Partnership HDR UK site.**
- **A substantive site application can be submitted by a single RO or multiple collaborating ROs. Each RO can only participate in one application.**

ROs wishing to coordinate a Substantive Site of the Institute should have a national/international profile in health and biomedical informatics research, as identified by one or more of the following criteria:

- i) being in receipt of significant research income from the funders in the field of health and biomedical informatics;
- ii) hosting a strategic investment from the funders with significant activity in this area;
- iii) hosting an important national health and biomedical informatics-relevant data/infrastructure resource.
- iv) track record of partnership working with key NHS or other partners

4.2 Director's Phase 1 Research Priorities

To help shape proposals for the Substantive Sites, the Director has outlined the following core research priorities. In this phase, Substantive Sites will be expected to address ambitious research challenges aligned to at least one of the following priorities:

A. Actionable Health Data Analytics:

Under this theme, HDR UK will harness data science to develop and deliver robust analytical methods, software tools and related resources on both structured and unstructured (eg imaging) data, with the most potential impact on, for example, (i) adding value at scale to existing world-leading cohorts in the UK; (ii) demonstrating system-wide, or patient journey-wide opportunities for research that improves quality of care; or (iii) the derivation of new or deep phenotypes.

B. Precision Medicine:

Working with partners, including but not limited to: Genomics England; NIHR Health Informatics Collaborative; and existing stratified medicine and molecular pathology consortia, HDR-UK will enable large scale, high-throughput research that combines DNA bio-repositories and genomic data with electronic health records (EHRs), and other data systems, in support of implementing molecular medicine and the understanding of disease from basic research to clinical care.

C. 21st Century Trial Design:

HDR UK will embrace technologies and data science to transform the approach to Phase II – Phase IV clinical trials by supporting the design of intelligent trials using EHRs. This work, including methodological development, will provide trialists with a better understanding of the available cohorts, targeted patient recruitment, automated ascertainment of events and on-going reporting of post-market adverse drug events, by partnering to create a world-class infrastructure for pharmacovigilance and phase IV ‘real world evidence’ studies.

D. Modernising Public Health:

HDR UK will address the priority of using information technologies and data science in enhancing the precision and speed of public health assessment and interventions. This might harness novel computational approaches and the ability to link health and administrative datasets across multiple environments and/or to existing cohorts. HDR UK will perform research that casts light on the full spectrum of health determinants and catalyses the adoption of new methods for evaluating the health impacts of individual- and population-level interventions. New technologies, from sensors to wearable devices to artificial intelligence, will help us achieve the shift towards prevention and early intervention.

5. Context for Substantive Site proposals

HDR UK is looking to make an initial investment of approximately £25m over the next five years in this first phase of establishing the Institute. Between 5-7 Substantive Sites are likely to be selected in this competition. Substantive Sites will be funded for up to five years in the first instance (with an option to renew subject to a five-year review). In addition, the level of programmatic funding may be adjusted by the HDR UK Director, according to the needs of the Institute as a whole, through the provision of additional flexibility funding or additional strategic challenge support.

Applications should build on the original Statements of Interest submitted by each participating RO. Substantive Sites will be expected to provide leadership across the UK and beyond and **an emphasis on working in partnership is strongly encouraged**. Each Substantive Site will not only be expected to build on their local partnerships, but also lead or actively participate in specific cross-site health data science research initiatives. They will also be responsible for building collaborations with other UK and international partners, to drive innovation in scientific and technological developments required to transform the use of health and biomedical related data across the UK.

ROs in collaborative bids should agree which RO will coordinate on behalf of the Substantive Site. The coordinating RO will be expected to take responsibility for contractual negotiations between the collaborative Site and HDR UK. The coordinating RO will be responsible for the overall management of any award, on behalf of their RO partners.

Once fully established, HDR UK will have a significant component of early career “Future Leaders” holding personal awards with an expectation for career progression within or beyond HDR UK at the end of their future leader appointment. As such, it is expected that these researchers, on successfully completing their training and being recognised as “rising stars”, will be capable of attracting offers of tenure at the host ROs comprising HDR UK. In this way, HDR UK will be able to continually recruit new Future Leaders to the shared benefit of the Institute as a whole.

Whilst focusing on addressing the research priorities set out by the HDR UK Director for this first phase of investment, applications should ‘look beyond’ the present call. Proposals should make

reference to the entirety of the HDR UK strategic vision and the potential for synergy with other investments that might provide significant opportunity for health and biomedical informatics research in the future. It should be noted that HDR UK and the Institute's Director expects to work closely with the Site Directors/Associate Director(s) and researchers to leverage substantial additional support from government, charitable and commercial bodies, as well as from the current funders.

5.1 Resourcing Principles

HDR UK directly incurred research costs will be fully covered, plus directly incurred general support and services directly associated with the research initiatives. Note that HDR UK is an independent Institute that is seeking to be established as a charitable company, and it will not use the FEC/TRAC costing system. Applications will therefore need to follow the guidance on costing that is provided under 'Financial Information' below. Substantial leveraged commitment is expected from hosting ROs.

The application should state how the participating ROs will provide resources to support the mission of the HDR UK. HDR UK will provide a small amount of capital (approx. £100k per site) to support cross-site communication facilities (this will be procured centrally), but will not fund any refurbishment costs. The RO is expected to provide suitable accommodation space to host 10-20 institute researchers and trainees, embedded and collocated alongside related multidisciplinary teams and complementary research activities.

Capital Infrastructure

Additional capital funds of around £25m are being sought to establish the distributed data infrastructure of HDR UK. It is expected that this capital will be invested to support Substantive Sites within the first two years of establishment. ROs will be expected to provide significant in-kind and leveraged financial support, including access to and alignment of existing advanced compute and data infrastructures, to augment HDR UK's planned computational infrastructure.

6. What to Include in the Case for a Substantive Site

6.1 Overview

The Substantive Site application should articulate the proposed Site Director's own vision for progression of cutting-edge health and biomedical informatics research, in the context of the Site's own capabilities and taking account the broader HDR UK vision and strategic priorities set out by the HDR UK Director (Sections 4.2). In doing so, the bid should identify between one and four internationally-leading health data science initiatives that will form the foundation research of the Site. The proposal should be specific as to how knowledge and infrastructure from the broader regional and UK landscape will be harnessed for health and biomedical informatics research at scale.

HDR UK will not support research that can be supported through traditional research project and programme funding mechanisms and which is not of clear relevance to its mission.

The case to host HDR UK research activity as a Substantive Site should be based upon demonstrating:

- the fit and strength of the proposed research initiatives, including future plans;
- commitment to open innovation and opportunity to reach out to key regional, national or international stakeholders, and to the wider UK or international research community. This

- should include alignment and added value from existing partnerships with external organisations/stakeholders (such as local NHS resources, data owners or controllers);
- commitment to the establishment of an Information Commons for Research; including adoption of digital standards; a commitment to support data controllers to work towards a federated, standard and interoperable data infrastructure and upholding the highest standards of responsible and ethical research use of data assets;
 - the track record of health and biomedical informatics-related research currently undertaken at the RO(s), which comprise the Site (which may for example include stewardship of data assets, development of data resources, analytical tools, new methodologies etc.) and collaboration with NHS and other bodies. Reference should be made to existing strategic funding in health and biomedical informatics research at or linked to participating ROs, and how the Site as a whole will interface with these investments and facilitate access across HDR UK;
 - the strategic approach to support and grow capability in such research in the future, for example identifying future investments that may directly contribute to, or synergize with, HDR UK, and;
 - the ability of the RO(s) to provide the necessary space and financial commitment to host the envisaged HDR UK research initiatives in an environment where the science will flourish. It is anticipated that the host RO(s) will provide significant institutional support, both direct and in kind, including:
 - administrative and broader management support to the Site Director and Site Associate Director(s);
 - matched (50/50 contribution) towards the salary support of the Site Director and Associate Director(s)
 - provision of research, technical specialist/technologist and other complementary posts meeting the expectation that HDR UK will fund at least 5 PhD students per Site per quinquennium under the HDR UK Future Leaders Programme, with this provision to be at least matched by the host institution(s);
 - Substantive Sites will also be expected to host a smaller number of early career “Future Leaders” supported through personal awards from HDR UK;
 - provision of suitable accommodation to host the institute researchers and trainees;
 - commitment to alignment of existing data assets and computational infrastructure(s).

Research Organisations are encouraged to contact MRC to discuss plans in advance of submission if there are any uncertainties over remit or the content of the case.

6.2 The Site Director and Associate Director(s)

Substantive Sites will be fully integrated constituencies within HDR UK, which together will provide a cohesive set of research initiatives and capabilities aligned to HDR UK’s vision. The distributed nature of both the Institute and also potentially the Substantive Sites themselves, places significant responsibilities on the Site Directors (based in the coordinating ROs) and Associate Directors. The Site Director is expected to commit a minimum of at least 0.4 FTE to this challenging role. HDR UK will expect to jointly agree with the Coordinating RO, the appointment and where necessary replacement of the Site Director.

A significant element of the Site Directors’ and Associate Directors’ roles will be to ensure that HDR UK collaborative activities are successful. They will:

- take personal responsibility for the seamless collaboration and interaction of the Site's resources, infrastructure, science and researchers within each Site;
- be empowered and well connected to senior stakeholders within their RO, to effectively engage, influence and drive change locally, to deliver HDR UK's vision;
- identify and create synergies within the local and distributed institutional environments that will comprise each Site and the Institute as a whole.

The Site Director will be an important player within the central governance structures of HDR UK, being a member of a senior scientific leadership team within the Institute. This team will work with the HDR UK Director, Executive and Board (and through them, the funders), to help manage the ongoing research delivery and strategic development of the institute.

The Site Director will therefore:

- be an exceptional, internationally-renowned, individual who is able and willing to foster the very best science within the Site and beyond;
- be a team player able to interact regularly and effectively, with not only the HDR UK Director but also the Directors of other Sites for the good of HDR UK as a whole;
- create shared agendas and leverage commitment with stakeholders across the UK and beyond;
- have the stature and authority to attract the best researchers from outside the host institution(s), both nationally and internationally.

Site and Associate Directors with career tracks outside the traditional academic research pathway are welcomed. While it is considered likely that the Site Director will lead a research initiative within HDR UK, consideration will exceptionally be given to individuals whose research is not central to the proposed vision, but where such a compelling leadership case can be presented.

With the multidisciplinary nature of the challenges HDR UK seeks to address, ROs are strongly encouraged to build a diverse site leadership team, representing the breadth of skills needed within each site, ranging from traditional academic research leaders to leading technologists and technical specialists.

7. Format for application

7.1 General

The submitted case must be specific to the needs set out in this call, demonstrating how the proposal will deliver against the HDR UK Director's strategic vision during the Institute's critical establishment phase. Generic university information should not be included.

Applications should be prepared using the form provided and submitted as a single, bookmarked pdf, using a typeface of 11 pt Arial font, single line spacing, with 1.5cm margins on all page borders. Pages should be numbered. To maintain a level playing field, applications which do not follow the specified format may be rejected without assessment.

The correctly formatted document should be submitted to the Informatics mailbox:

Informatics@headoffice.mrc.ac.uk

The application should comprise:

- **Cover Letter**
- **Title:** Coordinating RO [Name] followed by Associate ROs [Names]: Application to become a

Substantive Site of Health Data Research UK.

- **Executive Summary:** up to 400 words.
- **Part 1:** Case for a HDR UK Substantive Site (up to 4 sides) plus
- **Part 2:** Cases for support for research initiatives
- **Part 3:** Outline of requirements for renewal or establishment of computational and data infrastructure.
- **Part 4: Annexes** in order a-d as outlined below

7.2 Specific guidance

Cover Letter: (maximum two sides of A4, signed by all parties to the proposal) To include:

- high level statement of support on behalf of the participating RO(s), identifying the coordinating RO;
- a summary of the attributes of the proposed site, demonstrating alignment to the HDR UK Director's strategic vision and high level principles underpinning the Institute's activities, including commitment to work with HDR UK towards developing new career frameworks for interdisciplinary research and technical staff where needed;
- confirmation that the Framework Heads of Terms (HoT), covering the HDR UK principles defining the operation of the Site within HDR UK, has been signed. For those Sites where there are multiple ROs contributing, each should sign a separate Framework HoT to indicate acceptance. Applications will be rejected if a signed HoT has not been received from all parties to a proposal. Substantial renegotiation of the terms of the framework will not be considered in subsequent contractual discussions. It must be noted that contractual negotiations will only take place between HDR UK and the Coordinating RO, who will negotiate on behalf of all participating ROs within a Substantive Site and be responsible for managing the legal relationship with HDR UK. The relationship between Coordinating and Associate ROs should not significantly deviate from the principles set out within the Framework HoT to ensure a consistency of approach across the Institute.

Part 1: Case for a HDR UK Substantive Site (4 sides).

The case should be presented under the following headings:

- a) Rationale** for the Site, identifying the coordinating RO and any associate ROs.
- b) Site Director's vision**, including commitment to the principles of the Information Commons for Research (Section 3.2) and ambitions for site growth over the next 5 years (as supported by HDR UK, RO and external funding, providing context for section f)
- c) Overview of the Site**, building on information presented in each participating RO's Statement of Interest. To include:
 - leadership and governance structures (reflecting the multidisciplinary nature of the research);
 - descriptions of the Site's health and biomedical informatics-relevant scientific highlights;
 - high level overview of key partner and stakeholder relationships;
 - a statement on the advanced computational and data infrastructure to which HDR UK will have access;
 - training capability and existing support for interdisciplinary skills development and career progression;
 - and details of the space that the RO(s) will provide to facilitate the Site's activities.

- d) Justification** for Phase 1 HDR UK funding (overview, to encompass proposed plan for proposed research initiatives).
- e) Partnerships with the NHS, academia, industry and other bodies:** details of the supporting environment, including key partnerships/stakeholder relationships that could be leveraged to support HDR UK. Where relevant, the application should demonstrate how partnership data assets could, through the development and adoption of the information commons for research, be made increasingly accessible as national resources.
- f) RO support for HDR UK:** details of access to key resources and other infrastructure, and for support posts (such as academic positions, researchers including technical specialists/technologists, infrastructure staff, administrative support, capacity building positions etc.) including commitment to evolve career development frameworks for important categories of interdisciplinary research staff such as technical specialists/technologists who fall outside the well understood academic PI track (noting this latter may be expanded upon in the allowed "Training and Staff Development Annex").
- g) Future investment strategy** across the Substantive Site which will support and grow capabilities and capacity across the field more broadly

Part 2: Case for HDR UK Research Initiative support (5 sides).

It is expected that there should be at least one and no more than four research initiatives spanning the site proposal and addressing one or more of the research initiatives highlighted within the HDR UK's Director strategic vision for the Institute during this critical establishment phase. Each research initiative should be led by a named Principal Investigator (PI), with Co-Investigator (CoI)s listed as appropriate.

Site Directors and/or Associate Directors may lead a research initiative, in addition to their Site leadership responsibilities. Additional research or technical leaders, able to contribute diverse expertise and capabilities to HDR UK are also welcomed as PIs of research initiatives.

Note that:

- An 'initiative' is a coordinated and coherent group of related projects, which may be to answer an inter-related set of questions on a broad format.
- The initiative should be for work requiring long term support, which would be challenging to support through traditional funding mechanisms.
- HDR UK will be looking for opportunities to scale research initiatives across the Institute, building on and maximizing the diverse skills, expertise and data assets identified by each Substantive Site. Existing research networks, able to accelerate this collaborative approach should be highlighted.
- The PI's and Co-I's track record of research should demonstrate their potential to successfully manage and deliver a major, collaborative research programme.
- The PI and Co-I's can request salary support consistent with time to be spent on the award. Co-Is should not be included unless they are major, direct contributors to the intellectual leadership and delivery of the research initiative.
- Research staff may include post-doctoral research assistants, technologists/technical specialists and other science support staff dedicated to specific needs within the initiative. Up to 100% salary support may be requested for these research staff, alongside the associated resources to undertake the proposed research.

Each research initiative case for support should be structured as follows:

- a) **Current status of the field / background to research direction and summary of future plans**
- b) **Future objectives**
- c) **Research questions and methodological approach**
- d) **Resource justification.**

Awards will be contingent on compliance with HDR UK's terms and conditions of award, which will broadly align with standard MRC policy for grant awards, including the use of animals, use of human tissue or data etc., and build on the Framework HoT.

Part 3: Outline of requirements for renewal or establishment of computational and data infrastructure (4 sides)

a) Space/Accommodation (1 side)

Provide details of the space to be made available by the RO (or each ROs in collaborative site proposals) to host institute staff and trainees. Outline how the space will be positioned within the RO(s), to maximise opportunities to bring staff from complementary disciplines together.

It should be noted that HDR UK will provide a small amount of capital (approx. £100k per site) to support cross-site communication facilities (which will be procured centrally), but will not fund any refurbishment costs.

b) Advanced Data and Computational Infrastructure (3 sides)

Additional capital funds of around £25m are being sought to establish the distributed data infrastructure of HDR UK. It is expected that this capital investment will be made to support Substantive Sites within the first 2 years of establishment. It is not directly available in this call. ROs will be expected to commit to working towards a standard and interoperable data infrastructure, underpinned by a common technology strategy, as part of the Information Commons for Research.

Provide details of:

- Existing health and biomedical computational and data infrastructure(s) that can be leveraged and aligned to support the research ambitions of HDR UK.
- An indication of the immediate (1-2 year) and longer-term (up to 5 years) data and computational data infrastructure requirements needed to support the research ambitions of HDR UK at the local (Site specific) and national scale. This should include provision of indicative capital costs.
- Requests should clearly distinguish between costs associated with refreshing existing infrastructure and those associated with expansion and provision of new capabilities.

Part 4: Annexes

Only the following annexes will be allowed:

- a) Schematic diagram: A single diagram to illustrate the Site's research landscape, identifying the relevant ROs/research groups/resources that might be connected to the proposed Site, and their locations (one side of A4).
- b) Two page CVs for the Site Director, Associate Director(s) and other PIs/Co-Is leading research initiatives within the site. For the Site Director only, an additional appendix providing full publication list for the past 10 years and details of all grant support obtained in the past 5 years, plus abstracts for all live awards.

- c) Training and staff development: One side to be provided as assurance on the training and capacity building environment available through or linked to the proposed Site. To include:
- details of the numbers of PhDs/Fellows and other related capacity and skills programs (e.g. MSc, CPD training, online resources etc.) supported in this area over the past 5 years. Including quantitative metrics where available.
 - details of the policies, career development and evaluation frameworks which support early-career researchers (including technical specialists/technologists) who may be associated with HDR UK. This should include any work in progress to consider how best to support interdisciplinary career pathways, recognised as a key challenge in capacity building/staff development needs in the UK. ROs should make it clear they are committed to working with HDR UK to adopt best employment practice being developed by HDR UK for these important staff, including working towards early adoption of new career structures and evaluation frameworks.
- d) Financial information (see below).

Any additional diagrams, tables etc., must be included within the body of the application.

7.3 Financial information tables

The financial information should be presented in a summary table as well as separate tables for Site core support (Part 1 above) and for each Research Initiative requested (Part 2 above). The request for HDR UK support will be shown side by side with the support to be offered by the participating ROs in the tables. The tables to use are set out in the form supplied with this call; please note that the separate resource tables should equate to the total resources set out in the financial summary table.

The Site Director and Associate Director(s), together with Research Initiative PIs and Co-Is can request salary support consistent with time to be spent on the award (noting the Site Director is expected to commit a minimum of 0.4 FTE to this role). Direct science and science support, including directly incurred general support and services associated with the proposed research, may be requested in full such that the full research costs are covered. However, note that these are to be calculated and justified individually based on the proposed HDR UK activity and should not be costed based on FEC/TRAC methodology.

The request for financial support should be presented under the following four categories, making it clear what is being requested of the HDR UK funding and what will be supported by the participating ROs:

- 1) **Direct Science** - includes salaries of staff working on HDR UK science initiatives, and directly related costs of consumables, travel and subcontracts
- 2) **Direct Science Support** - includes directly attributable Science Support costs e.g. Data and Compute costs, facility access charges, Research Support and Publication costs
- 3) **General Support & Services directly associated with delivery of HDR UK initiatives** - includes underpinning research management and support services (e.g. Research Support, Infrastructure Management, Health & Safety & Technical services), building service costs (e.g. estates, utilities, cleaning, security), administration costs (e.g. personnel, finance, library and some purchased host departmental services)

The case for support should set the scene with a short, focused, high level overview which links the HDR UK Site science strategy to the requested funding. In the financial information provided, ROs should be clear how funds have been allocated to each of the Research Initiatives.

Funding may be requested to ensure Open Access compliance over the lifetime of the site.

8. Assessment

An independent Expert Review Group. Chaired by Professor Dan Roden, Vanderbilt University will assess the applications received and advise the Board of HDR UK and through them, the funders. For shortlisted proposals, the candidate Site Director, Associate Directors, VC/Dean Research (for the lead RO only) and two additional representatives (eg NHS/academic representative) will be interviewed by the review group as part of the decision making.

Please note that while future plans are requested, assessment will be primarily on track record. The following assessment criteria will be used, with the top four representing the most important criteria:

<p>1. The Site Director's vision and the strategy for the Site; Site Leadership</p>	<ul style="list-style-type: none"> • How will it fit with the ambitions of HDR UK? • Has the Site Director provided a clear scientific direction and identified important and achievable goals for the development of the key research initiatives within the Site for the next 5 years? • Has the identified senior leadership the skills and capabilities needed to deliver against the Site's ambitions and to manage relationships and potentially lead interactions across HDR UK? • Has the Site Director the necessary experience to play a senior leadership role within the Institute's Scientific Executive Team
<p>2. Strength of proposed research initiatives / PIs</p>	<ul style="list-style-type: none"> • What are the strongest areas within the Site at present and where are the opportunities? How are these areas geared for maximum synergy and/or innovation as part of the Site and of HDR UK as a whole? • Are the proposed PIs internationally competitive researchers and do they have/ show the potential for, the required leadership skills? • Are the proposed research plans exciting and innovative, and likely to provide impact across HDR UK?
<p>3. Level of institutional commitment</p>	<ul style="list-style-type: none"> • What other support, both direct and in kind, has the university offered, eg. posts and studentships, facility management, data asset, data and computational infrastructure access and technical service provision etc.
<p>4. Strength of the training environment & commitment to capacity building & interdisciplinary career development</p>	<ul style="list-style-type: none"> • Has the RO demonstrated a commitment to career development for interdisciplinary researchers including technical specialists and technologists? • What is the quality of the interdisciplinary training environment, as assessed through current metrics of success? Is high quality supervisory capacity available? What reward and recognition frameworks are currently in place to allow career progression for interdisciplinary researchers, including technical specialists and technologists? • What is the track record of training in health data science and allied disciplines?

5. Strength of supportive research environment	<ul style="list-style-type: none"> • Will the HDR UK initiatives have appropriate access to resources/infrastructures to execute their plans within the host RO(s)? • What is the quality of the key research platforms and technical services? • Has the RO(s) demonstrated strong commitment to sharing resources across HDR UK as a whole?
6. Research governance	<ul style="list-style-type: none"> • Are satisfactory governance structures and decision-making processes in place? • How empowered will the Site Director be within the host RO(s)?
7. Estates capacity	<ul style="list-style-type: none"> • Is there sufficient collegiate space to host 10-20 additional researchers/students and other trainees directly supported by HDR UK, alongside other RO staff committed to the Site? • What is the potential for growth?

9. Key Dates

Applications should be structured as above and sent as a single, bookmarked, pdf document to: informatics@headoffice.mrc.ac.uk

The deadline for receipt of applications is 16.00h on Thursday 5th October 2017.

Submission of applications by this deadline is mandatory and late applications will be rejected. Applications will be shortlisted and successful applicants invited for interview in November 2017. Feedback will be provided after the Expert Review Group's recommendations have been ratified by the HDR UK Board and funders committee in January 2018. Decisions will be announced by February 2018, with awards intended to commence from April 2018.

10. Contact Details

For general queries please contact informatics@headoffice.mrc.ac.uk

The scientific programme managers responsible are:

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Annex 1 – Health Data Research UK Organisational Structure

