

Institution: London School of Hygiene & Tropical Medicine
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1. Context and mission

The London School of Hygiene & Tropical Medicine (LSHTM) is a specialist postgraduate institution. Its mission is to improve health and health equity in the UK and worldwide, working in partnership to achieve excellence in public and global health research, education and translation of knowledge into policy and practice.

We are distinctive in four main ways:

- Our dominant focus is health and its determinants – genetic, biological, environmental, socioeconomic, behavioural and cultural.
- Our disciplinary spread encompasses fundamental laboratory research, bioinformatics and clinical, epidemiological and social science research.
- Our global reach and partnerships span high-, middle- and low-income countries.
- We actively engage with external stakeholders to shape health policy and practice and to improve health outcomes.

In the 2020 Shanghai World Rankings LSHTM was placed third globally and first in the UK for public health. In the 2020 CWTS Leiden Ranking LSHTM was fifth in the UK for research impact in all sciences.

Staff are based across three campuses, organised into three Faculties and two MRC Units. The Units joined LSHTM in 2018, with Faculty-equivalent status.

- The Faculty of Epidemiology and Population Health (EPH) informs and advances understanding of social and biomedical causes of disease, providing rigorous and innovative approaches to generating evidence for public health decision-making (386 academic and research staff).
- The Faculty of Infectious and Tropical Diseases (ITD) explores the biology of pathogens, host-pathogen interactions and the diseases they cause. It also develops, designs and evaluates tools for controlling infectious diseases (347 academic and research staff).
- The Faculty of Public Health and Policy (PHP) improves health globally through research on policy, interventions, systems, services and individual, social and environmental influences (298 academic and research staff).
- The Medical Research Council (MRC) Unit the Gambia (MRCG) delivers world-leading research to reduce the burden of illness and death in low-and-middle-income countries (LMICs) (832 academic and scientific staff).
- The MRC/UVRI Uganda Unit (MRCU) improves the control of infectious and non-communicable diseases in Uganda, Africa and globally (243 academic and scientific staff).

Our REF submission includes all staff at Assistant, Associate and Professor grades who have significant responsibility for research.

In addition to the formal organisational structure, LSHTM has 14 Centres. These cross-institution networks actively draw together and promote School-wide expertise.

Departments within Faculties, along with the MRC Units, constitute researchers' 'homes', where support is provided for research, doctoral training and career development. Faculties are supported by Central Service departments; the Units draw on these but also have their own support

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structures. Research activity is centred on flexible and dynamic groupings, often spanning Departments, Faculties and the Units.

Total annual income in 2019/20 was £242.9m. Competitive research income accounted for £168.4m (69%) and funding body grants £29.3m (12%).

Education of Masters, doctoral and short-course students is key to LSHTM's mission, providing 9% of annual income. In 2019/20 we had 718 Masters students on 19 London-based programmes; 3,107 Masters students on five distance-learning programmes; 493 doctoral students; nearly a thousand professional development course participants; and hundreds of thousands of Massive Online Open Course (MOOC) participants.

2. Strategy

2.1. Strategy for research

The assessment period encompasses two strategy periods: 2012-2017 and 2017-2022. The former set six broad objectives:

- To be a world-leading centre of excellence for research into key diseases/conditions
- To develop and evaluate new methodologies, tools, interventions, delivery systems and policies to prevent, diagnose and treat these diseases/conditions
- To understand, evaluate and improve the performance of health services and systems in high-, middle- and low-income countries
- To understand cross-sectoral influences on health
- To optimise intra-institutional and inter-institutional working across traditional boundaries to maximise our contribution to knowledge and meet public health goals
- To support research through School-level investment in high-quality resources and facilities, including data management and biological materials

This period enhanced our strengths in infectious diseases, vaccine research and non-communicable diseases (NCDs); developed a strong research community around maternal, neonatal, child and adolescent health; and expanded our multidisciplinary expertise. Building on these successes, our 2017-2022 priorities included both ongoing and new themes:

- Infectious diseases (vaccines, antimicrobial resistance [AMR] and emerging infectious diseases/epidemics)
- Chronic conditions (especially large-scale data use and closing the mental health treatment gap)
- The lifecourse and vulnerable populations
- Health services and systems (especially the economics and strengthening thereof)
- Environment, climate change and health

Overall, across both periods and between 2013 and 2020, our key achievements included the following:

- We recruited world-leading academics and promising early/mid-career researchers in a full range of priority areas.
- We intensified support to early/mid-career researchers and promoted rising stars across all research areas.
- Staff won 120 competitive fellowships and personal awards, including MRC Career Development Awards, Wellcome Senior Fellowships, and UK Research and Innovation (UKRI) Future Research Leaders.
- Research income increased by 194%, from £57.3m in 2013/14 to £168.4m in 2019/20. Within this, increases by major funder were:
 - UKRI – 436%
 - EU government – 394%
 - UK government – 95%
 - UK charities – 22%

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- We expanded our work on vaccines, including taking a major role in Ebola vaccine trials (total funding: €110.5m), co-founding the UK Vaccines Manufacturing Innovation Centre and contributing expertise to the Coalition for Epidemic Preparedness Innovations.
- We were among the most successful Global Challenges Research Fund university bidders, receiving 46 grants, worth £54.9m, including as partner on six of the 12 GCRF Hubs.
- We were among the most successful COVID-19 UKRI funding call university bidders – third in the UK by total value, fourth in average value and fifth in number.
- The inclusion of the MRC Units strengthened our research in infectious diseases (both Units) and NCDs (MRCU), bringing in leading scientists and additional funding.
- To address new global emergencies, we established three new interdisciplinary Centres: the Health in Humanitarian Crises Centre (2016), the AMR Centre (2016) and the Centre on Climate Change and Planetary Health (2019).

This enhanced capacity supported major achievements and contributions including the following:

- We were named *Times Higher Education* University of the Year 2016 for our response to West Africa's Ebola epidemic.
- Two staff took up prominent national roles (Chief Medical Officer for England and Chief Scientific Adviser of the Foreign, Commonwealth and Development Office [FCDO]).
- We were awarded the UK Public Health Rapid Response Team (UK-PHRST), which supports LMICs in investigating and responding to disease outbreaks, in partnership with Public Health England (PHE).
- Our multidisciplinary research, including scenario-based modelling and behavioural science insights, informed the UK government's response to COVID-19. We also contributed 15 academics to Scientific Advisory Group for Emergencies and its subgroups.
- We were involved in 42 papers for 15 *Lancet* Special Series between 2014 and 2020, making evidence-based cases for addressing specific global health priorities.

Reflecting our mission to improve health worldwide, our research had global impact – including in the poorest countries and among vulnerable groups. For example:

- Peek Vision, a social enterprise born out of LSHTM research, used smartphone technology to address the burden of visual impairment and treatment inaccessibility. The app has been used in over a hundred countries.
- Ten countries have eliminated trachoma following our research showing the effectiveness of mass azithromycin treatment. World Health Organization (WHO) has reported a 91% decrease in the number of people at risk of trachoma since 2002.
- Research demonstrating the effectiveness of the novel group A meningococcal conjugate vaccine led to its rollout, halting epidemic meningitis across Africa and preventing over 100,000 deaths.
- Our Vaccine Confidence Project put vaccine hesitancy on the international policy agenda. Measuring opinions and attitudes in 149 countries, it has shaped national strategies – including during the Ebola vaccine rollout in Africa.
- Our malaria researchers showed treatment with antimalarials during the rainy season – 'seasonal malaria chemoprevention' – to be highly protective against malaria, as well as cost-effective. National scale-up in 13 African countries saw 21.5 million children treated in 2019.
- LSHTM researchers in Zimbabwe highlighted significant gaps in HIV testing and treatment coverage in adolescents. This led to adolescents' inclusion in WHO and national policies and the adaption of HIV testing to their specific needs.

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- Pioneering research in South East Asia, Europe and the UK demonstrated the full impact of human trafficking on the health of survivors. This led to changes in policy and practice to better support their needs.

2.2. Enabling impact

Our approach to impact has four main elements:

Generic activities designed to support staff to achieve impact

LSHTM's media activity has increased understanding of science and health, shaped public debate and influenced policy, practice and behaviours. Around 20,000 pieces of coverage have been generated per year across print, online and broadcast media during the assessment period.

Our 14 Centres have played an important part in achieving impact, ensuring our impact case studies benefited from shared expertise and external networks. Centres also supported communication of research findings, enhanced links with users and the public and interacted with stakeholders, including parliamentary select committees and all-party parliamentary groups.

We have further strengthened our systems for encouraging and assisting staff to achieve impact in the following ways:

- Research dissemination activities and seeking policy and practice impact are explicit expectations in our promotion criteria, developed in 2015.
- HR policies support staff to be based overseas, where they can interact closely with local research users. 95 submitted staff are based overseas.

Mechanisms which help build long-term relationships with research users

Opportunities for shared appointments have allowed academics to play an active role in organisations including PHE, FCDO, UNAIDS and WHO. We have supported policymakers and government bodies through specific advisory roles in the UK and internationally and have partnered with professional and implementing agencies – including the Royal Colleges of Surgeons, and Obstetricians and Gynaecologists, and NGOs such as Médecins sans Frontières – to embed research within their activities.

All these mechanisms ensure we are aware of, able to influence and ready to respond to national and global research priorities. Many alumni also hold influential positions in global health – for example, at WHO – further helping us connect with research users.

Activities relating to specific research projects and programmes

Our teams have actively engaged research users at all stages of their work. We regard and encourage this as standard practice.

LSHTM staff include academics recognised worldwide as pioneers in their areas of expertise. We combine top-quality research programmes with global advocacy to change policy and practice, aided by specialist communications experts for dissemination plans, strategies and policy briefs.

The creation in 2016 of UK-PHRST further increased our capacity for impact. It has been deployed to assist in tackling outbreaks of infectious diseases including meningitis, Lassa fever, Ebola and COVID-19.

Influencing future decision-makers through teaching

The close alignment of our research expertise and education programmes means students are taught by world-leading experts and exposed to cutting-edge knowledge. Our PhD programmes

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focus entirely on our research, and we offer a Doctorate in Public Health for current and future health leaders.

We also offer a portfolio of short courses and, since 2015, MOOCs. The latter, led by eminent researchers who translate their expertise into appropriate learning materials, have reached over 400,000 individuals since 2017.

2.3. Interdisciplinary research

Our Centres are key mechanisms for developing interdisciplinary research in strategic priority areas. All those below – whether focused on a disease, a programme or a development challenge – explicitly engage with and integrate the various disciplines that could contribute.



2.4. Open research environment

Principles of open research are instilled in researchers at all levels, supported by our Library and Archives Service. Our 2017 Open Access Policy mandated open-access for all research outputs.

Our research data management service offers in-depth advice about data management plans, ethics and legal issues and maintains our Data Compass repository, which held over a thousand datasets by 2020.

In the 2020 CWTS Leiden Ranking indicators for all sciences, 90.7% of our publications were open-access, ranking us second in the UK and third in the world for this indicator.

2.5. Research integrity

A Research Governance Committee was established in 2013 to strengthen oversight of our responsibilities and obligations, including as a sponsor of health-related research. Underpinned by a Good Research Practice policy aligned with the Concordat to Support Research Integrity, our Research Governance and Integrity Office ensures accordance with good practice, professional frameworks and relevant legislation in all countries where we work; it also regularly audits clinical trials, projects involving human tissue and tissue storage facilities to ensure compliance with study protocols, regulations and LSHTM policies.

International projects must receive approval from the relevant country's ethics committee; clinical trials of investigational medicinal products or medical devices must also receive approval from the relevant regulatory authority. The MRC Units have their own ethics review processes, with projects fast-tracked through LSHTM's overarching committees.

Ethics committees were reviewed and updated to meet increased demands (submissions rose by 76% between 2014 and 2019). A Commercialisation and Rapid Response Committee was established to review research with quick turnaround times.

2.6. Partnerships, collaborations and engagement with wider community through research

LSHTM's research collaborations span the world. The 2020 CWTS Leiden Ranking for all sciences placed us first in the UK and ninth globally for proportion of papers published in collaboration with other institutions (95%) and first in the UK and seventh globally for proportion published with researchers outside the UK (78.3%). InCites data show we collaborated between 2014 and 2020 on over 10 publications each with institutions across Africa (118 institutions), the Middle East (74), Asia Pacific (295), Latin America (66), North America (319), the EU (420) and the UK (167).

We have developed many productive and valuable links within the UK. Our partnerships encompass government, the NHS, PHE, local authorities, charities and industry.

2.7. Plans for next five years

A new Director will take office in August 2021. At that point we will engage in a wide-ranging strategy review and development process.

Despite the impact of COVID-19, a challenging funding landscape, Brexit, shifting priorities in human health and the emergence of new threats, we face great opportunities. Our aspiration is to further strengthen LSHTM's role as a global centre of excellence that leads innovative research, translates it into improved health and trains the next generations of researchers and public health leaders.

Our strategic priorities will continue in the areas of infectious diseases, chronic conditions and diseases, health systems, economics and policy, and the environment. We will expand work on pandemic preparedness and climate change's health impacts; strengthen efforts to ensure collaborations are based on equity and mutual respect; and build on the MRC Units' successes to date.

Tackling discrimination and inequalities in all their forms will be a key priority. A proactive approach to improving diversity and inclusion will remain integral to everything we do.

3. People

3.1. Staff development

LSHTM is a signatory to the Concordat to Support the Career Development of Researchers. We were awarded the EU HR Excellence in Research Award in 2019 and established a Research Staff Forum to support the delivery of planned activities.

The Talent and Educational Development (TED) team and the Strategic Research Office (SRO) oversee researchers' career development. TED is responsible for professional development and opportunities to improve skills and capabilities. SRO provides comprehensive support with funding applications, particularly for early/mid-career researchers.

In 2015 we introduced Expectations for Academic Staff, retaining LSHTM's traditional structure of academic work – knowledge generation, education, internal contributions and external contributions – but setting criteria for performance at each grade and in each category. We adopted the terminology of Assistant Professor and Associate Professor, introduced Professorial bands to ensure fair pay and expectations at each career stage and explicitly described how personal circumstances – including clinical practice, overseas location and characteristics protected in law – would be taken into account. Our annual Performance and Development Review includes an analysis of whether objectives have been met and agrees goals and development activities for the coming year.

We run an in-house Mentoring Programme, open to all staff. It was evaluated and relaunched in 2018 and is complemented by mentoring arrangements in research groups and Departments.

3.2. Staffing strategy

A key aim of our 2017-2022 strategy was 'to recruit, develop and retain outstanding and diverse researchers and educators who produce excellent science and can influence the public and global health agenda, providing equal opportunity for progression'. Joint appointments have been used to cement our network of national and international partnerships and to build work in areas of common interest.

LSHTM's Recruitment and Selection Procedures ensure a fair and transparent staff selection process. To match our expectations for academic staff and provide a standard framework, job description templates have been created for all academic roles.

LSHTM continually recruits junior researchers. Our promotion processes ensure recognition of their achievements and growing professional maturity. Promotion cycle procedures and outcomes, including statistics on applications and outcomes by gender and ethnicity, are reviewed annually.

In 2014 LSHTM largely eliminated fixed-term contracts for Professors. Our Fixed-Term Contracts Policy was revised and updated in 2016, with all staff at Associate Professor level and above reviewed for transfer to permanent contracts the following year.

3.3. Support to early-career researchers (ECRs)

SRO and TED support for ECRs includes funding proposal reviews, facilitation of external research/policy links and targeted training. SRO, TED and the Careers Service all support staff with career options outside academia.

Research Assistants and Research Fellows without a PhD can register for a doctorate at a highly reduced rate. All ECRs can access our MSc modules and in-house TED programme.

In 2018, using LSHTM's Wellcome-funded Institutional Strategic Support Fund, we initiated a biennial fellowship scheme to support researchers at the crucial mid-career transition point. In

2019 we set up an Early-Career Researcher Network to aid career development and provide networking and training opportunities.

As well as sharing in these initiatives, the MRC Units have their own longstanding ECR support systems. In 2016 MRCG created a new department that builds the human resources required for world-class research in sub-Saharan Africa; MRCU has similarly strong capacity-strengthening programmes.

3.4. Research students

As an exclusively postgraduate institution with a research-active community, LSHTM provides a fertile environment for doctoral study.

We have doctoral students from 70 countries. Staff undertaking PhDs made up 24% of the doctoral student body in 2019-2020. In 2019 a PhD-by-publication route was introduced to enable researchers with significant research experience to submit a PhD within six to 18 months, based on work already completed.

To ensure fair recruitment, all funded studentships are advertised. Our Capacity-Strengthening Research Degree Scheme provides subsidised fees for low-income-country students employed by 15 major overseas partners. MRC Unit staff have accessed LSHTM doctoral degrees at discounted rates since 2018.

We were members of UKRI and Wellcome Doctoral Training Programmes during the assessment period. Other funding included individual scholarships awarded by National Institute for Health Research, national governments and charities. We also support the development of doctoral training overseas and partner in seven capacity-strengthening consortia supported by Wellcome's Developing Excellence in Leadership, Training and Science Africa programme.

Since 2018 a Doctoral College has coordinated our extensive transferable skills training programme and technical courses, enabling students to acquire abilities listed in Vitae's Researcher Development Framework. Doctoral students are considered full members of academic departments, invited to meetings and seminars and encouraged to join Centres – most of which have student representatives.

3.5. Equality and diversity

Our Equality, Diversity and Inclusion (EDI) Strategy 2016-2019 detailed our vision 'to embrace and value the diversity of the staff and student population and to embed equality and diversity activities as an essential element in enhancing our contribution to the improvement of health worldwide'.

In 2019, following a series of staff surveys, we developed a framework for enhancing leadership, values, culture and staff wellbeing. In 2020, in parallel with this process, staff's growing engagement with Decolonising Global Health (DGH) and Black Lives Matter (BLM) networks underlined the importance of keeping EDI at the heart of everything we do.

LSHTM has acknowledged its colonial origins and in 2018 funded archival research to explore its colonial legacies. All staff are required to undergo mandatory EDI training, and progressing race equality is a key focus of our new EDI action plan.

We have a structured, single career path for academic staff, progressing from Research Assistant to Professor. The promotions process runs annually, and anyone – regardless of FTE and length of contract – can apply. Staff promotion committees and recruitment panels are required to have diverse membership.

29% of Research Assistants identified as BME in 2020. This decreased to 15% at Professorial level. Although there was an increase in BME staff at all grades between 2015 and 2020, we are seeking further improvement. Recruitment data show white applicants were more likely to be

appointed than BME applicants, and analysis by grade shows fewer BME applicants for higher academic grades. The School has signed up to Race Equality Charter self-assessment.

We reformed our EDI Committee in 2020. In developing its action plan we have drawn on progress against our previous strategy, staff surveys and follow-up activities, DGH and BLM testimony, Athena SWAN submissions, external focus groups and data analysis.

LSHTM's institutional Athena SWAN bronze award was renewed in 2018. PHP's silver award was renewed in 2018, and ITD's and EPH's bronze awards were renewed in 2018 and 2019 respectively. Various activities supporting female career progression have improved gender distribution during the assessment period. The 2020 CWTS Leiden Ranking for all sciences named LSHTM the UK's top university in all sciences for the proportion of academic research with women listed as authors (48.1%). LSHTM offers a range of support and cover for parental and adoption leave and has a maternity return rate of 92% for academics (sector benchmark: 88%).

Our policies and practices have always supported flexible working arrangements. These have been developed further in light of remote working during the COVID-19 outbreak. A June 2020 survey reported 90% satisfaction with support from line management, as well as increased trust and collegiality, during the pandemic.

We are a Stonewall diversity champion, committed to supporting LGBT staff. The School is also a Disability Confident Employer. In 2017 LSHTM achieved the London Healthy Workplace Charter Award and signed the Time to Change Pledge, which recognised our action plan to end mental health discrimination in the workplace. We have set up networks of staff volunteer Mental Health Champions and Mental Health First Aiders.

Our Wellbeing and EDI Committees have developed an annual Wellbeing Week. The LSHTM community also devised numerous wellbeing resources, including a Microsoft Teams site for parents and carers, during the COVID-19 outbreak. An online Report & Support tool was launched in 2020, enabling staff and students to report bullying or harassment.

3.6. REF Code of Practice

Our Code of Practice was drafted to ensure an inclusive process. This enabled us to identify all independent researchers and the outputs produced by Category A eligible staff across all protected groups and with individual circumstances that may have constrained their ability to undertake research during the REF period.

A mock REF for outputs was conducted, with the scoring profile and number of outputs allocated to all submitted staff compared with the equality profile to determine whether the outputs from any groups with protected characteristics were underrepresented. Analysis of the submitted outputs by gender, ethnicity and disability demonstrated no evidence of underrepresentation.

4. Income, infrastructure and facilities

4.1. Institutional infrastructure supporting research and impact

Research is housed across LSHTM's Tavistock Place (PHP) and Keppel Street (EPH, ITD) sites in London; MRCG's three campuses in Fajara, Basse and Keneba; and MRCU's facilities at the Ministry of Health's Uganda Virus Research Institute (UVRI) campus in Entebbe.

In 2017 the School's Council agreed a £62.2m capital programme, including a new building at Tavistock Place, laboratory refurbishment at Keppel Street and completion of ongoing building projects at both Units. Environmental sustainability and access for all are major objectives of the programme and throughout our operations.

We developed our institutional departments and teams supporting research and impact in the following ways:

- Establishing the SRO in 2015 to support academics in securing funding and to manage institutional income and grants
- Investing in the Research Operations Office, which manages our external research funding portfolio
- Enhancing research's wider reach through investment in our Communications & Engagement Department
- Developing an inclusive strategy to embed and facilitate public engagement across the School
- Consolidating support for Centres via a centrally funded team

Chariot Innovations Ltd was established in 2013 to manage commercial activities resulting from LSHTM research and provide an incubator for spin-out companies. We have enhanced support for translational research by recruiting an Intellectual Property Manager and a dedicated SRO staff member.

Our Library has extensive collections of print and electronic material and is responsible for the open-access repositories of our research outputs (LSHTM Research Online) and data (LSHTM Data Compass).

During the assessment period we have established secure facilities to support increased use of large routine datasets. Researchers embarking on a study store data in accordance with licence agreements with collectors and processors.

The Units expanded our specialist infrastructure and facilities. MRCG's research is underpinned by excellent laboratories, access to field sites, clinical services and GCP-compliant clinical trials delivery. MRCU includes clinics and laboratories, with field stations hosting studies and staff. Both Units run high-performance computing clusters.

4.2. Shared or collaborative use of research infrastructure or major facilities

Creating and consolidating strong partnerships is a strategic priority for 2017-2022. The Deputy Director and Provost has overall responsibility, supported by a Partnerships Officer. A Special Adviser on Overseas Programmes in Africa provides oversight of our African partnerships.

Our shared research facilities in Africa stem from capacity-strengthening efforts that have developed into significant research programmes. In 2019 we reviewed our African partnerships to consolidate key relationships and enhance regional connections.

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- *Ethiopia*: The Ethiopian Public Health Institute and the Armauer Hansen Research Institute, under the Federal Ministry of Health, are key partners for various projects.
- *Malawi*: The Malawi Epidemiology and Intervention Research Unit is a partnership with the Malawi College of Medicine and the Malawi Ministry of Health.
- *Tanzania*: The Mwanza Interventions Trials Unit is a partnership with the Tanzania National Institute for Medical Research Mwanza Centre.
- *Uganda*: UVRI is a key MRCU partner.
- *Zambia*: Zambart is a research organisation that grew out of a 20-year collaboration with the University of Zambia's School of Medicine.
- *Zimbabwe*: The Biomedical Research and Training Institute is an NGO and a key partner in the Zimbabwe LSHTM Research Partnership.

We had significant growth in Asian partnerships during the assessment period, including:

- A new shared research resource with Nagasaki University, Japan, to support the Nagasaki School of Tropical Medicine and Global Health provided LSHTM researchers with access to research opportunities in the region
- A partnership with the National University of Singapore's three health sciences faculties, managed through the National University Health System
- An ongoing partnership with the Public Health Foundation of India, including collaboration on two joint centres

LSHTM is a key member of the London International Development Centre, alongside SOAS, the Royal Veterinary College and UCL's Institute of Education. With UCL, Imperial College, Queen Mary University and King's College, we are also a member of Health Data Research London, which enables access to large-scale data and develops advanced analytics to provide transformative health benefits.