National Institute for Health Research / NHS England / Improvement
ACADEMIC HEALTH SCIENCE CENTRES

Reference number	NIHR201657
Programme	Infrastructure
Call	Academic Health Science Centres Competition 2019
Institution Director	Professor Keith Channon
Director Institution	University of Oxford
AHSC Name	Oxford Academic Health Partners
Start Date	01/04/2020
End Date	31/03/2025

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1. Details of the Partnership

Institutions

University of Oxford
Oxford Brookes University
Oxford Health NHS Foundation Trust
Oxford University Hospitals NHS Foundation Trust

Please provide details of the governance and leadership arrangements for the proposed AHSC including:

- Details of the organisational model including an organogram;
- Please describe the lines of accountability; how the partnership will demonstrate effective governance; and demonstrate meaningful patient and public involvement (PPI/E/P) in the delivery of the objectives of the proposed AHSC over the term of designation.

OAHP **governance** builds on strong existing strategic and operational partnerships. Experience has shown OAHP's governance to be flexible, responsive and agile allowing decisions to be progressed quickly. **Board members are key decision makers and leaders in their own organisations at Chief Executive level or equivalent.** Thus, the Board will deliver its objectives and vision as integral elements of the activities and approaches of the partner organisations. The Partners have agreed the objectives as outlined in Section 5 and have prioritised partnership working in their respective strategic plans. OAHP will continue to be hosted by OUH with each partner making an annual financial contribution.

Engagement of OAHP with Buckinghamshire, Oxfordshire & Berkshire (BOB) Integrated Care System (ICS) will ensure strong links with social and community care, the Oxford-Cambridge Knowledge ARC and other bodies, and particularly the **Oxford AHSN**, strengthening wider reach across the Region and the UK. OAHP's global reach is strong and will be developed further.

The Board leads the **integration of OAHP's research infrastructure, specifically the NIHR infrastructure - two BRCs, MIC, ARC, CRF, CRN,** and the lead for the **NIHR School for Primary Care Research**, ensuring effective alignment to benefit all aspects of Partners' work, and ensuring focus on population healthcare needs. The development of nationally leading mental health capability, through the OH BRC exemplifies the OAHP's approach to strategic developments and decision making.

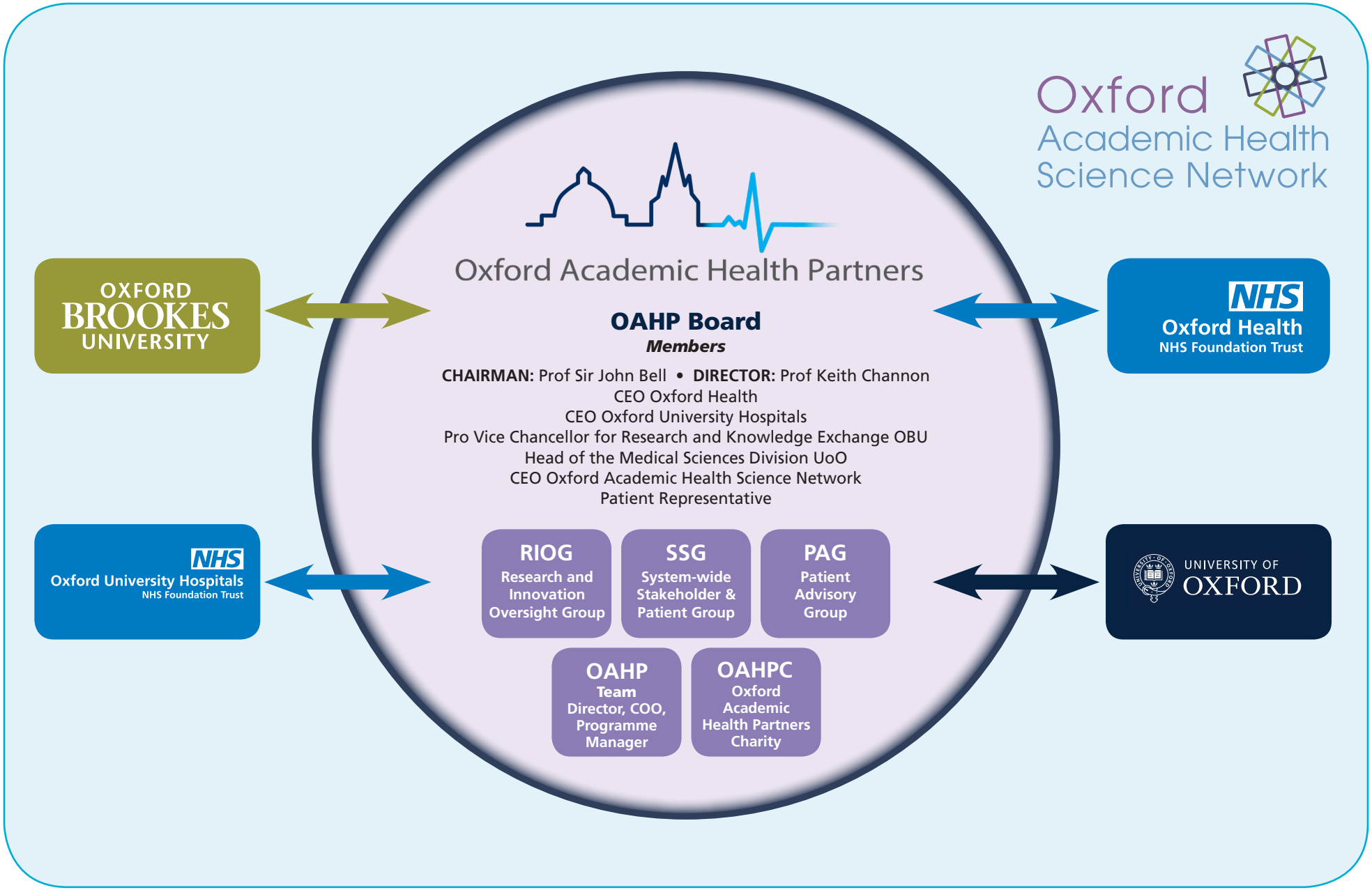
The Director, supported by the COO and Programme Manager, reports to the Board and is responsible for the overall management of the OAHP, working closely with all partners to ensure delivery of objectives and wider engagement. This team will develop and coordinate PPI/E/P activities, drawing on existing programmes across OAHP and Oxford AHSN. These include OUH and OH Trust and BRC PPIE groups, the AHSN's PPI programme, the ARC's PPIE theme which includes an implementation manager, UoO's Public Engagement with Research programme and OBU's Public Engagement Network.

OAHP will recruit Patient Representatives to work with the OAHP Board and PPI/E/P leads of the Partners' research and care infrastructure to establish a Patient Advisory Group, to ensure that innovations are developed to deliver patient benefit.

The Board, chaired by Sir John Bell (see Organogram, Appendix 1), will meet quarterly and provide reports to the Boards or equivalents of the Partner organisations. Supporting the Board is the Research and Innovation Oversight Group (RIOG), chaired by Prof Chas Bountra (UoO PVC Innovation), on which the OAHP Director sits.

OAHP will establish a formal system-wide Stakeholder Group (reporting to the Board) with key individuals including NEDs of NHS Trusts, BOB ICS leads and Local Authorities, to ensure a wide network of expertise, and engagement in support of OAHP's vision and strategy.

OAHP charity # 1174725, registered in 2017 provides an independent vehicle for delivery of objectives and a platform for formal interaction with stakeholders through associate member status and grant awards to individuals within the Partnership. **This name has now been adopted for the Partnership.** The OAHP Board will continue as the Trustees for the Charity.


Oxford Academic Health Science Network
Oxford Academic Health Partners
OAHP Board
Members
CHAIRMAN: Prof Sir John Bell • DIRECTOR: Prof Keith Channon
CEO Oxford Health
CEO Oxford University Hospitals
Pro Vice Chancellor for Research and Knowledge Exchange OBU
Head of the Medical Sciences Division UoO
CEO Oxford Academic Health Science Network
Patient Representative
OXFORD BROOKES UNIVERSITY
NHS Oxford Health NHS Foundation Trust
NHS Oxford University Hospitals NHS Foundation Trust
UNIVERSITY OF OXFORD
RIOG Research and Innovation Oversight Group
SSG System-wide Stakeholder & Patient Group
PAG Patient Advisory Group
OAHP Team Director, COO, Programme Manager
OAHPC Oxford Academic Health Partners Charity

2. Excellence in research, patient care and health education

The Designation Committee will be provided with a range of published metrics which it will use to judge the partnership's excellence in research, health education and patient care.

If you believe that the metrics provided to the Designation Committee may not reflect the true status of your partnership's excellence in research, patient care and health education please provide additional information.

The 2020 THE **World University Rankings placed UoO #1** for pre-clinical, clinical and health subjects for the ninth consecutive year, and the World's #1 University, for the fourth consecutive year. Recent highlights for UoO Medical Sciences Division (MSD) include the opening of the **BioEscalator** - a new innovation centre for high-potential, early-stage medical science companies at the Old Road Campus; the opening of a preventative healthcare clinic 'The Oxford University Clinic' in London in partnership with Mayo Clinic and OUH and the award of the **Nobel Prize** in Physiology or Medicine to UoO's Professor Sir Peter Ratcliffe, also Clinical Director at the **Francis Crick Institute**.

THE **Young Universities Rankings placed OBU #1 in the UK for research and #2 for teaching**. For the third year, OBU is the only UK university in the QS global ranking 'top 50 under 50'. OBU has forged international partnerships with Mexico, Brazil and Ghana to support research into Global Challenges including parasitic diseases, gene therapy and vaccines.

OAHP established **The Oxford Institute of Nursing, Midwifery and Allied Health Research (OxINMAHR)** at OBU in 2017 as a nationally unique research institute that encompasses experts across health and social care research, with a strong focus on excellence in research, patient care and health education. The Institute stimulates research in allied health professions across the OAHP, working closely with Chief Nurses at OUH and OH and includes an OxINMAHR-appointed NIHR 70@70 fellow. OxINMAHR research is now nationally or internationally leading in areas including cancer survivorship, child health and social care, substance abuse and addiction, and physical and occupational rehabilitation. OBU's Swindon campus provides adult nursing education and celebrates its 20th year. OBU is one of only three NMC Assessment/Competency Centres for overseas healthcare workers.

UoO MSD and OBU's Faculty of Health and Life Sciences hold **Silver Athena Swan Awards**. OBU partners with UoO, the Royal Society, Elsevier UK and PertinaxPharma in the EPSRC funded project **Promoting Equality, Diversity and Inclusion in University Spinout Companies - A Case for Action** and OBU's **Centre for Diversity Policy Research and Practice** covers all aspects. OBU has been awarded EU funding for the roll out of Athena Swan across Europe.

OAHP's NHS Foundation Trusts provide an extensive range of local, regional and national services. OH is the designated lead provider for regional specialist mental health services for eating disorders, inpatient adolescent mental health and forensic care across central southern England. OH established Oxford Healthcare Improvement (OHI) to bring the knowledge base of improvement science to bear to achieve better safety and outcomes mental health and community care settings. OUH is one of only 5 designated Major Trauma Centres and has a significant number of tertiary services across all age groups. Examples include the Cleft Lip and Palate Service and the Motor Neurone Disease Care and Research Centre.

Oxford University Hospitals NHS Foundation Trust

12,000 staff

1.4 million patient contacts

7,500 babies delivered

105,000 planned admissions

143,000 attendances at emergency departments

Over **£1 billion** annual turnover

NIHR Oxford Biomedical Research Centre

NIHR Oxford Clinical Research Facility

NIHR South Midlands & Thames Valley Clinical Research Network

Oxford Academic Health Science Network

- Four hospital sites – John Radcliffe Hospital, Churchill Hospital and Nuffield Orthopaedic Centre, all located in Oxford, and Horton General Hospital in Banbury.
- Secondary care services for the people of Oxfordshire, tertiary and specialist services to neighbouring counties – including the Satellite Surgical Centre at Milton Keynes University Hospital and Renal Dialysis Units in Swindon and Stoke Mandeville.
- A number of supra-regional services are also provided through clinical networks including Vascular Surgery and Paediatric Cardiology (with Southampton University Hospital).

Oxford Brookes University

2,800 staff in four renowned faculties

18,000 students

82% of our students are from the UK

18% are from the EU or overseas

79% of our students are full-time

Oxford Institute of Nursing and Midwifery and Allied Health Research

Oxford Brookes University (Swindon)

Oxford Clinical Allied Technology and Trial Services Unit

Oxford School of Nursing and Midwifery

- Significant investment in our estate has already resulted in multi award-winning facilities and this carries on with a £220 million investment over the next 10 years.
- Teaching partnerships in Hong Kong, Malaysia, Singapore, India, China and France. They include franchise arrangements, dual degrees, and a combination of 'flying faculty' and distance learning.
- Four campuses – Headington, Swindon, Wheatley and Harcourt Hill.
- Undergraduate, masters and post graduate degree courses – Adult nursing, Children's nursing and Midwifery, Biomedical Sciences, Psychology, Sports Science, Nutrition, Occupational Therapy.

UNIVERSITY OF OXFORD

#1 medical school in the World

24,000 students from **140+** countries

Supporting **30,000** jobs as the largest employer in Oxfordshire

£2 billion contribution to local economy

£340 million research income in Medical Sciences alone

NIHR School for Primary Care Research

Big Data Institute

Oxford University Innovations

Oxford Sciences Innovations

- Four divisions - Humanities Division, Mathematical, Physical & Life Sciences Division, Medical Sciences Division and Social Sciences Division.
- 16 Departments within Medical Sciences Division.
- Undergraduate, Masters and Doctoral degrees including 350+ graduate programmes.

NHS Oxford Health NHS Foundation Trust

6,700 staff

194+ clinical teams

£340 million annual turnover

400 mental health beds

130 community hospital beds

44,000 patients treated each month

NIHR Oxford Health Biomedical Research Centre

NIHR Community Healthcare MedTech and In Vitro Diagnostics Co-Operative

NIHR Applied Research Collaborative Oxford and Thames Valley

- Buckinghamshire – Mental health services for children, young people, adults and older people.
- Bath and North East Somerset, Swindon and Wiltshire – Mental health services for children and young people and eating disorder services.
- Oxfordshire – Physical health, mental health, eating disorders, learning disability and autism services for children, young people, adults and older people.

3. Track record of translating scientific advances into benefits for patients and the healthcare system

Please provide three examples from the past five years as evidence of the partnership's track record of translating findings from research across a range of disciplines into benefits for patients and improved health outcomes and health care delivery.

Please also provide an outline of how the proposed AHSC would act as a system leader for innovation and good practice by supporting the development and early implementation of transformative technologies (e.g. genomics, informatics, artificial intelligence or cell and gene therapy) in the NHS.

OAHP's multidisciplinary capabilities across the translational research spectrum generate a world-leading track record in benefits for patients, for example:

1. **Musculoskeletal Disease**: OAHP has delivered a programme of major clinical trials that have provided the evidence base to transform clinical practice and deliver significant patient benefits at reduced cost. The CSAW study evaluated arthroscopic subacromial decompression. Patients who had sham surgery did no worse than those with surgical intervention. As a result, withdrawal of this procedure in the NHS saves >£125 million /year. Similarly, the Back Skills Training Trial tested cognitive behaviour therapy for persistent low back pain showed considerable benefit, now applied in 165 hospitals, saving £1 billion of care costs/year. OAHP supported the DRAFFT trial of fixation techniques for wrist fracture, comparing K-wire fixation with plates, showed that wire fixation was better and more cost-effective and changed NICE guidance (NG38). Use of plates has reduced from 80% to 50%, with major cost savings and patient benefit.

2. **Digital Health**: OAHP has delivered a range of products from BRC research that are now transforming the care of 100,000s of NHS patients. Including:

- **Gestational Diabetes (GDm) health App**, approved by NICE and adopted by hospitals across the OAHSN region. GDm significantly reduced preterm birth, diabetes medication requirements and caesarean section rates.
- **System for Electronic Notes Documentation (SEND)** provides early warning scores in hospitals for deteriorating patients. This digital health App was commercialised and licensed and is now being applied to 100,000s of patients across multiple hospitals.
- **Sleepio** is the sleep-enabling App, accessed widely through the NHS App Store and disseminated via the Oxford AHSN.
- **Cristal Health**, an OU spinout delivering sustainable development of UK-CRIS, a large linked dataset of de-identified mental health (including dementia) records from around the UK. CRIS provides a unique resource for both early-stage drug discovery and clinical service development.
- **OpenPrescribing** and **OpenPathology platforms,** providing AI-determined early warnings to all registered UK practices when prescribing trends deviate from comparators.

3. In **Microbiology and AMR**, OAHP pioneered the use of whole genome sequencing (WGS) to modernise microbiology in the NHS including:

- Understanding *Clostridium difficile* genetic epidemiology, transforming the approach to hospital outbreaks in the NHS.
- WGS of *Mycobacterium tuberculosis* to identify the pathogen, pattern of drug resistance/susceptibility and contact tracing. This programme has been adopted by PHE and increasingly used globally.
- Same-day sequencing using Oxford Nanopore, integrating clinical records with genomic data. Clinical data and pathogen sequencing rapidly solved the potential large-scale hazard of new *Candida auris* outbreaks in hospital ICUs.

System Leadership: OAHP plays an important role in developing national resources used by biomedical scientists across the UK to discover and translate for the benefit of patients, in genomics, informatics, AI and gene therapy:

OAHP worked together to achieve the establishment of OH BRC dedicated to brain health and neuroscience (the only entirely new BRC awarded in the 2016 competition, and still 1 of only 2 mental health BRCs nationally); OAHP's NIHR BRCs contribute and lead across all major NHS/UK health challenges and priorities.

In **Big Data, Informatics,** and **AI**, OAHP led development of the **UK Biobank,** (Sir Rory Collins), a unique programme that created the world's largest and deepest high-quality resource for the correlation of clinical phenotypes and biological markers including genomics. This resource is an asset for global scientific studies and publications, primarily by non-Oxford centres.

OAHP is pioneering the use of new i**nformatics-based approaches for large scale clinical trials** via 'digital recruitment' such as the ORION4 trial of PCSK9 siRNA for cardiovascular disease prevention with The Medicines Company.

Oxford BRC led the establishment of the **NIHR Health Informatics Collaborative** (HIC), bringing together all NIHR BRC NHS Trusts nationally to make clinical data readily available to researchers, industry and the wider NHS community. OUH and OH are **Global Digital Exemplar NHS Trusts**. OAHP leads the Innovate-UK **National Consortium for Intelligent Medical Imaging** (**NCIMI**) that will provide access to large-scale NHS imaging datasets across multiple NHS Trusts, for academic and commercial partners to develop and apply AI-based imaging solutions.

In **Genomics**, OAHP has played a pivotal role in bringing whole genome sequencing (WGS) into mainstream clinical practice. OAHP's WGS500 project was the first large-scale test of clinical WGS in patients and families, demonstrating utility across multiple disease areas, underpinning the creation of Genomics England.

OAHP has taken a leadership position in **Tissue, Cell** and **Gene Therapy** academically and commercially, developing advanced therapies:

- The Oxford BRC spinout, **Nightstar** (sold to Biogen for $800m) generated new vectors to treat inherited blindness and is now undertaking 1st in human phase 2b trials.
- The £30m **Nucleic Acid Therapeutics Accelerator (NATA)** on Oxfordshire's Harwell campus will develop new therapies and technologies targeting genetic mutations in diseases including muscular dystrophies, cancer, Huntingdon's, Parkinson's and arthritis.
- OAHP surgeons and engineers developed **biomimetic materials** (Bioyarn, Biopatch, manufactured in OAHP's GMP facilities), now in clinical trials to provide biophysical cues to improve tissue repair and healing in orthopaedic and reconstructive surgery.
- The Oxford **Institute of Developmental and Regenerative Medicine** (IDRM, under construction) will mobilise expertise across cardiology, immunology and neuroscience, to develop advanced therapies for immune, cardiovascular and neurological disease.
- OAHP leads the development of **recombinant gene- and viral-vectored vaccines** to tackle many of the world's infectious disease challenges including: Universal Influenza A, MERS, Zika, HBV, and Malaria. The recent single-dose typhoid conjugate Typhoid vaccine (developed within the Oxford BRC, now approved by WHO), will transform the problem of antibiotic-resistant typhoid in children.

OAHP will play leadership roles with regional, national and international partners in target and drug discovery, for example the UoO-led **Rosalind Franklin Institute** at Harwell, a national facility that benefits from substantial OAHP support.

The **Structural Genomics Consortium** (Prof. Bountra) accelerates drug discovery through a vast research output (>900 new protein structures, 80 new drug probes) with an open collaborative network of >300 scientific labs around the World, partnering with 10 global pharmaceutical companies.

4. Strategic plan

In plain English present the specific vision and goals of the proposed AHSC
Further guidance on writing in plain English is available online at NIHR Make it clear http://www.invo.org.uk/makeitclear/

OAHP will:

- leverage local assets and partnerships in research infrastructure and educational capacity to drive improved outcomes for patients, the population, researchers, and staff.
- foster the development and evaluation of transformative technologies and innovations locally and in partnership with other AHSCs, AHSNs and BOB ICS in areas including digital health, multimorbidity, ageing, infection and AMR, cell and gene therapies.
- create an integrated Research Office to support all Partners in the creation of physical Clinical Research Facilities to enable early stage research. OAHP will deliver close formal coordination of research infrastructure including NIHR Centres, Facilities and Collaboratives alongside other major Centres and Institutes, to ensure pull through from its world class basic research to clinical practice.
- ensure joint working and strategic planning, working with local authorities, residents and patient groups to coordinate ambitious new capital developments across the OAHP Campus and within individual sites.
- expand capacity in target discovery for new drugs, building on public-private partnerships, and development of gene/nucleic acid therapies including manufacturing capacity.
- extend the environment for innovation, spin outs and start-ups to accelerate the transitions from scientific discovery to clinical application for patient benefit, by working between Partners and with internal and external investors.
- promote new multidisciplinary research and educational opportunities to support increased capability and capacity (e.g. Big Data and genomics, engineering, social sciences and humanities), and the training of under-provided AHP disciplines to code, build and analyse large data sets.
- support initiatives in gender diversity and equality. In partnership with the Athena SWAN Charter, Advance HE, co-host an international conference to develop expertise and leadership for innovations and interventions in this area.
- agree formal joint working arrangements across the Partnership, building on those already established.

Please describe the partnership's approach to further aligning NHS organisation and university strategic objectives in order to harness and integrate world-class research, excellence in health education, and excellence in patient care over the 5 years of designation. Please describe how these strategic objectives will improve health and healthcare delivery.
This should include:

- A statement of the partnership's vision and purpose;
- Specific overall short (1-2 years), medium (2-3 years) and long term (4-5 years) objectives and

deliverables for the AHSC;

- The proposed AHSC's strategy to contribute to the delivery of the goals of the Life Science Industrial Strategy;
- The proposed AHSC's strategy to support the delivery of the goals of the expanded Accelerated Access Collaborative including evidence of the partnership's capacity to carry out pragmatic (real world) testing in support of the aims of the expanded AAC;
- Evidence that the AHSC is nested within a local AHSN, emphasising the complimentary roles of AHSCs and AHSNs and provide evidence of appropriate co-working with other AHSNs and AHSCs nationally
- The partnership's strategy for maximising the impact of multi-disciplinary and multi-professional research and education across AHSC realising the full potential of talent from across the whole workforce including promotion of equality and diversity; and including details of how the multi-disciplinary and multi-professional approach will be used to deliver the aims and objectives of the proposed AHSC.

Vision and Purpose

OAHP's **vision** is to respond to major challenges facing healthcare such as healthy ageing, multimorbidity and mental health, AMR and the best use of digital tools to improve care and patient self-management. OAHP will build on its track record of discovery, translation, innovation and education to create an infrastructure that accelerates the testing of innovations from all healthcare stakeholders to deliver patient benefit. OAHP will create a dynamic research culture through promotion of multidisciplinary working and collaboration, extending healthcare research and education into new disciplines. OAHP will draw on skills and resources across both Universities and Trusts, drawing on expertise in social studies, sports science, geographical analysis and the built environment.

OAHP's **purpose** is to harness the Partners' collective expertise, capabilities and infrastructure from across a wide range of fields including discovery, translation, education and commercialisation. OAHP will provide the platform to promote multidisciplinary research including all clinical and allied health professionals, healthcare scientists, paramedics, social workers, working together with patients.

OAHP will drive national efforts to develop, translate and adopt innovations into the NHS, leveraging local assets and skills to support collaboration and partnerships with Oxford AHSN and BOB ICS and with other AHSCs and stakeholders to support innovation and implementation addressing the priorities of NHS LTP, the Life Science Industry Strategy and the AAC.

Short term goals:

- Deliver a Joint Working Agreement for the Partnership.
- Support development, delivery and coordination of strategic plans across the Partners.
- Create an integrated Oxford Research Office, across all OAHP partners to promote operational collaboration.
- Establish a national network of AHSCs and AHSNs to support the AAC in demand signalling and horizon scanning for innovations and transformative technologies.

Medium term goals:

- Establish new early stage clinical research facilities including cell & gene therapy operating at GMP, GLP and GCP standards
- Develop joint working and strategic planning with local authorities, residents and patient groups to coordinate new capital and infrastructure plans across the OAHP Campus.
- Develop the workforce in transformative technologies through education and training, in areas including big data, genomics, bioinformatics and advanced therapeutics.
- Create a Centre for Healthcare Implementation & Change to train the workforce in approaches to implementation and adoption of innovation in the health system supporting local, regional and national programmes.
- Extend partnerships with the Oxford AHSN, NIHR ARC, BOB ICS and the AHSN network providing

academic support to evaluate innovations e.g. AAC rapid uptake products and facilitate adoption and spread.

Long term goals:

- Support development of the OAHP estate, including a new clinical-academic campus dedicated to neuroscience and mental health, combining translational research with high quality clinical care.
- Expand capacity in target discovery for new drugs, building on public-private partnerships, and development of gene/nucleic acid therapies including manufacturing capacity.
- Develop the OAHP's campus as an international centre for multi-disciplinary and cross-sector research, attracting major pharma and medtech companies to invest in Oxford to support the development of technologies and therapeutics to address national and international priorities.

OAHP is making unique contributions in the following areas specifically identified by the LSIS:

- **Genomics:** OAHP led in the development of polygenic risk scores (Donnelly), the scientific support for WGS analysis of UK Biobank, and used GEL data to deliver the largest number of defined variants. OAHP has relationships with Amgen, J&J, GSK and AZ in genomics.
- **Data:** OAHP leads the Digital Trials Platform and contributes to AI advances in imaging and digital pathology. Nationally, UoO has developed approaches to the creation of metadata catalogues that have led work in the NIHR HIC and with NHS Digital. OAHP will also lead work on the ethics, social and policy aspects of AI and digital healthcare.

OAHP will:

- Support **early stage companies locally and promote growth**. OAHP has the UK's leading rate and portfolio of spin out companies (~20/year).
- Develop strategic partnerships across the **Oxford-Cambridge Knowledge Arc**, including Cambridge University Health Partners, expanding current collaborations, supporting commercial and economic developments and deliver innovations into healthcare.
- **Build on commercial relationships** e.g. with Novo Nordisk to address the challenge of diabetes and chronic disease; build on investments in Big Data including collaborations with Novartis, J&J, Sensyne Health and Bayer; partnering with MSD, J&J and GE Healthcare; with Imperial and LSHTM create a £67m Vaccines Manufacturing Innovation Centre at Harwell to accelerate early stage clinical development, and provide emergency response capability for the UK Government.
- Support local **education and training programmes to build workforce skills that support adoption of new technologies**, with dissemination of best practice to expand national capabilities.

OAHP expertise in **pragmatic trials** include the ProtecT trial (early detection and treatment for localised prostate cancer and the DROPLET study (total diet replacement for treatment of obesity in primary care). OAHP developed innovative pragmatic trial designs for digital interventions, e.g. the i4i-funded gameChange trial of automated virtual reality (VR) cognitive therapy in psychosis and the OASIS trial of the Sleepio app in mental health, improving sleep, wellbeing, and quality of life, in line with the NHS Long Term Plan.

OAHP will leverage its **primary care research** (one of the largest and highly ranked centres globally), to deliver trials that will change international guidelines and practice. This follows the examples of stroke prevention in atrial fibrillation (BAFTA, SAFE, and SMART trials), heart failure (ECHOES and REFER trials), and hypertension self-management (TASMINH series).

OAHP will further support the AAC through its research infrastructure, including OAHP's:

- **NIHR Applied Research Collaborative (ARC)** that supports research programmes integrating health and social care with mental health. This includes work on disease prevention, digital tools and implementation science across entire patient pathways.
- **NIHR Medtech and In Vitro Diagnostics Co-Operative (MIC)** includes a specific horizon scanning function, the **Oxford Diagnostic Horizon Scan Programme** that identifies new and emerging diagnostic technologies relevant to primary care in the NHS.

OAHP supports AHSN projects, providing research evidence to promote adoption. OAHP researchers pioneered the evaluation and adoption of **PIGF testing in pregnant women at risk of pre-eclampsia**. This work was recognised in 2019 by an HSJ Partnership Award and a Univants of Healthcare Excellence Award, followed by NHSE funding from the Innovation and Technology Payment (ITP) and the AAC to promote adoption of PlGF-based testing for pre-eclampsia in all NHS hospital trusts nationally.

OAHP has national collaborations including those with current AHSCs and with Academic Health Partnerships such as Birmingham Health Partners, forming the '**M40 Alliance**' that brings together clinical researchers from centres across Oxford and Birmingham and University Hospitals in Coventry and Warwick. The M40 Alliance leverages complementary strengths from large metropolitan populations with cutting-edge basic science and novel treatments. The **Arthritis Therapy Acceleration Programme (A-TAP)** brings together basic science with translational research capabilities in orthopaedics and rheumatology (OUH, OBU) with the Institute of Translational Medicine (University of Birmingham) and commercial partners. In **Haematology,** the OAHP-Birmingham collaboration has delivered 15 national Phase I-III clinical trials, including state-of-the-art single cell genomics. Through the national Therapy Acceleration Programme and the IMPACT Program, these trials have brought novel therapies to NHS patients pre-approval, leveraged £55M of drugs, established precision medicine in routine NHS pathways, improving outcomes and saving costs.

In partnership with Imperial AHSC, OAHP leads **CHERUB (Collaborative HIV Eradication of Viral Reservoirs: UK BRC**) bringing together internationally leading researchers from five NIHR BRCs in a UK-wide programme, targeting the objective of HIV eradication.

OAHP (Prof Alan Stein) works with **A Better Start Blackpool**, a multimillion National Lottery-funded programme promoting good early childhood development. This includes development of psychological interventions for mothers with perinatal depression and improving family communication in the context of parental illness.

OAHP hosts and leads the **NIHR-BHF Cardiovascular Partnership**, that fosters collaboration between research programmes and capabilities (cohorts, imaging, bioresources) across all BRCs and UK British Heart Foundation (BHF) Centres.

The **NIHR Mental Health Translational Research Collaboration** (MH-TRC), co-led by OAHP and Kings Health Partners, provides a coordinated national network between mental health translational and clinical research, industry and charitable partners.

OAHP's ability to address healthcare needs are further strengthened by OBU's **OxINMAHR;** the only research institute in the UK dedicated to the full remit of healthcare professions, through research and education programmes for nurses, midwives, AHPs and paramedics, biomedical scientists and social workers.

The **Oxford Biomedical Data Science Training Programme**, funded by Wellcome and NIHR Oxford BRC, trains biomedical scientists in the skills for analysis of large-scale biomedical and genomic datasets. OBU's training programmes cover genomics, informatics, biomedical science and public health for the wider healthcare workforce.

OUH and UoO partner in OBU's **Senior Leaders MBA scheme**, with candidates undertaking work-based projects leading to the award of a Global MBA.

OAHP will create the **Oxford Collaboration for Clinical Academic Pathways** for AHPs, as a "test bed" for national implementation, in collaboration with **NIHR Academy**.

5. Contribution to Economic Growth

Please provide details of the proposed AHSC's strategy and ambition for contributing to economic growth through partnerships with commercial life science organisations including evidence that the proposed AHSC has clear routes to commercialisation of innovative technologies, and clear mechanisms to measure this contribution.

OAHP will contribute to economic growth through its vibrant translation and commercialisation economy, engaging all aspects of industry across the Region, from SMEs to major pharmaceutical and medtech companies, leveraging internal partnerships and working with and through OAHSN. This strategy will build on:

- **A strong mid-sized company ecosystem** including Nanopore, Immunocore, BlueEarth, Vertex, Novo Nordisk and Vaccine Manufacturing Innovation Facility.
- The regional 'import and export' of healthcare innovation by all 15 AHSNs through **Innovation Exchange**, an AHSN-coordinated approach to identify, select and support the adoption of innovations that improve our economy and patients' lives. The current call in Artificial Intelligence (AI) will link into the £250m funding that has recently been pledged for the NHS to invest in AI, with the aim of providing AI solutions that will transform care and reduce waiting times.
- A track record in **multidisciplinary biomedical engineering innovations** including academic-commercial collaborations and spinouts in areas such as tissue engineering, organ preservation (Organox), remote monitoring (OxeHealth), virtual reality (Oxford VR) and targeted drug delivery (OxSonics).
- The **AHSN Accelerator Programme**, with innovations in drug discovery, diagnostics, digital health and service delivery. The SMEs will develop a business venture with the help of experts supporting the programme delivered by Oxford AHSN with BioCity.
- **Oxford AHSN** and **Eastern AHSN,** working together to align links with ~1500 life science/biosciences/Medtech/IT and R&D companies across the wider region known as the **Oxford-Cambridge Knowledge Arc**. OAHP is already working directly with many of the >700 Oxford AHSN-engaged companies, including Adaptimmune, Oxford Nanopore and Sensyne Health plc.
- OBU's clinical trials unit (**OxCATTS**), specifically targeting the development and evaluation of local, national and international technology innovations for allied health professions and nursing to support their route into the NHS and other markets. OBU's Swindon campus will be involved in this work.
- OBU's **Bio-Innovation Hub,** providing space offering equipment, facilities and tailored support for young companies working in the life science sector. In addition, it supports collaborative R&D projects and provides expertise to industry in specific areas of life sciences, including a successful partnership with Porton Biopharma to develop a diagnostic tool for the detection of metastasis in cancer cells and the screening of candidate molecules.
- UoO's **Bioescalator** facility, co-located on the OUH/UoO campus, hosts both early spinout/start-up companies as well as large pharma, including Novo-Nordisk with >100 scientists benefitting from direct interactions across the OAHP integrated clinical-academic campus.
- OAHP's newly established **Centre for Clinical Therapeutics,** based on the UoO/OUH campus (Director Duncan Richards) will work with OAHP biomedical researchers and more widely with the pharmaceutical, biotechnology and diagnostics industries, to drive promising new drug treatments through decision-making in early phase clinical trials.
- The OAHP **Translational Research Office** (TRO), established with a mission to:
    - Identify translational projects addressing unmet medical need and to drive the development of the OAHP's translational project portfolio.
    - Provide oversight and delivery of translational research projects.

OAHP's contribution to economic growth is underpinned by the Partners' spinout and licencing activity. Recent examples include:

- *Perspectum* has pioneered the use of new MRI techniques such as T1 mapping to support the detection

and accurate, quantitative measurement of liver, gallbladder and pancreatic disease.

- *Optellum* uses AI and ML applied to the world's largest clinical dataset to develop the first AI Clinical Decision Support software for lung cancer diagnosis & treatment, by identifying at-risk patients, reducing unnecessary interventions and expediting optimal therapy for patients with cancer. Now supported for NHS-wide adoption by Innovate-UK.
- *Ultromics* developed the FDA-approved EchoGo, which uses AI to accurately calculate routine measurement of heart function, that are highly prone to human inter-observer variability. This includes automated cardiac strain imaging, a unique 'first' for an AI application.

This activity has been supported by the creation of **Oxford Sciences Innovation (OSI)** in 2015, a £600m investment fund focused on new Oxford spinouts and start-ups; the largest of its type in the World. Key features include:

- A Portfolio of 73 investments with a value £251m of which £69m net valuation uplift with an expected investment of £935m by 2025.
- £150m of OSI capital deployed, leading to £230m external investment attracted.
- support for a five-fold increase in the number of spinouts annually, from 4 to ~20.
- portfolio support for a workforce of 750+ people.

Oxford University Innovations (OUI) provides the OAHP's capability for IP, licencing and spin outs, seamlessly across all Partners, and has supported:

- Creation of more than 20 new spin outs for each of the last 4 years (#1 in the UK), including 32 life science companies.
- Raising >£500m in 2019 OUI's spin outs alone, one third of the total amount of capital raised by spin outs in the whole of the UK. Companies include Oxford Nanopore, a "unicorn" valued at ~$2B, and NightStar Therapeutics, sold to Biogen this year for $877m.
- 180 commercial licences completed last year, including more than 100 licences for Patient-Reported Outcomes Measures which are used globally in trials.
- Two ground-breaking collaborative translational funding mechanisms in the life sciences, established by OUI since 2016:
    - **LAB282**, a £13m partnership with OSI and Evotec SE to create new, commercially focused drug discovery programmes based on Oxford's world-class basic medical research. LAB282 has funded 26 discrete projects to date and discussions are underway to form the first spinouts based on successfully completed programmes.
    - **LAB10x**, a £5m partnership to develop new digital health technologies that have the potential for impact in a clinical setting, coupled with collecting data that can be used to elucidate new drug targets.

OBU has extensive experience of commercialising innovation and is in the top ten of UK universities for UK universities for IP income (>£4M), from patented clinical diagnostic assays used globally, including, inhibin A (Down's Syndrome) and AMH (ovarian reserve in IVF treatment and monitoring ovarian reserve after chemotherapy).

6. Other Information

Please provide evidence that the partnership has a strong digital infrastructure platform, with demonstrated intra-operability between partners, to underpin the delivery of the proposed AHSC objectives.

OAHP will develop its clinical informatics programme, based in the Big Data Institute (BDI) and supported by funding from NIHR and UKRI (Innovate-UK). The clinical informatics team have developed a Data Warehouse, including data on 12m patient episodes, 131m biochemistry results, 58m microbiology results, and 12m radiology

reports. The Warehouse supports service improvement, translational research, and data science. OAHP will work with commercial and public sector organisations to develop the Data Warehouse through a spinout company, creating an EHR linking existing infrastructure to make data accessible to clinicians and patients.

OAHP teams have developed new technologies that will support health data management and re-use at scale, such as the metadata catalogue toolkit being used by **NHS Digital** to support a new version of the **NHS Data Dictionary,** by **HDR-UK** to support the **Innovation Gateway**, and by a range of other organisations to support the management of large health datasets.

NIHR Oxford BRC is the coordinating centre for the **NIHR Health Informatics Collaborative** (HIC), now incorporating 23 NHS Trusts in a framework data sharing agreement. Data are used to address 'real world' clinically relevant questions in multiple therapeutic areas.

NIHR OH BRC spun-out Cristal Health in May 2019, providing a sustainable pathway for the **NIHR and MRC-funded UK-CRIS programme**. UK-CRIS manages secure access to one of the World's largest repositories of de-identified patient data in mental health and dementia. Cristal Health will facilitate early-stage drug discovery, reduce clinical trial costs, and underpin Phase IV evaluation and pharmacovigilance. UK-CRIS supports NHS Trusts in participation in the global trials market and supports academic research by developing tools to support text-mining to create real knowledge from distributed and heterogeneous data.

OAHP's BDI hosts **NCIMI**, an Innovate-UK funded national cloud-connected network bringing together 15 NHS Trusts, academia, large-scale industry such as GE Healthcare, Alliance Medical, multiple SMEs and patient groups. OAHP is a lead partner in **PathLAKE** (Pathology Image Data Lake for Education, Analytics and Discovery), a UK ecosystem for AI development in pathology. PathLAKE will drive deployment of digital pathology platforms to transform diagnostic NHS cellular pathology laboratories.

OAHP is part of the Thames Valley and Surrey Local Health and Care Record Exemplar (LHCRE), creating an information sharing environment for health and care services across the Region, supporting anonymised data analysis for improvements in health and wellbeing for 3.8 million local people.

7. Administrative contact details

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8. Acknowledgement, review and submit

AHSC Director - Agreement to terms and conditions
In ticking this, you as AHSC Director confirm that the information given on this form is correct and that you will be actively engaged in this AHSC and responsible for its overall management. In addition, you will accept responsibility for ensuring that the Host Institution and interested parties are kept informed.

Ticking this box constitutes an electronic signature of the AHSC Director with regard to this application
☒Confirmed