



Department
of Health &
Social Care

DEPARTMENT OF HEALTH & SOCIAL CARE DESIGNATED ACADEMIC HEALTH SCIENCE CENTRE (AHSC)

2019/20 FINAL REPORT

Note: Please note this form should be completed in font no smaller than 10-point Arial.

1. ACADEMIC HEALTH SCIENCE CENTRE DETAILS

Name of the Department of Health & Social Care Academic Health Science Centre:

Contact details of the DHSC AHSC lead to whom any queries and feedback on this Annual Report will be referred:

Name: Jill Lockett

Job Title: Managing Director

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2. OVERVIEW OF ACTIVITIES (no more than 4 pages)

Please provide a brief overview of activities for your AHSC for 2019/20 financial year, addressing the following points:

- progress with further aligning the strategic objectives of the NHS provider(s) and university(ies) in order to harness and integrate world-class research, excellence in health education and excellence in patient care;
- a summary of the progress against the specific short, medium and long-term objectives as detailed in your full stage application, and a brief summary of progress made in each of the approved themes / work programmes for the AHSC as detailed in the full application;
- summary of the AHSC's contribution to economic growth and the economy, including through partnerships with industry;
- progress on the development and delivery of an appropriate e-Health informatics platform;
- an overview of any significant developments or issues associated with the leadership, strategy and governance arrangements which had an impact on the delivery of the aims and objectives of your AHSC.

Our progress with further aligning the strategic objectives of our NHS providers and university to harness and integrate world-class research, excellence in health education and excellence in patient care

King's Health Partners launched as an Academic Health Sciences Centre (AHSC) in 2009. As an engine room of high impact innovation, our reach extends from insights into disease mechanisms, transformative diagnostics and into new therapeutics, novel devices, digital tools and models of healthcare delivery. We add further value through integrating mental and physical healthcare, implementing value-based healthcare, publishing our outcomes, developing global health programmes and joined-up informatics. As we moved into the final stages of our 2014-2019 accreditation, we continued to maximise our combined expertise to improve the lives of the people we serve, building on the evidence already provided in our previous four annual reports and looking towards the next five years, 2020-2025.

Our NHS and university partners are focused on the delivery of our shared clinical academic ambitions to improve outcomes and experience for patients through a powerful combination of world-class research, excellent clinical practice and education and training. By bringing these together through 22 Clinical Academic Groups (CAGs), we provide better and more joined up physical and mental healthcare for our patients and communities.

The most significant step we have taken as a partnership is the establishment of five new clinical academic Institutes in Cardiovascular, Women & Children's Health, Neurosciences, Haematology, and Diabetes, Endocrinology & Obesity. The Institutes build on our CAG model to improve translational research and improve outcomes for patients, staff and students. Our partners have committed nearly £12m to create this integrated model of clinical academic strength. Our vision for a joint partnership in heart and lung care and research excellence grows ever closer through the KHP-Royal Brompton and Harefield Partnership. We anticipate a full merger between RBH and Guy's and St Thomas' next year.

Working in partnership with the south east London Integrated Care System, we are transforming the way we work to reduce health inequalities, improve prevention and increase the focus on health outcomes data for the whole population. We are working closely with our local Academic Health Science Network (AHSN), the Health Innovation Network (HIN), and Kent, Surrey and Sussex AHSNs to improve translational learning, share innovations and build stronger networks of care to maximise our collective strength and deliver on key priorities in the NHS Long Term Plan and Life Sciences Industrial Strategy.

Updated citation analysis (SciVal/Scopus) for highly-cited papers (2013-2018) demonstrates alignment to KHP strategy of excellence (rankings for KCL in the UK):

- Medicine or "Clinical, Pre-clinical and Health": 4th
- Psychiatry/mental health: 1st worldwide
- Medical imaging: 2nd
- Neuroscience/clinical neurology: 3rd/2nd
- Paediatrics/perinatology/child health: 2nd
- Cardiology/cardiovascular: 5th
- Cancer/oncology: 7th
- Nursing: 1st; Dentistry: 1st.

NHS research has benefitted significantly: highly-cited papers increased three-fold since designation (2009-2018), and overall output by 88%. KHP collaboration is shown by co-authorship (2014-2018):

- KCL-GSTT: 3,788 joint publications (field-weighted citation impact 3.16)
- KCL-KCH: 1,170
- KCL-SLaM: 1,025.

Combining our clinical academic strengths has resulted in substantial investment in translational research capabilities, including two Biomedical Research Centres (BRCs) and Clinical Research Facilities (CRFs) (£140m total), four Research England capital awards (Institute for Healthcare Engineering, Advanced Therapies Accelerator, Neuropsychiatric Hub, Cancer Centre (£51m total)).

Our KHP Education Academy has enabled development of innovative, multi-professional education and training that is accessible to all. Highlights include:

- KHP online Learning Hub with 16,000 users, providing 105 resources globally
- Four Athena Scientific Women's Academic Network Silver Awards across Health Faculties and many research divisions in KCL
- Postgraduate Certificate in Advanced Medical Training between KCL Business School
- Created Centre for Adherence Research and Education to improve patient outcomes

- Four mental health Massive Open Online Courses (MOOCs), with over 25,000 participants worldwide
- A large Integrated Academic Training Programme and one of the most popular Academic Foundation Programmes in London
- Developing and supporting research opportunities for healthcare students, led by students (INSPIRE funding, c.£30k)
- Offering Mind & Body training which is one of the first of its kind in the UK. Hosted five online training sessions in Integrating Mental & Physical healthcare: Research, Training & Services, with more than 26,000 people in 173 countries taking part
- Consistently strong scores in Postgraduate Taught Experience Survey.

Research and education supporting clinical excellence

Our research and education programmes have translated into significant service change and improved outcomes in our NHS services resulting in reduced admissions, more multi-disciplinary care models, bespoke services for frailty, recovery and reasonable adjustments, and care at home.

We have made major recruitments in the fields of population health, frugal innovation and child health.

Significant high-impact patient-centred developments in 2018/2019 include: RADAR-AD to use digital technology to assess the progression of patients with early Alzheimer's Disease, €2.1m funding to create an international network to better understand and treat sickle cell disease, a new Centre for Inflammation Biology & Cancer Immunology (CIBC1) launched, and we are part of a major new study leading to a ground-breaking treatment for peanut allergy.

Excellence in health education

Our Education Academy published its 2019 annual report, highlighting key achievements across the CAGs and partners. Our online Learning Hub was relaunched in 2019, offering regional and international audiences new learning modules including Understanding Dementia, Understanding and Prescribing Chemotherapy, and Medicines Adherence training. It also provides a platform for postgraduate courses, conferences and continuing personal and professional development activities.

Our new Postgraduate Certificate (PG Cert) in Advanced Medical Training (Children's Health, Haematology or Women's Health) has been approved and is now being marketed nationally and internationally. The first students were enrolled in September 2019. A new, international education and training brochure has attracted significant attention from global partners. Additionally, a series of highly successful educational conferences was held, including the student-lead Clinical and Academic Research Society national conference, Safety Connections conference, neuroscience nurse conference, Realising Your Potential event, and the launch of the Centre for Adherence Research and Education (CARE).

Excellence in patient care

Our CAGs are the collaborative vehicles through which our tripartite mission for excellence in care, research and education is delivered through our partner organisations. Our five Institutes represent the next stage in the evolution of our CAG model. Focusing on achieving internationally competitive outcomes in research, education and clinical practice, and developing regional networks of care and engagement to improve outcomes and experience for patients across the south of England.

In some cases, our institutes have begun to test the methodology for working as fully integrated clinical academic 'One Teams' to further break down barriers between NHS and university working, and to improve care and research pathways. Examples include,

- Cardiovascular teams working jointly to reduce waiting times for patients in need of surgery and improving patient survival rates, continuing work on an integrated heart failure service, carrying out world-first surgical techniques, and developing a revolutionary new blood test for detecting heart attack
- Haematology staff working as 'One Team' to improve care for people with blood diseases, supporting patients with their mental health and using novel therapies to deliver world first treatments
- Neurosciences research is being consolidated to tackle the complexity of the nervous system and the vast array of conditions and disorders that can affect it
- In diabetes care, we are leading an NHS England-funded pioneering new service for people with type 1 diabetes and disordered eating (sometimes known as Diabulimia). We are using new technology and data to give us a clearer picture of the scale of the needs of local people across Lambeth and Southwark. In addition, the findings of our research on practical ways to increase the uptake of patient education in diabetes has been directly applied across south London through the new Diabetes Book & Learn programme, in collaboration with the HIN
- Taking a different approach in recognising and addressing the links between women's and children's health, we are combining the significant clinical academic strength across our partnership in this area to improve outcomes nationally and internationally

- Building on our strengths in understanding, identification and treatment of mental health problems in children and young people, we are working collaboratively to transform research, clinical innovation and education across mother and baby, brain development, and contemporary childhood through a new clinical research facility focused on Child and Adolescent Psychiatry and Forensic and Neurodevelopment Sciences – the Centre for Children and Young People’s Mental Health.

We are part of the London South Genomic Laboratory Hub, one of seven newly commissioned genomic laboratory hubs across the country announced by NHS England. This network will be one of the largest providers of genomic testing in the UK, delivering services to south London, Kent, Surrey and Sussex, as well as providing a national centre for specialist testing for cardiology, gastro-hepatology, haematology, neurology, respiratory and skin conditions.

Integrated mental and physical health (Mind & Body)

Our partnership is the leading voice in the UK for integrating mental and physical health through a unique combination of research, teaching and clinical expertise.

We have now screened more than 65,000 physical health patients for anxiety and depression across 60 acute outpatient clinics, a 17% increase from the end of 2017/2018.

We have also supported work across our partnership to care for staff health and wellbeing. Working with the Mind & Body Champions Network, a team-based health and wellbeing toolkit has been made available to all staff. More than 90% of feedback so far strongly agreed or agreed that the toolkit helped them feel more confident in understanding how to support their own or their colleagues’ wellbeing and feel they were able to make a positive change.

900 staff have signed up to be part of our Mind & Body Champion’s Network. This year we engaged with nearly 1,000 local patients, service users and carers in the development of our projects and programmes.

King’s Health Partners has become a member of Equally Well UK, a new collaborative to support the physical health of people with mental illness and we hosted the first UK-wide learning event of the year.

Led by the Institute of Psychiatry, Psychology & Neuroscience (IoPPN), our partnership has secured further research income to fund work on personalised medicine in psychiatry and the role of cardio-metabolic traits, seizures and stress, and the effects of nutrition on compulsive behaviours.

Value based healthcare

Over the last year, we have engaged widely through our work focussing on improving outcomes and using resources sustainably. Over 500 people in local teams have taken part in training, education and conferences on Value Based Healthcare, including our new two-day training course for Multi-professional teams. We have engaged widely: more than 300 local residents have participated in workshops and presentations exploring health inequalities, as well as over 700 professionals receiving presentations from members of the King’s Health Partners team at regional, national and international events sharing expertise in Value Based Healthcare.

Through the European University Hospital Alliance, we are developing health outcomes observatories in four European countries through an innovative industry-academic healthcare collaboration, on which we are leading the research on type 1 and 2 diabetes outcomes.

To further improve value and reduce health inequalities we are working on the Vital 5, an innovative new approach to population health. The Vital 5 are smoking tobacco, having a high blood pressure, obesity, drinking too much alcohol, and common mental health conditions, such as anxiety and depression. We are engaging with people across health and care on the Vital 5 - including local people, Healthwatch organisations, teams across primary, community and secondary care, local authorities, as well as regional and national bodies - and have launched a joint programme focussed on population health and reducing health inequalities with the south east London Integrated Care System. 17 of our 22 CAGs have now published Outcomes Books, which evidence a wide range of clinical, research and education delivery, as well as providing powerful benchmarks against which to measure future progress. We are developing Outcomes Scorecards, which will form an important part of our strategy for supporting CAGs and Institutes to drive value by identifying opportunities for improvement.

Global impact

The King’s Centre for Global Health & Health Partnerships launched their 10-year strategy and global volunteering scheme in 2019/2020. The strategy sets out how we will deliver our ambition to strengthen healthcare and outcomes in Somaliland, Sierra Leone, DR Congo and Zambia. The scheme provides exciting opportunities for King’s Health Partners staff (clinical and non-clinical) to volunteer time and skills.

We continue to work with international colleagues to share our learnings as an AHSC. This year we have supported colleagues in Denmark, China, Singapore, Australia and Malaysia as they explore ways to translate our model and replicate CAG infrastructure in key specialties.

As a member of the European University Hospital Alliance, we have hosted pathway and outcomes working groups and secured funding of €230k for pathway work and publications.

Our Five-Year Plan 2020 – 2025 - [Delivering Better Health for All Through High Impact Innovation](#) Launched at our annual conference – [presentations viewable on-demand here](#).

Our new five-year plan builds on the maturity of our partnership, and anticipates extending our reach from an Academic Health Sciences *Centre* to an Academic Health Sciences *System*, through four themes:

1. Delivering high impact innovations in **novel technologies, therapeutics and diagnostics**, for earlier diagnosis and improvement in patient outcomes; facilitated by our emerging life sciences cluster
2. Driving **quality improvement** across the system, using the evaluative capability of the South London ARC and AHSN
3. Improving **urban population health** needs of south London by rolling out our Vital 5 prevention strategy, enabled by our Institute of Population Health
4. Training and developing the healthcare **workforce of the future**, recognising the need for new roles, skills and values, focusing on diversity, all facilitated by our Education Academy's uniquely broad portfolio of health education.

Progress on the development and delivery of an appropriate e-Health informatics platform

We are a leader in digital infrastructure, having developed and deployed systems integrating electronic patient records for direct care (Local Care Record) and analytics platforms allowing interrogation of entire hospital records with natural language processing (CogStack), an approach pioneered within our Mental Health Biomedical Research Centre. We lead the Innovate UK London Medical Imaging & AI Centre for VBHC (AICentreforVBH), where our diverse patient populations enable AI products to be developed that are relevant to all. We are addressing challenges including: data protection and governance; technological/infrastructural requirements to access curated data in an approved manner (including linkage, de-identification, federated learning); connecting AI innovation with clinical pathway improvement; health economic analysis, and new reimbursement models. Our infrastructure will drive faster and earlier diagnosis, increased efficiency, enhanced patient screening and stratification to optimise treatment, and ultimately allow fundamental redesign of clinical pathways to improve outcomes and reduce costs. We are working on over 20 patient pathways covering early life (fetal diagnosis) to old age (dementia), and diseases such as heart failure, stroke, congenital conditions and cancer. Early health economic assessment of the impact of these technologies in eight of the pathways gives an estimated 10-year financial benefit to the health system of over £150m. Together with our local Integrated Care System we have appointed a joint Director for Reducing Health Inequalities - one of the key priorities of this programme will be the development and deployment of a joined-up population health data management system.

Our contribution to economic growth and the economy, including through partnerships with industry

We continue to attract commercial partners to co-locate with our research and patient populations to accelerate innovation and increase opportunities to facilitate the flow of ideas, innovation and collaboration.

Building on our existing clinical academic strengths and infrastructure, we are attracting industry partners in the life sciences sector to drive health and wealth that will improve patient outcomes, benefit our local communities and drive better population health. Our plans to develop a Biomedical Hub at our Guy's campus have already secured key industry partners including, UCB, Unilever and GSK, and we are working with Siemens, Medtronic and a host of SMEs, to further develop a MedTech Hub at our St Thomas' campus. Our London Institute for Healthcare Engineering has attracted in excess of £60m in development funds.

We have signed a three-year deal with global biopharmaceutical company UCB to co-locate researchers and academics with a focus on early development and translational medicine. We agreed a collaboration and licence deal that could lead to a new class of pain medications with Wellcome and MSD. We have seen success from recent spinouts with major external investment from industry partners such as Leucid Bio, Quell Therapeutics, IgEM Therapeutics and GammaDelta Therapeutics Ltd, which is an example of a CAG founded innovation, involving pioneering research into gamma delta ($\gamma\delta$) T cells that received up to \$100m investment from Takeda and Abingworth.

An overview of any significant developments or issues associated with the leadership, strategy and governance arrangements which had an impact on the delivery of the aims and objectives of your AHSC.

In early 2019, our Executive Director, Professor Sir Robert Lechler announced his plans to step down from both his roles in the AHSC and as KCL's Senior Vice President and Provost (Health). Following a world-wide search, we have appointed Professor Richard Trembath our current Executive Dean of the KCL faculty of Life Sciences and Medicine. Professor Trembath brings both a wealth of experience and stability and we are delighted to welcome him as the new Executive Director, King's Health Partners from September 2020. In January 2020, Jill Lockett was appointed Managing Director of the AHSC.

3. SUMMARY OF PROGRESS MADE (2014-2020)

Please provide up to five key impacts achieved as a result of the AHSC designation between 1st April 2014 – 31st March 2020 (no more than 300 words per example)

Recent examples of research translation into patient benefit and implementation of transformative technologies into the NHS are:

Response to Covid -19

King's Health Partners created the Life Lines project which allows family to see and speak to patients in intensive care units using "virtual visiting" via a tablet using a secure online platform. As of September 2020, 1,200 devices have been provided to more than 150 UK hospitals, allowing more than 40,000 virtual visits.

The COVID-19 Symptom Tracker App (Spector) developed by King's College London has recruited more than four million people across the UK and secured major media coverage. The app aims to identify how fast the virus is spreading in each area, the highest-risk areas in the country, and who is most at risk through better understanding symptoms linked to underlying health conditions. This has already generated major insights into the disease, including identification of the loss of smell and taste as a significant symptom of COVID-19. The data also reveals that symptoms including fever, fatigue and anosmia have genetic influences (50% responsible for the presentation of key symptoms of COVID-19); and the development of AI diagnostic to predict COVID-19 without testing.

King's Health Partners research community responded extremely rapidly to the emerging COVID-19 outbreak, with more than £800k of pilot funding (from Wellcome and NIHR Biomedical Research Centres) allocated in March to 40 projects, from a wide range of disciplines. More widely, key aspects of notable research also include:

- Childhood immune syndrome response showing the clinical characteristics of paediatric inflammatory multisystem syndrome which emerged in a small number of children with COVID-19 (Shankar-Hari)
- Immune signature and prognosis which identified a dynamic COVID-19 immune signature which includes associations with poor prognosis (Hayday)
- Study showing Black and South Asian patients are more severely affected by COVID-19 at different stages of the disease (Shah).

Medical Imaging: Transforming cancer outcomes through personalised treatment

A KHP team led by Professor Sally Barrington (KCL academic, NIHR Professor, GSTT consultant) has developed a novel approach, using positron emission tomography (PET), to guide treatment decisions in Hodgkin's lymphoma. This provides insights into metabolic changes in the cancer at molecular level arising from chemo/radiotherapy, allowing earlier and more accurate information on the effects of treatment. As a result, each patient's treatment can be personalised – with intensive chemotherapy (BEACOPP regime) and radiotherapy for the highest-risk patients, and sparing the most toxic drugs (bleomycin, which causes significant lung damage) and/or radiotherapy (AVD regime) for patients who respond well to initial chemotherapy. This has been formally demonstrated in two phase III randomised trials (NEJM 2015, NEJM 2016), and is also highly relevant to other cancers. The new PET method for personalised treatment is now the standard of care in the UK, USA, much of Europe, and adopted in international guidelines (European Association of Nuclear Medicine/International Consensus on Malignant Lymphoma Guidance, European Society Medical Oncology Clinical Practice Guidelines, National Comprehensive Cancer Network Clinical Practice Guidelines in Oncology) to benefit patients worldwide.

Neuroscience: The world's first preventative treatment for cluster headaches

A KHP team led by Professor Peter Goadsby (KCL academic, KCH consultant) developed a novel treatment for cluster headache and migraine – previously intractable and debilitating conditions. Through a pipeline of fundamental biological research, the team proposed calcitonin gene-related peptide (CGRP) as a potentially important mediator and demonstrated proof of concept in pre-clinical models. They identified an existing therapy – galcanezumab, a monoclonal antibody originally developed for other indications – and tested its efficacy through an international multi-centre, trial led by KHP (NEJM 2019). The EU (EMA) has now approved galcanezumab in Europe for migraine and the FDA for treating cluster headaches and migraine.

Cell and gene therapy

KHP has strength in advanced therapies. We lead the London Advanced Therapies Network (£5m) and have taken our research into human trials in blood and solid cancers, autoimmune diseases and transplantation, alongside exciting pre-clinical work in cardiovascular disease and frontotemporal dementia. This has led to successful spinout companies such as Leucid Bio, Gammadelta Therapeutics and Quell Therapeutics. KHP is the largest manufacturer of lentiviral gene therapy vectors for clinical trials in Europe and offers cutting-edge GMP cell therapy production.

Genomics

Within the London South Genomic Laboratory Hub, we host the South London Genomic Medicine Centre, bringing DNA sequencing technology into clinical practice, revolutionising the accurate, timely diagnosis of monogenic diseases, and increasingly enabling precision medicine approaches in oncology. The centre and network will be one of the largest providers of genomic testing in the UK, delivering services across the south, providing specialist testing for cardiology, gastro-hepatology, haematology, neurology, respiratory and skin conditions. We have developed minimal-residual disease tests for cancers, novel long-read sequencing for repeat expansion disorders, and rapid, sequencing-enabled approaches for infections, now in clinical use.

The completed AHSC Annual Report 2019/20 must be submitted via email, to the NIHR CCF Infrastructure mailbox: ccf-infrastructure-team@nhr.ac.uk copying the programme manager Charlotte Scott (charlotte.scott@nhr.ac.uk) by 1pm on **Monday 19th October 2020**.

The Final Report aims to capture progress against the stated objectives, specific themes and work programmes as set out in your application, in order for the Department of Health and Social Care to be able to understand the overall progress of the AHSCs. However, please note that we will not be providing feedback for the AHSC Final Reports.

An electronic sign off confirming the AHSC Final Report 2019/2020 is required by the Department of Health and Social Care. An electronic declaration/signature page for each report will be provided directly to the Director/CEO to sign and return once the submissions have been received.

The key NIHR CCF contact for the AHSC Final Report 2019/20, to whom all queries should be addressed (copying in ccf-infrastructure-team@nhr.ac.uk) is Charlotte Scott, charlotte.scott@nhr.ac.uk, Tel: 020 8843 8082.